
**DRAFT COMPREHENSIVE CONSERVATION PLAN
AND ENVIRONMENTAL ASSESSMENT**

PIEDMONT NATIONAL WILDLIFE REFUGE

Jones and Jasper Counties, Georgia

**U.S. Department of the Interior
Fish and Wildlife Service**

Southeast Region
Atlanta, Georgia

May 2010

TABLE OF CONTENTS

SECTION A. DRAFT COMPREHENSIVE CONSERVATION PLAN

I. BACKGROUND.....	1
Introduction.....	1
Purpose And Need For The Plan	1
Fish and Wildlife Service	1
National Wildlife Refuge System	2
Legal and Policy Context.....	4
National and International Conservation Plans and Initiatives	5
Relationship To State Wildlife Agency.....	6
II. REFUGE OVERVIEW.....	9
Introduction.....	9
Refuge History and Purpose	10
Special Designations	14
Ecosystem Context.....	16
Regional Conservation Plans and Initiatives	17
Ecological Threats and Problems	20
Physical Resources	22
Climate	22
Geology and Topography.....	24
Soils	24
Hydrology and water quality	25
Air Quality.....	27
Biological Resources	28
Habitat.....	28
Wildlife.....	32
Cultural Resources	37
Socioeconomic Environment	39
Land Protection and Conservation.....	39
Visitor Services	40
Personnel, Operations, and Maintenance.....	43
III. PLAN DEVELOPMENT	45
Summary of Issues, Concerns, and Opportunities	45
Fish and Wildlife Population Management.....	47
Habitat Management.....	49
Resource Protection.....	52
Visitor Services	52
Refuge Administration.....	53
IV. MANAGEMENT DIRECTION.....	55
Introduction.....	55
Vision.....	56
Goals, Objectives, and Strategies	56
Fish and Wildlife Population Management.....	56
Habitat Management.....	62

Visitor Services	68
Resource Protection	70
Refuge Administration	73
V. PLAN IMPLEMENTATION	77
Introduction	77
Proposed Projects	77
Fish and wildlife population management.....	77
habitat management.....	78
Visitor Services	80
Resource Protection	82
Climate change.....	83
Refuge Administration	83
Funding and Personnel.....	84
Partnership/Volunteers Opportunities	84
Step-Down Management Plans.....	85
Monitoring and Adaptive Management.....	85
Plan Review and Revision.....	88
SECTION B. ENVIRONMENTAL ASSESSMENT	
I. BACKGROUND	89
Introduction	89
Purpose and Need for Action	89
Decision Framework.....	90
Planning Study Area	90
Authority, Legal Compliance, and Compatibility.....	90
Compatibility	90
Public Involvement and the Planning Process	91
II. AFFECTED ENVIRONMENT	93
III. DESCRIPTION OF ALTERNATIVES.....	95
Formulation of Alternatives.....	95
Description of Alternatives.....	95
Alternative A - (Current Management - No Action)	95
Alternative B – (Wildlife and habitate diversity - Proposed Alternative)	97
Alternative C - (Migratory Birds).....	99
Features Common to all Alternatives	103
Comparison of the Alternatives by Issue.....	105
Alternatives Considered But Eliminated From Further Analysis.....	124
IV. ENVIRONMENTAL CONSEQUENCES	125
Overview	125
Effects Common to All Alternatives	125
Environmental Justice.....	125
Climate Change	125
Other Management.....	126
Land Acquisition	126

Cultural Resources.....	126
Refuge Revenue-Sharing.....	127
Other Effects	127
Summary of Effects by Alternative	127
Alternative A - (Current Management - No Action)	127
Alternative B – (Wildlife and habitate diversity - Proposed Alternative)	128
Alternative C - (Migratory Birds).....	129
Alternative D - (RARE, THREATENED, AND ENDANGERED SPECIES)	130
Unavoidable Impacts and Mitigation Measures.....	146
Water Quality from Soil Disturbance and Use of Herbicides.....	146
Wildlife Disturbance	146
Vegetation Disturbance.....	147
User Group Conflicts.....	147
Effects on Adjacent Landowners.....	147
Land Ownership and Site Development.....	147
Cumulative Impacts	148
Direct and Indirect Effects or Impacts.....	150
Short-term Uses versus Long-term Productivity.....	150
V. CONSULTATION AND COORDINATION	151
Overview.....	151
APPENDICES	
APPENDIX A. GLOSSARY.....	155
APPENDIX B. REFERENCES AND LITERATURE CITATIONS.....	165
APPENDIX C. RELEVANT LEGAL MANDATES AND EXECUTIVE ORDERS.....	175
APPENDIX D. PUBLIC INVOLVEMENT	189
Summary Of Public Scoping Comments	189
APPENDIX E. APPROPRIATE USE DETERMINATIONS.....	209
APPENDIX F. COMPATIBILITY DETERMINATIONS	221
APPENDIX G. INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION	249
APPENDIX H. WILDERNESS REVIEW.....	253
APPENDIX I. REFUGE BIOTA	255
APPENDIX J. BUDGET REQUESTS.....	271
Refuge Operating Needs System (RONS).....	271
Maintenance Management System Needs.....	272
APPENDIX K. LIST OF PREPARERS.....	273

LIST OF FIGURES

Figure 1. Piedmont National Wildlife Refuge	11
Figure 2. Erosion on the Georgia Piedmont, on what is now Piedmont National Wildlife Refuge. Photographs from Piedmont Refuge files: Erosion due to farming and 1921 gully.	15
Figure 3. Bailey's Ecoregions	18
Figure 4. Non-attainment Areas.....	29
Figure 5. Land Cover Types – Piedmont National Wildlife Refuge, 2008.....	33
Figure 6. Double Brick Chimney	38
Figure 7. Proposed Organizational Staffing Chart.	86

LIST OF TABLES

Table 1. Climatological normals for the years 1971-2000 from the National Weather Service station at the Macon, GA Airport.....	23
Table 2. Forest Types, SAF Forest Cover Types, and NVCS Alliances that occur on the refuge.....	34
Table 3. Hunting and fishing opportunities available in 2009 – 2010	41
Table 4. Summary of projects.....	87
Table 5. Refuge National Wildlife Refuge step-down management plans related to the goals and objectives of the comprehensive conservation plan	88
Table 6. Comparison of alternatives by management issues for Piedmont National Wildlife Refuge.....	105
Table 7. Summary of environmental effects by alternative, Piedmont National Wildlife Refuge	132

SECTION A. DRAFT COMPREHENSIVE CONSERVATION PLAN

I. Background

INTRODUCTION

This Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA) for Piedmont National Wildlife Refuge (NWR) was prepared to guide management actions and direction for the refuge. Fish and wildlife conservation will receive first priority in refuge management; wildlife-dependent recreation will be allowed and encouraged as long as it is compatible with, and does not detract from, the mission of the refuge or the purposes for which it was established.

A planning team developed a range of alternatives that best met the goals and objectives of the refuge and that could be implemented within the 15-year planning period. This Draft CCP/EA describes the Fish and Wildlife Service's (Service) proposed plan, as well as other alternatives considered and their effects on the environment. The Draft CCP/EA will be made available to state and federal government agencies, non-governmental organizations, conservation partners, and the general public for review and comment. Comments from each entity will be considered in the development of the final CCP.

PURPOSE AND NEED FOR THE PLAN

The purpose of the Draft CCP/EA is to develop a proposed action that best achieves the refuge purpose; attains the vision and goals developed for the refuge; contributes to National Wildlife Refuge System (Refuge System) mission; addresses key problems, issues and relevant mandates; and is consistent with sound principles of fish and wildlife management.

Specifically, the plan is needed to:

- Provide a clear statement of refuge management direction;
- Provide refuge neighbors, visitors, and government officials with an understanding of Service management actions on and around the refuge;
- Ensure that Service management actions, including land protection and recreation/education programs, are consistent with the mandates of the Refuge System; and
- Provide a basis for the development of budget requests for operations, maintenance, and capital improvement needs.

U.S. FISH AND WILDLIFE SERVICE

The Service traces its roots to 1871 and the establishment of the Commission of Fisheries involved with research and fish culture. The once independent commission was renamed the Bureau of Fisheries and placed under the Department of Commerce and Labor in 1903.

The Service also traces its roots to 1886 and the establishment of a Division of Economic Ornithology and Mammalogy in the Department of Agriculture. Research on the relationship of birds and animals to agriculture shifted to delineation of the range of plants and animals so the name was changed to the Division of the Biological Survey in 1896.

The Department of Commerce, Bureau of Fisheries, was combined with the Department of Agriculture, Bureau of Biological Survey, on June 30, 1940, and transferred to the Department of the Interior as the Fish and Wildlife Service. The name was changed to the Bureau of Sport Fisheries and Wildlife in 1956 and finally to the Fish and Wildlife Service in 1974.

The Service, working with others, is responsible for conserving, protecting, and enhancing fish and wildlife and their habitats for the continuing benefit of the American people through Federal programs relating to migratory birds, endangered species, interjurisdictional fish and marine mammals, and inland sport fisheries (142 DM 1.1).

As part of its mission, the Service manages more than 540 national wildlife refuges covering over 95 million acres. These areas comprise the National Wildlife Refuge System, the world's largest collection of lands set aside specifically for fish and wildlife. The majority of these lands, 77 million acres, is in Alaska. The remaining acres are spread across the other 49 states and several United States territories. In addition to refuges, the Service manages thousands of small wetlands, national fish hatcheries, 64 fishery resource offices, and 78 ecological services field stations. The Service enforces federal wildlife laws, administers the Endangered Species Act, manages migratory bird populations, restores nationally significant fisheries, conserves and restores wildlife habitat, and helps foreign governments with their conservation efforts. It also oversees the Federal Aid program that distributes hundreds of millions of dollars in excise taxes on fishing and hunting equipment to state fish and wildlife agencies.

NATIONAL WILDLIFE REFUGE SYSTEM

The mission of the Refuge System, as defined by the National Wildlife Refuge System Improvement Act of 1997 is:

“...to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.”

The National Wildlife Refuge System Improvement Act of 1997 (Improvement Act) established, for the first time, a clear legislative mission of wildlife conservation for the Refuge System. Actions were initiated in 1997 to comply with the direction of this new legislation, including an effort to complete comprehensive conservation plans for all refuges. These plans, which are completed with full public involvement, help guide the future management of refuges by establishing natural resources and recreation/education programs. Consistent with the Improvement Act, approved plans will serve as the guidelines for refuge management for the next 15 years. The Improvement Act states that each refuge shall be managed to:

- Fulfill the mission of the Refuge System;
- Fulfill the individual purposes of each refuge;
- Consider the needs of wildlife first;
- Fulfill requirements of comprehensive conservation plans that are prepared for each unit of the Refuge System;
- Maintain the biological integrity, diversity, and environmental health of the Refuge System; and

-
- Recognize that wildlife-dependent recreation activities including hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation are legitimate and priority public uses; and allow refuge managers authority to determine compatible public uses.

The following are just a few examples of your national network of conservation lands. Pelican Island National Wildlife Refuge, the first refuge, was established in 1903 for the protection of colonial nesting birds in Florida, such as the snowy egret and the brown pelican. Western refuges were established for American bison (1906), elk (1912), prong-horned antelope (1931), and desert bighorn sheep (1936) after over-hunting, competition with cattle, and natural disasters decimated once-abundant herds. The drought conditions of the 1930s Dust Bowl severely depleted breeding populations of ducks and geese. Refuges established during the Great Depression focused on waterfowl production areas (i.e., protection of prairie wetlands in America's heartland). The emphasis on waterfowl continues today but also includes protection of wintering habitat in response to a dramatic loss of bottomland hardwoods. By 1973, the Service had begun to focus on establishing refuges for endangered species.

As the number of Americans that engage in wildlife-associated recreation grows, there are significant economic benefits to local communities. In 2006, 87.5 million Americans, 16 years and older, fished, hunted, and observed wildlife, generating more than \$122 billion (USFWS 2006)

Recreational visits to national wildlife refuges are an important component of this economic activity. In FY 2006, 34.8 million people visited refuges in the lower 48 states for recreation, mostly to observe wildlife in their natural habitats. Their spending generated almost \$1.7 billion of sales in regional economies. As this spending flowed through the economy, nearly 27,000 people were employed and \$542.8 million in employment income was generated. About 82 percent of total expenditures are generated by non-consumptive activities on refuges. Fishing accounted for 12 percent and hunting 6 percent. Local residents accounted for 13 percent of expenditures while visitors coming from outside the local area accounted for 87 percent. Refuge recreational spending generated about \$185.3 million in tax revenue at the local, county, state and federal level. (Carver and Caudill 2007)

In a study completed in 2002 on 15 refuges, visitation had grown 36 percent in seven years. At the same time, the number of jobs generated in surrounding communities grew to 120 per refuge, up from 87 jobs in 1995, pouring more than \$2.2 million into local economies. The 15 refuges in the study were Chincoteague (Virginia); National Elk (Wyoming); Crab Orchard (Illinois); Eufaula (Alabama); Charles M. Russell (Montana); Umatilla (Oregon); Quivira (Kansas); Mattamuskeet (North Carolina); Upper Souris (North Dakota); San Francisco Bay (California); Laguna Atacosa (Texas); Horicon (Wisconsin); Las Vegas (Nevada); Tule Lake (California); and Tensas River (Louisiana) -- the same refuges identified for the 1995 study. Other findings also validate the belief that communities near refuges benefit economically. Expenditures on food, lodging, and transportation grew to \$6.8 million per refuge, up 31 percent from \$5.2 million in 1995. For each dollar spent on the Refuge System, surrounding communities benefited with \$4.43 in recreation expenditures and \$1.42 in job-related income (Caudill and Laughland 2003).

Volunteers continue to be a major contributor to the success of the Refuge System. In 2002, volunteers contributed more than 1.5 million hours on refuges nationwide, a service valued at more than \$22 million.

The wildlife and habitat vision for national wildlife refuges stresses that wildlife comes first; that ecosystems, biodiversity, and wilderness are vital concepts in refuge management; that refuges must be healthy and growth must be strategic; and that the Refuge System serves as a model for habitat management with broad participation from others.

The Improvement Act stipulates that comprehensive conservation plans be prepared in consultation with adjoining federal, state, and private landowners and that the Service develop and implement a process to ensure an opportunity for active public involvement in the preparation and revision (every 15 years) of the plans.

All lands of the Refuge System will be managed in accordance with an approved comprehensive conservation plan that will guide management decisions and set forth strategies for achieving refuge unit purposes. The plan will be consistent with sound resource management principles, practices, and legal mandates, including Service compatibility standards and other Service policies, guidelines, and planning documents (602 FW 1.1).

LEGAL AND POLICY CONTEXT

Legal Mandates, Administrative and Policy Guidelines, and Other Special Considerations

Administration of national wildlife refuges is guided by the mission and goals of the Refuge System, congressional legislation, presidential executive orders, and international treaties. Policies for management options of refuges are further refined by administrative guidelines established by the Secretary of the Interior and by policy guidelines established by the Director of the Fish and Wildlife Service. Select legal summaries of treaties and laws relevant to administration of the Refuge System and management of the Piedmont NWR are provided in Appendix C.

Treaties, laws, administrative guidelines, and policy guidelines assist the refuge manager in making decisions pertaining to soil, water, air, flora, fauna, and other natural resources; historical and cultural resources; research and recreation on refuge lands; and provide a framework for cooperation between Piedmont NWR and other partners, such as the Georgia Forestry Commission, Georgia Department of Natural Resources, USDA Forest Service – Oconee Ranger District and Hitchiti Experimental Forest, The Southern Company, National Wild Turkey Federation, and private landowners, etc.

Lands within the Refuge System are closed to public use unless specifically and legally opened. No refuge use may be allowed unless it is determined to be compatible. A compatible use is a use that, in the sound professional judgment of the refuge manager, will not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuge. All programs and uses must be evaluated based on mandates set forth in the Improvement Act. Those mandates are to:

- Contribute to ecosystem goals, as well as refuge purposes and goals;
- Conserve, manage, and restore fish, wildlife, and plant resources and their habitats;
- Monitor the trends of fish, wildlife, and plants;
- Manage and ensure appropriate visitor uses as those uses benefit the conservation of fish and wildlife resources and contribute to the enjoyment of the public; and
- Ensure that visitor activities are compatible with refuge purposes.

The Improvement Act further identifies six priority wildlife-dependent recreational uses. These uses are: hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation. As priority public uses of the Refuge System they receive priority consideration over other public uses in planning and management.

Biological Integrity, Diversity, and Environmental Health Policy

The Improvement Act directs the Service to ensure that the biological integrity, diversity, and environmental health of the Refuge System are maintained for the benefit of present and future generations of Americans. The policy is an additional directive for refuge managers to follow while achieving refuge purpose(s) and the Refuge System mission. It provides for the consideration and protection of the broad spectrum of fish, wildlife, and habitat resources found on refuges and associated ecosystems. When evaluating the appropriate management direction for refuges, refuge managers will use sound professional judgment to determine their refuges' contribution to biological integrity, diversity, and environmental health at multiple landscape scales. Sound professional judgment incorporates field experience, knowledge of refuge resources, and the refuge's role within an ecosystem, applicable laws, and best available science, including consultation with others both inside and outside the Service.

NATIONAL AND INTERNATIONAL CONSERVATION PLANS AND INITIATIVES

Multiple partnerships have been developed among government and private entities to address the environmental problems affecting regions. There is a large amount of conservation and protection information that defines the role of the refuge at the local, national, international, and ecosystem levels. Conservation initiatives include broad-scale planning and cooperation between affected parties to address declining trends of natural, physical, social, and economic environments. The conservation guidance described below, along with issues, problems, and trends, was reviewed and integrated where appropriate into this Draft CCP/EA.

North American Bird Conservation Initiative. Started in 1999, the North American Bird Conservation Initiative is a coalition of government agencies, private organizations, academic institutions, and private industry leaders in the United States, Canada, and Mexico working to ensure the long-term health of North America's native bird populations by fostering an integrated approach to bird conservation to benefit all birds in all habitats. The four international and national bird initiatives include the North American Waterfowl Management Plan, Partners-in-Flight, Waterbird Conservation for the Americas, and the U.S. Shorebird Conservation Plan.

North American Waterfowl Management Plan. The North American Waterfowl Management Plan is an international action plan to conserve migratory birds throughout the continent. The plan's goal is to return waterfowl populations to their 1970s levels by conserving wetland and upland habitat. Canada and the United States signed the plan in 1986 in reaction to critically low numbers of waterfowl. Mexico joined in 1994, making it a truly continental effort. The plan is a partnership of federal, provincial/state and municipal governments, non-governmental organizations, private companies, and many individuals, all working towards achieving better wetland habitat for the benefit of migratory birds, other wetland-associated species and people. Plan projects are international in scope, but implemented at regional levels. These projects contribute to the protection of habitat and wildlife species across the North American landscape.

Partners-in-Flight Bird Conservation Plan. Managed as part of the Partners-in-Flight Plan, the Southern Piedmont physiographic area represents a scientifically based land bird conservation planning effort that ensures long-term maintenance of healthy populations of native land birds, primarily non-game land birds. Non-game land birds have been vastly under-represented in conservation efforts, and many are exhibiting significant declines. This plan is voluntary and non-regulatory, and focuses on relatively common species in areas where conservation actions can be most effective, rather than the frequent local emphasis on rare and peripheral populations.

U.S. Shorebird Conservation Plan. The U.S. Shorebird Conservation Plan is a partnership effort throughout the United States to ensure that stable and self-sustaining populations of shorebird species are restored and protected. The plan was developed by a wide range of agencies, organizations, and shorebird experts for separate regions of the country, and identifies conservation goals, critical habitat conservation needs, key research needs, and proposed education and outreach programs to increase awareness of shorebirds and the threats they face.

Northern American Waterbird Conservation Plan. This plan provides a framework for the conservation and management of 210 species of waterbirds in 29 nations. Threats to waterbird populations include destruction of inland and coastal wetlands, introduced predators and invasive species, pollutants, mortality from fisheries and industries, disturbance, and conflicts arising from abundant species. Particularly important habitats of the southeast region include pelagic areas, marshes, forested wetlands, and barrier and sea island complexes. Fifteen species of waterbirds are federally listed, including breeding populations of wood storks, Mississippi sandhill cranes, whooping cranes, interior least terns, and Gulf Coast populations of brown pelicans. A key objective of this plan is the standardization of data collection efforts to better recommend effective conservation measures.

RELATIONSHIP TO STATE WILDLIFE AGENCY

A provision of the Improvement Act, and subsequent agency policy, is that the Service shall ensure timely and effective cooperation and collaboration with other state fish and game agencies and tribal governments during the course of acquiring and managing refuges. State wildlife management areas and national wildlife refuges provide the foundation for the protection of species, and contribute to the overall health and sustainment of fish and wildlife species in the State of Georgia.

The Georgia Department of Natural Resources, Wildlife Resources Division (WRD), provides management and protection for the state's fish and wildlife resources through conservation enforcement officers in each county statewide and through fisheries and wildlife biologists. The Department's major goal is to promote stewardship and enjoyment of Georgia's natural resources, both for present and future generations. It is responsible for freshwater fish, wildlife, marine resources, waterway safety, state lands, state parks, and other natural resources. The WRD manages 90 wildlife management areas on approximately 1 million acres, public fishing areas, and natural areas. The Georgia State Parks and Historic Sites (GASPHS) are charged with managing state park lands and historic sites. The GASPHS manages 63 state and historic parks on more than 800,000 acres of land. Additionally, the state agencies provide and direct public recreation opportunities, including extensive hunting and fishing programs on wildlife management areas and parks.

The state's participation and contribution throughout this planning process will provide for ongoing opportunities and open dialogue to improve the ecological sustainment of fish and wildlife in the State of Georgia. An essential part of comprehensive conservation planning is integrating common mission objectives where appropriate.

II. Refuge Overview

INTRODUCTION

Piedmont NWR is one of 548 refuges which comprise the Refuge System. The mission of the Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans. Within this context, the following general objectives were established for Piedmont NWR:

- Conserve, protect, reestablish, and manage for threatened and endangered wildlife;
- Conserve and manage migratory birds and their habitats;
- Conserve and manage native wildlife and their habitats; and
- Provide compatible wildlife dependent recreational and educational opportunities for the public.

The Improvement Act establishes that wildlife conservation is the first and foremost component of the mission of the Refuge System. Further, it establishes the following goals for the Refuge system, which provides a broader context for the conservation role of Piedmont NWR:

- Fulfill statutory duty to achieve refuge purpose(s) and further the Refuge System mission;
- Conserve, restore, and enhance all species of fish, wildlife, and plants that are endangered or threatened with becoming endangered;
- Perpetuate migratory bird, inter-jurisdictional fish, and marine mammal populations;
- Conserve the diversity of fish, wildlife, and plants;
- Conserve and restore representative ecosystems of the United States, including the ecological processes characteristic of those ecosystems; and
- Foster understanding and instill appreciation of fish, wildlife, and plants, and their conservation, by providing safe, quality, and compatible wildlife-dependent public use.

Development of the Piedmont NWR Draft CCP/EA was initiated in November 2007 and is scheduled for completion in 2010. This Draft CCP/EA contains concepts to guide further development and implementation of land use and management programs and associated facilities and management structures for the next 15 years. Consideration of the refuge's physical, biological, and cultural resources, along with the socioeconomic environment and refuge management and administration, are taken into account and analyzed to produce an overview of the refuge and the challenges it faces. The EA is being prepared in compliance with the National Environmental Protection Act (NEPA) guidelines. In addition to documenting the existing natural environmental and socioeconomic setting, the EA evaluates the impact of the proposed and alternative actions and no action alternative in order to facilitate selection of the proposed alternative most suitable for implementation.

Piedmont NWR (Figure 1) is located in central Georgia, on the Southern Piedmont Plateau, a strip of land lying between the Appalachian Mountains and the coastal plain. Piedmont NWR consists of 34,955 acres in Jones and Jasper Counties, Georgia (28,552 and 6,403 acres in Jones and Jasper Counties, respectively). In total, this acreage is essentially contiguous and the refuge has reached most of its established acquisition boundary except for several private in-holdings. The refuge lies just east of the Ocmulgee River approximately 30 miles north of the city of Macon, 18 miles east of Forsyth, and 11 miles north of Gray. The refuge's topography is typical of the region, with open low hills interspersed with small streams. Most of the refuge is in forest cover. Habitats and vegetative communities include upland pine and pine-hardwood forests on the ridges, mixed pine and hardwood forests along the numerous creeks, open grassy fields and roadsides, man-made ponds and impoundments, and a few beaver swamps. The refuge is managed and is owned in fee title by the Service and is primarily used by the public for hunting, fishing, wildlife observation, and hiking.

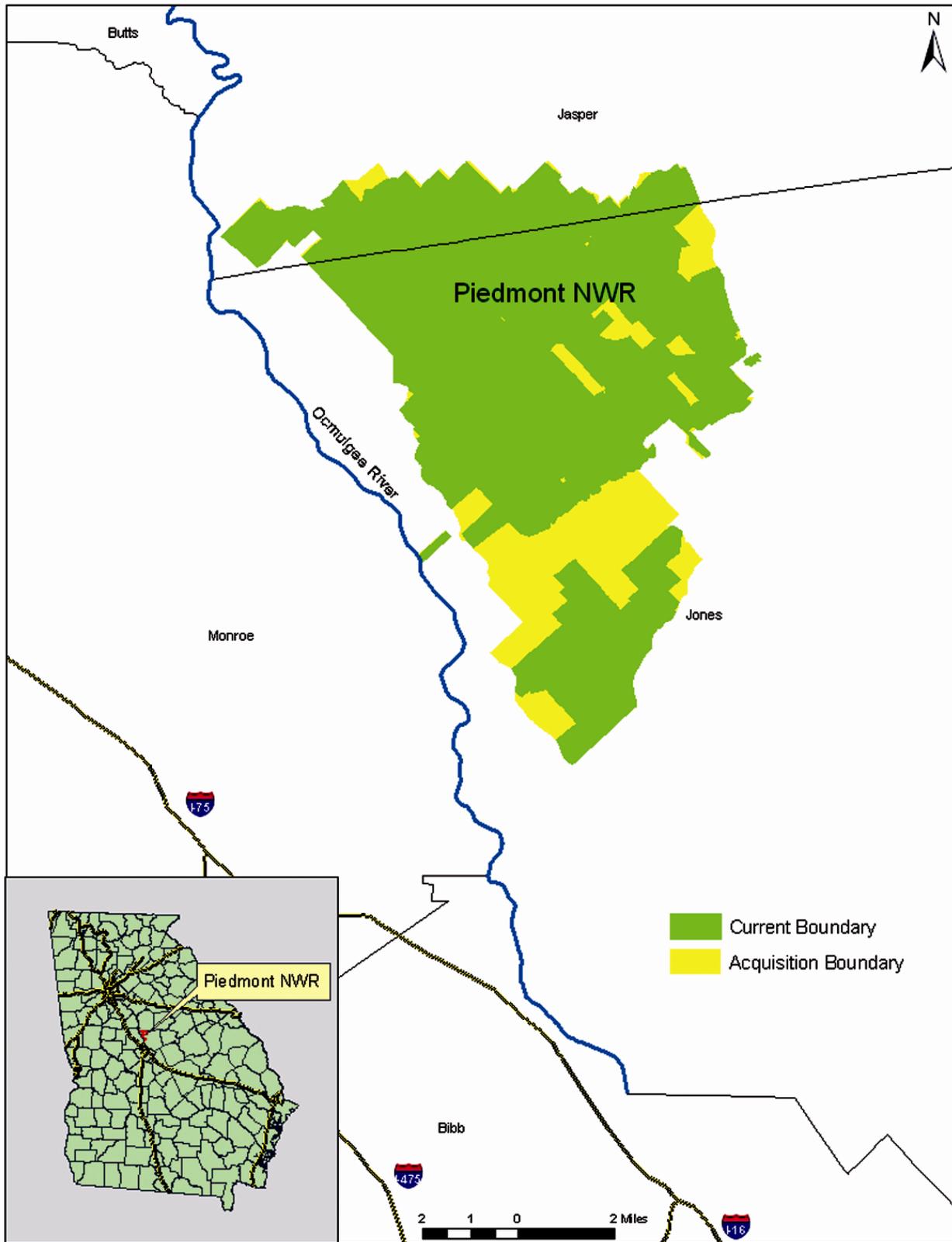
REFUGE HISTORY AND PURPOSE

The refuge was established in 1939 through Executive Order 8037 of President Roosevelt. Establishing authorities include the Migratory Bird Conservation Act, Bankhead-Jones Farm Tenant Act, and the Refuge Administration Act. The refuge was established:

- "as a refuge and breeding ground for birds and other wildlife." Executive Order 8037, dated January 18, 1939;
- "for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. 715d (Migratory Bird Conservation Act)
- "conservation, management, and restoration of the fish, wildlife, and plant resources and their habitats for the benefit of present and future generations of Americans" 16 U.S.C. 668dd(a)(2) (National Wildlife Refuge System Administration Act)
- "conservation, management, and restoration of the fish, wildlife, and plant resources and their habitats ... for the benefit of present and future generations of Americans." 16 U.S.C. 668dd(a)(2) (National Wildlife Refuge System Administration Act)
- "purposes of a land-conservation and land-utilization program." 7 U.S.C. 1011 (Bankhead-Jones Farm Tenant Act)

The first human influence on the North American landscape was the American Indian. The southeastern climate evolved to what it is today about 3000 Before Common Era (BCE), during the Archaic period (8000 to 1000 BCE). The forest was changing with climate. The Piedmont was covered with a mixed hardwood forest or a pine-hardwood forest that replaced the earlier evergreen forest. The people were nomadic hunter/gatherers. They were very successful and their population increased, so that by the end of the Archaic period, humans lived in every part of Georgia (White 2002).

Figure 1. Piedmont NWR



When the 1539-1543 expedition of Hernando de Soto arrived in present-day Georgia, the landscape was home to more than a dozen largely distinct Indian chiefdoms (Worth 1993). The members of this expedition were the *first* Europeans to see the chiefdoms of the Indians of the interior southeast in a largely pristine (i.e., unimpacted by Europeans) state (Worth 1994). At the same time, the landscape they witnessed was not pristine (i.e., unimpacted by humans). The de Soto chroniclers described middle Georgia as an area teeming with people (Clayton et al. 1993). The large Indian population had a significant impact on the environment. Earthworks, fields, and settlements were everywhere (Denevan 1992). The largest impact, however, was through the use of fire (Cowell 1998). This human-influenced fire regime changed the “natural” fire regime, which in turn modified the composition and structure of the plant communities (Barden 1997, Hamel and Buckner 1998, Williams 2000). American Indians affected the survival and abundance of wildlife and changed the natural vegetation through their land use practices.

Within only a few decades of contact, European diseases decimated the Indian populations. Greatly reducing the American Indian population removed their keystone status, resulting in a significant shift in the composition of the ecological community. By the time most historical records were being written in the 18th century, the Indian-influenced environment of 1492 had largely vanished. Former Indian fields and fire-maintained uplands were supporting communities that developed for 50 to 150 years under completely different disturbance regimes than that of pre-European contact.

While 18th century records do not represent conditions prior to substantial human-related changes to the landscape of middle Georgia, they are valuable documentation of conditions at that point in time. Although William Bartram is the most well-known travel/nature writer of the time, Benjamin Hawkins also wrote prolifically and descriptively. Survey records are a further source, complementing the anecdotal records of these writers with quantifiable data.

William Bartram was America’s first native born naturalist and the first author in the modern genre of writers who portrayed nature through personal experience as well as scientific observation. He set off from Savanna to Augusta in 1773 to attend an Indian Congress. He depicted the Piedmont west of Augusta as an “extensive nearly level plain of pine forests, mixed with various other forest trees. The trees and shrubs are *Pinus taeda*, great black Oak, *Quercus tinctoria*, *Q. rubra*, *Laurus*, *Sasafras*, *Magnolia grandiflora*, *Cornus Florida*, *Cercis*, *Halesia*, *Juglans acuminate*, *Juglans-exaltata*, *Andromeda arborea*; and, by the sides of the rivulets (which wind about and between these hills and swamps, in the vales) *Styrax latifolia*, *Ptelea trifoliata*, *Stewartia*, *Calycanthus*, *Chionanthus*, *Magnolia tripetala*, *Azalea*, and others” (Harper 1998).

Benjamin Hawkins, a United States agent to the Creek Nation, traveled through north Georgia and to the Piedmont region of western Georgia and eastern Alabama in late 1796 and early 1797. He described the lower Piedmont of west-central Georgia, in the area of present day Coweta County, as “the timber pine, oak, hickory, the soil stiff,” the drainages “stored with cane” (Hawkins 1916).

Georgia was settled between 1733 and 1832. Territorial expansion between 1733 and 1784 was without any logical scheme for land apportionment. The land law of 1784 required that plats be surveyed into rectangles and squares. Expansion of the frontier in 1805 was accompanied by a land lottery system. Eight times between 1805 and 1833, Georgia held lotteries to distribute land. Each new territory was subdivided into districts. Surveyors recorded one witness tree at each lot corner, and two intervening line trees. Tree size was not measured. Trees were identified by common name, and certain taxa recognized only to genus; i.e., pine, hickory. The original Baldwin County consisted of 20 districts. Districts 1-5 were part of the

1805 drawing; districts 6-20 were part of the 1807 drawing. Cowell (1995) investigated the districts which are in the current Baldwin, Putnam, and Morgan Counties. The percentage frequencies of trees were as follows:

Tree Species		Percent Frequency	
Oak			50.1
	Post	17.5	
	Red (several species)	10.5	
	Black (several species)	10.9	
	White	7.3	
	Spanish	2.7	
	Black Jack	1.1	
	Water	0.1	
	other oak		
Pine			26.8
Hickory			10.1
Other			13.0

Cowell then investigated species-environment relationships using landform classes as a proxy for environmental and moisture gradients. Pine and post oak dominated the uplands on upper slopes and south facing mid-slopes. They were more prevalent than other species on north, east, and west facing mid-slopes, and east and west facing lower slopes. Pine was always more common than post oak. Red oak frequencies showed a clearly increasing trend from upland to lowland. Black oak frequency was steady on all classes except lower slopes and riparian areas where it decreased. Hickory showed a slightly decreasing trend from lowland to upland. Other species, especially white oak and hickory, were most common in riparian areas and in coves. Large-scale disturbance, primarily anthropogenic fire, likely was a significant factor in determining plant community composition and structure.

Baldwin County was formed on May 11, 1803. Jones County, which comprises most of the refuge, was officially formed and opened for settlement when it was partitioned from Baldwin County on December 10, 1807. A part was added from Putnam County in 1810, and a piece was given to Bibb County in 1822. The boundaries have remained stable since then (Williams 1992).

There were already many families in Jones County by 1803 (when it was still part of Baldwin County), as well as Indians. After the survey, land lots were distributed by lottery to induce settlement, which occurred rapidly. At the time of settlement, the western boundary of Jones County (where the refuge currently is) "there stood deeply fertile lands of pine and oak forests. There were numerous natural springs, branches, creeks and streams which flowed cool and clear. Among the oaks and pines there grew chestnut, beech, maple, and short-leaf pines. Underneath these pines of more than 3 feet in diameter and 120 feet high also grew wild

azaleas, sweet shrub, dogwood, chinquapin, red bud, huckleberry and jasmine.” The settlers found deer, rabbits, turkeys, squirrels, and quail for food. The streams were full of fish and the woods full of wild fruit (Williams 1992).

The western half of the county was quickly settled and fields cleared. Past Indian burning had maintained an open understory; however, the large pines and oaks had to be removed. The “logrollings,” where the huge trees were felled and rolled into piles and burned, were community affairs where neighbor helped neighbor. Cotton, corn, and flax were grown, sheep and cattle grazed, apples and peaches planted. During the 1830s and 1840s, wealthy planters with slaves moved into the area. Cotton growing increased and the area prospered until the Civil War. The economy was destroyed during the Civil War. After the war, most of the land went to a single crop, cotton, and a sharecropping system came into prominence (Williams 1992).

Settlement and land conversion quickly changed the landscape. Within 50 years of European settlement, the southern Piedmont was converted from forests to farms. At first the farms were smaller subsistence farms, but within 20 years of settlement, cotton as a cash crop took over. Contour plowing and crop rotation were not practiced, and serious erosion set in. Charles Lyell traveled by rail from Savannah to Macon in 1845-1846. In Milledgeville he described the already apparent effects of poor farming practices: “the clearing away of the woods, where these Creek Indians once pursued their game, has caused the soil, previously level and unbroken, to be cut into by torrents, so that deep gullies may every where be seen” (Lane 1973). Nearly all the topsoil was lost from the uplands, and fertility was lost. As a result of deposition from the uplands, the bottomlands were also degraded (Brender 1974).

Land abandonment followed in the wake of land degradation. Economic and political circumstances of the Civil War, the agricultural depression of the 1880s, and the advent of the boll weevil in 1920 increased land abandonment. An estimated 10, 30, and 35 percent of farmland was abandoned from cultivation during these respective episodes (Brender 1974).

Despite the extreme level of degradation, forests quickly reestablished themselves. Trees were left in fencerows, turnarounds, and small woodlots. Pines, especially loblolly pine, are prolific seed producers, and their lightweight seeds are easily disseminated by wind. Pure stands of “old field pine” became established throughout the Piedmont, particularly after periods of land abandonment. Loblolly pine grew rapidly, so that by 1910 sawmills were in production (Brender 1974). A substantial erosion control program was initiated after the establishment of the refuge in 1939 (Gabrielson 1943); however, the forest had restored itself to such a degree that by 1945 the refuge began an active timber harvesting program. This program has continued to this day.

SPECIAL DESIGNATIONS

During the development of this Draft CCP/EA, lands within Piedmont NWR were reviewed for their suitability in meeting the criteria for wilderness areas, as defined by the Wilderness Act of 1964 [Public Law 88-577 (16 U.S.C. 1131-1136)]. No areas in the refuge were found to meet these criteria. Therefore, the suitability of refuge lands for wilderness designation is not further analyzed in this Draft CCP/EA.

**Figure 2. Erosion on the Georgia Piedmont, on what is now Piedmont NWR—
photographs from Piedmont NWR files: Erosion due to farming and 1921 gully**



The Five Points Research Natural Area, located in compartment 32, is 118 acres. While the establishment date is unknown, its presence was documented in the Society of American Foresters' report of the Committee on Natural Areas in 1947 (Shanklin et al. 1947). The committee recognized the need of practicing foresters for comprehensive knowledge of natural developments within virgin forest associations: "Only by reference to recorded data and by continuous study of areas containing virgin type associations may the forester view a managed forest in its proper perspective. Complete knowledge of the original forest is therefore essential to the practice of silviculture." This report defined a natural area as "an area set aside to preserve permanently in unmodified condition a representative unit of the virgin growth of a major forest type primarily for the purposes of science, research, and education. Timber cutting and grazing are prohibited and general public use discouraged." The Federal Committee on Research Natural Areas (1968) modified this definition, defining a research natural area as "an area where natural process are allowed to predominate and which is preserved primarily for the purposes of research and education." Under certain circumstances, deliberate manipulation may be used to maintain the unique features for which the research natural area was established.

The Comprehensive Wildlife Conservation Strategy for Georgia identified Falling Creek as one of Georgia's 212 high-priority waters (Georgia Department of Natural Resources 2005). High-priority waters are defined as containing populations of high-priority aquatic species or are representative of a high-priority aquatic system and its associated community.

Five ponds on the refuge became a part of the robust redhorse recovery program in 1996. The robust redhorse is a fish species of special concern and until the 1980s was thought to be extinct. Piedmont NWR ponds were needed to provide additional locations to raise fingerlings before being restocked into the Ocmulgee and Oconee Rivers. The refuge is working in cooperation with the Georgia DNR Fisheries Division to return ponds no longer needed in the recovery effort back into the refuge's public fishing program (U.S. Fish and Wildlife Service, Piedmont NWR Biological Review, Fisheries Section, 2008).

The Round Oak-Juliette Road which bisects the refuge has been designated as part of the Ocmulgee-Piedmont Scenic Byway, a Georgia State Scenic Byway (Ocmulgee-Piedmont Scenic Byway Committee 2005).

ECOSYSTEM CONTEXT

An ecosystem is a geographical area that includes and interconnects all the living (biotic) organisms, their physical (abiotic) surroundings, and the natural cycles that sustain them. All of these elements are interconnected. Managing any one resource affects the others in that ecosystem. Ecosystems can be small (a single stand of aspen) or large (an entire watershed including hundreds of forest stands across many different ownerships). Piedmont NWR is located in the Service's Altamaha River watershed ecosystem unit. The ecosystem approach is comprehensive and is based on all of the biological resources within a watershed.

Bailey (1995) developed a regional ecosystem, or ecoregion, classification scheme based on climate and vegetation. There are three levels in this hierarchy. The two broadest, *domain* and *division* are based on large climatic zones. Each division is subdivided into *provinces* on the basis of vegetational macrofeatures, which are expressions of more refined climatic differences. The refuge falls into the following classifications:

- 200 Humid Temperate Domain – The climate, located in the middle latitudes (30 to 60 degrees N), is governed by both tropical and polar air masses. The middle latitudes are

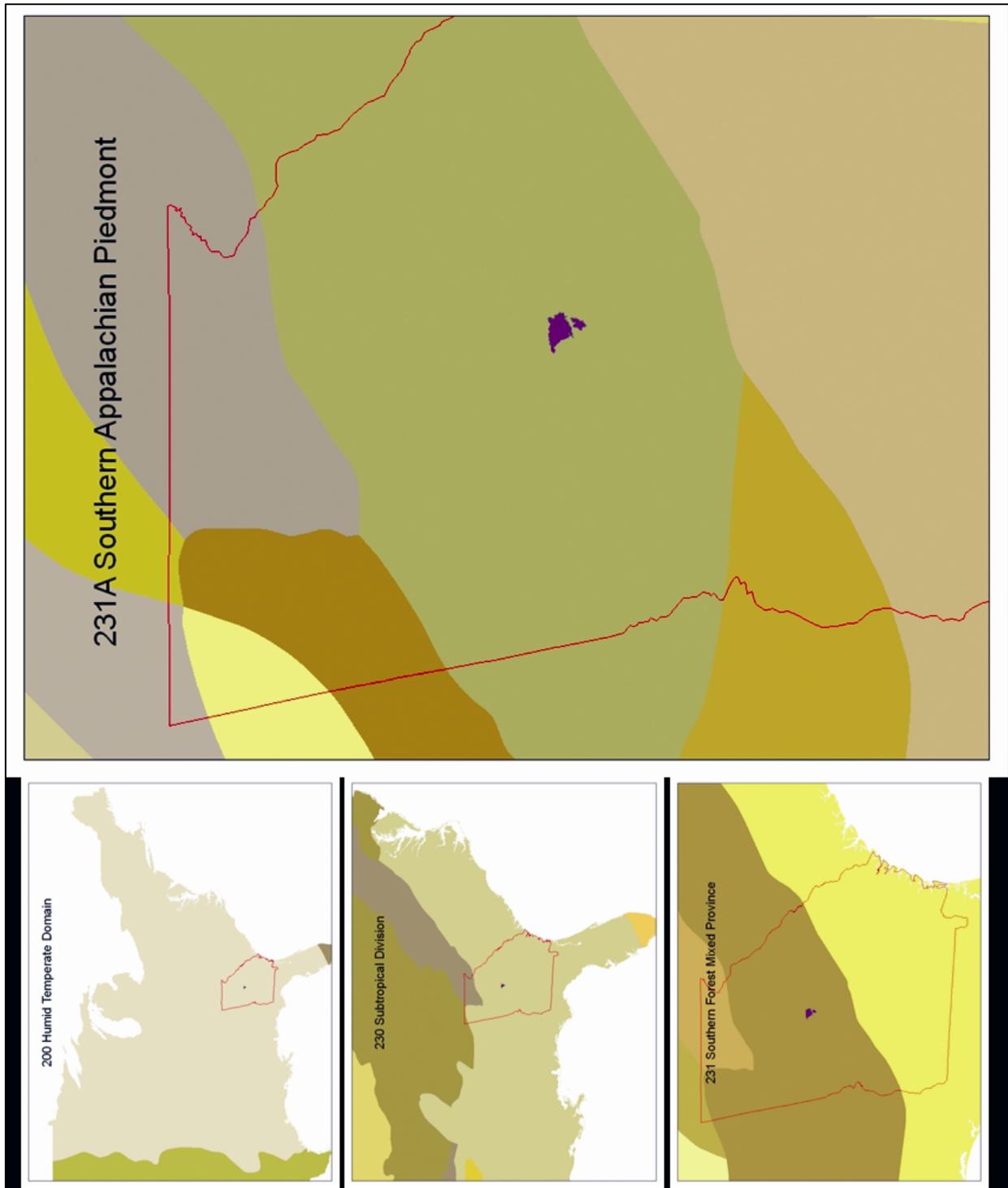
subject to cyclones; much of the precipitation in this belt comes from rising moist air along fronts within these cyclones. Pronounced seasons are the rule, with strong annual cycles of temperature and precipitation. The seasonal fluctuation of energy and temperature is greater than the diurnal. Climates of the middle latitudes have a distinctive winter season.

- 230 Subtropical Division – The humid subtropical climate, marked by high humidity (especially in summer) and the absence of really cold winters, prevails in Southern Atlantic and Gulf Coast States. There is no dry season; even the driest summer month receives at least 1.2 inches of rain. The average temperature of the warmest summer month is above 72°F. Rainfall is ample all year, but is markedly greater during summer. Thunderstorms, whether of thermal, squall-line, or cold-front origin, are especially frequent in summer. Tropical cyclones and hurricanes strike the coastal area occasionally, always bringing very heavy rains. Winter precipitation, some in the form of snow, is of the frontal type. Temperatures are moderately wide in range and comparable to those in tropical deserts, but without the extreme heat of a desert summer.
- 231 Southern Mixed Forest Province – This province comprises the Piedmont and the irregular Gulf Coastal plains. Climax vegetation is provided by medium-tall to tall forests of broadleaf deciduous and needleleaf evergreen trees. At least 50 percent of the stands are made up of loblolly pine, shortleaf pine, and other southern yellow pine species, singly or in combination. Common associates include oak, hickory, sweetgum, blackgum, red maple, and winged elm. The main grasses are bluestem, panicums, and longleaf uniola. Dogwood, viburnum, haw, blueberry, American beautyberry, yaupon, and numerous woody vines are common.

The National Hierarchical Framework of Ecological Units, developed by the USDA Forest Service divided these national designations into regional categories called *sections* (Cleland et al. 1997). Sections are relatively homogeneous subdivisions of provinces based on physiographic and biological features (McNab et al. 2007). The refuge falls into the following section:

- 231A Southern Appalachian Piedmont – The terrain is moderately dissected, irregular plains with occasional isolated high hills or low mountains on more resistant formations. Underlain by highly metamorphosed crystalline rocks that have weathered to form deep, infertile clayey soils, it is now highly eroded from long, intensive cultivation. Current forest cover is a mixture of loblolly-shortleaf pine and oak-pine cover types. Kuchler (1964) mapped the Potential Natural Vegetation as oak-hickory-pine forest and southern mixed forest (PNV is the “climax” vegetation that will occupy a site without disturbance or climatic change).

Figure 3. Bailey's ecoregions



REGIONAL CONSERVATION PLANS AND INITIATIVES

Comprehensive conservation plans are being prepared for the nine national wildlife refuges in the State of Georgia. When final, the CCPs will provide Service managers with a 15-year strategy and broad direction: (1) Conserve wildlife and their habitats; (2) achieve refuge purposes; and (3) contribute toward the mission of the Refuge System. In addition, the plans identify wildlife-dependent opportunities available to the public, including opportunities for hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation.

Many regional conservation plans and initiatives are derivatives of national plans. These regional plans are developed by a variety of cooperating regional organizations and agencies and are being planned and implemented in the southeastern United States. Some of the more notable, which are compatible with the mission and purpose of Piedmont NWR, are listed below:

- CWCS -- Georgia's Comprehensive Wildlife Conservation Strategy:
Supported by the State Wildlife Grants (SWG) Program, Georgia's CWCS (also known as the State Wildlife Action Plan) identifies the challenges facing Georgia's diverse wildlife species and devises strategies to conserve those "species with the greatest conservation need," and their habitats. Georgia ranks sixth in the nation in overall species diversity based on numbers of vascular plants, vertebrate animals, and selected invertebrates. The state currently has 223 species that are protected by state or federal laws and hundreds of additional animal and plant species in need of conservation. The CWCS is a guide to conserving the species of fish and wildlife that have immediate conservation needs or are key indicators of the diversity and health of the state's wildlife. The CWCS emphasizes a cooperative, proactive approach to conservation, inviting local governments, businesses, and conservation-minded organizations and individuals to join in the task of maintaining the fish and wildlife resources (Georgia Department of Natural Resources 2005).
- The Red-Cockaded Woodpecker (RCW) Recovery Plan:
The ultimate recovery goal is red-cockaded woodpecker (*Picoides borealis*) viability. Once this goal is met, the size, number, and distribution of populations will be sufficient to counteract threats of demographic, environmental, genetic, and catastrophic stochastic events, thereby maintaining long-term viability for the species as defined by current understanding of these processes (U.S. Fish and Wildlife Service 2003)
- SAMBI – The South Atlantic Migratory Bird Initiative:
This plan represents one of the initial efforts in North America to integrate the objectives of four major bird conservation plans (the North American Waterfowl Management Plan, United States Shorebird Conservation Plan, North American Waterbird Conservation Plan, and Partners in Flight Bird Conservation Plan) under the North American Bird Conservation Initiative into a single plan that land managers, biologists, administrators, and private landowners can use to achieve common goals and objectives for bird conservation across a regional landscape. The primary objectives are to develop population and habitat goals for priority species, delineate "all bird" focus areas, develop a long-term framework for bird conservation in the Southeastern Coastal Plain, and develop and seek funding for "all bird" projects (Atlantic Coast Joint Venture 2005).

-
- NBCI – Northern Bobwhite Conservation Initiative:
The NBCI charged with meeting the conservation and management needs of the northern bobwhite quail and facilitate integration with other bird management plans. The goal is to restore bobwhites to the density they enjoyed during the baseline year 1980. Forest habitat objectives are to enhance habitats in pinelands and mixed pine-hardwood forests through silvicultural treatments such as thinning and prescribed burning (Southeast Quail Study Group, no date).

ECOLOGICAL THREATS AND PROBLEMS

HABITAT LOSS

1) Southern Forest Resource Assessment

The Southern Forest Resource Assessment was a 3-year project initiated in 1999 as a result of concerns regarding the status and future of forests in the south (Wear and Greis 2002). Federal natural resource agencies (USDA Forest Service, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service) and the Tennessee Valley Authority agreed to work together to conduct a careful evaluation of the condition and ongoing changes of southern forests. State agencies actively contributed to the effort. The broad findings from this report are:

- Multiple forces of change are simultaneously affecting forest conditions. Land use changes, atmospheric pollution, fire exclusion, and the introduction of non-native species are reshaping the composition, productivity, and ecological function of forests. The interaction of these variables is complex and difficult to predict.
- Urbanization has a significant impact on the extent, condition, and health of forests. The Piedmont region will experience the greatest loss of forest area among the ecoregions of the south. The Piedmont already has a low ratio of interior forest to total forest, indicating a high degree of forest fragmentation. This trend will increase, altering wildlife habitats for certain key species such as neotropical migratory birds. A result of urbanization will be increasing limitations on forest management options, such as prescribed burning, that are important in maintaining healthy, productive forests.
- The population is growing and the social context is changing. The demographic profile has changed towards a more urban population. Public values about forests vary among different segments of the populace and include both commodity and biocentric views.
- The total forest area should remain stable, but there will be subregional changes. Regionally, losses to urbanization are expected to be offset by agricultural land reverting to forest. However, urban development is forecast to be concentrated in the eastern part of the region and agricultural conversion to forest in the western part, resulting in a westward shift in forest area.
- Timber production is expected to increase but not deplete forest inventories below current levels.
- Forecasting models indicate that pine plantation acreage will increase from 32 million acres in 1999 to 54 million acres in 2040. This additional acreage will come from agricultural afforestation and conversion of hardwood, natural pine, and mixed pine-hardwood forests. This should concentrate timber harvesting on fewer acres that would otherwise be necessary to meet demand, but at the expense of natural forests.
- Changing land use and harvesting patterns will have economic and political impacts. Urban sprawl into timber production areas will increase controversy and likely increase local regulation of land uses and forest treatments.

-
- Increasingly scarce forest components are vulnerable to change.
 - Scarce forest types have high ecological value. Thus, much biodiversity consideration is concentrated on relatively few acres.

2) Comprehensive Wildlife Conservation Strategy for Georgia

The Georgia Department of Natural Resources, Wildlife Resources Division (WRD) began a process to develop a comprehensive wildlife conservation strategy in December 2002 (Georgia Department of Natural Resources 2005). The goal of the strategy is to conserve Georgia's animals, plants, and natural habitats through proactive measures. Goals were defined broadly, while strategies more specifically address the objectives that must be met to achieve these goals. Conservation goals and strategies were identified for the five ecological regions of the state. Identifying problems affecting wildlife diversity was part of the process of developing goals and strategies. Those problems identified for the Piedmont region are:

- The rapid pace of residential and commercial development. These pressures have resulted in the loss or fragmentation of a number of habitats, including bottomland hardwood forest, oak-hickory-pine forest, granite outcrops, and mesic hardwood forest.
- Point-source discharges into streams including wastewater industrial facilities and municipal treatment facilities.
- Reductions in streamflow fluctuations by upstream dams have resulted in isolation and dewatering of floodplains in many areas. Restoration of natural hydrologic conditions, maintenance of vegetated stream buffers, and continued improvements in erosion and sedimentation control are essential to the protection of aquatic diversity.
- Conversion of remaining upland hardwood and pine-hardwood forests to pine plantations. Problems associated with this forest conversion include loss of vegetative structure and nesting sites, decline in hard and soft mast production, loss of understory and groundcover diversity, and physical disturbance of habitat for organisms found in leaf litter or soil.
- A lack of fire has resulted in the decline in the extent and quality of habitats such as oak-pine-hickory forest, oak woodlands and savannas, montane longleaf pine-hardwood forest, serpentine outcrops/woodland/savanna, and canebrakes. Concerns about smoke management, air quality, and damage to structures make it difficult to implement prescribed burn plans for these habitats.
- Invasive/alien species pose significant problems to habitats in the Piedmont.
- For some high-priority species and habitats, unmanaged recreational use represents a serious problem.
- The Piedmont is the primary region of water supply reservoir construction in Georgia. These impoundments threaten the viability of populations of native aquatic species.
- Incompatible road and utility corridor management represent potential problems for some high-priority plants of open areas. Indiscriminant use of herbicides or excessive ground disturbance along roads and in utility corridors may impact adjacent terrestrial and aquatic habitats.
- Encroachment of vegetated stream buffers and general loss of permeable watershed surfaces are particularly significant problems due to intense development pressures.

INVASIVE/EXOTIC SPECIES

People have moved plants and animals around the world for centuries. Most of these non-native species are benign or even beneficial – for example, food crops and domesticated

animals. A few, however, cause serious problems. These are known as invasive species. An invasive species is defined as a species that is non-native (or exotic) to the ecosystem under consideration, and whose introduction causes or is likely to cause economic or environmental harm or harm to human health (National Invasive Species Council 2001). This “silent” biological invasion threatens biodiversity by homogenizing flora and fauna (Westbrooks 1998). Invasive species of concern that occur on or near the refuge include Kudzu (*Pueraria Montana*), Chinese privet (*Ligustrum sinense*), Japanese Privet (*Ligustrum japonicum*), Japanese honeysuckle (*Lonicera japonica*), Hydrilla (*Hydrilla verticillata*), Chinese tallow tree (*Sapium sebiferum*), Nepalese browntop (*Microstegium vimineum*), Bamboo (*Phyllostachys aurea*), Chinaberry (*Melia azedarach*), Chinese wisteria (*Wisteria sinensis*), Mimosa (*Albizia julibrissin*), tall fescue (*Lolium arundinaceum*), Johnson grass (*Sorghum halepense*), Bermuda grass (*Cynodon dactylon*) and Cogongrass (*Imperata cylindrical*).

CURRENT FOREST CONDITIONS

Ninety-eight percent of the refuge is forested. There are 25,537 acres in pine and 8,785 acres in hardwood. Seventy-four percent, or 18,925 acres, of the pine acreage is in the mature size class. Eighteen percent (4,511 acres) of the pine acreage is in the pole size class, eight percent (2,102 acres) in the regeneration class.

The current distribution is unsustainable. There are too many acres in the mature size/age class, and insufficient acreage in the regeneration and pole classes. Furthermore, the majority of the stands in the mature class are 75+ years old. As a consequence of these missing age class acreages, sooner or later there will be a shortage of red-cockaded woodpecker (RCW) habitat. A significant change in the age/size class structure of the refuge’s forests will occur over the next 50 years (Powell 1998). Because of mortality, the mature size/age class will no longer dominate the forest. Instead, poles will be the dominant size/age class, increasing from 18 percent to between 38 to 46 percent of the pine forest. The mature size/age class will decrease from 74 to 32 percent of the pine acreage (10,950 acres).

SOUTHERN PINE BEETLE EPIDEMICS

Five species make up the guild known as the southern pine bark beetles: southern pine beetle (*Dendroctonus frontalis* Zimmerman), black turpentine beetle (*D. terebans* Oliver), small southern pine engraver or fourspined engraver (*Ips avulsus* Eichhoff), fivespined engraver (*I. grandicollis* Eichhoff) and the sixspined engraver (*I. calligraphus* Germar). Because of its behavior and reproductive potential, the southern pine beetle (SPB) causes more concern than the other bark beetles. Historically, periodic SPB outbreaks increased forest heterogeneity, thus increasing biodiversity. Now, however, the SPB is considered a pest because of the value placed on the pine forests it destroys (Nebeker 2004). These values include timber, water quality, fish and wildlife populations, recreation, biodiversity, endangered species, and cultural resources (Fettig et al. 2007)

PHYSICAL RESOURCES

CLIMATE

The refuge is located in the Southern Piedmont Plateau near the geographical center of Georgia. The refuge's climate results from a blend of maritime and continental climates. Summers typically consist of long spells of warm and humid weather. Average afternoon high temperatures are in the upper 80s to around 90. Readings of 90 or higher can be expected on 30 to 60 days. Overnight lows usually range from the middle 60s to lower 70s. Temperatures

during winter months are more variable. Stretches of mild weather can alternate with cold spells. Winter high temperatures average in the 50s. Lows average in the 30s. Lows of 32 degrees or lower can be expected on 50 to 70 days. Spring and autumn seasons are characterized by daily and annual variability. The average dates of first freeze in the autumn range from late October to mid-November. The average dates of last freeze in the spring range from mid-March to early April. The highest observable temperature recorded at the National Weather Service station at Macon, Georgia (Station: {095443} MACON WSO AIRPORT, GA) was 108°F, on July 13, 1980; while the lowest recorded temperature was -6°F, on January 21, 1985 (Georgia Department of Natural Resources 2008).

A measurable amount of rain falls on about 120 days each year, producing amounts averaging between 40 and 50 inches, usually distributed rather uniformly throughout the year. The average annual total snowfall is 1 to 2 inches. Usually this snowfall occurs on just one or two days. The driest month is October and the wettest month is January. Thunderstorms are common in the spring and summer months. On a typical year, thunder will be heard on 50 to 60 days. The maximum one-day total rainfall *recorded* at the National Weather Service station at Macon, Georgia (Station: {095443} MACON WSO AIRPORT, GA) was 5.30 inches on September 27, 2004. On July 5, 1994, Macon received 11.48 inches; this measurement is not official, however, because the extreme weather caused the weather station to malfunction (Georgia State Climate Office 1998). The highest total snowfall was 16.5 inches on February 9 and 10, 1973.

Using data collected at the National Weather Service station at the Macon, Georgia, airport (Station: {095443} MACON WSO AIRPORT, GA) for the period 1971 to 2000, daily temperature (average maximum, average minimum, and average) and average daily precipitation data; and normal temperature and rainfall data are tabulated in Table 1. Data is from the Southeast Regional Climate Center at the University of North Carolina, Chapel Hill.

Table 1. Climatological normals for the years 1971-2000 from the National Weather Service station at the Macon, Georgia, airport

Month	N O R M A L				
	High (°F)	Low (°F)	Mean (°F)	Rainfall (inches)	Snowfall (inches)
Jan	56.6	34.5	45.5	5.00	T
Feb	61.0	37.1	49.0	4.55	T
Mar	68.5	43.8	56.2	4.90	T
Apr	75.9	49.5	62.7	3.14	0.0
May	83.4	58.6	71.0	2.98	0.0
Jun	89.5	66.6	78.0	3.54	0.0
Jul	91.8	70.5	81.1	4.32	0.0
Aug	90.5	69.5	80.0	3.79	0.0
Sep	85.4	63.7	74.5	3.26	0.0
Oct	76.8	51.1	63.9	2.37	0.0
Nov	67.8	42.5	55.1	3.22	0.0
Dec	59.2	36.3	47.8	3.93	T

Yearly Normals				
High (°F)	Low (°F)	Mean (°F)	Total Rainfall	Total Snowfall
75.5	52.0	63.7	45.00	T

GEOLOGY AND TOPOGRAPHY

The Piedmont physiographic region comprises a transitional boundary between the Appalachian Mountains to the northwest and the flat Coastal Plain to the southeast. It is a mosaic of metamorphic and igneous rocks with a moderately dissected irregular landform of plains and some hills. Granite outcrops are scattered across the region. Soils contain more clay and less sand than those of the Coastal Plain. The southern boundary is at the Fall Line, where Coastal Plain sediments are deposited over Piedmont rock (Griffith et al. 2001).

The refuge's topography is typical of the region, with open low hills interspersed with small streams. Twenty to fifty percent of the refuge is gently sloping; the majority of the slope is on uplands. Elevations on the refuge range from 360 to 640 feet above mean sea level.

SOILS

Soils directly influence the kind and amount of vegetation and the amount of water available; in this way they indirectly influence the kind of wildlife that can live in an area. Soils are organized into a taxonomic classification system by the U.S. Department of Agriculture, Natural Resources Conservation Service, in which each soil is categorized by order, suborder, great group, subgroup, family, and soil series. Nationwide, there are twelve soil orders, three of which are found on the refuge – Ultisols, Alfisols, and Inceptisols. The soils in the area dominantly have a thermic soil temperature regime, a udic soil moisture regime, and kaolinitic or mixed mineralogy. They are shallow to very deep, generally well-drained, and loamy or clayey. Within these three orders there are nine soil series found on the refuge (Payne 1976).

The soil series Davidson, Vance, Cecil, and Gwinnett are found in the order Ultisols. These soils are acidic and are characterized by an argillic or clay deposition horizon. They are acid, becoming more so as depth increases. Soils in the Davidson, Vance, and Cecil series occupy 78 percent of the refuge and are found on interstream ridgetops and slopes adjacent to drainages. Slopes range from 2 to 25 percent. Most of these soils are classed as eroded; in some areas erosion has removed all or nearly the entire original surface layer. Loblolly pine is best adapted to these degraded soil conditions. Soils in the Gwinnett series occur on steep slopes adjacent to drainages. Slopes range from 15 to 35 percent. Good upland hardwood sites are found on Gwinnett soils. More specifically:

- Davidson – This series is found extensively on the refuge on the ridge tops and upper slopes and are well-drained soils. These soils are deep, usually 20 feet to bedrock. Slopes range from 2 to 25 percent. Pine is usually found on these soils, but on some of the less severely eroded areas stands of upland hardwoods can be found.
- Vance – This series is found sparingly in small areas. Vance soils are derived from acid crystalline rock, and are well-drained. They have low organic matter content and low fertility. Unlike most of the other upland soils, they have a yellow to brown subsoil.
- Cecil – These soils are of limited extent on the refuge. They are well-drained soils weathered from gneiss and granite. Cecil soils are strongly acidic throughout and have low natural fertility.
- Gwinnett – This series is limited in area on the refuge, but is important since some of the better upland hardwood sites are found on Gwinnett soils. These soils are well-drained, low in natural fertility, and medium to strongly acid throughout. Gwinnett soils were derived from diorite and hornblende gneiss.

There are two Alfisols (suborder Udalfs) present on the refuge - Enon and Wilkes. These soils are similar to the Ultisols in that they have an agrillic horizon as the identifying horizon; however, Alfisols have a higher pH than Ultisols and the pH will remain the same or increase with depth. In most climates, these soils tend to be somewhat younger than Ultisols. Enon and Wilkes soils occur on the uplands and on slopes adjacent to drainages. Together, they occupy 12 percent of the refuge. Pine is best adapted to these soils. More specifically:

The soil order Inceptisols is young soils with no distinct horizons. Within this order are found the soil series Chewacla and Starr, of the suborder Udepts. Chewacla is in the subgroup Fluvaquentic Dystrudepts and Starr is in the subgroup Fluventic Dystrudepts. The soil series Congaree is in the suborder Fluvents, subgroup Oxyaquic Udifluvents. These soils are found along the stream bottoms. They occupy 10 percent of the refuge. While they are suitable for both hardwoods and pines, they are better suited to hardwoods due to the somewhat poor drainage.

- Chewacla – This series consists of somewhat poorly drained soils that are formed on alluvium. They are found on the flood plains of the larger streams on the refuge. Although the flood plains are narrow, the surface is usually flat. Bottomland hardwoods are found on these soils.
- Starr – These soils are found to a limited extent on the refuge. They are located in the upper bottomlands and in small depressions. They have moderate natural fertility and are strongly to medium acidic throughout.
- Congaree – The Congaree soil is found in bottoms along streams. It is a well-drained soil. The soil is subject to frequent flooding and is best suited to bottomland forests.

Various degrees of erosion are found on all these soils. On 20 percent of the area the topsoil is completely gone. An additional 70 percent retains only a thin layer of topsoil. Gullies are numerous throughout the forest.

HYDROLOGY AND WATER QUALITY

The Ocmulgee River basin which drains Piedmont NWR contains a dynamic hydrological system that includes interactions between aquifers, streams, reservoirs, and wetlands. Many tributary streams receive a substantial contribution of water from groundwater base flow during dry periods and withdrawal of groundwater can, under certain conditions, also result in reduction in surface water flow.

Groundwater

Groundwater in the Piedmont Province largely flows along faults and fractures, making it difficult to find but often locally abundant. The principal aquifer underlying the Ocmulgee River basin in the region of the refuge is the Piedmont Crystalline Rock aquifer, which is typically unconfined. Typical well yields are 1 to 25 gallons per minute, though systematic well-site techniques can produce high-yielding wells (greater than 100 gallons per minute). Currently, the crystalline rock aquifer is used primarily for domestic water supply and livestock watering. It is commonly believed that groundwater in the Piedmont part of Georgia is not sufficient to supply such uses as municipal supplies and industry, although several municipalities and industries use groundwater to augment local surface-water resources. Because groundwater is transmitted through faults and fractures, each surface water drainage basin or watershed is also a groundwater drainage basin or watershed; surface and groundwater are in such close hydraulic interconnection that they can be considered as a single and inseparable system. In the

Piedmont, the saprolite that holds groundwater may also contain considerable clay and may act locally as a barrier to groundwater pollution. The Piedmont section of the Ocmulgee River basin is generally ranked as having below-average pollution susceptibility (Georgia Department of Natural Resources 2003).

Surface Water

Piedmont NWR lies within the upper Ocmulgee River watershed. Piedmont NWR has approximately 35 miles of permanent streams/creeks and is drained primarily by Falling Creek and its tributaries (Little Falling Creek, Stalking Head Creek, Allison Creek, Rocky Branch, Caney Creek and Hurricane Creek). Also, Butlers Creek and Hurricane Creek (and their tributaries) drain the southern portion of the refuge. There are several intermittent (unnamed) streams scattered throughout the refuge. Both Falling Creek and Butler Creek flow in a general south and southwesterly direction and discharge into the Ocmulgee River, which lies about 3 miles to the west of the refuge boundary.

Falling Creek (USGS 02212600), just downstream from its confluence with Little Falling Creek and Allison Creek has a annual average stream flow of 58.8 cubic feet per second, ranging from an annual average of 19.6 cfs in 1988 to an annual average of 120 cfs in 1998 (U.S. Geological Survey 2008).

In addition to these surface water streams, there are 12 impoundments ranging in size from 1.8 to 45.8 acres, with a total estimated surface area of 118 acres.

Forest Management Activities

Siltation (sedimentation), pathogens (bacteria), and nutrients (nitrogen and phosphorous) are the leading causes of water pollution in the south. While silvicultural activities, such as tree harvesting, prescribed burning, and chemical application, have the potential to degrade water quality, these activities ranked 9th out of 10 major sources of pollution (West 2002). Pollution impacts from silviculture are generally local in nature, short term, less extensive, and less frequent than impacts from agriculture or urbanization.

Without controlling measures such as forestry Best Management Practices (BMPs), however, silvicultural activities do have the potential to significantly impact water quality (Fulton and West 2002). The primary silvicultural impact to water quality is from non-point source pollution from roads and skid trails. Forestry BMPs are the most appropriate or applicable forest practices or activities to attain a silvicultural goal while protecting the chemical, physical, and biological integrity of waterways. BMPs achieve this by minimizing non-point source pollution from silvicultural activities. Georgia's Best Management Practices for Forestry (Georgia Forestry Commission 2009) emphasizes protecting water resources when conducting silvicultural operations through proper forest management and sound conservation practices and techniques. Streamside management zones (buffer strips adjacent to perennial or intermittent streams), stream crossings, log decks (a place where logs or tree length material is assembled for loading and transporting), skid trails, fireline construction, and herbicide use are regulated by Georgia's BMPs.

According to the Ocmulgee River Basin Management Plan, no streams were identified in the Ocmulgee River Basin as impacted due to commercial forestry activities (Georgia Department of Natural Resources 2003). Also, research conducted on the refuge demonstrate that habitat management (i.e., silvicultural activities such as timber harvesting and prescribed fire) had no

effect on stream condition and subsequently no negative effects on wildlife species dependent on high-quality functioning stream reaches (Lang 1998, Powell 1998, Brady 2005).

Refuge Stream Studies

Third Branch and Gladesville, Scoggins and Butlers Creeks (streams which drain to the Ocmulgee River in the eastern portion of the refuge) have been identified by the State of Georgia and EPA as having an impaired biota and biological habitats due to non-point sources of sediment loading to the creeks. These creeks are identified as only partially supporting their designated uses for fishing. Georgia and EPA have also identified a section of Falling Creek (from the confluence of Little Falling Creek to the Ocmulgee River) as being impacted by high concentrations of fecal coliform bacteria, and not supporting its designated use for fishing (Georgia Department of Natural Resources 2003, U.S. Environmental Protection Agency 2006).

An earlier USGS report identifies an old feldspar-processing plant located on the headwaters of Falling Creek; from which settling pond discharges have impacted the water quality of the creek with suspended sediment and chemical contamination (pH, fluoride, and sulfate). This industrial wastewater discharge resulted in the Falling Creek Hydrological Benchmark Network monitoring site (Station 02212600, located on the refuge just east of Juliette) being discontinued in 1994 (Mast and Turk 1999). Investigations of the impacts of the settling pond discharges on the present day chemical and biological quality of Falling Creek would seem to be prudent.

Little Falling Creek has been identified as one of the only functioning low order Piedmont streams that is not eroded. A study that began in 2008 was designed to assess and evaluate environmental and vegetative characteristics of Little Falling Creek and Jesters Creek restoration site in Clayton County (Boudell 2008).

In 2003 and 2004, Falling Creek between management compartments 8 and 16 (Bridgeout Road) was sampled for water quality and biological indicators as part of a watershed assessment study for the city of Gray, Georgia. The study concluded that water quality was excellent—excluding one reading of high fecal coliform during a wet weather event in June 2004. The bioassessment was conducted in 2004 and consisted of three parts, habitat assessment, benthic macroinvertebrate assessment, and fish assessment. Falling creek received an optimal rating for habitat, unimpaired stream for benthic macroinvertebrates, and a “good” overall Index of Biotic Integrity for fish assemblage health. Overall the study suggested the refuge’s natural setting afforded a rare opportunity for an undisturbed, pristine stream to serve as a reference for other study streams (University of Georgia 2004)

Campbell Environmental studied the same area of Falling Creek between 2003 and 2008. This study’s objective was to provide information on a lower Piedmont third order stream which is fairly stable. The study suggests that Falling Creek is a suitable reference reach to measure other streams in the lower Piedmont in which stream restoration measures have been proposed and implemented.

Air Quality

The Clean Air Act (CAA) of 1970 (as amended in 1990 and 1997), required the U.S. Environmental Protection Agency (EPA) to implement air quality standards to protect public health and welfare. National Ambient Air Quality Standards (NAAQS) were set for six pollutants commonly found throughout the United States: lead, ozone, nitrogen oxides (NOx), carbon

monoxide (CO), sulfur dioxide (SO₂), and particulate matter less than 10 and 2.5 microns in diameter (PM₁₀ and PM_{2.5}).

The Georgia Department of Natural Resources, Environmental Protection Division (EPD), Air Protection Branch, Ambient Monitoring Program, conducts monitoring to satisfy Clean Air Act monitoring requirements and has monitored air quality in Georgia for more than 30 years. The Air Sampling Network currently collects data at 65 locations in 37 counties in Georgia. Air quality monitoring sites surround the refuge. The three sites nearest the refuge are to the south in the Macon metropolitan statistical area (MSA): Allied Chemical (site 130210007), Georgia Forestry Commission (site 130210012), and Lake Tobesofkee (site 130210013). There are also 24 monitoring sites in the Atlanta MSA and one in the Athens MSA. Furthermore, there are three that are not in a MSA – one in each of Baldwin, Wilkinson, and Washington Counties (Georgia Department of Natural Resources 2008).

Two criteria pollutants – PM_{2.5} and ozone – have the greatest ability to impact refuge management activities. In July 1997, EPA issued NAAQS for PM_{2.5}. There are two standards: an annual standard of 15 µg/m³, based on the 3-year average of annual mean PM_{2.5} concentrations, and a 24-hour standard of 65 µg/m³, based on the 3-year average of the 98th percentile of 24-hour concentrations. In 2006, the 24-hour standard was: 65 µg/m³ to 35 µg/m³.

EPA also issued new NAAQS for ozone in 1997, replacing those that had been in place since 1979. The new standard is 0.08 parts per million, averaged over 8 hours.

Areas that meet the NAAQS are designated “attainment areas,” while areas not meeting the standards are termed “non-attainment” areas. While the two counties the refuge is in – Jones and Jasper – are currently in attainment status, many of the surrounding counties are not (Figure 4). Smoke from refuge prescribed fires has the potential to impact these non-attainment areas (Hu et al. 2008).

BIOLOGICAL RESOURCES

HABITAT

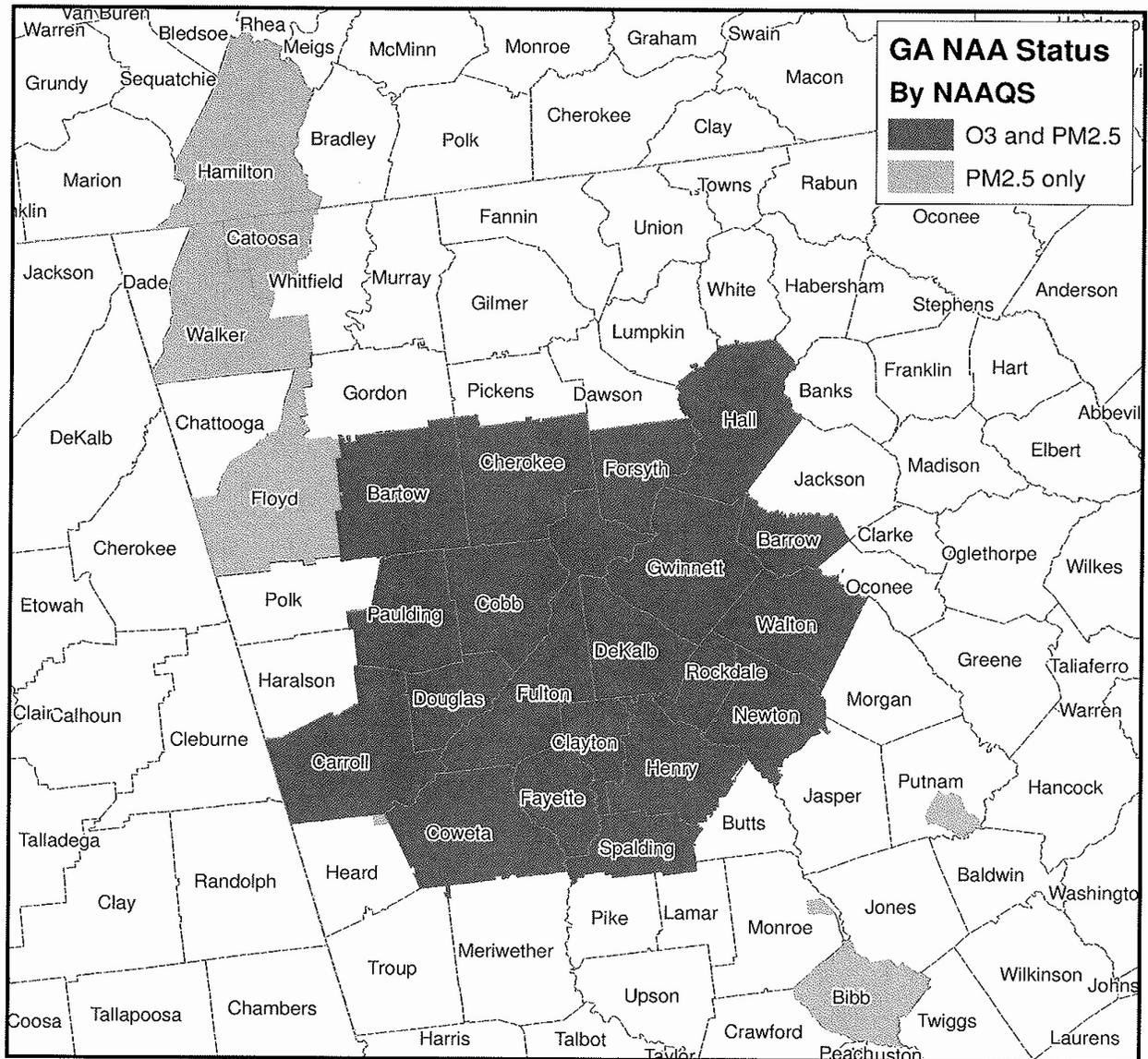
Piedmont NWR supports a diversity of wildlife species common to the Piedmont physiographic region of Georgia. The current wildlife list for the refuge contains over 200 species of birds, 45 mammals, 14 amphibians, 41 reptiles, and many fish species. Although many different species occupy the same general area, the specific habitat needs of each species vary in some degree from those of every other species. The particular food and cover requirements of a given species may be general, or they may be very specialized. As such, a diversity of habitats tends to encourage and support a diversity of wildlife species.

Georgia's Department of Natural Resources, in its Comprehensive Wildlife Conservation Strategy (2005), lists sixteen high priority communities for the Piedmont region. Several of these occur on the refuge:

Beaver Ponds; Freshwater Marsh – Beaver ponds are temporary impoundments created by beaver on small- to medium-sized streams. Freshwater marshes develop in shallow beaver ponds and along the edges of larger lakes and ponds. Dominants include a variety of sedges, rushes, grasses, and forbs, with scattered buttonbush, red maple, swamp dogwood, and tag

Figure 4. Non-attainment areas for National Ambient Air Quality Standards (NAAQS) established by EPA

Georgia NAAQS Non-attainment Status Map As of 2008-04-29



0 30 60 120 180 240 1:1,500,000
Kilometers

NOTE: This map uses US Census and USGS boundary files that are based on NAD83 but treats them as if they are based on air quality model sphere (R=6370997m) for the projection purpose. The projection is the Lambert Conformal Conic Projection for GA SIP modeling domain. The details of projections parameters are following: False_Easting = 0., False_Northing = 0., Central_Meridian = 97W, Standard_Parallel_1 = 33N, Standard_Parallel_2 = 45N, Latitude_of_Origin = 40N

Created by Byeong-Uk Kim (2008-04-29)
Air Protection Branch, GA Environmental Protection Division
Byeong.Kim@dnr.state.ga.us



alder. Few Georgia examples exist that are not invaded by the exotic weed, *Murdannia*. These wetlands provide habitat for a wide variety of wildlife species.

Bottomland Hardwood Forests – Forested wetlands of alluvial river floodplains, characterized by a diverse association of deciduous hardwood trees. Canopy dominants vary, but may include water oak, willow oak, overcup oak, cherrybark oak, swamp chestnut oak, green ash, sweetgum, bitternut hickory, and pignut hickory. Shrub layer may be dense or relatively sparse, containing a variety of mesophytic or hydrophytic woody plants and often a significant woody vine component. Many of these habitats have been impacted by invasive exotic species such as Chinese privet and Nepalese browntop.

Canebrakes – Thickets of native cane (*Arundinaria gigantea*) found along rivers and creeks under sparse to full tree cover. Canebrakes represent important wildlife habitat for a variety of neotropical birds and insects. These habitats require fire or other form of periodic disturbance for maintenance. Most canebrakes on the refuge are relatively small and fire-suppressed, often occurring along the edges of fields and other clearings.

Mesic Hardwood Forests – Non-wetland forests of floodplains, ravines, and north-facing slopes in the Piedmont. These may include species such as American beech, white oak, northern red oak, bitternut hickory, pignut hickory, shagbark hickory, bigleaf magnolia, yellow poplar, blackgum, dogwood, black cherry, and loblolly pine. Typical shrubs include spicebush, sweetshrub, pawpaw, Oconee azalea, rusty viburnum, and pinxter-flower.

Oak Woodlands and Savannas – Rare upland hardwood habitats found in scattered locations in the Piedmont. These xeric or subxeric oak-dominated woodlands are influenced by edaphic conditions (i.e., thin soils, mafic rocks) and periodic fire. Dominants may include southern red oak, scarlet oak, post oak, and blackjack oak, sometimes with shortleaf pine. Sparkleberry and hawbushes are common shrub components. A particularly rare type, the post oak-blackjack oak savanna, was apparently much more common in pre-settlement times; only small, fire-suppressed remnants of these habitats exist today.

Oak-Hickory-Pine Forest – Considered the climax forest of the Piedmont, this forest type formerly covered 50 to 75 percent of the region; most examples on fertile soils were eliminated by conversion to agricultural uses. Remaining examples are often found in rocky areas that were difficult to convert to agricultural fields. These typically include a variety of hardwood species such as white oak, black oak, southern red oak, pignut hickory, shagbark hickory, mockernut hickory, red maple, blackgum, shortleaf pine, and loblolly pine, with dogwood, rusty viburnum, hog plum, dwarf pawpaw, and various hawbushes in the understory. American chestnut was formerly a major component of the canopy. Examples over circum-neutral soils influenced by mafic or ultramafic bedrock are often floristically richer, and may contain species such as Oglethorpe oak, basswood, red mulberry, redbud, and fringetree.

Streams – In the upper Piedmont, streams are low to moderate gradient and typically contain well-defined riffles and pools. Substrate consists of gravel, pebble, sand, and silt; some bedrock may also be present. Lower Piedmont streams are lower gradient, have fewer riffles and pools, and their substrates have a higher proportion of silt, clay, and detritus than upper Piedmont streams. Turbidity is highly variable, but most of these streams become highly turbid after rain.

Upland Depression Swamp – A non-alluvial open swamp with water oak, southern shagbark hickory, Oglethorpe oak, and loblolly and shortleaf pine. Coastal plain elements in the understory include swamp palmetto and parsley haw. Usually found on Iredell or Enon soils in

the lower Piedmont. These sticky, plastic soils hold water in the spring, resulting in swampy conditions for a portion of the year.

Xeric Pine Woodlands – Pine-dominated habitats of dry, rocky ridgetops and granitic outcrops. Dominants are loblolly, shortleaf, and Virginia pine. These woodland habitats are maintained by a combination of edaphic factors and periodic fire.

The refuge's 34,995 acres are subdivided into 34 approximately 1,000-acre management compartments. Ninety-eight percent (34,322 acres) of the refuge is forested. Seventy-two percent (25,537 acres) is pine, 25 percent (8,785 acres) is hardwood, and non-forest habitat types (open fields, roadsides, utility rights-of-way, ponds, and impoundments) comprise less than 4 percent of the refuge acres (Figure 5).

The refuge's forests were originally classified into three broad forest types in the refuge's first Timber Management Plan: pine, upland hardwood, and bottomland hardwood (U.S. Fish and Wildlife Service 1948). These were then associated with a Society of American Forester's (SAF) forest cover type. The SAF defined forest type as a "group of stands of similar character ... by which they may be differentiated from other groups of stands." A cover type "is a forest type now occupying the ground." SAF's classification of forest cover types was based on the existing tree cover (Evans et al. 1932). The pine was considered as SAF forest cover type 68 – loblolly pine-shortleaf pine, the upland hardwoods SAF type 71 – loblolly pine-white oak, and the bottomland hardwoods SAF type 81 – red gum-swamp red oak. Each cover type was then subdivided into condition classes based on size class (1 = pre-commercial, 2 = pulpwood, and 3 = sawtimber) and canopy closure (A = dense crown canopy 70 to 100 percent canopy closure; B = semi-dense crown canopy 40 to 70 percent canopy closure; C = sparse crown canopy 40 percent or less canopy closure).

Later management plans (U.S. Fish and Wildlife Service 1968, 1982) increased the number of cover types associated with the broad forest types, using updated SAF forest cover types (Society of American Foresters 1954, Eyre 1980). They maintained the basic approach of the original plan, except condition classes were no longer assigned to hardwoods.

A standardized method of classification is a step forward in the ability to manage and protect ecosystems for the following reasons: (1) It allows data integration across administrative units; (2) it more precisely defines ecosystem units; and (3) it provides a structure for framing and answering questions about patterns and processes.

One such system is the National Vegetation Classification System (NVCS). This system is a systematic approach to classifying a continuum of natural, existing vegetation. It uses a combined physiognomic-floristic hierarchy, using both qualitative and quantitative data appropriate for conservation and mapping at various scales (Grossman et al. 1998). The physiognomic hierarchy is:

- Class – forest, woodland, shrubland, herbaceous, etc.
- Subclass – evergreen, deciduous, mixed
- Group – leaf characteristics such as broadleaf, needleleaf, etc.
- Subgroup – natural/semi-natural or cultural
- Formation – environmental factors, structural factors, hydrologic modifiers

The floristic hierarchy is:

- Alliance – a physiologically uniform group of plants, usually defined by the dominant vegetation
- Association – a plant community type of definite floristic composition, uniform habitat conditions and uniform physiognomy

The NVCS alliance is roughly equivalent to the SAF forest cover type. Those that occur on the refuge, by broad forest type, are shown in Table 2.

There is a possibility that several protected plant species, known to occur in Jones or Jasper Counties, may be found on or near the refuge. The Georgia Department of Natural Resources lists the following protected plants in Jones and Jasper Counties, along with management recommendations (Patrick et al. 1995):

- Pink ladyslipper (*Cypripedium acaule*) – avoid disturbance. May require periodic thinning and winter prescribed fire to maintain an open-canopy pine habitat.
- Oglethorpe oak (*Quercus oglethorpensis*) – avoid draining the site. This is a state listed threatened species.
- Relict trillium (*Trillium reliquum*) – avoid disturbance. Will only tolerate hand thinning of trees in the vicinity. Control exotics, especially Japanese honeysuckle. This is a state and federal listed endangered species.

Piedmont NWR has approximately 35 miles of permanent creeks/streams. There are 12 impoundments/ponds totaling 118 acres created by damming sections of these creeks. These impoundments/ponds range in size from 1.8 to 45.8 acres. Most of the ponds were constructed with the trees in place to provide both waterfowl and fish habitat; many snags and stumps from those trees remain today. A variety of fish species are commonly found in these ponds.

Invasive species tend to aggressively colonize lands and ecological niches, displacing native plants and animals. Not all invasive species are non-native (i.e., originating outside of North America). Some species of both plants and animals are indigenous to the area or native to North America, but are still considered invasive and problematic because they spread quickly and become abundant, to the detriment of native flora and fauna, and thus indigenous biodiversity.

Most river floodplains and valleys in the Piedmont Region are overrun with invasive plants such as Chinese privet (*Ligustrum sinense*), Japanese Privet (*Ligustrum japonicum*) and Nepalese browntop (*Microstegium vimineum*). Japanese honeysuckle (*Lonicera japonica*) is a major component of the understory in many upland forest stands. Non-native plants species such as Chinese wisteria (*Wisteria sinensis*), Mimosa (*Albizia julibrissin*), Chinaberry (*Melia azedarach*), and privet are commonly found around the remains of old home sites on the refuge and have become invasive around these sites.

WILDLIFE

The refuge is home to over 200 bird species; 14 amphibians and 41 species of reptiles; 45 mammals; 85 species of butterflies; and many fish species. Lists of the flora and fauna which have been observed (on at least one occasion) in the vicinity of Piedmont NWR are given in Appendix I.

Figure 5. Land cover types – Piedmont NWR 2008

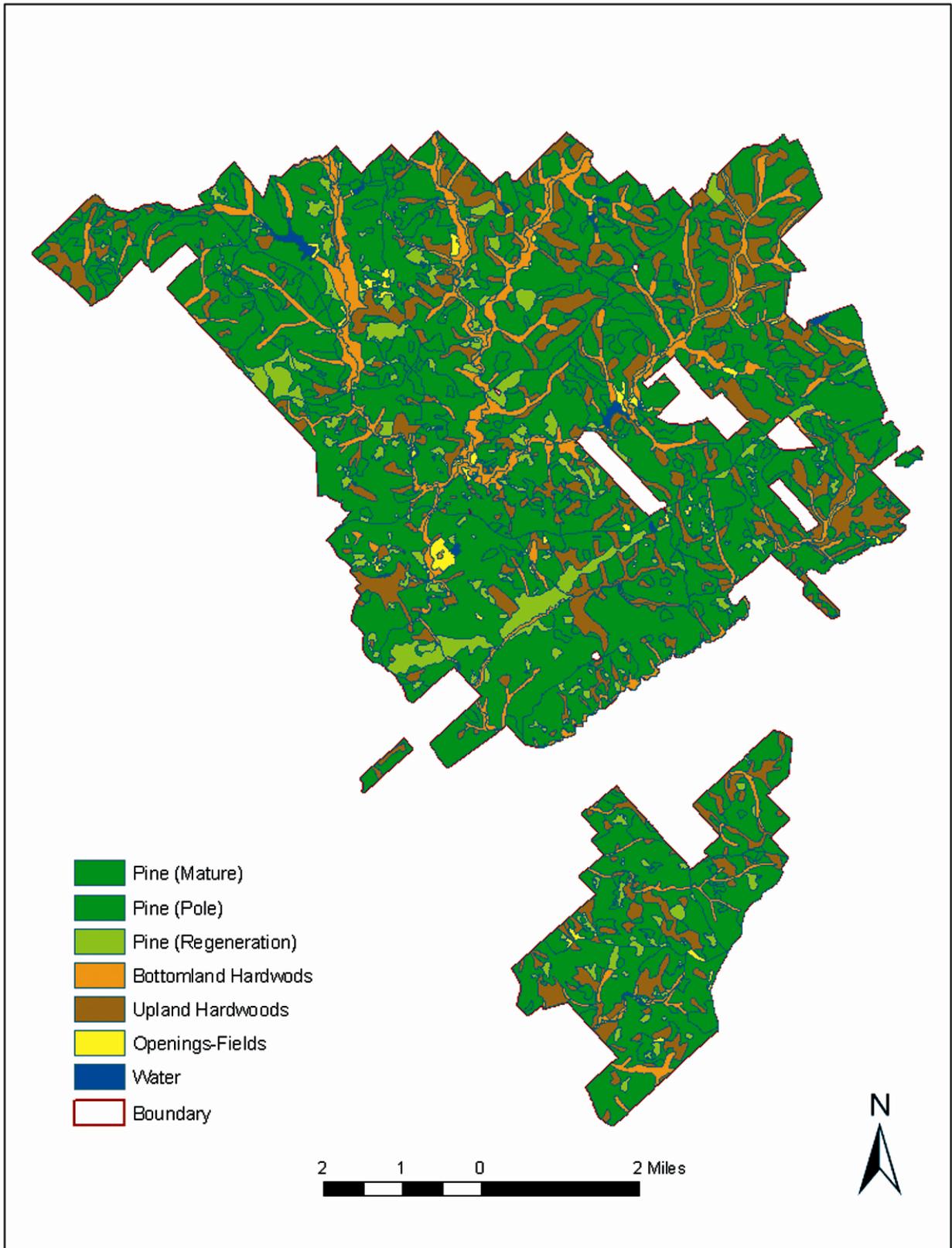


Table 2. Forest types, SAF forest cover types, and NVCS Alliances that occur on the refuge

Broad Forest Types	FRES Ecosystems (Garrison et al. 1997)	SAF Forest Cover Types (Eyre 1980)	NVCS Alliances http://www.natureserve.org/explorer/
Pine	Loblolly-Shortleaf Pine (13)	Shortleaf Pine (75) Shortleaf Pine-Oak (76) Loblolly Pine-Shortleaf Pine (80) Loblolly Pine (81) Loblolly Pine-Hardwood (82)	Shortleaf Pine Forest (A.119) Loblolly Pine-Shortleaf Pine Forest (A.129) Loblolly Pine Forest (A.130) Loblolly Pine-(White Oak, Southern Red Oak, Post Oak) Forest (A.404) Shortleaf Pine Woodland (A.515) Longleaf Pine Woodland (A.520) Loblolly Pine Woodland (A.526)
Upland Hardwood	Oak-Pine (14) Oak-Hickory (15)	White Oak-Black Oak-Northern Red Oak (52) White Oak (53) Yellow Poplar-White Oak-Northern Red Oak (59) Shortleaf Pine-Oak (76) Loblolly Pine-Hardwood (82)	American Beech-White Oak Forest (A.228) American Beech-Northern Red Oak - White Oak Forest (A.229) Sweetgum Forest (A.234) Tuliptree Forest (A.236) White Oak-(Northern Red Oak, Hickory species) Forest (A.239) White Oak-(Southern Red Oak, Post Oak) Forest (A.241) Loblolly Pine-(White Oak, Southern Red Oak, Post Oak) Forest (A.404) Post Oak - Blackjack Oak Woodland (A.625)
Bottomland Hardwood	Oak-Gum-Cypress (16) Elm-Ash-Cottonwood (17)	Sweetgum-Yellow Poplar (87) Swamp Chestnut-Cherrybark Oak (91) Sweetgum-Willow Oak (92) Sugarberry-American Elm-Green Ash (93) Sycamore-Sweetgum-American Elm (94)	American Beech - White Oak Forest (A.228) Sweetgum-(Tuliptree, Red Maple) Temporarily Flooded Forest (A.287) (Swamp Chestnut Oak, Cherrybark Oak, Shumard Oak)-Sweetgum Temporarily Flooded Forest (A.291) (Willow Oak, Water Oak, Diamondleaf Oak) Temporarily Flooded Forest (A.292) Giant Cane Wooded Shrubland (A.794) Giant Cane Temporarily Flooded Shrubland (A.795)

Terrestrial Species

The Georgia Department of Natural Resources identified “high priority species” using criteria such as global and state rarity rankings, population and habitat trends, range of occurrence, number of protected populations, and importance of Georgia efforts to the global conservation of the species (Georgia Department of Natural Resources 2005). Some species not globally imperiled but considered indicators of habitat quality over a large area or region were also included. An effort was made to use existing criteria used by the Georgia Nongame Wildlife and Natural Heritage Section. These criteria utilize the basic Global (G) and State (S) rarity rankings:

- 1 – Critically imperiled globally (5 or fewer occurrences or less than 1000 remaining individuals)
- 2 – Imperiled globally (6 to 20 occurrences or between 1,000 and 3,000 remaining individuals)
- 3 – Vulnerable to extirpation (21 to 100 occurrences or between 3,000 and 10,000 remaining individuals)
- 4 – Apparently secure (more than 100 occurrences and more than 10,000 individuals)
- 5 – Secure (more than 100 occurrences and more than 10,000 individuals)

Some additional criteria include:

- G#G# - used to indicate the range of uncertainty about the exact status of the species
- T - The status of subspecies or varieties (taxa) are indicated by a "T-rank" following the species' global rank
- ? – An inexact or uncertain numeric rank

The following state high priority species are on the refuge species lists in Appendix I:

Common Name	Global Rank	State Rank
Red-cockaded woodpecker	G3	S2
Bachman's sparrow	G3	S3
Bald eagle	G4	S2
Least bittern	G4	S3
Loggerhead shrike	G4T3	S?
Swainson's warbler	G4	S3
King rail	G4G5	S3
Northern bobwhite	G5	S4

Two of these species are specifically mentioned with respect to the refuge in the Georgia Comprehensive Wildlife Conservation Strategy: the federally endangered Red-cockaded woodpecker (*Picoides borealis*) and Bachman's sparrow (*Aimophila aestivalis*).

The Red-cockaded woodpecker (RCW) was listed in the Federal Register as endangered in 1970 (35 FR 16047), and received federal protection under the Endangered Species Act of 1973, as amended. Once a common bird distributed across the southeastern United States, by the time of listing the RCW had declined to fewer than 10,000 individuals (Jackson 1971). The RCW prefers mature, older age open canopy pine stands with low ground cover of grasses and forbs. Its decline has been traced to the loss of older age open pine forest in the south, a fire dependent ecosystem to which the RCW has adapted. Because fire is a historic disturbance agent, and critical to the continued existence of the RCW's habitat, the refuge uses prescribed fire on a 3-year rotation to manage RCW habitat. Piedmont NWR had 44 active clusters in 2009.

Bachman's sparrow is traditionally associated with mature pinelands in the south. It has declined in the southern portion of its range. Historically, Bachman's sparrows were found in mature to old growth southern pine forests that had frequent fire. Declines in the southern portion of its range are due to changing forestry practices that emphasize intensively managed pine plantations instead of mature natural pine forests (Dunning and Watts 1990). Bachman sparrows occur on the refuge where habitat is managed for red-cockaded woodpeckers.

Aquatic Species

Piedmont NWR has approximately 35 miles of permanent creeks/ streams. There are 12 impoundments/ponds totaling 118 acres created by damming sections of these creeks. These impoundments/ponds range in size from 1.8 to 45.8 acres. The ponds have suitable habitat for warm-water fish populations. The most common fish species within the refuge ponds are largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), redear sunfish (*Lepomis microlophus*), and channel catfish (*Ictalurus punctatus*). Other non-sportfish species are brown bullhead (*Ictalurus nebulosus*), yellow bullhead (*Ictalurus natalis*), golden shiner (*Notemigonus crysoleucas*), and gizzard shad (*Dorosoma cepedianum*). Redbreast sunfish (*Lepomis auritus*) and redeye bass (*Micropterus coosae*) are present in small numbers in the larger creeks and streams located throughout the refuge.

The Altamaha shiner (*Cyprinella xaenura*), a state listed endangered species, and the Goldstripe darter (*Etheostoma parvipinne*), a state high priority species, may occur in the refuge streams (Ozier et al. 1999). The Altamaha shiner inhabits small tributaries and rivers, usually in small pools with rocky to sandy substrates. The Goldstripe darter is usually found in small streams and spring seeps with organic debris, or slow-moving riffle pools. Conserving both of these fish species depends on maintaining and restoring habitat and water quality. It is essential to minimize sediment runoff from land disturbing activities. Implementing Georgia's Best Management Practices for Forestry (Georgia Forestry Commission 2009) is critical to the protection of this species on the refuge.

The freshwater submergent and emergent vegetation found in many impoundments consists of naiad (*Najas spp.*), pondweeds (*Potamogeton spp.*), cattails (*Carex spp.*), watershield (*Brasenia schreberi*), coontail (*Ceratophyllum spp.*), and various sedges. The vegetation varies in density from pond-to-pond, and in most cases provides a benefit to waterfowl and does not pose a threat to the fishery resource.

CULTURAL RESOURCES

Few archaeological and historical investigations have been conducted on Piedmont NWR. Since its establishment in 1939, all archaeological investigations and historic building assessments have been conducted primarily to ensure compliance with Section 106 of the National Historic Preservation Act (Cobb 1983 and 1984; Kanaski 2000; 2002-2003; n.d.; Thomas, Holland and Stanyard 2000; Wright and Perry 1978). An exception is the refuge's effort to document historic period cemeteries.

To date over 125 historic properties have been identified on the refuge. These properties include precolumbian lithic and ceramic scatters, rock mounds, 19th – early 20th farm sites, agricultural terraces, and cemeteries. Efforts, primarily driven by the refuge's prescribed fire and forestry programs, are underway to systematically document and map the historic period farm sites.

Cemeteries

Cemeteries located on Piedmont NWR are a link to the settlers that once lived on this land. Headstones are inscribed with dates leading as far back as the 1700s, and mark the graves of several generations. There are Revolutionary War as well as Civil War veterans' graves, and several cemeteries are regularly visited by family and friends. The gravestones are cultural artifacts that can teach us much about our American forebears.

Thirty-two cemeteries have been documented on the refuge since the late 1990s. All of the cemeteries share certain characteristics, such as old cedars, large mature oaks, and dogwood, growing within them. They are often located on ridges or hills and have old roadbeds leading to and around them. Three cemeteries have limestone or concrete block walls built around several graves. There are indications that several cemeteries had ornamental metal or wrought iron fences around them or around individual family plots. Often ornamental shrubs or trees, such as red cedar, mark the corners or boundary lines of the cemetery.

There are several different types of grave markers on the refuge. One of the most common markers is an engraved or carved tabletstone. Often these stones are set on a base and accompanied by a footstone that may be carved with initials of the deceased. Another type of marker is a large tabletop stone either set flush on the ground or placed on a stone box or vault. Tabletop stones are rectangular-shaped markers about three feet wide by six feet long and two inches thick. At least one cemetery has vaulted crypts or boxtombs, which are variation of the flat tabletop markers. Monuments, such as obelisks, are present in several of the refuge's cemeteries. Rectangular rock cairns, seen in the Beeland Cemetery, were occasionally placed over the grave. Uncarved fieldstone markers, sometimes accompanied with smaller footstones, are used in a number of the cemeteries. A number of graves are not marked, but visible only as oval or rectangular indentations that range from 3 to 5 feet in length.

Figure 6. Double brick chimney site photo by Rick Kanaski, FWS



SOCIOECONOMIC ENVIRONMENT

REGIONAL DEMOGRAPHICS AND ECONOMY

Piedmont NWR is in rural central Georgia approximately 30 miles north of Macon, Georgia, a city of about 100,000 people. The refuge is predominately located in northwestern Jones County with a smaller portion of the refuge extending into southern Jasper County. Four counties (Jones, Jasper, Monroe and Bibb) lie within 10 miles of the refuge boundary. Middle Georgia residents account for a significant number of refuge visitors. The nearest metropolitan area, Atlanta, Georgia, is a city of more than 5,000,000 people, located about 75 miles northwest of the refuge.

According to the U.S. Census Bureau, the 2006 population estimate of Jones County was 26,973. The county's population is largely rural and about one-fourth of the county is federally owned. Natural resources in the county include crushed stone, timber, and pulpwood. The largest and only incorporated city in the county is Gray, the county seat, with a population of about 2,000. The city of Gray represents approximately 10 percent of the population of Jones County. Jones County is about 75 percent white versus 25 percent nonwhite. From 2000 to 2006, the population grew by about 14.1 percent, lagging slightly behind Georgia's population growth of 14.4 percent. The economic area for the refuge is defined as Jones, Jasper, Bibb and Monroe Counties. It is assumed that refuge visitor expenditures occur primarily in this 4-county area.

OUTDOOR RECREATIONAL ECONOMICS

The resources of the Piedmont wildlife refuge are economically important (U.S. Department of the Interior and U.S. Department of Commerce 2006). The refuge provides numerous sites for hiking, recreational fishing, and wildlife observation. As our country's population increases and the number of places left to enjoy wildlife decreases, the refuge will become even more important to our community. The refuge benefits the community directly by providing recreational and employment opportunities for the local population and indirectly by attracting tourists from outside the area to generate additional income to the local economy. Whether it is gas used to travel to and from the refuge, a meal at a local restaurant, ammunition, or an overnight at a local motel, visitors to the refuge add substantially to the regional economy.

Piedmont NWR had 50,000 visitors in 2007. The majority of recreation visits were for hunting and fishing. About 65 percent of recreation visits were undertaken by visitors that live more than 30 miles from the refuge. Total expenditures were almost \$2.3 million with visitors that live greater than 30 miles from the refuge accounting for 90 percent of the total expenditures (Caudill and Henderson 2005). Piedmont NWR has a 13-person staff and an annual budget in excess of \$750,000.

REFUGE ADMINISTRATION AND MANAGEMENT

LAND PROTECTION AND CONSERVATION

Management policies of Piedmont NWR are designed to conserve, restore, and enhance in their natural ecosystems all threatened and endangered plants and animals, manage for the diversity of resident flora and fauna that naturally occur in the Piedmont region, and perpetuate the migratory bird resource. Creating and maintaining habitat for the endangered RCW is a high-priority activity. The two primary forest management methods used to create and maintain a diverse array of forest structures, including RCW habitat, are timber harvesting and prescribed fire.

Forest Management

Refuge annual narrative reports indicate forest management was used as a refuge development tool starting in 1940. Utilizing harvesting as a land management tool was first considered in 1942. In 1945, timber operations as a management tool began. Timber harvesting as a land management tool continues to this day.

The overall goal of forest management is to create a variety of forest condition classes to benefit a diversity of wildlife. A specific goal is to manage pine forests for the RCW and associated species of concern such as the Bachman's sparrow and brown-headed nuthatch.

Prescribed Fire

Prescribed fire has been used as a management tool on the refuge since 1940. Burning stopped in 1948, resumed in 1962, and continues to this day. Most of the refuge is under some active management regime, including burning areas on a 2- or 3-year interval. It is used to reduce the severity of wildfire and enhance habitat for resident and migratory wildlife. Prescribed burning is essential to the management, conservation, and recovery of the RCW.

Fields and Streams

Openings account for less than 1 percent of the refuge area and include fields, roadsides, pond dams, and power lines. Open areas are maintained by mowing and/or burning. Some fields have been converted to native warm season grasses for improved wildlife benefit. Invasive species such as Johnson grass, tall fescue, and *Sericea lespedeza* provide little wildlife value and reduce the benefit of open area wildlife. These openings are important feeding and nesting areas for many species of birds and animals.

Numerous clear flowing creeks and beaver ponds provide wetlands used by waterfowl. Eleven ponds are managed for wildlife and fish. Wood duck boxes have been placed around these ponds to provide nesting structures. The refuge manipulates water levels in two areas for wintering waterfowl. These sites primarily serve as demonstration areas. Other water bodies are not manipulated but serve as permanent water sources for those species dependent on wetland environments.

VISITOR SERVICES

The Improvement Act and E.O. 12996 emphasize the importance of providing compatible wildlife-dependent educational and recreational opportunities on national wildlife refuges. A variety of public use opportunities has been available on Piedmont NWR for over 30 years. The Visitor Center is open from 8 a.m. to 5 p.m. weekdays. General public access for birding and hiking along with environmental education began in the early 1980s. Hiking and wildlife observation are encouraged on Piedmont NWR. Access through the refuge is available on 50 miles of graveled roads and numerous county clay roads. Except during severe rain events that flood the stream crossings, the refuge road system is open most of the year. Some roads are closed to vehicles in March and April for turkey hunt season. The Little Rock Wildlife Drive offers a 6-mile auto tour route over narrow graveled roads. The refuge can be accessed from I-75 in Forsyth or Highway 11 between the cities of Gray and Monticello. The Round Oak - Juliette Road, which bisects the refuge, has been designated as part of a state scenic byway.

Hunting

The refuge has a long history of public hunting that dates back to the late 1940s. The big game hunting program is one of the largest in the Service's Southeast Region and began in 1961. Throughout the year, the refuge offers small game, opossum, and raccoon hunting, along with

white-tailed deer and turkey hunting. White-tailed deer and turkey gun hunting is offered as quota drawn hunts. Hunting is permitted on approximately 34,000 acres of the refuge. The hunt program also includes 3,400 acres of Hitchiti Experimental Forest, which is owned by the USDA Forest Service. Hunting is permitted within the framework of state regulations. All hunters must possess applicable valid state hunting licenses in order to hunt on the refuge, along with a special use permit issued by the refuge. In addition to federal regulations, State Game and Fish laws and regulations are adopted and in effect unless they have been further restricted by federal laws and regulations. Hunting seasons and limits are coordinated with the State of Georgia every two years. For an example of hunting opportunities, see Table 4.

Fishing

Sport fishing on Piedmont NWR is permitted only in creeks and on ponds designated as open to fishing from April 1 through September 30 annually. A free permit is required to fish and all state regulations are in effect. Boats with electric trolling motors are permitted in Allison Lake and Pond 2A only. Portable non-motorized boats are allowed in all ponds opened to fishing. The Children's Pond (Pond 21A) offers family fishing for children 15 years of age or younger. Species that may be taken include 5 catfish, 15 sunfish and 5 bass, with a minimum 12 inches in length. Fishing piers are located at Pond 2A, Allison Lake, and the Children's Pond.

Table 3. Hunting and fishing opportunities available in 2009 – 2010

Species	Type hunt	Season	Permit
White-tailed deer	Archery	September – 24 days	Free permit
	Disable Hunt Wheel chair bound only	October -2 days 2 deer limit	Free special use permit
	Gun hunt Quota 1250 hunters/ hunt	October – November - 3 day either sex - 3 day primitive weapon - 3 day either sex - 3 day either sex 2 deer limit	\$12.50 fee special use permit
Turkey	Gun Quota 300 hunters/hunt	3 five day hunts from the end of March through April State limit applies	\$12.50 fee special use permit
Small game	Gun	State season except no	Free permit

Species	Type hunt	Season	Permit
Squirrel Rabbit Quail		small game hunting during any deer hunts	
Raccoon / opossum		8 nights in January	Free permit
Fishing	Designated ponds and all creeks	April 1 – Sept 30 Bank and small boat	Free permit

Environmental Education and Interpretation

Piedmont NWR offers environmental education programs, which can fit the needs to students from elementary through college. The Visitor Center contains exhibits describing refuge wildlife and habitats. It is open Monday through Friday 8:00 a.m. – 5:00 p.m. Other facilities include an auditorium, picnic area, and hiking trails. Interpretive kiosks are at several locations. The refuge has limited availability to provide staff-led trail walks and programs. Schools and other groups are encouraged to contact the refuge to schedule field trips to enhance their classroom learning experience.

Walking, Hiking and Wildlife Observation

Wildlife observation and photography, environmental education and interpretation are all supported and encouraged at Piedmont NWR. There are over 5 miles of walking trails on the refuge, which are available throughout the year. Three foot trails are accessible from the Visitor Center and Allison Lake. Two other foot trails are located on the Little Rock Wildlife Drive.

A parking area and three interconnecting wildlife trails are located adjacent to Allison Lake and the visitor center. These trails are limited to foot travel and involve some moderate walking over uneven and hilly terrain. The 0.9-mile Allison Lake Trail and the 1.3-mile Pine and Creek Trails interconnect and provide foot access through hardwood and pine habitat and views of Allison Lake. Allison trail provides viewing opportunities for wintering waterfowl. The Red-Cockaded Woodpecker Trail is 2.9 miles starting at Allison Lake and traveling through an active cluster site. Cavity trees are characterized by accumulations of white pitch and are marked by a painted white stripe at the base of the tree. The best time to view RCWs along the trail is during the nesting season in May and June.

There are two hiking trails located near Pond 21 (Children's Pond) on the Little Rock Wildlife Drive that provide additional hiking opportunities. The Dragonfly trail is a 0.6-mile loop around the 10-acre pond. The Little Rock trail is a 1-mile loop along a graveled road through open native grass fields and seasonally flooded impoundments. This trail is seasonally opened from February 16 to November 14 and is closed to reduce disturbance to waterfowl.

The wildlife drive offers a 6-mile auto tour route through representative habitats of the refuge. Public access through the refuge is available on 50 miles of refuge graveled roads and numerous county clay roads. There are over 100 miles of woods roads that provide foot access deeper into the refuge for the public. These woods roads are maintained to provide refuge vehicle access for monitoring and management.

PERSONNEL, OPERATIONS, AND MAINTENANCE

Piedmont NWR is administered as an independent refuge and complex headquarters for Bond Swamp NWR, approximately 30 miles to the south. The refuge has a good base of facilities and equipment to support management operations on site. The staff is responsible for maintaining over 120 assets including buildings, roads, parking lots, foot trails, ponds, impoundments, and a fleet of heavy equipment, passenger vehicles, and small equipment. The refuge has 12 full-time employees and 1 position assigned to Bond Swamp NWR, with collateral duties at Piedmont NWR. The Piedmont NWR budget supports all activities and staff on both refuges.

The annual budget of Piedmont NWR varies. In FY06 and FY07, basic refuge funding for Piedmont was \$789,000 and \$751,200, respectively. This does not include the fire program (\$282,000 and \$262,100 - FY06 and FY07 respectively) or deferred maintenance projects. Salary and benefits accounted for 91 percent of the base budget, leaving 9 percent or \$67,600 of the base funding for operations.

As of January 2009, Piedmont NWR staff comprised the following:

- Project Leader GS-0485-13
- Deputy Project Leader GS-0485-12
- Law Enforcement Officer GS-025-9
- Refuge Operation Specialist GS-0485-7/9/11 (Bond Swamp) Vacant
- Engineering Equipment Operator WG-5716-10
- Engineering Equipment Operator WG-5716-10
- Office Assistant GS-0341-9
- Administrative Forester GS-0460-11
- Forestry Technician GS-0462-7
- Prescribed Fire Specialist (FIRE) GS-0401-11
- Forestry Technician (FIRE) GS-0462-5
- Forestry Technician (FIRE) GS-0462-5
- Engineering Equipment Operator (FIRE) WG-5716-8

No new positions are expected in the next 5 years. Staff at Piedmont NWR will be increasingly stretched to provide effective administrative, management, monitoring, law enforcement, and public use oversight for both refuges.

III. Plan Development

INTRODUCTION

Development of the Draft CCP/EA for Piedmont NWR was initiated in October 2007, and is scheduled for completion by September 2010. The planning team responsible for its development was established in December 2007. It includes natural resource management professionals representing Piedmont NWR, Service staff, and GADNR (Appendix K). The Service had previously established a biological review team for Piedmont NWR with representatives from the same agencies in addition to USDA Forest Service (USFS), Southern Research Station (USFS), National Wild Turkey Federation (NWTF), and a retired USDA Entomologist. This team conducted an on-site evaluation and completed a Biological Review Report. A visitor services review team was established for Piedmont NWR that presented recommendations to the refuge staff and prepared a Visitor Services Review Report in February 2008 (USFWS 2008).

Public input in the development of this Draft CCP/EA was obtained, in part, through a public scoping meeting held at the refuge, Jones County, Georgia, in May 2008. News releases and website announcements were utilized to advertize the meeting to the public. The meeting was attended by two stakeholders; however, over the 30-day comment period more than 1,200 comments were received. Comments received during the public scoping process are listed in Appendix D.

In identifying key issues to be addressed during the planning process, the planning team considered recommendations from the Biological Review and Visitor Services Review reports, comments received through the public scoping meeting, and input from core planning team meetings, comment packets, and personal contacts of planning team members. In addition, the team considered opportunities for coordination with other relevant conservation plans (Chapter II – Regional Conservation Plans and Initiatives); applicable legal mandates (Appendix C – Relevant Legal Mandates and Executive Orders); the purposes of Piedmont NWR as well as the mission, goals, and policies of the Refuge System as a whole; and evaluations and documentation required by Service procedures for refuge planning (Appendix E – Appropriate Use Determinations, Appendix F – Compatibility Determinations, and Appendix H – Wilderness Review).

SUMMARY OF ISSUES, CONCERNS, AND OPPORTUNITIES

The planning team identified a number of issues, concerns, and opportunities related to fish and wildlife population management, endangered species management, habitat management and restoration, visitor and educational services, resource protection, and refuge administration. Additionally, the planning team considered federal and state mandates, as well as applicable local ordinances, regulations, and plans. The team also directed the process of obtaining public input through public scoping meetings, open planning team meetings, comment packets, and personal contacts. All public and advisory team comments were considered; however, some issues important to the public fall outside the scope of the decision to be made within this planning process. The team considered all issues that were raised throughout the planning process, and has developed a Draft CCP/EA that attempts to balance the competing opinions regarding important issues. The team identified those issues that, in the team's best

professional judgment, are most significant to the refuge. A summary of the most significant issues ranked by the team are:

- Re-evaluate goals for RCW populations and habitat interrelations of surrounding populations including threats from Southern pine beetles.
- Develop a list of target invasive species and practice integrated pest management.
- Coordinate with private landowners where focus is on habitat management across boundaries.
- Explore potential for expanding refuge boundary.
- More staffing including a permanent employee at front desk and a permanent biologist. Reinstatement of assistant forester and park ranger positions. Identify resource issues from loss of positions (capabilities).
- Recovery of more appropriate groundcovers. Work in partnership for research refuge wide botanical survey, especially with changes in groundcover. Evaluate use of herbicides to control sweetgum to enhance habitat for RCW and other wildlife species.
- Managing upland and bottomland hardwoods for priority species habitats (hardwood/mast producers). Initiate canebrake restoration.
- Manage/consider longleaf/shortleaf pine (value for brown-headed nuthatch) where appropriate
- Identify imperiled species and critical habitat and correct habitat loss in streams.
- Education about fire - Participate with Georgia Prescribed Fire Council - provide interpretive and education materials on the benefits of fire.

During the public comment period, approximately 1,200 comments were submitted to the refuge. The majority of the comments expressed support for the current hunting and fishing programs, and the current habitat conservation and management programs. Most commenters were satisfied with current public use and visitation opportunities. Many comments expressed some type of concern over lack of resources for the refuge. As mentioned above, these comments are listed in Appendix D.

FISH AND WILDLIFE POPULATION MANAGEMENT

Threatened and Endangered Species

The GADNR identified “high-priority species” using criteria such as global and state rarity rankings, population and habitat trends, range of occurrence, number of protected populations, and importance of Georgia efforts to the global conservation of the species (Georgia Department of Natural Resources 2005). The following state high-priority species are on the refuge species lists in Appendix I:

Common Name	Global Rank	State Rank
Red-cockaded woodpecker	G3	S2
Bachman’s sparrow	G3	S3
Bald eagle	G4	S2
Least bittern	G4	S3
Loggerhead shrike	G4T3	S?
Swainson’s warbler	G4	S3
King rail	G4G5	S3
Northern bobwhite	G5	S4

Two of these species are specifically mentioned with respect to the refuge in the Georgia Comprehensive Wildlife Conservation Strategy: the federally endangered Red-cockaded Woodpecker and Bachman's sparrow.

Piedmont NWR contains one of the highest concentrations (per acre of available habitat) of RCWs in Georgia. Approximately 22,500 acres of upland pine and 3,000 acres of upland hardwood are treated through prescribed fire and timber harvesting to create conditions suitable for RCW and associated species of management concern. In 2009, the refuge had 44 active RCW clusters. Prescribed burning and timber harvesting are key forest management practices used to ensure future habitat.

The Altamaha shiner (*Cyprinella xaenura*), a state listed endangered species, and the Goldstripe darter (*Etheostoma parvipinne*), a state high-priority species, may occur on the refuge (Georgia Department of Natural Resources 1999).

There is a possibility that several protected plant species, known to occur in Jones or Jasper Counties, may be found on or near the refuge. The Georgia Department of Natural Resources (1995) lists the following protected plants in Jones and Jasper Counties, along with management recommendations:

- Pink ladyslipper (*Cypripedium acaule*) – avoid disturbance. May require periodic thinning and winter prescribed fire to maintain an open-canopy pine habitat.
- Oglethorpe oak (*Quercus oglethorpensis*) – avoid draining the site. This is a state listed threatened species.
- Relict trillium (*Trillium reliquum*) – avoid disturbance. Will only tolerate hand thinning of trees in the vicinity. Control exotics, especially Japanese honeysuckle. This is a state and federal listed endangered species.

Neotropical Migratory Birds and Resident Birds

Two of the primary purposes of the refuge are to provide refuge and breeding habitat for resident and migratory birds: "... as a refuge and breeding ground for birds and other wildlife: ..." Executive Order 8037, dated Jan. 18, 1939; and "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. 715d (Migratory Bird Conservation Act).

Piedmont NWR and surrounding areas provide habitat for over 200 species of breeding and non-breeding birds. A number of these species, especially landbirds, are transients that utilize the refuge for only brief periods, such as during spring or fall migration. However, the majority will rely on the refuge for considerably longer periods, spending the majority of breeding or non-breeding season, or even their entire annual cycle, at the refuge.

The operation and management of the refuge provides for the basic needs of these species, including feeding, resting, and breeding. Piedmont NWR currently conducts a Christmas bird count and a breeding bird migratory bird point count. Current forest management at Piedmont NWR is directed for the benefit of RCWs; however, these practices also benefit many other bird species. Several recommendations from the biological review team aim to support and expand efforts to manage areas that will promote a variety of bird species. Some forest management practices need to be adjusted to provide or maintain habitat for priority neotropical migratory birds and resident birds.

Waterfowl and Wetland-dependant Birds

The refuge currently implements a limited water management program. Eleven impoundments are maintained at full pool except during repairs. In the last 10 years, 8 impoundments have had major dam, emergency spillway, and water control structure repairs or replacements. The refuge provides habitat for both resident and migratory species of waterfowl. Wintering migratory birds on the refuge include: ring-necked ducks, lesser scaup, mallards, wood ducks, and hooded mergansers. Other species observed in lesser numbers include: American widgeon, gadwall, northern pintail, blue-winged teal, green-winged teal, and American black ducks. In November 2006, the refuge proposed to eliminate all waterfowl banding due to a realignment of priorities, lack of staff availability, and low success rate compared to amount of staff time required.

Resident Wildlife

While the Service's primary goal is the protection of federal trust species (e.g., RCWs and migratory birds), the refuge's purposes include improving natural diversity of resident fish and wildlife species. Therefore, it is the responsibility of the refuge to manage resident wildlife within its boundaries. The most widely recognized resident game species that are common in the area include white-tailed deer, eastern wild turkey, gray squirrel, raccoon, opossum, eastern cottontail rabbit, wood duck, bobcat, and gray fox. Game animals of less common occurrence include northern bobwhite, black bear, swamp rabbit, fox squirrel, and red fox. Feral hogs, coyotes, and beavers also occur on Piedmont NWR and can have significant impacts on other wildlife species and their habitat. Otter and mink are two additional mammal species that frequent aquatic habitats in this area of Georgia. Other mammals include various bat species.

During the public comment, the public expressed interest in maintaining a healthy deer population. The refuge will need to evaluate current management practices to address how to maintain a healthy deer population.

Other Resident Species

Resident reptiles and amphibians include alligators, various snakes, frogs, skinks, and turtles. Ninety-two species of butterfly occur at Piedmont NWR. Little is known about the occurrence, distribution, or relative abundance of any number of potentially occurring rare, threatened, or endangered plants, butterflies, dragonflies, and species associated with dense canebrakes. Determining their presence will help their needs to be fully considered in the development of any refuge habitat management plans, or justify the need for specific management attention.

HABITAT MANAGEMENT

Habitat management is the manipulation of vegetation, water, and other factors for the benefit of targeted animal communities (Schroeder et al. 1998). Habitat management is a major component of the wildlife manager's responsibilities (Yoakum 1979). Most habitat management on a forested refuge like Piedmont is equivalent to forest management. Forest management includes activities such as timber thinning and regeneration, prescribed fire, and openings' management. For simplicity's sake, forest management in this document refers to timber harvesting and associated activities.

Timber harvesting is traditionally an economic activity that influences habitat and habitat quality – it “results in generation of a commodity which is or can be sold for income or revenue or traded for goods or services” (50 CFR 25.12). It should be noted, however, that commodity production is not the purpose for the activity; it is only a tool used to achieve habitat management objectives.

Forest Management

Piedmont NWR has a very active forest management regimen that includes prescribed burning, thinning, regeneration, and stand improvement as some of the techniques used to enhance and maintain habitat conditions. Current management occurs to provide optimal habitat for RCWs through time. The majority of public comments received during the comment period is in favor of current forest management on the refuge.

Ecology provides two patterns for the forester to follow: succession and disturbance. Succession and disturbance interact to determine the ecological landscape of the forest through the interplay of their actions within or across existing stands (Oliver and Larsen 1996).

Succession represents the growth and development of an existing forest or stand. Following a major disturbance that eliminates most or all vegetation on a site and assuming no more major disturbances, the forest stand passes through four distinct stages of development: 1) *Stand Initiation*, 2) *Stem Exclusion*, 3) *Understory Reinitiation*, and 4) *Old Growth*. In reality, only the rarest forest stands reach the old growth stage since the exclusion of major disturbances over centuries is unusual.

Disturbance is the partial or complete removal of an existing forest stand. Disturbances can be divided into two types based on the amount of overstory removed: major disturbances, which eliminate all existing trees from the site, and minor disturbances, which leave some of the pre-disturbance trees alive. In general, disturbance tends to prevent stands from achieving or maintaining canopy closure. When long periods of time pass with little disturbance, the susceptibility of the stand to disturbance increases. Types of disturbance include fires, winds, floods, landslides, insects, and diseases.

Minor disturbances that eliminate some of the vegetation on a site can occur between or instead of major disturbances. Minor disturbances can create either uneven-aged or even-aged stands. They influence stand structure, species composition, and growth rates depending on how much of the existing stand is left alive and in what species and crown positions. Regenerating trees compete for growing space with previously established, large trees which survived the disturbance, as well as trees regenerating after the disturbance.

Ecologically, silviculture is the forester's attempt to imitate succession and disturbance. Harvest and regeneration cutting imitates disturbance; stand management after regeneration imitates succession. The first two stages of succession set the stage for even-aged silviculture. By imposing disturbances significant enough to promote regeneration across the entire stand, the forester can encourage the development of shade intolerant or intermediate species as one or two ages distributed across the stand. The later stages of succession, primarily the understory re-initiation stage, provide the ecological basis for uneven-aged silviculture. When trees in the overstory die, a new age class becomes established within the resulting gap. Moreover, as overstory mortality continues over time, some regeneration will become established between gaps because of reduced overstory stocking. Uneven-aged silviculture mimics the scattered overstory mortality in the older age classes, thereby following the later stages of succession.

Fire Management

Fire has influenced the composition, structure, and landscape patterns of plant and animal communities for millennia. The southeastern pine region extends from eastern Texas to Florida, north to Virginia, and west through the Appalachians of Tennessee, Kentucky, and Arkansas (Smith 2000). The vegetation is characterized by "southern pines" – longleaf, loblolly, slash, and shortleaf and lesser represented pine species like Virginia, pond pine, and sand pine. These pines tolerate and even depend on fire. Most hardwood species in the same area are suppressed by fire. Many of the grasses and forbs associated with these pine forests also depend on fire (Frost et al. 1986).

A basic premise of fire ecology is that fire is neither innately positive nor negative; it simply causes change. Whether these changes are desirable or not depends on the land management objectives. Resource managers can manipulate fire-caused changes in plant and animal communities. To do this, knowledge of the ecological role of fire, both past and present, is essential.

Plants and animals respond differently to fire variables including fire frequency, seasonality, intensity, size, and depth of burn. While fire is variable, general patterns occur over long periods. These patterns describe fire regimes (Brown et al. 2000). Put another way, fire regime refers to the nature of fire occurring over long periods and the prominent immediate effects of fire that generally characterize an ecosystem.

There are four fire regime classifications: 1) *Understory*, 2) *Stand-Replacement*, 3) *Mixed-Severity*, and 4) *Nonfire* (Brown et al. 2000). Piedmont NWR falls in the first classification. Fires in the understory fire regime are generally non-lethal to the dominant vegetation (i.e., the overstory) and do not substantially change the structure of the dominant vegetation. Approximately 80 percent of the aboveground dominant vegetation survives fires.

Understory fire regimes *can* change the overstory in several ways (Smith 2000). First, understory fires may kill or top-kill a few of the most fire-susceptible trees. Second, they may selectively kill or top-kill a cohort of tree regeneration according to fire resistance. Furthermore, understory fires reduce woody understory biomass (Wade et al. 1989), sometimes in a patchy pattern. At the same time, it increases understory grasses and forbs. The structural changes caused by a single understory fire are not dramatic, but repeated fires create and maintain a forest characterized by large, old trees, park-like conditions, and few understory trees.

Fire management within the refuge consists of both wildfire suppression and prescribed burning activities. These management actions are used to maintain healthy diverse forests. There are challenges to prescribed burning within the refuge. The biggest challenges are managing smoke production and acquiring an adequate number of resources when conditions are good for burning.

Invasive and Pest Species Control

An “invasive species” is defined as a species that is exotic (or alien) to the ecosystem under consideration, and whose interdiction causes or is likely to cause economic harm, environmental harm, or harm to human health (EO 13112). These species are normally introduced by direct or inadvertent human actions.

Invasive and pest organism issues at Piedmont NWR are associated primarily with plants. The biological review of the refuge identified a limited number of plants that are classified as invasive. These are: privet, non-native wisteria, Chinaberry, Bicolor Lespedeza, Bermuda grass and Japanese stilt grass/Nepal grass. Additionally, sweet gum is a native species that has invaded the understory of the upland pine habitat of the refuge. Methods to control sweet gum and other invasive species need to be identified.

Presently, there are no known issues regarding mammals (e.g., feral hogs, nutria) or fish (e.g., common carp).

RESOURCE PROTECTION

Cultural Resources

Thirty-four cemeteries have been documented on Piedmont NWR. All of the cemeteries share certain characteristics, such as old cedars, large mature oaks, and dogwood, growing within them. They are often located on ridges or hills and have old roadbeds leading to and around them. At least three cemeteries have limestone or concrete block walls built around several graves. There are indications that several cemeteries had ornamental metal or wrought iron fences around them or around individual family plots. Often ornamental shrubs or trees, such as red cedar, mark the corners or boundary lines of the cemetery. The refuge developed an interpretive brochure that discusses the historic cemeteries and home sites found on the refuge. Refuge specific regulations and information are provided to ensure protection of the cultural resources. Unknown sites are found periodically and additional staff resources are needed to ensure proper and timely documentation of these sites.

VISITOR SERVICES

Fishing and Hunting

As expressed in the public responses, hunting and fishing opportunities on the refuges are of great public interest. The hunting program at Piedmont NWR is managed via a combination of quota and non-quota hunts. Gun hunting for white-tailed deer and turkey is offered through public lottery. Other hunting opportunities include deer archery, quail, squirrel, rabbit, raccoon, and opossum. Hunting is permitted on approximately 34,000 acres of the refuge.

Sport fishing is permitted April 1 to September 30 in accordance with state regulations on six refuge impoundments and in refuge creeks. Fishing for bass, bluegill, and catfish is one of the top two public activities on the refuge.

Public comments expressed interest in expanding hunting opportunities by increasing quota hunt days, increasing small game hunts, and allowing for more special hunt programs. Other comments included increasing food plots, incorporating a deer trophy program, and increasing fees for hunting. Many commenters support the current hunting and fishing programs offered by the refuge.

Wildlife Observation and Photography

Piedmont NWR offers a variety of opportunities for wildlife observation and photography. A 6-mile auto tour route is provided that enhances opportunities for wildlife observation and photography. Allison Lake and the Little Rock Wildlife Drive Demonstration Area have two developed observation areas. Allison Lake has a bird blind and the Wildlife Drive has an overlook intended and used primarily during winter months for waterfowl viewing. Hiking trails offer opportunities for wildlife observation. Trails at Piedmont NWR offer hiking opportunities ranging from 1 to 3 miles and interconnect for those that wish to hike longer distances. The Allison Trail, Creek Trail, Pine Trail, and the RCW trail can be accessed from the visitor center or Allison Lake parking area. The RCW trail provides viewing opportunities of this endangered species. Two new hiking trails are located on the Little Rock Wildlife Drive near the children's pond. There is an extensive network of roads throughout the refuge that can be used for wildlife viewing.

Environmental Education and Interpretation

The refuge currently has adequate environmental education facilities in and around the visitor center. The refuge lost the park ranger (interpretive) position 4 years ago. So the environmental education and interpretation activities are limited by the workloads of existing staff. Attention is directed to third and fourth grade on-site student programs as well as programs given to university classes. The refuge has conducted summer programs at libraries in neighboring communities. Past environmental education partnerships with area universities, schools, organizations, and agencies have declined due to lack of a public use staff. A long-term recommendation from the visitor services review is to hire a park ranger (interpretive) position to implement environmental education program.

REFUGE ADMINISTRATION

Resource Needs

Additional resources are needed to meet the refuge's goals and vision for the next 15 years. This plan details these needs by establishing goals, objectives, and strategies.

Wilderness Review

Refuge planning policy requires a wilderness review as part of the comprehensive conservation planning process. No lands are identified for inclusion as wilderness on the refuge. The results of the wilderness review are included in Appendix H.

IV. Management Direction

INTRODUCTION

The Service manages fish and wildlife habitats considering the needs of all resources in decision-making. But first and foremost, fish and wildlife conservation assumes priority in refuge management. A requirement of the Improvement Act is for the Service to maintain the ecological health, diversity, and integrity of refuges. Public uses are allowed if they are appropriate and compatible with wildlife and habitat conservation. The Service has identified six priority wildlife-dependent public uses. These uses are: hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation.

Described below is the proposed CCP for managing the refuge over the next 15 years. This proposed management direction contains the goals, objectives, and strategies that will be used to achieve the refuge vision.

The following four alternatives for managing the refuge were considered:

- Alternative A - (Current Management-No Action)
- Alternative B - (Wildlife and Habitat Diversity - Proposed Alternative)
- Alternative C - (Migratory Birds)
- Alternative D - (Rare, Threatened, and Endangered Species)

Each of these alternatives is described in Section B. The Service chose Alternative B - (Wildlife and Habitat Diversity) as the proposed management direction.

Implementing the proposed alternative would result in a better understanding of the biological resources present on the refuge through an increase in inventorying and monitoring surveys and prioritizing the refuge's purposes and the Service's mission in support of trust species. Red-cockaded woodpecker management would increase to reach the population goal. Habitat management actions, under this alternative, would increase the structural, and thus the biological, diversity of the refuge. The range of acceptable structural diversity would be constrained by threatened and endangered species requirements. This would allow endangered species management to coexist, to the greatest extent possible, with wildlife-dependent recreation. Furthermore, since a biologically diverse ecosystem is more resistant to change and can recover from change faster than a simple ecosystem, the proposed alternative would present the best option for adapting to climate change in the southern Piedmont region. Invasive and pest species would be controlled or eradicated.

This alternative would improve the quality of visitor services. Invasive aquatic species would be controlled to improve fishing opportunities. Wildlife observation and photography would be increased with the addition of photo blinds and observation decks. Environmental Education, Interpretation, and Outreach would increase. Hunting opportunities would increase where possible. Resource protection would increase through an enhanced law enforcement and cultural resource program. Refuge administration would be enhanced through increased partnerships, volunteer programs, and staffing.

VISION

Piedmont NWR serves as a demonstration area of quality wildlife habitat through active forest management in the Southern Piedmont region. Management creates and maintains fire-dependent open canopy oak-pine forest with areas of prairie and savannas for red-cockaded woodpecker, Bachman's sparrow, brown-headed nuthatch, bobwhite quail, and associated wildlife species. Stretches of cane breaks along streams and bottomlands provide enhanced habitat for Swainson's warbler, Kentucky warbler, and cane-dependent butterfly species. Cooperative partnerships integrate refuge wildlife habitat management into a landscape vision of a healthy forest. Wildlife-dependent opportunities are provided to enhance public awareness and appreciation of the area's natural resources for present and future generations.

GOALS, OBJECTIVES, AND STRATEGIES

The goals, objectives, and strategies presented are the Service's response to the issues, concerns, and needs expressed by the planning team, the refuge staff and partners, and the public and are presented in hierarchical format. Chapter V identifies the projects associated with the various strategies.

These goals, objectives, and strategies reflect the Service's commitment to achieve the mandates of the Improvement Act, the mission of the Refuge System, and the purposes and vision of Piedmont NWR. The Service intends to implement these goals, objectives, and strategies within the next 15 years.

FISH AND WILDLIFE POPULATION MANAGEMENT

Goal 1: Manage, enhance, and restore healthy and viable populations of migratory birds, native wildlife, and fish, including all federal and state threatened and endangered species found on the refuge.

Discussion: Piedmont NWR supports a diversity of wildlife species common to the Piedmont region of Georgia. The refuge is home to more than 200 bird species; 14 amphibians and 41 species of reptiles; 45 mammals; 58 species of plants; 85 species of butterflies; and many fish species.

Objective 1.1: Wildlife Inventory and Monitoring Plan

Within 5 years of CCP approval, develop and implement a wildlife inventorying and monitoring plan.

Discussion: Wildlife populations are a product of the land and its habitats; therefore, the wildlife manager must be able to evaluate the habitat and the wildlife species. Evaluations are analyses (i.e., observations) plus value judgments based on goals and objectives (De Vos and Mosby 1969). Evaluations can be either intensive or extensive efforts to appraise the value of different parameters of the environment for wildlife populations. Inventory – quantitatively sampling the spatial distribution, composition, and rates of change of various parameters within specified levels of precision (Helms 1998) – is one of many forms of analysis.

Evaluation is used to determine the status of wildlife and their habitats for planning management actions. Monitoring is used to determine the results of such actions and evaluate the results in terms of the CCP's objectives. This iterative cycle of planning, project implementation, monitoring, and evaluation continues integrating the knowledge and experience from the previous adaptive management cycle into the next one (Stankey et al. 2005).

Monitoring the broad range of wildlife and their relationships with habitats that occur on the refuge is an incredibly difficult and complex task. Providing adequate habitat for a suite of focal species that represent the range of habitats on the refuge, and only monitoring those focal species, is one approach to simplifying this complexity (Lambeck 1997). The assumption that the response of the chosen focal species to management actions represents the response of other species in a particular assemblage, however, is questionable (Lindenmayer et al. 2002). A complementary strategy is to monitor structure based diversity indicators such as stand complexity, connectivity, and heterogeneity (Lindenmayer et al. 2000).

Strategies:

- Develop and implement a wildlife inventory and monitoring plan.
- Identify focal species and appropriate survey methods.

Objective 1.2: Red-cockaded Woodpecker (RCW)

Over the 15-year life of CCP, expand current RCW monitoring and management to increase the population by 3 to 5 percent annually working toward a goal of 60 to 70 groups. This would support the overall refuge recovery goal of 96 groups.

Discussion: In 2009, the refuge had 44 active RCW clusters. The population goal would be 60-70 active clusters within the next 15 years. Prescribed burning has contributed to but has not yet achieved control of understory hardwoods within foraging habitat. Timber harvesting has improved pine stands for foraging through thinning and reduction of midstory hardwood. Some short-term management actions may facilitate more rapid increases in the RCW population, including intra-population translocation and reassessment of recruitment cluster locations. Long-term management actions must address anticipated degradation of entire loblolly pine stands associated with age-related mortality. The resulting future shortage of older age mature cavity trees could result in a loss of foraging and nesting habitat, creating a significant bottleneck to RCW population growth. Silvicultural prescriptions need to deal with a highly skewed age-class distribution and begin extensive regeneration of pine across the forest.

Strategies:

- Manage 22,500 acres of upland pine to meet the refuge's RCW population goal.
- Visually examine nest and roost cavities during breeding season at 100 percent of the managed clusters.
- Band 5 to 10 nests per year.
- Seek opportunities to translocate juveniles.
- Annually monitor 100 percent potential breeding groups and determine cluster activity and cavity suitability status.
- Install artificial cavities to maintain the number of recruitment sites equal to 20 percent of the number of active clusters.
- Explore opportunities for predator prevention.
- Explore opportunities for systematic survey for new active cavities.
- Aggressively control bark beetle infestations that pose a risk of spreading within clusters and associated foraging habitat.

-
- Perform timber stand thinning and regeneration operations to improve foraging habitat conditions and to ensure a continuous supply of foraging habitat through time.
 - Implement prescribed burning to improve the quality of nesting and foraging habitat.
 - Continue working with Oconee National Forest and Hitchitti Experimental Forest to manage RCW population as one recovery unit.

Objective 1.3: Migratory Birds

Over the 15-year life of CCP, determine species presence, relative abundance, or habitat use of migratory birds on the refuge.

Discussion: Piedmont NWR and surrounding areas provide habitat for more than 200 species of breeding and non-breeding birds. A number of these species is transients that utilize the refuge for only brief periods, such as during spring or fall migration. However, the majority will rely on the refuge for considerably longer periods, spending the entire breeding or non-breeding season, or even their entire annual cycle on the refuge.

Strategies:

- Conduct annual Christmas Bird Count.
- Identify focal species and appropriate survey methods.
- Reinstate breeding bird survey.
- Explore opportunities with local groups to implement surveys.
- Evaluate need for MAPS (Monitoring Avian Productivity and Survivorship) stations and seek partnerships to implement monitoring.

Objective 1.4: Waterfowl

Within 5 years of CCP approval, determine species presence and abundance of wintering waterfowl on the refuge.

Discussion: Refuge habitats and resources for waterfowl include bottomland hardwood forests along 35 miles of permanent streams/creeks, beaver ponds, and 11 impoundments. The impoundments range in size from 2 to 46 acres, totaling 114 acres and are generally located at the lower portions of a watershed. Most of these impoundments are managed for recreational fishing. The average depth is around 3 feet, with a maximum depth of 10 feet recorded in most ponds.

Strategy:

- Reinstate the mid-winter waterfowl survey in cooperation with GADNR.

Objective 1.5: Wood Duck

Within 5 years of CCP approval, provide breeding habitat and increased knowledge of nesting success for wood ducks on the refuge.

Discussion: Resident wood ducks occur throughout the aquatic habitats in Piedmont NWR. Migratory birds add to this number during fall and winter. Management that increases the number of suitable cavity trees and increases mast production will improve habitat conditions for wood ducks. The use of artificial nest cavities to supplement natural ones and improvements to brood habitat can make positive improvements in wood duck populations.

Strategies:

- Evaluate appropriate locations for installation of wood duck nest boxes.
- Improve and maintain brood habitat.
- Annually monitor nest success and maintain nest boxes.

Objective 1.6: Wetland-Dependent Birds

Within 5 years of CCP approval, determine species presence of wetland-dependent birds on the refuge.

Discussion: There are no known nesting rookeries on the refuge; however, beaver ponds and riparian areas provide foraging habitat and potential rookery sites for heron, egret, ibis, and anhinga. Sandhill cranes and foraging wood storks would find potential feeding and roosting habitats in the wetlands.

Strategy:

- Explore opportunities with partners to initiate surveys for wetland-dependent birds.

Objective 1.7: Raptors

Within 5 years of CCP approval, determine species presence of raptors on the refuge.

Discussion: Bald eagles and osprey occasionally forage on the refuge with no known nesting. Several species of owls and hawks utilize the refuge year-round. Raptors play an important role on the refuge but are not currently monitored. As management efforts intensify in the Piedmont Savanna focus area, the interrelationship between targeted wildlife species and raptors may become important in the assessment of management actions.

Strategies:

- Reinstate annual winter bald eagle survey.
- Initiate raptor survey in Piedmont Savanna focus area.

Objective 1.8: Resident Wildlife – Birds

Over the 15-year life of CCP, determine species presence, relative abundance, or habitat use of resident birds on the refuge.

Discussion: Management strategies through prescribed fire and timber harvesting favor conditions that benefit wild turkey, northern bobwhite, Bachman's sparrow, brown-headed nuthatch and red-cockaded woodpecker. Historically, management enhanced habitats for turkey and quail to provide huntable populations. In coordination with GADNR, the refuge monitors turkey and quail to ensure stable populations. Northern bobwhite populations have experienced long-term and severe declines across the South, including most of Georgia. The Service is a partner with the Northern Bobwhite Conservation Initiative, a range-wide recovery plan. Piedmont NWR offers a unique opportunity to manage enough acres of contiguous habitat to sustain populations of bobwhite, turkey, Bachman's sparrow, brown-headed nuthatch, and red-cockaded woodpecker.

Strategies:

- Identify focal species and appropriate survey methods.
- Conduct summer quail call counts and initiate fall quail covey count in cooperation with GADNR.
- Reinstate spring turkey brood count in cooperation with GADNR.

Objective 1.9: Resident Wildlife – Mammals

Over the 15-year life of the CCP, expand management to maintain the deer population of 30-35 per square mile, with a balance sex ratio to maintain carrying capacity in coordination with GADNR.

Discussion: Piedmont NWR has a history of managing the deer population through controlled hunts. Harvest strategies should be developed to maintain a healthy deer population in balance with available habitat.

Strategies:

- Maintain check station.
- Ensure a minimal harvest of between 200-275 adult does each year.
- Investigate ways to restore or maintain an even sex ratio by initiating all hunts as either sex, initiating an even buck program, and/or establishing a one buck limit per hunt.
- Explore opportunities to utilize combination of quota and non-quota hunts.
- Conduct deer browse survey.

Objective 1.10: Resident Wildlife – Mammals – Focus Area

Within 5 years of CCP approval, determine species presence of furbearers in Piedmont Savanna focus area.

Discussion: Furbearers are a part of the Piedmont ecoregion. The refuge is exploring opportunities to enhance management in the Piedmont Savanna focus area to restore and sustain the habitat characteristics for target wildlife populations. Monitoring furbearers will provide information to ensure changes in management do not negatively impact predator/prey relationships.

Strategy:

- Initiate annual scent station surveys in coordination with GADNR.

Objective 1.11: Resident Wildlife – Mammals – Focal Species

Over the 15-year life of the CCP, determine potential focal species to monitor and evaluate management actions on the refuge.

Discussion: The refuge has a long history of active management. Monitoring focal species is one approach to the monitoring and evaluation parts of the adaptive management cycle. As the refuge practices adaptive management, the evaluation of wildlife and habitat relationships are needed. Piedmont NWR offers a unique opportunity to manage enough acres of contiguous habitat to sustain populations of resident mammals such as fox squirrels.

Strategy:

- Identify focal mammal species and appropriate survey methods.

Objective 1.12: Reptiles and Amphibians

Over the 15-year life of the CCP, determine species presence and habitat use of reptiles and amphibians on the refuge.

Discussion: Piedmont NWR provides habitat diversity which supports reptiles and amphibians. No known species of special conservation concern occur on the refuge.

Strategies:

- Survey reptiles and amphibians to update species list in coordination with GADNR.
- Explore potential focal species and appropriate survey methods.

Objective 1.13: Fish

Within 10 years of CCP approval, determine fish species presence in refuge streams.

Discussion: The refuge has limited information on fish species in streams. The Altamaha shiner (*Cyprinella xaenura*) is a state listed endangered fish species that may occur on the refuge.

Strategies:

- Explore opportunities with partners to survey streams.
- Develop species list and identify priority stream protection.

Objective 1.14: Invertebrates

Over the 15-year life of CCP, determine species presence and habitat use of invertebrates on the refuge.

Discussion: Approximately 98 of the 130 expected butterfly species for the Piedmont region of Georgia have been documented on Piedmont NWR through organized butterfly surveys. It is likely that many of the others could occur here, but perhaps infrequently or in limited numbers. Many species require specific host plants to complete their life cycles, and a number of such host plants require forest openings, early successional patches, and other sunlit areas to thrive. Several butterfly species tied to cane and native grasses have been found on the refuge. There has been no comprehensive invertebrate survey of threatened, endangered, or listed species of concern inside the Piedmont NWR.

Strategies:

- Conduct annual butterfly survey in coordination with the North American Butterfly Association 4th of July Count.
- Explore opportunities with partners to initiate basic inventories of dragonflies, crayfish, and mussels.
- Explore potential focal species and appropriate survey methods.

Objective 1.15: Plants

Within 10 years of CCP approval, inventory rare plants on the refuge.

Discussion: Little is known about the occurrence, distribution, or relative abundance of rare, threatened, or endangered plants on the refuge.

Strategy:

- Explore opportunities with partners to develop a rare plant list.

HABITAT MANAGEMENT

Goal 2: Manage, enhance, and restore suitable habitat for the conservation of migratory birds, native wildlife, fish, and plants, including all federal and state threatened and endangered species endemic to the refuge.

Discussion: Piedmont NWR's 34,995 acres are subdivided into 34 management compartments of approximately 1,000 acres each. Ninety-eight percent (34,231 acres) of the refuge is forested. Seventy-two percent (25,280 acres) is pine; twenty-six percent (8,951 acres) is hardwood. Non-forest habitat types (open fields, roadsides, and utility rights-of-way, ponds, and impoundments) comprise two percent of the refuge.

Objective 2.1: Habitat Management Plan

Within 2 years of CCP approval, develop and implement a habitat management plan.

Discussion: The need to develop and implement a habitat management plan was identified in the scoping stage of the CCP process. This management plan will identify resource needs and establish habitat restoration and management programs based on goals, objectives, and strategies identified in the CCP. This plan will also identify appropriate habitat monitoring strategies to compliment wildlife inventorying and monitoring.

Strategies:

- Develop and implement a habitat management plan.
- Explore potential structure based diversity indicators and appropriate monitoring methods.

Objective 2.2: Upland Forest Management

Over the 15-year life of the CCP, manage 22,500 acres of upland pine to meet the refuge's RCW recovery goal of 96 groups.

Discussion: The RCW prefers mature, open canopy pine stands with low ground cover of grasses and forbs. Its decline has been traced to the loss of this fire-dependent ecosystem. Bachman's sparrows are found in similar habitat where frequent fires have occurred. Brown-headed nuthatch, bobwhite quail, and fox squirrel are also associated with this habitat type. Forest management to include prescribed fire and timber harvesting are essential tools to manage for a sustainable RCW population and associated species.

Strategies:

- Implement Georgia's Best Management Practices for Forestry as appropriate for the refuge.
- Manage for a basal area of 40-80 square feet per acre.
- Explore the benefits of underplanting of shortleaf and longleaf pine.
- Integrate forestry and fire management programs.
- Ensure adequate regeneration over time to provide a continuous flow of suitable habitat.
- Compartment level entry cycle
- Regenerate annually approximately 1-2 percent of pine to achieve an even-age class distribution based on anticipated minimal rotation stand age of 100-120 years.

Objective 2.3: Forest Management for Diversity

Within 5 years of CCP approval, modify the forest management program to benefit wildlife and habitat diversity at multiple scales while continuing to meet RCW recovery goals.

Discussion: A forest is a collection of stands. A forest stand is a relatively homogenous group of trees that are a distinguishable unit. A stand may be considered even-aged if the difference in age between the oldest and youngest trees does not exceed 20 percent of the length of the expected life span of the principal species. An uneven-aged forest stand contains at least three well-defined age classes; "well-defined" means differing in stem diameter, total height, and age.

Forest regulation details how silvicultural treatments are implemented over the entire property (Davis and Johnson 1987). In even-age regulation, silviculture is regulated by dividing the forest up into stands of different age classes that are regenerated as it reaches maturity. In uneven-age regulation, trees of at least three age classes form a relatively homogeneous mixture in a stand. Silviculture is regulated by periodically removing trees of all sizes to achieve and maintain a specified diameter distribution.

Even-aged and uneven-aged regulation creates different structures at different scales. In even-age regulation, all trees in each stand are approximately the same age; however, all age classes are represented in approximately the same total area across the forest. In uneven-age regulation, at least three age classes are in each stand. All stands have about the same character, however, only varying in appearance with time of last harvest. Diversity is richest in the forest managed under both even-aged and uneven-aged management (Hunter 1990).

Strategies:

- Explore a combination of even- age and uneven age stand management.
- Modify prescribed burn program as appropriate for pine regeneration.
- Investigate potential structure based diversity indicators and appropriate monitoring methods.
- Implement Georgia's Best Management Practices for Forestry as appropriate for the refuge.

Objective 2.4: Bottomland Forest Management

Over the 15-year life of the CCP, strategically manage bottomland forests on the refuge.

Discussion: Significant patches of bottomland forest habitat on the refuge are closed canopied and lack understory complexity, particularly in interior stands away from roads, old logging operations, and other disturbed areas. The development of understory layers is principally influenced by light penetration and hydrologic forces. Bird diversity is directly related to vertical structure (MacArthur and MacArthur 1961). Best Management Practices for Forestry are the most appropriate or applicable forest practices or activities to attain a silvicultural goal while protecting the chemical, physical, and biological integrity of waterways (Georgia Forestry Commission 2009). BMP's achieve this by minimizing non-point source pollution (i.e., erosion and stream sedimentation) from forestry practices.

Strategies:

- Increase vertical structure through creation of variable size gaps using mechanical and chemical means. Create areas where mid- and understory strata are well developed, providing important structure and foraging/nesting substrates for many wildlife species.
- Implement Georgia's Best Management Practices for Forestry as appropriate for the refuge.
- Implement an aggressive invasive plant species program using herbicide to control highly invasive plants.

Objective 2.5: Fire Management – Fuels

Within 5 years of CCP approval, manage fuels to reduce the likelihood of an unwanted ignition becoming large, intense, or difficult to control and prevent damage to sensitive areas.

Discussion: There are four fuel types on the refuge – pine needle litter and light brush, grass with pine litter, logging debris, and hardwood litter (Southern Forest Fire Laboratory 1976). Reducing hazardous fuels through prescribed fire and rearranging fuels through mechanical treatments reduces the incidence of injury to life and property resulting from catastrophic wildfire. The refuge has resources that may be sensitive to intense fire such as RCW cavity trees, some yucca and rock outcrops, and some cultural and historic resources.

Strategies:

- Reduce hazardous fuels through an active prescribed fire program.
- Maintain RCW habitat on 22,000 acres of pine type through a 3-year burn cycle.
- Mechanically rearrange vertical and horizontal fuels.
- Reduce hazardous fuels around sensitive areas.

Objective 2.6: Fire Management – Uplands

Over the 15-year life of the CCP, manage upland pine with prescribed fire to comply with RCW recovery goals.

Discussion: Prescribed burning is essential to the management, conservation, and recovery of the RCW. Prescribed fire is the preferred method to control pine and hardwood midstory, the primary cause of cluster site abandonment (Loeb et al. 1992). Using prescribed fire to control understory hardwoods in pine stands has been an accepted practice for decades (Grano 1970). Successful regeneration of loblolly pine for future RCW habitat depends, in part, on controlling hardwood competition and on preparing a suitable seedbed. Prescribed fire is the most economical method for creating a good seedbed (Edwards 1987). Prescribed fire is also an accepted method to thin young stands of loblolly pine (Wade 1993).

Strategies:

- Reduce the woody component and increase the grass and forbs component of the understory in RCW habitat (22,000 acres).
- Reduce the pine and hardwood midstory basal area to acceptable standards for RCW management.
- Implement Georgia's Best Management Practices for Forestry as appropriate for the refuge.
- Integrate forestry and fire management programs.
- Work with interagency collaborators, adjacent landowners, and other partners for prescribed fire use.

Objective 2.7: Fire Management – Wildland Urban Interface

Over the 15-year life of CCP, identify, map, and protect communities and/or structures at risk from wildfire.

Discussion: Wildland/urban interface (WUI) is where community resources intermingle with wildland fuels, and may be threatened by wildfire. The classic WUI is characterized by areas of urban sprawl where homes and other structures press against public and private wildlands. The isolated WUI is made up of remote structures surrounded by large areas of vegetation (Macie and Hermansen 2002). This is the primary WUI component around the refuge. Structural firefighting is not a functional responsibility of Service employees.

Strategies:

- Provide for firefighter and public safety as the highest priority.
- Contain 95 percent of all wildfires within 24 hours.
- Implement a hazard fuel program.
- Work with interagency collaborators, adjacent landowners, and other partners in wildfire suppression.
- Implement Georgia's Best Management Practices for Forestry as appropriate for the refuge.

Objective 2.8: Fire Management – Focus Area

Within 5 years of CCP approval, modify the fire management program to include the 5,000-acre Piedmont Savanna focus area.

Discussion: The fire management plan is required to be reviewed every 5 years.

Strategies:

- Update fire management plan to include smaller burn units on a two year rotation in the Piedmont Savanna focus area.
- Integrate forestry and fire management programs.

Objective 2.9: Impoundments

Within 5 years of CCP approval, enhance water management program on Little Rock Demonstration area to benefit wetland-dependent species.

Discussion: The refuge currently implements a limited water management program. Eleven impoundments are maintained at full pool except during repairs. In the last 20 years, only Allison dewatering area and the Little Rock demonstration area (below Pond 21) have been actively managed for wintering waterfowl habitat. Allison Dewatering area has been managed for moist-soil plants and Little Rock demonstration area has been planted with agricultural crops such as corn, millet, and wheat.

Strategy:

- Write and implement water management components within the Habitat Management Plan.

Objective 2.10: Unique Rare Habitats – Rock Outcrops
Within 10 years of CCP approval, identify and inventory rock outcrops.

Discussion: Rock outcroppings present opportunities to observe the earliest plant successional stages including lichens and mosses. There are at least two outcroppings on the refuge. The one on Little Falling Creek is comprised mainly of yucca, loblolly pine, and eastern red cedar. Two butterflies, the Yucca Giant Skipper (caterpillar or larval host plant: *Yucca filamentosa* and *Yucca aloifolia*) and the Juniper Hairstreak (caterpillar or larval host plant: eastern red cedar) are inhabitants of this outcropping. Yuccas are more abundant here than anywhere else on the refuge. The other smaller outcropping is on Falling Creek and has not been explored for plant or butterfly diversity.

Strategies:

- Modify management activities as needed to protect and restore identified rock outcrops.
- Incorporate these areas into a GIS habitat layer.

Objective 2.11: Unique Rare Habitats – Cane
Within 5 years of CCP approval, strategically enhance existing cane habitat for Swainson's warbler and associated species.

Discussion: The canebrake ecosystem that was once a prominent feature of bottomland forests is now considered a critical component of this system (Noss et al. 1995). Giant cane (*Arundinaria gigantea*) is found in bottomlands and along creeks and ravines scattered throughout Piedmont NWR. Cane normally inhabits low-lying, moist to wet sites. Cane is usually intermixed with shrubs, but in more favorable situations, often forms dense stands or brakes. Brakes composed of giant cane occur in fertile, alluvial stream and river bottoms sufficiently elevated so that flooding is of short duration. Canebrakes provide critical habitat for numerous bottomland hardwood forest animal species. Canebrakes are prime habitat for several migratory birds including American woodcock, Swainson's warbler, and hooded warbler. At least six satyrine and skipper butterflies are considered cane obligates.

Strategies:

- Identify and map locations of canebrakes.
- Allow for natural cane expansion in designated wildlife openings.
- Integrate fire management with cane restoration.

Objective 2.12: Invasive Control

Within 5 years of CCP approval, prioritize the need for the control or removal of nuisance/native or exotic/invasive plant and animals on the refuge that are hindering the ability to meet habitat/population objectives for federal trust species.

Discussion: Invasive species of plants and animals tend to aggressively colonize lands and ecological niches, displacing native plants and animals of higher value. Not all invasive species are non-native (i.e., originating outside of North America). Some invasive species of both plants and animals are indigenous to the area or native to North America, but are still considered invasive and problematic because they spread quickly and become abundant, to the detriment of native flora and fauna, and thus indigenous biodiversity. Invasive/alien species pose significant problems to habitats in the southern Piedmont region. Many invasive plant species are introduced and/or spread through native wildlife such as bird and management actions.

Strategies:

- Identify and map locations of infestations.
- Implement systematic removal of invasive plant species by mechanical and chemical means and by prescribed burning.
- Write and implement invasive species control components within the Habitat Management Plan.
- Implement equipment sanitizing protocol to prevent spread of invasive species.

Objective 2.13: Open Lands – Early Successional Habitat

Within 5 years of CCP approval, strategically enhance wildlife openings and roadsides for early successional habitat diversity.

Discussion: Open lands consist of less than 1 percent of refuge habitat. Currently, openings are dominated by invasive species and are poor quality for wildlife. The Georgia Power Company maintains 75 acres of utility rights-of-way that traverse the refuge, primarily with the interest of protecting utility infrastructure. However, many of these acres present excellent opportunities to promote management for open, successional habitats consistent with utility maintenance. The low, grassy, and herbaceous utility right-of-way corridors were deemed beneficial for butterflies, providing some of the extensively open habitats on the refuge. Warm season grass mixes should be promoted in addition to diverse wildflower and herbaceous mixes.

Strategies:

- Integrate fire and rotational mowing and winter disking.
- Convert roadsides and permanent openings to native warm season grasses and forbs.
- Integrate conversion and maintenance of native warm season grasses and forbs with fire and forest management.
- Coordinate with the Georgia Power Company to convert and maintain 75 acres of utility rights-of-way that traverse the refuge.
- Plant native forbs and legumes to promote early successional habitat diversity.
- Use herbicides for conversion and maintenance of native warm season grasses and forbs on open lands.

VISITOR SERVICES

Goal 3: Provide wildlife-dependent public opportunities compatible with the refuge purposes that lead to greater understanding and enjoyment of fish, wildlife, and their habitats on the refuge.

Discussion: The Improvement Act states that compatible wildlife-dependent recreational uses are the priority public uses of the Refuge System (e.g., hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation) and will receive enhanced consideration over the other general public uses. These six wildlife-dependent recreational uses are available to refuge visitors.

Objective 3.1: Visitor Services Plan

Within 10 years of CCP approval, develop and implement a visitor services plan that reflects current legislation, director's orders, initiatives, policy, and the mission of the refuge, the Refuge System and the Service.

Discussion: The need to develop and implement a visitor services management plan was identified in the visitor services review, held in the scoping stage of the CCP process. This management plan will identify resource needs and establish visitor service programs based on goals, objectives, and strategies identified in the CCP.

Strategy:

- Develop and implement a visitor services plan.

Objective 3.2: Welcome and Orient Visitors

Over the 15-year life of CCP, ensure the refuge is welcoming, safe, and accessible. Provide visitors with clear information that promotes the refuge and the Service.

Discussion: Piedmont has a Visitor Center with exhibits of refuge wildlife and habitats. Refuge staff is available at the Visitor Center to help with questions about the refuge. Brochures and maps are also available at the Visitor Center. The refuge has signs and kiosks throughout the refuge. A website is also available to help the public plan their visit to the refuge.

Strategies:

- Update signs to meet current standards and revise sign plan.
- Update all brochures to meet current standards.
- Update website to meet current standards.
- Establish Americans with Disabilities Act (ADA) approved parking and accessible routes to Children's Pond and Pond 2A.
- Explore the possibility of a user fee program.
- Refurbish exhibit area in Visitor Center.
- Add automated phone system
- Install counters at high public use areas.
- Replace boundary signs as needed

Objective 3.3: Hunting

Within 5 years of settlement of a lawsuit against the Service now being litigated, maintain and where possible expand or modify current hunting program on the refuge.

Discussion: Throughout the year, the refuge offers small game, raccoon, white-tailed deer, and turkey hunting. White-tailed deer and turkey gun hunting is offered as quota drawn hunts. The refuge coordinates hunting opportunities with GADNR for recreation and wildlife population management. Hunting is permitted on approximately 34,000 acres of the refuge and Hitchitti Experimental Forest.

Strategies:

- Pending lawsuit update hunt plan annually.
- Initiate outreach on land management activities during hunting through signage, brochure, website, and refuge staff.
- Consider parent/child hunts and expanding mobility impaired hunts.
- Consider expanding archery hunting and raccoon hunting.
- Investigate ways to restore or maintain even sex ratio by initiating all hunts as either sex, initiating earn a buck program, and/or establishing a one buck limit per hunt.
- Explore opportunities to utilize combination of quota and non-quota hunts.

Objective 3.4: Fishing

Over the 15-year life of CCP, maintain and where possible expand current fishing opportunities on the refuge.

Discussion: The fishing program is designed to minimize disturbances to wildlife and reduce conflicts between user groups. Fishing is allowed during daylight hours from April 1 to September 30. Non-motorized portable boats are allowed in the ponds open for fishing. Boat ramps and fishing piers are available on select ponds.

Strategies:

- Evaluate opening designated ponds to year-round fishing.
- Open fishing in more ponds.
- Make all fishing piers fully accessible according to ADA.
- Reinstate Children's fishing rodeo.

Objective 3.5: Wildlife Observation and Photography

Over the 15-year life of the CCP, increase wildlife photography and observation opportunities for refuge visitors.

Discussion: The refuge maintains 5 walking trails, a 6-mile wildlife drive, and 45 miles of graveled road accessible to the public to provide opportunities for wildlife viewing and photography. Viewing and photographing wildlife in managed environments will foster a connection between visitors and natural resources.

Strategies:

- Replace photo blinds and observation decks as needed.
- Evaluate additional locations and installation of photo blinds and observation decks.

Objective 3.6: Environmental Education/Interpretation

Within 1 year of reinstating an interpretive park ranger position, expand current environmental education and interpretation opportunities on the refuge.

Discussion: The refuge currently has adequate environmental education facilities in and around the visitor center but limited staff to implement program. Limited onsite programs and tours are available to organized school, civic, professional, and conservation groups. An environmental education trunk is available to be checked out to area teachers developed by Partners in Flight.

Strategies:

- Add kiosks to emphasize the importance of wildlife and habitat diversity on the refuge.
- Update original visitor center exhibits.
- Update and redesign auditorium to meet environmental education needs.
- Developing additional environmental education trunks.
- Update standard lesson plans.

Objective 3.7: Outreach

Within 1 year of reinstating an interpretive park ranger position, identify potential outreach events to meet refuge needs.

Discussion: The refuge currently has adequate opportunities for outreach in the area, but limited staff to implement programs. There are no annual special events at the refuge. Refuge brochures are placed in the local Chamber of Commerce offices and at the State Welcome Center near Macon, Georgia. Currently, the refuge participates in GADNR, Kid's Fishing Rodeo and Jakes Event at Charlie Elliot Wildlife Management Area.

Strategies:

- Participate in two offsite events per year.
- Use and maintain the website to disseminate refuge information, press releases, and other public information
- Host a special event on the refuge.

RESOURCE PROTECTION

Goal 4: Protect the natural and cultural resources of the refuge, ensure visitor safety and facility integrity, and continue to acquire lands within the approved acquisition boundary.

Discussion: Protecting the natural and cultural resources of both Piedmont and Bond Swamp NWRs and ensuring the safety of all refuge visitors are fundamental responsibilities of the Refuge System. The middle Georgia region has a rich archaeological and historical heritage. Historic properties, such as pre-Columbian archaeological sites and the architectural ruins and associated archaeological deposits of historic period farms need to be protected from vandalism. Acquiring in-holdings would be beneficial for refuge operations by providing contiguous management control over the forested wetlands and reducing the complexity of hunting-related law enforcement in the area. Piedmont NWR staff has shared responsibilities with Bond Swamp NWR.

Objective 4.1: Law Enforcement

Within 10 years of CCP approval, revise Law Enforcement Plan.

Discussion: Piedmont NWR currently provides visitor safety, protects resources, and ensures public compliance utilizing refuge regulations with one full-time and one collateral duty officer on staff. These staff positions have shared responsibilities with Bond Swamp NWR.

Strategies:

- Revise and implement the Law Enforcement Plan.
- Maintain or expand collateral law enforcement assistance until additional staffing is approved.
- Maintain partnership with GADNR's law enforcement division.

Objective 4.2: Cultural Resources

Within 10 years of CCP approval, implement a cultural resources survey of the refuge and within 15 years of CCP approval, develop and begin to implement an Integrated Cultural Resources Management Plan.

Discussion: The middle Georgia area is rich in cultural and historic resources. To protect the public's interest in preserving the cultural and historic legacy that occurs on the refuge, Piedmont NWR follows Service and regional protocols for compliance with the National Historic Preservation Act and other federal historic preservation. When an undertaking possesses the potential to adversely impact historic properties, the refuge will consult with the Service's Regional Archaeologist, who determines "effect" and recommends steps to avoid or minimize potential impacts. An archaeological survey of the subject property may be performed to determine if any properties are eligible for listing in the National Register of Historic Places. The results of this survey will be submitted to all interested parties, including tribal governments. To date, no historic properties on the refuge have been determined to be eligible for listing in the National Register of Historic Places.

Strategies:

- Within 5 years of CCP approval, pertinent refuge staff attends the Overview for Cultural Resources Management Requirements Course (WLD 2117) offered at NCTC.
- In consultation with the Regional Archaeologist, integrate cultural resources management and protection strategies into refuge management plans such as Habitat Management Plan, Fire Management Plan, and Facilities Maintenance.
- Integrate and maintain archaeological and historic sites within the refuge's GIS database.
- Follow procedures outlined in Cultural Resources Management Plan for consultation with the Service's Regional Historic Preservation Office, the State Historic Preservation Office, and interested American Indian tribes.
- Follow existing regional protocols for the inadvertent discoveries of human remains.
- Work with local Native-American, African-American, and other communities to develop an education program and interpretive displays or panels regarding their cultural heritage and history, as well as the historical significance of refuge lands to the public.
- Document additional cemeteries as they are discovered and initiate documentation of home sites for refuge management.

Objective 4.3: Land Acquisition

Over the 15-year life of CCP, work with private landowners, non-governmental organizations, and the Regional Office to identify willing partners and lands that are realistically possible to benefit the refuge goals and Service mission.

Discussion: Piedmont NWR currently only acquires additional properties by opportunistic acquisition of inholdings within the approved acquisition boundary.

Strategy:

- Work with partners to acquire priority tracts from willing sellers.

CLIMATE CHANGE

Goal 5: Understand the impacts of climate change on Refuge resources to plan for and adapt management as necessary to protect the native wildlife and habitat of Piedmont NWR.

Discussion: Global climate change poses risks to human health and to terrestrial and aquatic ecosystems. Important economic resources, such as agriculture, forestry, fisheries, and water resources, also may be affected. Warmer temperatures, more severe droughts and floods, and sea level rise could have a wide range of impacts. All these stresses can add to existing stresses on resources caused by other influences such as population growth, land-use changes, and pollution.

Objective 5.1: Climate Change

Over the 15-year life of the CCP, coordinate with researchers and partners to identify climate change research needs for the refuge, investigating the impacts of climate change on fish and wildlife, listed species, vegetative communities, water quality and quantity, and other important resources.

Discussion: The increase of carbon within the Earth's atmosphere has been linked to the gradual rise in surface temperatures commonly referred to as global warming. Climate, along with soils and topography, determines what will grow, where it will grow, and how well it will grow. Changes in climate thus have the potential to dramatically impact forests. Forests play an important role in carbon cycling and sequestration. Thirty-three percent of the U.S. land base – 747 million acres – in the United States is forestland. Because this area is so vast, even small increases in carbon sequestration and storage per acre add up to substantial quantities. Enhancing this capacity depends on regulating stocking, maintaining health, and minimizing losses due to mortality (Malsheimer et. al 2008).

While carbon sequestration is the most common climate change mitigation tool considered in relation to comprehensive conservation planning for national wildlife refuges, it is not the only approach. What's missing from most climate change discussions is biodiversity. Diverse systems are better able to resist change and recover from disturbance. While change is normal for forest ecosystems, climate change represents change outside the historic range of variability. The goal of mitigation strategies should not be to prevent change; instead, they should try, to the extent possible, to keep change within the range of variability (Noss 2001).

Strategy:

- Develop a plan to coordinate research needs.

REFUGE ADMINISTRATION

Goal 6: Provide for sufficient staffing, facilities, and infrastructure to meet desired future conditions.

Discussion: Implementation of this CCP will depend on sufficient funding, staff, equipment, facilities, and infrastructure to follow through on objectives and strategies. Piedmont NWR administers staff and equipment for Bond Swamp NWR, approximately 30 miles to the south. All facilities and equipment for both refuges are located at Piedmont.

Objective 6.1: Private Lands

Over the 15-year life of the CCP, continue to work with private landowners near the refuge to promote goals and objectives for federal trust resources.

Discussion: Currently, the refuge has memoranda of understanding and grants of permission between refuge and private landowners for prescribed burning. There are currently twelve Farm Service Agency easements that the refuge oversees.

Strategies:

- Continue existing partnerships and expand opportunities to work with private land owners.
- Seek opportunities to participate in management field days or training workshops on the refuge, targeting landowners and land managers emphasizing refuge management programs and practice.
- Explore opportunities for the formation of public/private habitat management cooperatives.

Objective 6.2: Partnerships

Within 5 years of CCP approval, explore opportunities for new partnerships that support refuge management goals.

Discussion: The refuge currently cooperates with partners such as GADNR, GFC, TNC, NWTF, and Oconee NF.

Strategies:

- Continue existing partnerships with cooperators.
- Expand opportunities for new partnerships with groups such as National Bobwhite Quail Conservation Initiative and Interagency Burn Team.
- Explore and expand research opportunities with university partnerships.

Objective 6.3: Volunteers

Within 2 years of CCP approval, expand volunteer program to enhance aspects of refuge management.

Discussion: The refuge has a small volunteer program. Within the local area, there are many opportunities for program expansion which is limited by staff availability.

Strategies:

- Establish a recreational vehicle work camper volunteer program.
- Develop a partnership to conduct environmental education programs.
- Explore opportunities to work with local communities on specific refuge projects.
- Establish a volunteer coordinator to work with staff to develop and manage the volunteer program.
- Explore opportunities to establish a student volunteer program.

Objective 6.4: Staff

Over the 15-year life of the CCP, increase budget and bring staffing levels up to full capacity in order to better meet the obligations of wildlife stewardship, habitat management, refuge administration, and visitor services.

Discussion: Piedmont NWR currently has a staff of 12 full-time members. These employees have shared responsibilities with Bond Swamp NWR. Additional staff would be required to accomplish the goals of this CCP. This increased budget and staffing levels would better enable the refuge to meet the obligations of wildlife stewardship, habitat management, refuge administration, and public use.

Strategies:

- Secure funding to hire all necessary positions.
- Reinstate assistant forester position (GS 460-7/9/11).
- Reinstate park ranger (interpretive) position (GS 0025-5/7/9/11).
- Hire a biologist (GS 486-9/11).
- Hire a forestry technician (GS 462-5/6/7).
- Hire a park ranger (law enforcement) (GS 0025-7/9).
- Hire an engineering equipment operator (WG 5716-8/10).
- Hire a refuge operations specialist (GS 0485-7/9/11).
- Hire two seasonal forestry technicians (firefighters) (GS 0462-4/5)
- Hire a prescribed fire/fuels technician (GS 0462-6/7).

Objective 6.5: Capital Equipment, Facilities, and Infrastructure

Over the 15-year life of the CCP, acquire and maintain equipment, facilities, and infrastructure used as a part of refuge management to better meet the obligations of wildlife stewardship, habitat management, and visitor services.

Discussion: The refuge has a good base of facilities and equipment to support management operations. The refuge has a shared office/visitor center, maintenance shop and associated storage buildings and outbuildings, and five government quarters. The refuge has a campground that supports big game hunts. There are 45 miles of public access roads and related parking areas, 2 public boat ramps, 3 fishing piers, 5 hiking trails with associated observation deck and photo blinds, and 11 dams with water control structures.

Strategies:

- Construct additional residence quarters.
- Replace existing septic facility and add new well for government quarters.

- Expand visitor center to accommodate additional funded positions.
- Acquire equipment including skid steer with mulching head and rollback for hauling equipment without taking fire equipment out of service.
- Construct boat ramps, fishing piers, viewing areas, and kiosks.
- Construct new pole barn for equipment storage.
- Construct covered pavilion for campground.

V. Plan Implementation

INTRODUCTION

Refuge lands are managed as defined under the Improvement Act. Congress has distinguished a clear legislative mission of wildlife conservation for all national wildlife refuges. National wildlife refuges, unlike other public lands, are dedicated to the conservation of the Nation's fish and wildlife resources and wildlife-dependent recreational uses. Priority projects emphasize the protection and enhancement of fish and wildlife species first and foremost, but considerable emphasis is placed on balancing the needs and demands for wildlife-dependent recreation and environmental education.

To accomplish the purpose, vision, goals, and objectives contained in this Draft CCP/EA for Piedmont NWR, this section identifies projects, funding and personnel needs, volunteers, partnerships opportunities, step-down management plans, a monitoring and adaptive management plan, and plan review and revision.

PROPOSED PROJECTS

Listed below are the proposed project summaries and their associated costs for fish and wildlife population management, habitat management, resource protection, visitor services, climate change, and refuge administration over the next 15 years. This proposed project list reflects the priority needs identified by the public, planning team, and refuge staff based upon available information. These projects were generated for the purpose of achieving the refuge's objectives and strategies. The primary linkages of these projects to those planning elements are identified in each summary.

FISH AND WILDLIFE POPULATION MANAGEMENT

Project 1: Develop and Implement a Wildlife Monitoring Program

Monitoring wildlife and their habitats is an integral part of planning management actions and evaluating their effectiveness. This project would standardize monitoring for presence and distribution of migratory birds, waterfowl, wetland-dependent birds, raptors, resident birds, mammals, reptiles and amphibians, fish, native and non-native plants, and invertebrates. We would conduct systematic monitoring based on focal species and structure-based indicators to determine the diversity of available habitats for priority wildlife species providing baseline data to assist managers in management practices. Included would be the development of partnerships to conduct monitoring efforts to determine the potential impacts of climate change on the refuge. A full-time wildlife biologist would be employed to assist in implementing the monitoring program. Information to be collected is the foundation for implementing the CCP, formulating habitat management, and implementing adaptive management strategies for species of conservation concern.

Fish and Wildlife Population Objectives: 1.1-15

Habitat Management Objectives: 2.1

Visitor Services Objectives: 3.6

Climate Change Objectives: 5.1

Refuge Administration Objectives: 6.2-3; 6.4

HABITAT MANAGEMENT

Project 2: Develop Geographic Information System (GIS)

This project would build and maintain databases containing wildlife resources; habitat management activities, such as forestry and prescribed fire; cultural and historical resources; visitor service facilities; infestations of invasive species; and land-use patterns on and off the refuge. This project would develop an up-to-date data management, storage, and retrieval system; obtain spatial information from appropriate sources; develop geographic layers for refuge management programs; and facilitate spatial analysis and creation of maps by the refuge staff. The system would be used for evaluation of land protection plans. Spatial analysis would allow the integration of wildlife census and surveys with habitat management treatments. This project would allow the evaluation of management treatments and potential effects of surrounding land-use patterns and climate change.

Fish and Wildlife Population Objectives: 1.1-2, 1.10-11

Habitat Management Objectives: 2.1-13

Visitor Services Objectives: 3.1-6

Resource Protection Objectives: 4.1-3

Climate Change Objectives: 5.1

Refuge Administration Objectives: 6.1; 6.4-5

Project 3: Invasive and Exotic Species Control

The refuge's biological integrity is threatened by a variety of invasive species. This project would develop and implement an integrated pest management program (IPM) to control invasive and nuisance plants and animals. Some of the more common invasive species that create issues with habitat management are privet, Nepalese browntop, wisteria, and kudzu. Nuisance aquatic plants such as hydrilla and coontail are a challenge for the refuge's fisheries and recreational fishing program. A strategic program to identify, locate, and control non-native and nuisance species is needed to effectively protect the resources on the refuge. The project would support the installation of a washing station for equipment to prevent spread of invasive species on and off the refuge.

Fish and Wildlife Population Objectives: 1.1; 1.15

Habitat Management Objectives: 2.1-13

Visitor Services Objectives: 3.1-2; 3.4; 3.6-7

Resource Protection Objectives: 4.1

Climate Change Objectives: 5.1

Refuge Administration Objectives: 6.2-5

Project 4: Forest Management

An active forest management program is important to the wildlife resources on the refuge. This project would include the development of a habitat management plan emphasizing forest resources. Active management on all forested habitats would promote a resilient forest by increasing structural diversity, benefiting a diversity of wildlife species. Upland pine stands would be thinned and regenerated to sustainably meet red-cockaded woodpecker population goals in accordance with recovery guidelines. Bottomland forests would be treated to create a multi-layered canopy. This project would identify and promote the growth of desirable grasses, forbs, cane, and woody shrubs, benefiting a diversity of wildlife. All forest management activities would follow basic ecological forestry guidelines. Reinstating the assistant forester

position and hiring a forestry technician would provide the increased resources needed to accomplish this project.

Fish and Wildlife Population Objectives: 1.1-3; 1.7-8; 1.12; 1.15

Habitat Management Objectives: 2.1-13

Visitor Services Objectives: 3.3; 3.6

Resource Protection Objectives: 4.2-3

Climate Change Objectives: 5.1

Refuge Administration Objectives: 6.1-2; 6.4-5

Project 5: Fire Management for Wildlife Habitat

This project implements fire management to maintain and regenerate upland pine stands that would support healthy wildlife populations of species such as Bachman's sparrow, brown-headed nuthatch, fox squirrel, bobwhite quail, and the endangered red-cockaded woodpecker. This project would support the implementation of fire management on the Piedmont Savanna focus area. Additional resources are needed to implement shorter burn cycles in smaller burn blocks in the focus area to support animal and plant species that occur there. Fire would be used as a tool for managing invasive plants where appropriate. The project includes development and maintenance of the fire management plan and subsequent prescriptions as well as maintaining training qualifications for staff. Hiring a prescribed fire/fuels technician and two seasonal forestry technicians (firefighters) would provide the increased resources needed to accomplish this project.

Fish and Wildlife Population Objectives: 1.2-3; 1.10-12; 1.15

Habitat Management Objectives: 2.1-3; 2.5-8; 2.10-13

Visitor Services Objectives: 3.3; 3.6

Resource Protection Objectives: 4.2-3

Climate Change Objectives: 5.1

Refuge Administration Objectives: 6.1-2; 6.4-5

Project 6: Fire Management for Fuel Reduction

This project would minimize the incidence of injury to life and property resulting from catastrophic wildfire through the implementation of a hazard fuel program. It would also provide opportunities to identify, map, and protect communities, structures, and/or sensitive areas at risk from wildfire on and off the refuge. This project would utilize both prescribed fire and timber thinning as an integrated approach to better achieve objectives. Hiring a prescribed fire/fuels technician, two seasonal forestry technicians (firefighters), and reinstating the assistant forester position would provide the increased resources needed to accomplish this project.

Fish and Wildlife Population Objectives: 1.2

Habitat Management Objectives: 2.1; 2.5-6

Visitor Services Objectives: 3.6

Climate Change Objectives: 5.1

Refuge Administration Objectives: 6.2; 6.4-5

Project 7: Piedmont Savanna Focus Area Management

Through partnerships, this project would implement a 5,000-acre focus area where the management would emphasize the restoration and maintenance of open pine savanna habitat. This habitat supports priority wildlife species including the endangered red-cockaded woodpecker, Bachman's sparrow, brown-headed nuthatch, northern bobwhite quail, and fox squirrel. This project would include control of invasive species through mechanical and chemical treatments. Establishing, restoring, and enhancing native grasses and forbs using prescribed fire, planting, and timber thinning would enhance the quality of the focus area. Monitoring and evaluation would provide tools to implement adaptive management. Hiring a biologist, assistant forester, prescribed fire/fuels technician, and two seasonal forestry technicians (firefighters) would provide the increased resources needed to accomplish this project.

Fish and Wildlife Population Objectives: 1.1; 1.3; 1.8; 1.10-11; 1.14-15

Habitat Management Objectives: 2.1-3; 2.8

Visitor Services Objectives: 3.5-6

Climate Change Objectives: 5.1

Refuge Administration Objectives: 6.2-5

Project 8: Management of Unique Rare Habitats such as Rock Outcrops and Cane

Within the refuge boundary, there are several unique rare habitat types. Two species include rock outcrops and cane brakes. This project would identify and map unique rare habitats using Geographic Information Systems. This information would provide staff with better information to apply adaptive management integrating prescribed burning, mechanical and chemical operations, and timber thinning. Hiring a biologist, assistant forester, prescribed fire/fuels technician, and two seasonal forestry technicians (firefighters) would provide the increased resources needed to accomplish this project.

Fish and Wildlife Population Objectives: 1.1; 1.3; 1.8; 1.14

Habitat Management Objectives: 2.1; 2.3; 2.6; 2.10-11

Visitor Services Objectives: 3.5-6

Resource Protection Objectives: 4.1; 4.3

Climate Change Objectives: 5.1

Refuge Administration Objectives: 6.2-5

VISITOR SERVICES**Project 9: Improve Efforts on Visitor Welcome and Orientation Programs**

This project would focus on improving visitor welcome and orientation programs to provide visitors with clear information. Projects would include updating signs, brochures, and website to meet current standards. An ADA-approved parking lot and accessible routes would be established for Children's Pond and Pond 2A. The visitor center exhibits would be updated and/or replaced. Automated phone lines would be installed for visitor information. Reinstating the park ranger (interpretive) position would support this project and maintenance of the visitor services program.

Visitor Services Objectives: 3.1-2

Resource Protection Objectives: 4.1-2

Climate Change Objectives: 5.1

Refuge Administration Objectives: 6.2-5

Project 10: Enhance Hunting and Fishing Opportunities

This project would enhance hunting and fishing opportunities for refuge visitors. Improvement would include initiating outreach through signage, brochures, and websites. Enhanced hunting opportunities would include considering a parent/child hunt, expanding mobility impaired hunts, investigating ways to ensure healthy populations, and providing ample opportunities to visitors. Enhanced fishing opportunities would include opening more ponds for fishing and evaluating whether to designate some ponds for year-round fishing. All fishing piers would be fully ADA-accessible. The refuge would also host a children's fishing rodeo annually. Reinstating the park ranger (interpretive) position and hiring a biologist would integrate biological and visitor service programs to support this project.

Visitor Services Objectives: 3.1-4
Resource Protection Objectives: 4.1
Climate Change Objectives: 5.1
Refuge Administration Objectives: 6.2-5

Project 11: Improve Environmental Education and Interpretation Programs

This project would increase opportunities for environmental education and interpretation to include adding kiosks, updating and replacing visitor center exhibits, renovation and redesign of the refuge auditorium/environmental education classroom, development of additional educational trunks for check out by local schools, and updating standard lesson plans. A full-time park ranger (interpretive) position would be reinstated to support and maintain the program as well as train volunteers.

Visitor Services Objectives: 3.1-2, 3.6-7
Resource Protection Objectives: 4.1-2
Climate Change Objectives: 5.1
Refuge Administration Objectives: 6.1-5

Project 12: Expand Wildlife Observation and Photography Opportunities

This project would enable the refuge to expand wildlife observation and photography opportunities to visitors by installing additional photo blinds and observation decks at strategic locations on the refuge. Existing photo blinds and observations decks would be replaced to meet safety and ADA standards. Reinstating the park ranger (interpretive) position supports this project and the maintenance of the visitor services program.

Visitor Services Objectives: 3.1, 3.5
Resource Protection Objectives: 4.1
Climate Change Objectives: 5.1
Refuge Administration Objectives: 6.3-5

RESOURCE PROTECTION

Project 14: Land Acquisition

The refuge is in need of a land protection/acquisition plan. Information obtained through this project would help protect the refuge from encroachment. This project would develop a land acquisition plan to identify and, where possible, acquire additional lands from willing sellers that would help further the refuge's mission.

Fish and Wildlife Population Objectives: 1.1
Habitat Management Objectives: 2.1
Visitor Services Objectives: 3.7
Resource Protection Objectives: 4.3
Climate Change Objectives: 5.1
Refuge Administration Objectives: 6.1-2; 6.4

Project 15: Conduct Comprehensive Phase I Archaeological and Historic Reconnaissance and Develop Cultural Resource Management Plan

Piedmont NWR has a rich archaeological and historical heritage. More than 125 historic properties, including 32 historic period cemeteries, historic farm sites, and pre-Columbian archaeological sites, have been documented on the refuge since the 1980s. Many cultural and historic properties need to be protected during certain refuge management operations. Increased interpretation and law enforcement efforts would ensure that the sites are protected from accidental or deliberate disturbance from refuge visitors. This project would include the completion of a cultural resource survey, whose results would be incorporated into the refuge's GIS database. An integrated cultural resource plan and a cultural resource overview for the refuge would be developed as a part of this project.

Habitat Management Objectives: 2.1
Visitor Services Objectives: 3.1, 3.6
Resource Protection Objectives: 4.1-2
Refuge Administration Objectives: 6.4

Project 16: Protect Refuge Resources and Visitors

The increased law enforcement presence of one full-time park ranger (law enforcement) would result in improved visitor safety and services. Regular law enforcement patrols would deter vandalism and trespass, provide cultural resource protection, hunting and fishing compliance checks, and other activities that disturb wildlife and address law enforcement situations when they occur.

Visitor Services Objectives: 3.1
Resource Protection Objectives: 4.1
Refuge Administration Objectives: 6.4-5

CLIMATE CHANGE

Project 17: Climate Change

Global climate change poses risks to human health and to terrestrial and aquatic ecosystems. Implementing treatments to increase the resistance and resilience of the forests and becoming involved in carbon sequestration projects as appropriate are the best options for climate change mitigation at the refuge level. Reinstating the assistant forester position and hiring a forestry technician, fire technicians, and biologist provides the increased resources needed to accomplish projects and monitor potential effects of climate change on wildlife populations and habitats and help the refuge with management decisions to minimize impacts.

Fish and Wildlife Population Objectives: 1.1
Habitat Management Objectives: 2.1
Visitor Services Objectives: 3.1, 3.6
Resource Protection Objectives: 4.3
Climate Change Objectives: 5.1
Refuge Administration Objectives: 6.1-5

REFUGE ADMINISTRATION

Project 18: Facilities and Infrastructure

Acquire and maintain equipment, facilities, and infrastructure used as a part of refuge management to better meet the obligations of wildlife stewardship, habitat management, and visitor services.

This project would include construction of an additional residence quarters; replace existing septic facility and drill a new well for government quarters; expand visitor center; construct boat ramps, fishing piers, viewing areas, and kiosks; construct a new pole barn for equipment storage; and construct a covered pavilion for the campground. Equipment needs would include a skid steer with mulching head and a rollback for hauling equipment. This project requires the hiring of a full-time engineering equipment operator to complete essential rehabilitation and maintenance work on the refuge.

Fish and Wildlife Population Objectives: 1.1-2; 1.5
Habitat Management Objectives: 2.1-13
Visitor Services Objectives: 3.1-6
Resource Protection Objectives: 4.2
Refuge Administration Objectives: 6.3-5

Project 19: Staffing

Piedmont NWR has a staff of 12 full-time members that have shared responsibility with Bond Swamp NWR. This project would provide for additional staff to accomplish the goals of this CCP. Personnel priorities would include employing a biologist, forestry technician, refuge operations specialist, park ranger (law enforcement), engineering equipment operator, two seasonal forestry technicians (firefighters), and a prescribed fire/fuels technician. This project would also support reinstating an assistant forester position and a park ranger (interpretive). The increased staffing level would better enable the refuge to meet the obligations of wildlife stewardship, habitat management, visitor services, and refuge administration.

Fish and Wildlife Population Objectives: 1.1-15
Habitat Management Objectives: 2.1-13
Visitor Services Objectives: 3.1-7
Resource Protection Objectives: 4.1-3
Climate Change Objectives: 5.1
Refuge Administration Objectives: 6.2-5

Project 19: Fostering Partnerships and Volunteers

Partnerships and volunteer staff enhance aspects of refuge management. This project would provide for opportunities to expand and create new partnership and recruit new volunteers through increased outreach such as participating in offsite programs. It would also allow for the establishment of a recreational vehicle work camper volunteer program, expansion of the refuge's environmental education program, and fostering connections with local communities. It would maintain and enhance partnerships with landowners, private organizations, and universities. State and federal natural resource agencies are key elements to the success of this plan. Reinstatement of park ranger (interpretive) and assistant forester positions, and the hiring of a biologist would support this project.

Fish and Wildlife Population Objectives: 1.1-15
Habitat Management Objectives: 2.1-13
Visitor Services Objectives: 3.1-6
Resource Protection Objectives: 4.3
Climate Change Objectives: 5.1
Refuge Administration Objectives: 6.1-5

FUNDING AND PERSONNEL

Implementation of the CCP would require increased funding and personnel support that would come from a variety of internal and external sources. New projects and maintenance needs for existing facilities and projects are identified through the Service Asset Maintenance Management System (SAMMS). Figure 7 identifies the proposed Piedmont NWR organization chart and staffing required to help achieve the goals, objectives, and strategies outlined in this Draft CCP/EA. Table 4 lists the proposed projects described above and their costs and associated staffing. The CCP, when final, would not constitute a commitment (from Congress) for staffing increases, operational and maintenance increases, or funding for future land acquisition, but represents wildlife resource needs based on sound biological science and input from the public.

PARTNERSHIP/VOLUNTEERS OPPORTUNITIES

A key element of this Draft CCP/EA is to establish partnerships with local volunteers, landowners, private organizations, and state and federal natural resource agencies. In the immediate vicinity of the refuge, opportunities exist to establish partnerships with the Chattahoochee-Oconee National Forests and local landowners adjoining the refuge. At regional and state levels, partnerships may be established or enhanced with organizations such as: National Wild Turkey Federation, Quail Unlimited, Southern Company, Georgia Department of Natural Resources, and The Conservation Fund.

STEP-DOWN MANAGEMENT PLANS

A comprehensive conservation plan is a strategic plan that guides the direction of the refuge. A step-down management plan provides specific guidance on activities, such as habitat, fire, and visitor services. These plans (Table 5) are also developed in accordance with the National Environmental Policy Act, which requires the identification and evaluation of alternatives and public review and involvement prior to their implementation.

MONITORING AND ADAPTIVE MANAGEMENT

Adaptive management is a flexible approach to long-term management of biotic resources that is directed over time by the results of ongoing monitoring activities and other information. More specifically, adaptive management is a process by which projects are implemented within a framework of scientifically driven experiments to test the predictions and assumptions outlined within a plan.



Piedmont National Wildlife Refuge

Figure 7. Proposed organizational staffing chart

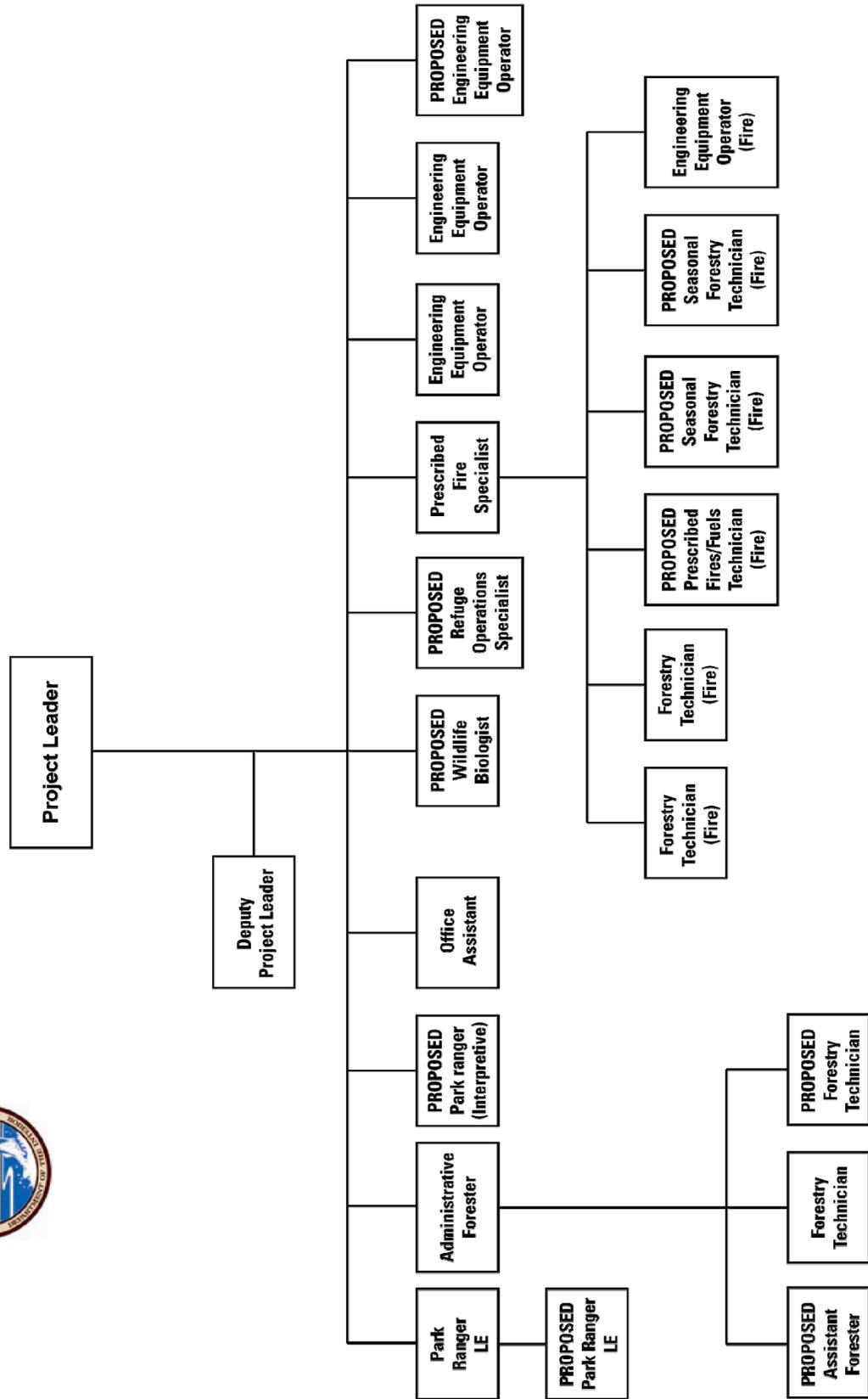


Table 4. Summary of projects

PROJECT NUMBER	PROJECT TITLE	FIRST YEAR COST	RECURRING ANNUAL COST	STAFF (FTE'S)
1	Develop and Implement a Wildlife Monitoring Program	135,000	80,000	1
2	Develop Geographic Information System (GIS)	45,000	5,000	
3	Invasive and Exotic Species Control	85,000	60,000	1
4	Forest Management	135,000	80,000	1
5	Fire Management for Wildlife Habitat	75,000	50,000	1
6	Fire Management for Fuel Reduction	75,000	55,000	2
7	Piedmont Savanna Focus Area Management	100,000	70,000	1
8	Management of Unique Rare Habitats such as Rock Outcrops and Cane	20,000	5,000	
9	Improve Visitor Welcome and Orientation	350,000	50,000	
10	Enhance Hunting and Fishing Opportunities	100,000	50,000	
11	Improve Environmental Education and Interpretation Programs	125,000	100,000	1
12	Expand Wildlife Observation and Photography Opportunities	100,000	25,000	
13	Land Acquisition	15,000		
14	Conduct Cultural Resource Survey and Develop Plan	145,000	5,000	
15	Protect Refuge Resources and Visitors	150,000	85,000	1
16	Climate change	20,000	20,000	
17	Facilities and Infrastructure	750,000	150,000	1
18	Staffing	955,000	615,000	
19	Fostering Partnerships and Volunteers	10,000	10,000	

Table 5. Step-down management plans related to the goals and objectives of the comprehensive conservation plan

Step-down Plan	Completion Date
Habitat Management Plan	2012
Visitor Services Plan	2020
Wildlife Inventory and Monitoring Plan	2015
Land Acquisition Plan/Land Protection Plan	2016
Integrated Cultural Resources Plan	2025
Law Enforcement Plan	2020
Hunt Plan	2013

To apply adaptive management, specific surveying, inventorying, and monitoring protocols would be adopted for the refuge. The habitat management strategies would be systematically evaluated to determine management effects on wildlife populations. This information would be used to refine approaches and determine how effectively the objectives are being accomplished. Evaluations would include ecosystem team and other appropriate partner participation. If monitoring and evaluation indicate undesirable effects for target and non-target species and/or communities, then alterations to the management projects would be made. Subsequently, the CCP would be revised. Specific monitoring and evaluating activities would be described in the step-down management plans.

PLAN REVIEW AND REVISION

The final CCP would be reviewed annually as the refuge's annual work plans and budgets are developed. It would also be reviewed to determine the need for revision. A revision would occur if and when conditions change or significant information becomes available, such as a change in ecological conditions or a major refuge expansion. The final CCP would be augmented by detailed step-down management plans to address the completion of specific strategies in support of the refuge's goals and objectives. Revisions to the CCP and the step-down management plans would be subject to public review and NEPA compliance.

SECTION B. ENVIRONMENTAL ASSESSMENT

I. Background

INTRODUCTION

The Fish and Wildlife Service prepared this Environmental Assessment (EA) for Piedmont NWR in compliance with the NEPA and the Improvement Act. The Improvement Act requires the development of comprehensive conservation plans for all refuges. Following a public review and comment period on this Draft CCP/EA, a final decision will be made by the Service that will guide Piedmont NWR management actions and decisions over the next 15 years, provide understanding about the refuge and management activities, and incorporate information and suggestions from the public and refuge partners.

The Draft CCP/EA proposes a management direction which is described in detail through a set of goals, objectives, and strategies. The Draft CCP/EA addresses current management issues, provides long-term management direction and guidance for the refuge, and satisfies the legislative mandates of the Improvement Act. While the CCP provides general management direction, subsequent step-down plans will provide more detailed management direction and actions.

The EA determines and evaluates a range of reasonable management alternatives. The intent is to support informed decision-making regarding future management of the refuge. Each alternative presented in this EA was generated with the potential to be fully developed into a final CCP. The predicted biological, physical, social, and economical impacts of implementing each alternative are analyzed in this EA. This analysis assists the Service in determining if the alternatives represent no significant impacts, thus requiring the preparation of a Finding of No Significant Impact, or if the alternatives represent significant impacts, thus requiring more detailed analysis through an Environmental Impact Statement and a Record of Decision. Following public review and comment, the Service will select an alternative to be fully developed for this refuge.

The CCP is needed to address current management issues, to provide long-term management direction for the refuge, and to satisfy the legislative mandates of the Improvement Act, which requires the preparation of a CCP for all national wildlife refuges.

PURPOSE AND NEED FOR ACTION

The purpose of the EA is to meet the purpose(s) of the refuge and the goals identified in the Draft CCP (for which we evaluate each alternative). The purpose is to ensure that Piedmont NWR conserves, restores, and enhances in its natural ecosystems (when practical) all species of animals and plants that are endangered or threatened with becoming endangered; manages for the diversity of resident flora and fauna that naturally occur in the southern Piedmont physiographic region; perpetuates the migratory bird resource; and provides an understanding for and appreciation of fish and wildlife ecology and our role in the environment, and to provide refuge visitors with quality, wholesome, and enjoyable recreational experiences oriented toward wildlife to the extent these activities are compatible with the purposes for which the refuge was established. The need of the EA is to adopt a 15-year management plan that provides guidance for future management and that meets the mandates of the Improvement Act.

DECISION FRAMEWORK

Based on the assessment described in this document, the Service will select an alternative to implement the CCP for Piedmont NWR. The final CCP will include a Finding of No Significant Impact (FONSI), which is a statement explaining why the selected alternative will not have a significant effect on the quality of the human environment. This determination is based on an evaluation of the Service and Refuge System mission, the purpose(s) for which the refuge was established, and other legal mandates. Assuming no significant impact is found, implementation of the CCP will begin and will be monitored annually and revised when necessary.

PLANNING STUDY AREA

Piedmont NWR is east of the Ocmulgee River in Jones and Jasper Counties, Georgia, approximately 30 miles north of the city of Macon. The refuge consists of 34,955 acres of upland pine and pine-hardwood forests in the Southern Piedmont Plateau (28,552 and 6,403 acres in Jones and Jasper Counties, respectively). The refuge has reached most of its acquisition boundary except for several private in-holdings.

This EA will identify management on refuge lands, as well as those lands proposed for acquisition by the Service.

AUTHORITY, LEGAL COMPLIANCE, AND COMPATIBILITY

The Service developed this Draft CCP/EA in compliance with the National Wildlife Refuge System Improvement Act of 1997 and Part 602 of the Fish and Wildlife Service Manual (National Wildlife Refuge System Planning). The actions described within this Draft CCP/EA also meet the requirements of the National Environmental Policy Act of 1969 (NEPA). The refuge staff achieved compliance with NEPA through the involvement of the public and the incorporation of an EA in this document, with a description of the alternatives considered and an analysis of the environmental consequences of the alternatives (Section B, Chapters III and IV). When fully implemented, the CCP will strive to achieve the vision and purposes of Piedmont NWR.

The CCP's overriding consideration is to carry out the purposes for which the refuge was established. The laws that established the refuge and provided the funds for acquisition state the purposes. Fish and wildlife management is the first priority in refuge management, and the Service allows and encourages public use (wildlife-dependent recreation) as long as it is compatible with, or does not detract from, the refuge's mission and purposes.

COMPATIBILITY

The Improvement Act states that national wildlife refuges must be protected from incompatible or harmful human activities to ensure that Americans can enjoy Refuge System lands and waters. Before activities or uses are allowed on a national wildlife refuge, the uses must be found to be compatible. A compatible use "...will not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuge." In addition, "wildlife-dependent recreational uses may be authorized on a refuge when they are compatible and not inconsistent with public safety."

An interim compatibility determination is a document that assesses the compatibility of an activity during the period of time the Service first acquires a parcel of land to the time a formal, long-term management plan for that parcel is prepared and adopted. The Service has completed an interim compatibility determination for the six priority general public uses of the system, as listed in the

Improvement Act. These uses are hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation.

PUBLIC INVOLVEMENT AND THE PLANNING PROCESS

In accordance with Service guidelines and NEPA recommendations, public involvement has been a crucial factor throughout the development of the Draft CCP/EA for Piedmont NWR. This Draft CCP/EA has been written with input and assistance from interested citizens, conservation organizations, and employees of local and state agencies. The participation of these stakeholders and their ideas has been of great value in setting the management direction for Piedmont NWR. The Service, as a whole, and the refuge staff, in particular, are very grateful to each one who has contributed time, expertise, and ideas to the planning process. The staff remains impressed by the passion and commitment of so many individuals for the lands and waters administered by the refuge.

The development of the Draft CCP/EA for Piedmont NWR was executed in accordance with refuge planning policy [602 FW 3.4C (1)] and NEPA. Initial planning began in December 2007, with the establishment of the core planning team and the preparation of the team charter and work plan. Through the planning process, and with input from local, state, and federal agencies, the public, and conservation associations, the planning team identified issues and concerns that were relevant to the current and future conservation and management of the refuge.

The Service established a biological review team for the refuge with representatives from its regional office and state and federal agencies, including the GADNR. The team conducted an on-site evaluation and completed a biological review report. Issues discussed included threatened and endangered species, migratory birds, resident wildlife, habitat management, surveys and research, and administration.

A visitor services review was conducted in February 2008. The review team met with refuge staff to discuss the visitor services program. A visitor services review report was prepared to provide guidance for short, intermediate, and long-term recommendations for improving the quality of public use and educational services. These recommendations included: developing a current Visitor Services Plan, establishing a volunteer program, and establishing a public use corridor.

Public involvement and input into the development of the Draft CCP/EA was initiated by the submission of a notice of intent (NOI). The NOI summarizing the intent of the refuge to begin the CCP process was published in the Federal Register on April 4, 2008. On May 12, 2008, a public scoping meeting was held at the Piedmont NWR visitor center to solicit input from stakeholders. Statewide news releases and website announcements were used to advertise the meeting to the public. The meeting was attended by two stakeholders. During the 30 day public scoping process, over 1,200 written and verbal comments were received. Comments received during this process are listed in Appendix D – Public Involvement.

A complete summary of the issues and concerns is provided in Appendix D.

II. Affected Environment

For a description of the affected environment, see Section A, Chapter II, Refuge Overview.

III. Description of Alternatives

FORMULATION OF ALTERNATIVES

Alternatives are different approaches or combinations of management objectives and strategies designed to achieve the refuge's purpose and vision, and the goals identified in the Draft CCP, the priorities and goals of the Piedmont Ecosystem Team, the goals of the Refuge System, and the mission of the Service. Alternatives are formulated to address the significant issues, concerns, and problems identified by the Service and the public during public scoping.

The four alternatives identified and evaluated represent different approaches to provide permanent protection, restoration, and management of the refuge's fish, wildlife, plants, habitats, and other resources, as well as compatible wildlife-dependent recreation. The CCP Team assessed the biological conditions and analyzed the external relationships affecting the refuge. This information contributed to the development of refuge goals and, in turn, helped to formulate the alternatives. As a result, each alternative presents different sets of objectives for reaching refuge goals. Each alternative was evaluated based on how much progress it would make and how it would address the identified issues related to fish and wildlife populations, habitat management, resource protection and conservation, visitor services, and refuge administration. A summary of the four alternatives is provided in Table 6.

DESCRIPTION OF ALTERNATIVES

Serving as a basis for each alternative, a number of goals and sets of objectives were developed to help achieve the refuge's purpose and the mission of the Refuge System. Objectives are desired conditions or outcomes that are grouped into sets and, for this planning effort, consolidated into four alternatives. These alternatives represent different management approaches for managing the refuge over a 15-year time frame while still meeting the refuge purposes and goals. The four alternatives are summarized below. A comparison of each alternative follows the general description.

ALTERNATIVE A - (CURRENT MANAGEMENT - NO ACTION)

This alternative is required by the National Environmental Policy Act (NEPA) and is the "no-action" or "status quo" alternative in which no major management changes would be initiated by the Service. This alternative also provides a baseline to compare the current habitat, wildlife, and public use management to the three action alternatives (Alternatives B, C and D).

Alternative A would address the CCP's wildlife population management goal: manage, enhance, and restore healthy and viable populations of migratory birds, native wildlife, and fish, including all federal and state threatened and endangered species found on the refuge. We would continue to monitor and manage the red-cockaded woodpecker population to achieve the refuge's red-cockaded woodpecker population goal in accordance with red-cockaded woodpecker recovery plan guidelines. We would continue to conduct current surveys for neotropical and migratory birds and butterflies. We would also continue to collect quail, turkey, and deer data through managed hunts, counts, and surveys. No active management would continue for waterfowl, wetland-dependent birds, raptors, fish, reptiles and amphibians, and other resident birds and mammals not listed above.

This alternative would also address the habitat management goal: manage, enhance, and restore suitable habitat for the conservation of migratory birds, native wildlife, fish, and plants, including all federal and state threatened and endangered species endemic to the refuge. We would continue with current forest management practices by actively managing 22,500 acres of upland pine with timber harvesting and prescribed burning in accordance with Piedmont NWR's red-cockaded woodpecker recovery plan and by actively managing around 4,000 acres of upland pine for best use. We would continue to manage and maintain current fire management programs to achieve healthy and viable wildlife and plants on the refuge and reduce fuels by burning on 3-year rotations and participating in a fuels' monitoring program. We would continue to maintain wildlife openings and roadsides through mowing and prescribed burning.

Under Alternative A, we would continue to opportunistically treat invasive plants with herbicide and prescribed burning, enhance cane areas, and manage bottomland and upland hardwoods. We would continue to implement Georgia's Best Management Practices for Forestry for water quality that is compatible with refuge goals for aquatic habitats. We would also continue to manage the impoundments as a demonstration area for waterfowl by performing periodic drawdown and planting.

Alternative A would also address the CCP's visitor services goal: provide wildlife-dependent public use opportunities compatible with the refuge purposes that lead to greater understanding and enjoyment of fish, wildlife, and their habitats on the refuge. We would continue to use our current Visitor Services Plan which needs updating. We would continue to welcome and orient visitors through directional and entrance signs, brochures, refuge website, visitor center, and maps. We would continue to maintain current opportunities for wildlife observation and photography which include a wildlife drive, hiking trails, a photo hut, observation platforms, and a public road system. We would also maintain current environmental education opportunities which are limited by staff availability. Current outreach activities which are limited to one event per year would also continue. We would continue to maintain existing hunting programs and facilities for deer, turkey, squirrel, rabbit, quail, raccoon, and opossum, as well as current seasonal fishing opportunities in designated ponds.

This alternative would also address the resource and visitor protection goal: protect the natural and cultural resources of the refuge and ensure visitor safety and facility integrity to fulfill the refuge purposes. We would continue to enforce all federal and state laws applicable to the refuge and provide visitor safety, protect resources, and ensure public compliance by enforcing current refuge regulations. This includes upholding current regulations and for protection of wildlife, visitors, and cultural and historical resources. Land would be acquired from willing sellers within the refuge's current acquisition boundary and in accordance with current Service policy.

Alternative A would not address the CCP's climate change goal: understand the impacts of climate change on refuge resources to plan for and adapt management as necessary to protect the native wildlife and habitat of Piedmont NWR. The refuge is not currently managing for climate change.

Alternative A would address the CCP's refuge administration goal: provide for sufficient staffing, facilities, and infrastructure to meet desired future conditions. We would maintain the refuge as funding allows. We would continue to include a combined staff of 13 full-time members. These staff positions would continue to specifically support Piedmont NWR and Bond Swamp NWR. We would continue to work with private landowners near the refuge to promote our goals and objectives for federal trust resources. We would continue to partner with GADNR, GFC, TNC, NWTF, and Oconee NF. We would continue to operate the current volunteer program.

ALTERNATIVE B - (WILDLIFE AND HABITATE DIVERSITY - PROPOSED ALTERNATIVE)

The proposed action, Alternative B, was selected by the Service as the alternative that best signifies the vision, goals, and purposes of the Piedmont NWR. Additionally, this alternative was developed based on public input and the best professional judgment of the planning team. Under Alternative B, the emphasis would be on restoring and improving refuge resources needed for wildlife and habitat management and providing enhanced appropriate and compatible wildlife-dependent public use opportunities.

Like Alternative A, Alternative B would address the CCP's wildlife population management goal: manage, enhance, and restore healthy and viable populations of migratory birds, native wildlife, and fish, including all federal and state threatened and endangered species found on the refuge. We would continue to monitor and manage the red-cockaded woodpecker population, but would increase the population goal by 3 to 5 percent. We would continue to conduct current surveys for neotropical and migratory birds and butterflies, but would also reinstate breeding bird, winter waterfowl, and winter bald eagle surveys. We would monitor the Piedmont Savanna focus area for raptors and resident birds, and would initiate surveys for wetland-dependant birds, raptors, and other resident birds.

Under alternative B, we would also initiate basic inventories for invertebrates to include dragonflies, crayfish, and mussels. We would also initiate a streams' survey to identify fish species and rare species. We would also begin to survey for reptiles and amphibians to update species list.

We would also continue to collect quail, turkey, and deer data through managed hunts, counts, and surveys, continue summer quail call counts and fall quail counts, and reinstate spring turkey brood counts. We would also increase efforts to maintain a deer population of 30 to 35 deer per-square-mile and balance the sex ratio of deer to maintain optimum carrying capacity.

We would also address the CCP's habitat management goal: manage, enhance, and restore suitable habitat for the conservation of migratory birds, native wildlife, fish, and plants, including all federal and state threatened and endangered species endemic to the refuge. We would expand forest management by modifying forest management strategies to benefit wildlife and habitat diversity. We would also continue to manage and maintain current fire management programs but would manage a 5,000-acre Piedmont Savanna focus area with smaller burn units on a 2-year rotation.

We would prioritize the need in uplands for removal of invasive plants and animals that hinder the ability for us to meet our habitat and population objectives for federal trust species. We would also enhance wildlife openings and roadsides for early successional habitat diversity.

For aquatic habitats, we would continue to implement Georgia's Best Management Practices for Forestry for water quality, but would also survey streams to identify species.

We would also continue to manage the impoundments as a demonstration area for waterfowl and would implement a water management program to enhance habitat and wildlife diversity. We would conserve, restore, and inventory the mix of unique and rare habitat types and would modify management activities as needed to protect and restore identified rare habitats. We would strategically manage cane areas.

We would also address the CCP's visitor services goal: provide wildlife-dependent public opportunities compatible with the refuge purposes that lead to greater understanding and enjoyment of fish, wildlife, and their habitats on the refuge. We would revise the visitor services plan to reflect current legislation, director's orders, initiatives, policy, and the mission of the refuge, the Refuge System, and the Service. We would continue to welcome and orient visitors and would update signs, brochures, exhibits, and

website, and add kiosks and automated phone system. We would expand current opportunities for wildlife observation and photography by adding and replacing photo blinds and observation decks. We would also expand current environmental education opportunities by adding kiosks to emphasize the importance of wildlife and habitat diversity. We would expand outreach opportunities. We would continue to maintain, and where possible, expand existing hunting programs and fishing opportunities.

Alternative B would address the CCP's refuge administration goal: protect the natural and cultural resources of the refuge and ensure visitor safety and facility integrity to fulfill the refuge purposes. We would continue to enforce all federal and state laws applicable to the refuge and provide visitor safety, protect resources, and ensure public compliance by enforcing current refuge regulations, but would revise the law enforcement plan and reinstate the law enforcement outreach program. Under this alternative, we would protect cultural resources as they do currently, but would also document additional cemeteries and update current GIS to provide for better resource protection. We would develop an integrated cultural resources plan. We would evaluate the potential for expansion of the refuge acquisition boundary to meet goals and objectives in accordance with current Service policy.

Alternative B would address the CCP's climate change goal: understand the impacts of climate change on refuge resources to plan for and adapt management as necessary to protect the native wildlife and habitat of Piedmont NWR. We would coordinate with researchers and partners to identify climate change research needs, and would investigate the impacts of climate change on fish and wildlife, listed species, vegetative communities, water quality and quantity, and other important resources.

Alternative B would address the CCP's refuge administration goal: provide for sufficient staffing, facilities, and infrastructure to meet desired future conditions, by increasing the refuge's budget and bringing staffing levels up to full capacity in order to better meet the obligations of wildlife stewardship, habitat management, and public use. Administration plans would stress the need for increased maintenance of existing infrastructure and construction of new facilities. We would acquire and maintain equipment, facilities, and infrastructure used to help manage and maintain the refuge. This would include: new residence quarters, replacing existing septic facility, well for shop, expanding visitor center to accommodate new hires, boat ramps, fishing piers, viewing areas and kiosks, pole barn for equipment, and covered pavilion for campground. Additional equipment would be a skid steer, with mulching head and a rollback truck for hauling equipment without taking fire equipment out of service.

Additional staff would be required to accomplish the goals of this alternative and would include reinstating an assistant forester and a park ranger (interpretive) and adding a biologist, a forestry technician, a park ranger (law enforcement), a refuge operations specialist, a prescribed fire/fuels technician, an engineering equipment operator, and two seasonal forestry technicians (firefighters). These staff positions would continue to support Piedmont NWR and Bond Swamp NWR.

We would continue to work with private landowners near the refuge to promote our goals and objectives for federal trust resources. We would continue our current partnerships and would explore new opportunities to partner with more organizations such as National Bobwhite Quail Conservation Initiative, and the Interagency Burn Team. We would expand our volunteer program to include more resident interns, volunteers, and to establish a residential recreational vehicle program.

ALTERNATIVE C - (MIGRATORY BIRDS)

The focus of Alternative C is migratory birds in which the refuge staff would direct the majority of its efforts to enhance habitat for and increase the population of migratory birds. Like the other alternatives, Alternative C would address the CCP's wildlife population management goal: manage, enhance, and restore healthy and viable populations of migratory birds, native wildlife, and fish, including all federal and state threatened and endangered species found on the refuge. We would continue to monitor and manage the red-cockaded woodpecker population on the refuge to achieve our red-cockaded woodpecker population goal in accordance with Red-cockaded Woodpecker Recovery Plan Guidelines.

As under Alternative B, we would continue to conduct current surveys for neotropical and migratory birds and butterflies; would reinstate breeding bird, winter waterfowl, and winter bald eagle surveys; would monitor a Piedmont Savanna focus area for raptors and resident birds; and would initiate surveys for wetland-dependent birds, raptors, and other resident birds. Additionally, we would initiate annual woodcock surveys and kestrel nesting box program; identify and manage for the habitat needs of neotropical and migratory birds using the refuge; reestablish wood duck banding program; work with partners to manage impoundments to benefit waterfowl; increase acres in impoundments to benefit wetland-dependent birds; and identify the nesting, breeding, roosting, and foraging habitat needs of raptors on the refuge.

We would also initiate basic inventories for invertebrates to include dragonflies, crayfish, and mussels, but would also study the effects of invertebrates on foraging base of migratory birds. We would initiate a streams survey to identify fish species and would restore and manage fisheries resources and would retain at least 30 percent of submergent vegetation in ponds. Additionally, to support healthy migratory bird populations, we would initiate predator control.

As under Alternative B, we would also continue to collect quail, turkey, and deer data through managed hunts, counts, and surveys, but would establish a Piedmont Savanna focus area, replace summer quail call counts to fall quail counts, and reinstate spring turkey brood counts. We would also increase efforts to maintain a deer population of 30 to 35 deer per-square-mile and balance the sex ratio of deer to maintain optimum carrying capacity.

No active management would continue for reptiles and amphibians, and mammals not listed above.

Alternative C would also address the CCP's habitat management goal: manage, enhance, and restore suitable habitat for the conservation of migratory birds, native wildlife, fish, and plants, including all federal and state threatened and endangered species endemic to the refuge.

Like Alternative B, we would expand forest management by modifying forest management strategies to benefit wildlife and habitat diversity; but would also identify areas to focus on cane habitat management and on increasing structural diversity of bottomland hardwood areas. We would also continue to manage and maintain current fire management programs but would increase the acreage of the Piedmont Savanna focus area to greater than 5,000 acres and change the fire intervals to maximize the benefits to migratory birds outside of the Piedmont Savanna focus area.

As with Alternative B, we would prioritize the need in uplands for removal of invasive plants and animals that hinder our ability to meet habitat and population objectives for federal trust species; but would expand invasive plant species control from uplands to include other habitat types, such as bottomlands and lower slopes, and control the spread of existing, invasive plants to reduce adverse impacts to migratory birds and their habitats.

We would also continue to manage the impoundments as a demonstration area for waterfowl and would also implement a water management program to enhance habitat and wildlife diversity; however, the emphasis would be on migratory birds. We would conserve, restore, and inventory the mix of unique and rare refuge habitat types, and would modify management activities as needed to protect and restore identified rare habitats with an emphasis on migratory birds.

We would identify management priority, target management in open lands for priority migratory bird species, and would continue to implement Georgia's Best Management Practices for Forestry for water quality for aquatic habitats.

Alternative C would address the CCP's visitor services goal: provide wildlife-dependent public opportunities compatible with the refuge purposes that lead to greater understanding and enjoyment of fish, wildlife, and their habitats on the refuge. We would revise the visitors services plan to reflect current legislation, director's orders, initiatives, policy, and the mission of the refuge, the Refuge System, and the Service.

We would continue to welcome and orient visitors but would update signs, brochures, exhibits, and website, and add kiosks and automated phone system. We would expand current opportunities for wildlife observation and photography by adding and replacing photo blinds and observation decks, but would identify observation constraints to avoid disturbance to migratory birds. We would also expand current environmental education opportunities by adding kiosks to emphasize the importance of wildlife and habitat diversity with an emphasis on migratory birds.

We would host one annual festival focusing on migratory birds. We would continue to maintain, and where possible, expand existing hunting programs, but would evaluate limiting or closing fishing on ponds to reduce impacts to wintering and nesting waterfowl.

Alternative C would address the CCP's refuge administration goal: protect the natural and cultural resources of the refuge and ensure visitor safety and facility integrity to fulfill the refuge purposes. We would continue to enforce all federal and state laws applicable to the refuge and provide visitor safety, protect resources, and ensure public compliance by enforcing current regulations. We would revise the law enforcement plan and reinstate the law enforcement outreach program that would focus on migratory birds. Under this alternative, we would protect cultural resources as we do currently. We would evaluate the potential for expansion of refuge acquisition boundary to meet our goals and objectives in accordance with current Service policy.

Like Alternative B, we would address the CCP's climate change goal: understand the impacts of climate change on refuge resources to plan for and adapt management as necessary to protect the native wildlife and habitat of Piedmont NWR. We would coordinate with researchers and partners to identify climate change research needs, and would investigate the impacts of climate change on fish and wildlife, listed species, vegetative communities, water quality and quantity, and other important resources.

Like Alternative B, we would address the CCP's refuge administration goal: provide for sufficient staffing, facilities, and infrastructure to meet desired future conditions. We would acquire and maintain equipment, facilities, and infrastructure used to help manage and maintain the refuge. These items are listed under Alternative B, but in addition, under Alternative C, an excavator, dozer, truck tractor, and lowboy would be required. The same staff requirements under Alternative B would be required under Alternative C. These staff positions would continue to support Piedmont NWR and Bond Swamp NWR.

We would continue to work with private landowners near the refuge to promote our goals and objectives for federal trust resources. We would continue our current partnerships and would explore new opportunities to partner with more organizations such as National Bobwhite Quail Conservation Initiative, the Interagency Burn Team, and Ducks Unlimited. We would expand our volunteer program to include more resident interns and volunteers and to establish a residential recreational vehicle program for work campers, except these programs would focus on migratory bird projects.

ALTERNATIVE D - (RARE, THREATENED AND ENDANGERED SPECIES)

Alternative D would address the CCP's wildlife population management goal: manage, enhance, and restore healthy and viable populations of migratory birds, native wildlife, and fish, including all federal and state threatened and endangered species found on the refuge. We would intensively manage for red-cockaded woodpeckers on the maximum potential acres in upland forest by removing hardwoods, promoting pine, and increasing prescribed burning; and initiating an intrapopulation translocation program.

As with Alternative B, under Alternative D we would continue to conduct current surveys for neotropical and migratory birds and butterflies, and would also reinstate breeding bird and winter bald eagle surveys. We would establish a Piedmont focus area for raptors and resident birds and intensively manage the Piedmont Savanna focus area. We would initiate surveys for wetland-dependent birds, raptors, and other resident birds. We would increase acres in impoundments and manage impoundments to benefit wood storks and other species of concern.

Under alternative D, we would conduct a comprehensive invertebrate survey focused on rare, threatened, and endangered species; consider the requirements of rare, threatened, and endangered reptiles and amphibians; survey streams to identify rare, threatened, and endangered species; and conduct bat surveys with focus on Rafinesque's big-eared bat

Alternative D would also address the CCP's habitat management goal: manage, enhance, and restore suitable habitat for the conservation of migratory birds, native wildlife, fish, and plants, including all federal and state threatened and endangered species endemic to the refuge.

We would intensively manage for red-cockaded woodpeckers and associated species of concern on the maximum potential acres in upland forest by removing hardwoods, promoting pine, and burning. We would intensively manage other habitats where other rare, threatened, and endangered species are found.

We would also continue to manage and maintain current fire management programs but would monitor a 5,000-acre Piedmont Savanna focus area with growing season burns in upland pine forests to benefit red-cockaded woodpecker management. We would conduct an initial attack of invasive species with emphasis on elimination, and would control the spread of existing, invasive, exotic, and nuisance plants to reduce adverse impacts to rare, threatened, and endangered species and their habitats; and would identify management priority to target management in open lands for rare, threatened, and endangered species.

We would continue to implement Georgia's Best Management Practices for Forestry for water quality and would also survey streams to identify species. We would continue to manage the impoundments as a demonstration area for waterfowl and would also implement a water management program to enhance habitat and wildlife diversity, with emphasis on wood stork foraging habitat and other rare, threatened, and endangered species.

We would conserve, restore, and inventory the mix of unique and rare habitat types and would modify management activities as needed to protect and restore identified rare habitats for rare, threatened, and endangered species.

Alternative D would also address the CCP's visitor services goal: provide wildlife-dependent public opportunities compatible with the refuge purposes that lead to greater understanding and enjoyment of fish, wildlife, and their habitats on the refuge.

Alternative D would also address the CCP's visitor services goal: provide wildlife-dependent public opportunities compatible with the refuge purposes that lead to greater understanding and enjoyment of fish, wildlife, and their habitats on the refuge. We would revise the visitor services plan to reflect current legislation, director's orders, initiatives, policy, and the mission of the refuge, the Refuge System, and the Service.

We would continue to welcome and orient visitors and update signs, brochures, exhibits, and website, and add kiosks and an automated phone system. We would expand current opportunities for wildlife observation and photography by adding and replacing photo blinds and observation decks, but would identify observation constraints to avoid disturbance to rare, threatened, and endangered species. We would also expand current environmental education opportunities by adding kiosks to emphasize the importance of wildlife and habitat diversity with an emphasis on rare, threatened, and endangered species. We would host one annual festival focusing on rare, threatened, and endangered species.

We would continue to maintain, and where possible, expand existing hunting programs, but would evaluate limiting or closing fishing on ponds to reduce impacts to rare, threatened, and endangered species.

Alternative D would address the CCP's refuge administration goal: protect the natural and cultural resources of the refuge and ensure visitor safety and facility integrity to fulfill the refuge purposes. We would continue to enforce all federal and state laws applicable to the refuge and provide visitor safety, protect resources, and ensure public compliance by enforcing current refuge regulations, but would revise the law enforcement plan and reinstate the law enforcement outreach program that would focus on rare, threatened, and endangered species. Under this alternative, we would protect cultural resources as we do currently. We would also evaluate the potential for expansion of the refuge acquisition boundary to meet our goals and objectives in accordance with current Service policy.

Like Alternatives B and C, Alternative D would address the CCP's climate change goal: understand the impacts of climate change on refuge resources to plan for and adapt management as necessary to protect the native wildlife and habitat of Piedmont NWR. We would coordinate with researchers and partners to identify climate change research needs, and would investigate the impacts of climate change on fish and wildlife, listed species, vegetative communities, water quality and quantity, and other important resources.

Alternative D would address the CCP's refuge administration goal: provide for sufficient staffing, facilities, and infrastructure to meet desired future conditions. We would acquire and maintain equipment, facilities, and infrastructure used to help manage and maintain the refuge. These items are listed under Alternative B. The same staff requirements under Alternative B would be required under Alternative D. These staff positions would continue to support Piedmont NWR and Bond Swamp NWR.

We would continue to work with private landowners near the refuge to promote our goals and objectives for federal trust resources. We would continue our current partnerships and would explore new opportunities to partner with more organizations. We would expand our volunteer

program to include more resident interns, volunteers, and to establish a residential recreational vehicle program for work campers, except these programs would focus on rare, threatened, and endangered species projects.

FEATURES COMMON TO ALL ALTERNATIVES

Although the alternatives differ in many ways, there are similarities among them as well. These common features are listed below to reduce the length and redundancy of the individual alternative descriptions.

- **Resource Protection** - Current enforcement of all federal and state laws applicable to the refuges to protect all known archaeological and historical sites would continue, including any efforts to increase resource protection through education and inventories. Certain mandated responsibilities such as protection of federal trust species, wetlands, prevention and control of invasive species, and payment of revenue sharing in lieu of taxes would be accomplished under all alternatives.
- **Habitat Management** - Existing management by habitat type would continue. Management activities may increase or decrease to meet other objectives under the various alternatives.
- **Control of Invasive Plants** - Each alternative would develop an Integrated Pest Management Plan that provides for control of invasive plants.
- **Threatened and Endangered Species** - Each alternative would provide protective conservation measures for federally listed species and their habitats on the refuges.
- **Resident Wildlife** - Each alternative would use sound scientific principles for managing populations of resident wildlife species such as white-tailed deer and wild turkey.
- **Control of Nuisance Wildlife Populations** - Each alternative would provide for control of wildlife populations that reach nuisance levels and negatively impact other refuge resources.
- **Maintain Refuge Boundary** - The existing refuge boundary and directional signs would be maintained as part of all alternatives.
- **Law Enforcement** - Law enforcement would provide visitor safety, protect resources, and ensure public compliance with refuge regulations under all alternatives. Enforcement presence varies under the various alternatives to meet specific objectives.
- **Maintain Capitalized Equipment** - All alternatives contain maintenance of refuge equipment, which is required to meet safety standards.
- **Partnerships** - Currently established partnerships with agencies, organizations, and individuals would continue to support refuge management programs.
- **Prescribed Burns** - Existing fire management, including prescribed burns, would continue. Fire management activities may increase or decrease to meet other objectives under the various alternatives.

-
- Climate Change – Each alternative would provide measures to counteract the effects of climate change by utilizing adaptive habitat management and monitoring.
 - Volunteer Programs - The volunteer program would continue and would likely grow as more interest is expressed.

COMPARISON OF THE ALTERNATIVES BY ISSUE

Table 6. Comparison of alternatives by management issues for Piedmont NWR

Goal 1. Wildlife Population Management - Manage, enhance, and restore healthy and viable populations of migratory birds, native wildlife, and fish, including all federal and state threatened and endangered species found on the refuge.

Issues	Alternative A Current Management (No Action Alternative)	Alternative B Wildlife and Habitat Diversity (Proposed Action)	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Wildlife Inventory and Monitoring Plan	Currently the refuge has an outdated plan.	Update and implement a Wildlife Inventorying and Monitoring Plan. Identify focal species and appropriate survey methods.	Same as Alternative B.	Same as Alternative B.
Red-cockaded Woodpecker (RCW)	Actively monitors and manages the RCW population on the refuge by examining nest and roost cavities, installing artificial cavities, installing cavity restrictors, banding nestlings to sustainably achieve the refuge's RCW population goal in compliance with the ESA in accordance with RCW Recovery Plan Guidelines.	Expand Alternative A. Increase RCW population by an average of 3-5 % annually. Increase the number artificial cavities to maintain the number of recruitment sites equal to 20% of the number of active clusters.	Same as Alternative A.	Intensively manage for RCWs on the maximum potential acres in upland forest by removing hardwoods, promoting pine, and burning intensively. Initiate an intrapopulation translocation program.

Issues	Alternative A Current Management (No Action Alternative)	Alternative B Wildlife and Habitat Diversity (Proposed Action)	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Migratory Birds	Conducts Christmas Bird and Neotropical Point Counts annually.	Expand Alternative A. Reinstate breeding bird survey. Identify focal species and manage for habitat needs.	Expand Alternative B. Initiate annual woodcock surveys. Expand programs for Refuge mammals.	Expand Alternative B. Identify and manage for the habitat needs of rare, threatened and endangered neotropical and migratory birds using the refuge.
Waterfowl	No Active Management.	Reinstate winter waterfowl surveys.	Expand Alternative B. Work with partners to manage impoundments to benefit waterfowl.	Same as Alternative A.
Wood Duck	No Active Management.	Maintain a suitable number of boxes and collect data. Improve and maintain brood habitat. Annually monitor nest success.	Expand Alternative B. Reestablish wood duck banding program.	Same as Alternative B.
Wetland-dependent Birds	No Active Management.	Initiate surveys for representative managed wetland-dependent birds.	Expand Alternative B. Increase acres in impoundments to provide quality breeding and wintering habitat to benefit wetland dependant birds.	Same as Alternative C but specifically manage for wood storks and other species of concern.

Issues	Alternative A Current Management (No Action Alternative)	Alternative B Wildlife and Habitat Diversity (Proposed Action)	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Raptors	No Active Management.	Reinstate annual winter bald eagle survey. Initiate raptor survey in Piedmont Savanna focus area.	Expand Alternative B. Identify the nesting, breeding, roosting, and foraging habitat needs of raptors on the refuge. Initiate kestrel nesting box program.	Same as Alternative B.
Resident Wildlife - Birds	Conducts summer quail call counts. Collects turkey hunt data through managed hunts.	Expand Alternative A. Monitor Piedmont Savanna focus area. Reinstate spring turkey brood counts. Initiate fall quail covey counts.	Same as Alternative B.	Expand Alternative B. Intensively manage Piedmont Savanna focus area.

Issues	Alternative A Current Management (No Action Alternative)	Alternative B Wildlife and Habitat Diversity (Proposed Action)	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Resident Wildlife - Mammals	<p>Maintains deer hunting program for recreation.</p> <p>Collects deer hunt data through managed hunts.</p> <p>Conducts deer browse survey</p>	<p>Expand Alternative A.</p> <p>Maintain population 30-35 deer per-square-mile.</p> <p>Balance sex ratio to maintain carrying capacity for deer.</p> <p>Conduct scent station surveys in focus area to identify predators.</p> <p>Identify focal species and manage for habitat needs.</p>	<p>Expand programs for refuge mammals.</p> <p>Initiate predator control.</p>	<p>Conduct bat surveys with focus on Rafinesque’s big-eared bat. If presence found, annually monitor known roost tree locations for use.</p>
Reptiles and Amphibians	<p>Species list.</p>	<p>Expand Alternative A.</p> <p>Survey to update current species list.</p> <p>Explore potential focal species and appropriate survey methods.</p>	<p>Same as Alternative A.</p>	<p>Consider the requirements of rare, threatened, and endangered reptiles and amphibians.</p>

Issues	Alternative A Current Management (No Action Alternative)	Alternative B Wildlife and Habitat Diversity (Proposed Action)	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Fish	<p>Opportunistic management.</p> <p>Implement Georgia's Best Management Practices for Water Quality.</p>	<p>Expand Alternate A.</p> <p>Explore opportunities with partners to survey streams.</p> <p>Develop species list.</p>	<p>Expand Alternative B.</p> <p>Retain at least 30% of submergent vegetation.</p>	<p>Survey streams to identify rare, threatened, and endangered species.</p> <p>Improve habitat quality by addressing culverts, fish passage, and headcuts.</p>
Invertebrates	<p>Conducts annual survey for butterflies.</p>	<p>Expand Alternative A.</p> <p>Explore opportunities with partners to initiate basic inventories of dragonflies, crayfish, and mussels.</p> <p>Explore potential focal species and appropriate survey methods.</p>	<p>Expand Alternative B.</p> <p>Effects of invertebrates on foraging base of migratory birds.</p>	<p>Conduct a comprehensive invertebrate survey focused on rare, threatened, and endangered species.</p>
Plants	<p>Plant list.</p>	<p>Expand Alternative A.</p> <p>Update current plant list.</p> <p>Explore opportunities with partners to develop a rare plant list.</p>	<p>Expand Alternative B.</p> <p>Explore relationships of rare plants to benefit migratory birds.</p>	<p>Same as Alternative B.</p>

Goal 2. Habitat Management - Manage, enhance, and restore suitable habitat for the conservation of migratory birds, native wildlife, fish, and plants, including all federal and state threatened and endangered species endemic to the refuge.

Issues	Alternative A Current Management (No Action Alternative)	Alternative B Wildlife and Habitat Diversity (Proposed Action)	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Habitat Management Plan	Currently, refuge has a Forest Management Plan.	Expand Alternative A. Develop and implement a habitat management plan. Explore potential structure based diversity indicators and appropriate monitoring methods.	Same as Alternative B.	Same as Alternative B.

Issues	Alternative A Current Management (No Action Alternative)	Alternative B Wildlife and Habitat Diversity (Proposed Action)	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Forest Management	<p>Actively manage 22,500 acres of upland pine with timber harvest and prescribed burning to comply with the refuge's red-cockaded woodpecker recovery goals, and other species of concern.</p> <p>Opportunistic management of bottomland and upland hardwoods.</p> <p>Implements Georgia's Best Management Practices for Forestry.</p>	<p>Expand Alternative A.</p> <p>Ensure adequate regeneration through time to provide a continuous flow of suitable RCW habitat.</p> <p>Explore a combination of even age and uneven age management to create habitat diversity.</p> <p>Increase vertical structure in bottomland hardwoods through creation of variable size gaps.</p> <p>Investigate potential structure based diversity indicators and appropriate monitoring methods.</p>	<p>Expand Alternative A.</p> <p>Increase vertical structural in bottomland hardwoods.</p> <p>Identify high-priority areas on which to focus cane habitat management.</p> <p>Investigate potential structure based diversity indicators and appropriate monitoring methods.</p>	<p>Expand Alternative A.</p> <p>Intensively manage for RCWs and associated species of concern on the maximum potential acres in upland forest by removing hardwoods, promoting pine, and burning intensively.</p> <p>Intensively manage habitats where other rare, threatened, and endangered species are found.</p>

Issues	Alternative A Current Management (No Action Alternative)	Alternative B Wildlife and Habitat Diversity (Proposed Action)	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Fire Management	<p>Conducts dormant and growing season prescribed fire to achieve RCW population goals, promote healthy and viable wildlife populations, and reduce hazardous fuels in wildlands and the WUI.</p> <p>Administers a fuels monitoring program.</p> <p>Implements Georgia's Best Management Practices for Forestry.</p>	<p>Expand Alternative A.</p> <p>Modify the fire management program to include a 5,000-acre Piedmont Savanna focus area with smaller burn units on a shorter rotation with half the burns being growing season burns.</p>	<p>Expand Alternative B.</p> <p>Expand Piedmont Savanna focus area.</p> <p>Change fire interval (5 to 10) to maximize benefits to migratory birds outside of Piedmont Savanna focus area.</p>	<p>Same as Alternative B in expanding Piedmont Savanna focus area.</p> <p>Shift where possible to growing season burns in upland pine for RCW management.</p>
Impoundments	<p>Perform periodic drawdowns and planting as a demonstration area for waterfowl.</p>	<p>Expand Alternative A.</p> <p>Write and implement water management plan to enhance habitat and wildlife diversity.</p>	<p>Same as Alternative B with emphasis on migratory birds.</p>	<p>Same as Alternative B, except with an emphasis on wood stork foraging habitat and other rare, threatened, and endangered species.</p>

Issues	Alternative A Current Management (No Action Alternative)	Alternative B Wildlife and Habitat Diversity (Proposed Action)	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Unique and Rare Habitats (Cane and Rock Outcrops)	Opportunistically enhance cane areas.	Expand Alternative A. Modify management activities as needed to protect and restore identified rock outcrops. Strategically manage cane; coordinate with fire and openings management.	Same as Alternative B with emphasis on migratory birds.	Same as Alternative B with focus on rare, threatened, and endangered species.
Invasive Control	Opportunistic treatment of invasive plants with herbicide and prescribed burning.	Expand Alternative A. Write and implement invasive species control plan within the Habitat Management Plan. Identify and map locations of infestations. Implement systematic removal of invasive plant species by mechanical, chemical, and prescribed burning.	Expand Alternative B. Expand invasive plant species control from uplands to include other habitat types such as bottomlands and lower slopes. Control spread of existing, invasive, exotic, and nuisance plants to reduce adverse impacts to migratory birds and their habitats.	Conduct initial attack with an emphasis on elimination. Control spread of existing, invasive, exotic, and nuisance plants to reduce adverse impacts to rare, threatened, and endangered species and their habitats.

Issues	Alternative A Current Management (No Action Alternative)	Alternative B Wildlife and Habitat Diversity (Proposed Action)	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Open Land	Maintain wildlife openings and roadsides through mowing and fire.	Expand Alternative A. Strategically enhance wildlife openings and roadsides for early successional habitat diversity.	Expand Alternative A. Identify management priority, target management in open lands for priority migratory bird species.	Expand Alternative A. Identify management priority, target management in open lands for rare, threatened, and endangered species.

Goal 3. Visitor Services - Provide wildlife-dependent public opportunities compatible with the refuge purposes that lead to greater understanding and enjoyment of fish, wildlife, and their habitats on the refuge.

Issues	Alternative A Current Management (No Action Alternative)	Alternative B Wildlife and Habitat Diversity (Proposed Action)	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Visitor Services Plan	Currently using out of date Visitor Services Plan.	Expand Alternative A. Develop and implement an up-to-date visitor services plan.	Same as Alternative B.	Same as Alternative B.

Issues	Alternative A Current Management (No Action Alternative)	Alternative B Wildlife and Habitat Diversity (Proposed Action)	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Welcome and Orient Visitors	Welcome and orient visitors to the refuge through directional and entrance signs, brochures, refuge website, visitor center, and maps.	Expand Alternative A. Update brochures, website and signs, add kiosks, refurbish exhibits, and add automated phone system.	Same as Alternative B.	Same as Alternative B.
Hunting	Maintain existing hunting program and facilities for deer, turkey, squirrel, rabbit, quail, raccoon, and opossum.	Expand Alternative A. Initiate outreach on land management activities during hunting. Consider parent/child hunts and expanding mobility impaired hunts. Consider expanding archery hunting and raccoon hunting. Investigate ways to restore or maintain even sex ratio.	Same as Alternative B.	Same as Alternative B.

Issues	Alternative A Current Management (No Action Alternative)	Alternative B Wildlife and Habitat Diversity (Proposed Action)	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Fishing	Maintain current seasonal opportunities in designated ponds.	<p>Expand Alternative A.</p> <p>Evaluate opening designated ponds to year-round fishing.</p> <p>Open fishing in more ponds.</p> <p>Make all fishing piers fully accessible according to the Americans with Disabilities Act of 1990.</p> <p>Reinstate Children’s fishing rodeo.</p>	<p>Same as Alternative A.</p> <p>Evaluate closing or limiting fishing on ponds to reduce impacts to wintering and nesting waterfowl.</p>	<p>Same as Alternative A.</p> <p>Evaluate closing or limiting fishing on ponds to reduce impacts on rare, threatened, and endangered species.</p>
Wildlife Observation and Photography	Maintain current opportunities for wildlife observation and photography including: wildlife drive, hiking trails, photo hut, observation platforms, and public road system.	<p>Expand Alternative A.</p> <p>Replace and add photo blinds and observation decks as needed.</p>	<p>Expand Alternative B.</p> <p>Identify observation constraints to avoid disturbance to migratory birds.</p>	<p>Expand Alternative B.</p> <p>Identify observation constraints to avoid disturbance of rare, threatened, and endangered species.</p>

Issues	Alternative A Current Management (No Action Alternative)	Alternative B Wildlife and Habitat Diversity (Proposed Action)	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Environmental Education (EE)/ Interpretation	Maintain current EE opportunities on the refuge which are limited by staff availability.	Expand Alternative A. Add kiosks to emphasize the importance of wildlife and habitat diversity on the refuge. Update and redesign auditorium to meet environmental education needs.	Expand EE programs to focus on the role and importance of migratory birds and add kiosk to emphasize migratory birds.	Expand EE program to focus on education of rare, threatened, and endangered species and add kiosk to emphasize rare, threatened, and endangered species.
Outreach	Current outreach activities are limited to one event per year.	Expand methods of outreach.	Expand Alternative A. Annually host one festival focusing on migratory birds	Expand Alternative A. Annually host one festival focusing on rare, threatened, and endangered species.

Goal 4. Resource and Visitor Protection - Protect the natural and cultural resources of the refuge and ensure visitor safety and facility integrity and continue to acquire lands within the approved acquisition boundary.

Issues	Alternative A Current Management (No Action Alternative)	Alternative B Wildlife and Habitat Diversity (Proposed Action)	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Law Enforcement	<p>Provide visitor safety, protect resources, and ensure public compliance with refuge regulations.</p> <p>One full-time and one collateral duty officer on staff.</p>	<p>Expand Alternative A.</p> <p>Revise law enforcement plan.</p>	<p>Expand Alternative B.</p> <p>Law enforcement outreach program would focus on migratory birds</p>	<p>Expand Alternative B.</p> <p>Law enforcement outreach program would focus on rare, threatened, and endangered species.</p>
Cultural Resources	<p>Enforce all federal and state laws applicable to the refuge.</p> <p>Protect all known archaeological sites on the refuge from illegal take or damage in compliance with the Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act and the national Historic Preservation Act.</p> <p>Active consultation with regional archaeologist.</p> <p>Brochures for cemeteries.</p>	<p>Expand Alternative A.</p> <p>Develop and to implement an Integrated Cultural Resources Management Plan.</p>	<p>Same as Alternative A.</p>	<p>Same as Alternative A.</p>

Issues	Alternative A Current Management (No Action Alternative)	Alternative B Wildlife and Habitat Diversity (Proposed Action)	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Land Acquisition	Opportunistic acquisition of inholdings within the acquisition boundary.	Expand Alternative A. Work with partners to acquire priority tracts from willing sellers.	Same as Alternative B.	Same as Alternative B.

Goal: 5 Climate Change - Understand the impacts of climate change on refuge resources to plan for and adapt management as necessary to protect the native wildlife and habitat of Piedmont NWR.

Issues	Alternative A Current Management (No Action Alternative)	Alternative B Wildlife and Habitat Diversity (Proposed Action)	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Climate Change	Current forest management sequesters carbon. Current fire management limits wild fires which produce more particulate matter and volatile organic compounds than prescribed burns.	Expand Alternative A. Coordinate with researchers and partners to identify climate change research needs for the refuge, investigating the impacts of climate change on fish and wildlife, listed species, vegetative communities, water quality and quantity, and other important resources.	Same as Alternative B.	Same as Alternative B.

Goal 6. Refuge Administration - Provide for sufficient staffing, facilities and infrastructure to meet desired future conditions

Issues	Alternative A Current Management (No Action Alternative)	Alternative B Wildlife and Habitat Diversity (Proposed Action)	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Private Lands	<p>Work with private landowners near the refuge to promote refuge goals and objectives for federal trust resources.</p> <p>MOU/Grants of permission between refuge and private landowners for prescribed burning.</p> <p>There are currently 12-14 Farmer Service Administration Easements.</p>	<p>Expand Alternative A.</p> <p>See opportunities to participate in management field days.</p> <p>Explore opportunities for the formation of public/private habitat management cooperatives.</p>	Same as Alternative B.	Same as Alternative B.
Partnerships	Cooperates with partners such as Georgia Department of Natural Resources, Georgia Forestry Commission, The Nature Conservancy, National Wild Turkey Federation, and Oconee National Forest.	<p>Expand Alternative A.</p> <p>Explore opportunities for new partnerships such as NBCI partnership-National Bobwhite Quail Conservation Initiative and IBT-Interagency Burn Team.</p>	<p>Expand Alternative B.</p> <p>Include partnership opportunities with Ducks Unlimited.</p>	Same as Alternative B.

Issues	Alternative A Current Management (No Action Alternative)	Alternative B Wildlife and Habitat Diversity (Proposed Action)	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Volunteer	<p>The refuge currently operates a volunteer program, and opportunistically includes an intern program.</p> <p>The refuge has no friends group.</p>	<p>Expand Alternative A.</p> <p>Expand volunteer program to enhance aspects of refuge management. Include resident interns, volunteers, and establish residential RV program for work campers.</p> <p>Explore possibility of establishing friends group.</p>	<p>Same as Alternative B but volunteers focus on migratory bird projects.</p>	<p>Same as Alternative B but volunteers focus on rare, threatened, and endangered species projects.</p>

Issues	Alternative A Current Management (No Action Alternative)	Alternative B Wildlife and Habitat Diversity (Proposed Action)	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Staffing Needs	Maintain current staffing structure.	<p>Increase complex budget and bring staffing levels up to full capacity in order to better meet the obligations of wildlife stewardship, habitat management, and public use.</p> <p>Reinstate assistant forester position. Reinstate Park Ranger (interpretive) position. Hire Biologist, Forestry technician, Park Ranger (LE), Engineering equipment operator, Prescribed fire/fuels technician, Refuge Operations Specialist, and two seasonal forestry technicians (firefighter).</p>	Same as Alternative B.	Same as Alternative B.

Issues	Alternative A Current Management (No Action Alternative)	Alternative B Wildlife and Habitat Diversity (Proposed Action)	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Capital Equipment, Facilities, and Infrastructure	Maintain existing equipment, facilities, and infrastructure.	<p>Increase budget to better meet the obligations of wildlife stewardship, habitat management, and public use.</p> <p>Acquire and maintain equipment, facilities, and infrastructure used as a part of refuge management to include: new residence quarters, replace existing septic facility and add new well for shop, expand visitors center to accommodate new hires, Skid steer with mulching head, Rollback (for hauling equipment without taking fire equipment out of service), boat ramps, fishing piers, viewing areas and kiosks, pole barn for equipment, and covered pavilion for campground (volunteer, hunting).</p>	Expand Alternative B with purchase of excavator, dozer, truck tractor, and lowboy.	Same as Alternative B.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS

The alternatives development process under NEPA and the Improvement Act is designed to allow consideration of the widest possible range of issues and potential management approaches. During the alternatives development process, many different solutions were considered. The following alternative components were considered but not selected for detailed study in this Draft CCP/EA for the reason(s) described.

Custodial Management

Under this alternative the refuge would cease all management including forest thinning, prescribed burning, and invasive control. This alternative was abandoned because it would not support habitat needed for the endangered red-cockaded woodpecker and associated native species.

IV. *Environmental Consequences*

OVERVIEW

This section analyzes and discusses the potential environmental effects or consequences that can be reasonably expected by the implementation of each of the four alternatives described in the previous chapter. For each alternative, the expected outcomes are portrayed through the 15-year life of the CCP.

EFFECTS COMMON TO ALL ALTERNATIVES

A few potential effects will be the same under each alternative and are summarized under seven categories: environmental justice, climate change, other management, land acquisition, cultural resources, refuge revenue-sharing, and other effects.

ENVIRONMENTAL JUSTICE

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" was signed by President Clinton on February 11, 1994, to focus federal attention on the environmental and human health conditions of minority and low-income populations, with the goal of achieving environmental protection for all communities. The order directed federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The order is also intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority and low-income communities with access to public information and opportunities for participation in matters relating to human health or the environment.

None of the management alternatives described in this EA will disproportionately place any adverse environmental, economic, social, or health impacts on minority and low-income populations. Implementation of any action alternative that includes public use and environmental education is anticipated to provide a benefit to the residents residing in the surrounding communities.

CLIMATE CHANGE

The U.S. Department of the Interior issued an order in January 2001 requiring federal agencies under its direction that have land management responsibilities to consider potential climate change impacts as part of long-range planning endeavors.

The increase of carbon within the earth's atmosphere has been linked to the gradual rise in surface temperatures commonly referred to as global warming. In relation to comprehensive planning for national wildlife refuges, carbon sequestration constitutes the primary climate-related impact to be considered in planning. The U.S. Department of Energy's *Carbon Sequestration Research and Development* (U.S. Department of Energy 1999) defines carbon sequestration as "...the capture and secure storage of carbon that would otherwise be emitted to or remain in the atmosphere."

The land is a tremendous force in carbon sequestration. Terrestrial biomes of all sorts—grasslands, forests, wetlands, tundra, perpetual ice, and desert—are effective both in preventing carbon emissions and in acting as a biological “scrubber” of atmospheric carbon monoxide. The conclusions of the Department of Energy’s report noted that ecosystem protection is important to carbon sequestration and may reduce or prevent the loss of carbon currently stored in the terrestrial biosphere.

Conserving natural habitat for wildlife is the heart of any long-range plan for national wildlife refuges. The actions proposed in this Draft CCP/EA would conserve or restore land and water, and would thus enhance carbon sequestration. This, in turn, contributes positively to efforts to mitigate human-induced global climate changes.

OTHER MANAGEMENT

All management activities that could affect the refuge’s natural resources, including subsurface mineral reservations, utility lines and easements, soils, water and air, and historical and archaeological resources, would be managed to comply with all laws and regulations. In particular, any existing and future oil and gas exploration, extraction, and transport operations on the refuge would be managed identically under each of the alternatives. Thus, the impacts would be the same.

LAND ACQUISITION

Funding for land acquisition from willing sellers within the approved acquisition boundary of Piedmont NWR would come from the Land and Water Conservation Fund, the Migratory Bird Conservation Fund, Corps of Engineers mitigation programs, or donations from conservation and private organizations. Conservation easements and leases can be used to obtain the minimum interests necessary to satisfy refuge objectives, if the refuge staff can adequately manage uses of the areas for the benefit of wildlife. The Service can negotiate management agreements with local, state, and federal agencies, and accept conservation easements. Some tracts within the refuge acquisition boundary may be owned by other public or private conservation organizations. The Service would work with interested organizations to identify additional areas needing protection and provide technical assistance if needed. The acquisition of private lands is entirely contingent on the landowners and their willingness to participate.

CULTURAL RESOURCES

All alternatives afford additional land protection and low levels of development, thereby producing little negative effect on the refuge’s cultural and historic resources. Potentially negative effects could include logging, construction of new trails or facilities, and development of water impoundments. In most cases, these management actions would require review by the Service’s Regional Archaeologist in consultation with the State of Georgia Historic Preservation Office, as mandated by Section 106 of the National Historic Preservation Act. Therefore, the determination of whether a particular action within an alternative has the potential to affect cultural resources is an on-going process that would occur during the planning stages of every project.

Service acquisition of land with known or potential archaeological or historical sites provides two major types of protection for these resources: protection from damage by federal activity and protection from vandalism or theft. The National Historic Preservation Act requires that any actions by a federal agency which may affect archaeological or historical resources be reviewed by the State Historic Preservation Office, and that the identified effects must be avoided or mitigated. The Service’s policy is to preserve these cultural, historic, and archaeological resources in the public trust, and avoid any adverse effects wherever possible.

Land acquisition, within the current acquisition boundary, by the Service would provide some degree of protection to significant cultural and historic resources. If acquisition of private lands does not occur and these lands remain under private ownership, the landowner would be responsible for protecting and preserving cultural resources. Development of off-refuge lands has the potential to destroy archaeological artifacts and other historical resources, thereby decreasing opportunities for cultural resource interpretation and research.

REFUGE REVENUE-SHARING

Annual refuge revenue-sharing payments to Jones and Jasper Counties would continue at similar rates under each alternative. If lands are acquired and added to the refuge, the payments would increase accordingly.

OTHER EFFECTS

Each of the alternatives would have similar effects or minimal to negligible effects on soils, water quality and quantity, noise, transportation, human health and safety, children, hazardous materials, waste management, aesthetics and visual resources, and utilities and public services.

SUMMARY OF EFFECTS BY ALTERNATIVE

The following section describes the environmental consequences of adopting each refuge management alternative. Table 7 summarizes and addresses the likely outcomes for the specific issues, and is organized by broad issue categories.

ALTERNATIVE A - (CURRENT MANAGEMENT - NO ACTION)

Alternative A would maintain the status quo, that is, current management direction in which the refuge's habitats, wildlife populations, and public use would continue to be managed as they have in recent years. This alternative assumes that current conservation management and land protection programs and activities by the Service, state and local agencies, and private organizations would continue to follow past trends over the next 15 years.

Current monitoring adequately addresses red-cockaded woodpecker, white-tailed deer, turkey, quail, and butterflies. Current monitoring of other wildlife and associated habitats provides minimal data for adaptive habitat management. We would continue to manage the red-cockaded woodpecker population according to Piedmont NWR RCW Plan; therefore, red-cockaded woodpecker populations would remain steady or increase at the current rate over the next 15 years. Neotropical, migratory, and resident bird populations would be expected to remain steady, based on information obtained from the continuation of current bird surveys. Resident mammals would be expected to remain steady with continuation of current hunt program and current habitat management.

Fishery resources in ponds would be expected to remain the same or slightly decrease as the current public fishing program is maintained but with reduced resources for maintenance. Waterfowl and wetland-dependent bird populations would be expected to remain the same or decrease over the next 15 years, due to lack of management programs to support these species. Currently, there is no information on raptors so it is unknown whether these populations are likely to be stable or decrease. The majority of invertebrates, except for butterflies, would either remain steady or decrease due to lack of information on current populations on which to base management actions. Currently, butterfly surveys are conducted annually. This knowledge may help maintain or increase current populations.

However, reptiles and amphibians are likely to decrease on the refuge since there is no current management and no up-to-date information on these species.

Under Alternative A, over the next 15 years, current forest management and fire management would continue making progress toward existing refuge goals by enhancing, and restoring suitable habitat for red-cockaded woodpeckers and other species of management concern endemic to the refuge. Forest management is effectively managing current forests but not sufficiently providing for regeneration. Use of prescribed fire as a management tool provides for diverse habitats and reduces hazardous fuels.

Complying with Best Management Practices (Georgia Forestry Commission 2009) would maintain and improve the quality of stream, beaver pond, and swamp habitats. Impoundment habitat would remain as they currently are. Other habitats such as open lands would remain the same or decrease, because currently there is limited maintenance to existing open land on the refuge. No active management would continue on unique and rare habitats found on the refuge, as a result these areas would remain as they are or would degrade.

Invasive species would continue to be combated, with no specific plan in place. Current management does not provide adequate control and removal of invasive species. This could result in an increase in invasive species, and could affect all habitats on the refuge. Currently, information is inadequate to assess the effects of climate change on the refuge and inability to effectively adjust management to mitigate those impacts could result in negative impacts on all habitats on the refuge.

Under the No Action Alternative, the visitor services plan would remain out-dated, environmental education and interpretation programs would remain limited by availability of staff, and the outreach program would remain limited to one per year. Other visitor services currently provided by Piedmont NWR, such as welcoming and orienting visitors, hunting, fishing, and wildlife observation and photography, are better than adequate.

Under Alternative A, we would continue to protect the natural and cultural resources of the refuge and ensure visitor safety and facility integrity to fulfill the refuge purposes. However, with the current staffing level and capital equipment, facilities, and infrastructure, no change in the levels of information, programs, and wildlife and habitat management would occur; and no improvements would be made to the refuge with existing equipment, facilities, and infrastructure.

ALTERNATIVE B - (WILDLIFE AND HABITATE DIVERSITY - PROPOSED ALTERNATIVE)

Implementing Alternative B would be the most effective management action for meeting the purposes of Piedmont NWR. A wildlife inventorying and monitoring plan and habitat management plan would be developed. Monitoring and surveying would be conducted systematically after assessing which species should be targeted based on their population status and ability to indicate health of important habitat. Populations of red-cockaded woodpeckers would be expected to remain steady or increase by maintaining more recruitment sites. Other birds, mammals, reptiles, amphibians, fish, and invertebrates would be expected to remain steady or increase benefitting from increased information which would result in better management of targeted species and their habitats. Increased monitoring and increased management of habitat should positively impact targeted wildlife populations.

Under Alternative B, over the next 15 years, forest management and fire management would have an improved effect on wildlife and habitat diversity by utilizing principles from disturbance ecology and stand dynamics (Franklin et. al 2002) to better achieve refuge goals. Modeling forest management activities after natural disturbance patterns leads to a range of structural outcomes (Palik et al. 2002), providing wildlife and habitat diversity. Varying prescribed fire frequency,

seasonality and intensity produces a variable understory structure (Langdon 1981, Waldrop et. al 1987), while reducing hazardous fuels. Complying with Best Management Practices (Georgia Forestry Commission 2009) would maintain or even improve the quality of streams, beaver ponds, and swamp habitats. Scheduled drawdowns of impoundments and implementing a water management program would provide for demonstration and better habitat management. By opportunistically inventorying for and in unique and rare habitat types, management actions can be conducted that protect and restore these habitats. Open lands would remain the same or increase by promoting desirable native shrubs and herbaceous ground cover. Invasive species would decrease and native species would increase by implementing a more aggressive and strategic invasive species plan. We would have a better understanding of the extent of impacts that climate change will have on our resources, enabling us to adjust management to mitigate, where possible, those negative consequences.

Alternative B would improve current visitor services by updating the visitor services plan, increasing and updating environmental education and interpretation programs and providing additional information to reach a broader audience, and increasing outreach program activities. While current visitor services provided are adequate, improvements under Alternative B to welcoming and orienting visitors, hunting, fishing, and wildlife observation and photography would increase visitor services opportunities for the greater public use.

Under Alternative B, we would update the law enforcement plan. We would improve management for cultural resources, and increase land acquisition plans. We would complete an integrated cultural resource plan. We would expand volunteer programs and increase staffing and equipment to provide resources to accomplish the needs of this alternative for desired future conditions. Staff additions would improve habitat management, increase visitor services, and ensure public safety.

ALTERNATIVE C - (MIGRATORY BIRDS)

Under Alternative C, we would emphasize migratory birds. While this alternative fulfills some aspects of the Improvement Act, it falls short of fulfilling the entire Act, the mission of the Refuge System, and the purposes of the refuge. A wildlife inventorying and monitoring plan and habitat management plan would be developed. All bird populations would be expected to increase or remain steady, but by focusing only on migratory birds, other important species could be overlooked. Reptiles and amphibians, fish and resident mammals could decrease, while invertebrates would remain steady because they would possibly be managed as food supply for migratory birds.

Under Alternative C, we would focus forest management to better achieve refuge goals and enhance habitat for migratory birds. We would adapt its fire program to better achieve management goals in and out of the focus area to benefit migratory bird habitat. Complying with Best Management Practices (Georgia Forestry Commission 2009) would maintain and improve the quality of stream, beaver pond, and swamp habitats. Scheduled drawdowns of impoundments and implementing a water management program would provide for better habitat management for migratory birds. Restoring, conserving, and inventorying unique and rare habitat types that benefit migratory birds, would have a positive impact on habitats that are suitable for migratory birds; however, other rare habitats not suitable for migratory birds may be ignored. Open lands would remain the same or increase, by promoting desirable native shrubs and herbaceous ground cover for migratory birds. Invasive species would decrease and native species would increase by implementing a more aggressive and strategic invasive species plan that would benefit migratory birds. We would have a better understanding of the extent of impacts that climate change would have on our resources, including those that benefit migratory birds, enabling us to adjust management to mitigate, where possible, those negative consequences.

Under Alternative C, the visitor services plan would be updated, there would be increased and updated environmental education and interpretation programs and increased outreach program activities that emphasize migratory birds. Improvements would be made to welcome and orient visitors, but because the emphasis of this alternative is on migratory birds, some types of opportunities for hunting would increase while others would decrease. Opportunities for wildlife observation and photography would be improved with updated facilities but this alternative may limit opportunities due to closings to avoid disturbance during critical periods for specific species. This alternative may also limit fishing opportunities.

Under Alternative C, we would update the law enforcement plan. We would increase land acquisition plans to manage for migratory birds. We would expand volunteer programs and increase staffing and equipment to provide resources to accomplish the needs of this alternative for migratory birds.

ALTERNATIVE D - (RARE, THREATENED, AND ENDANGERED SPECIES)

Under Alternative D, we would emphasize rare, threatened, and endangered species management. This alternative also meets some aspects of the Improvement Act; it does not fulfill all the requirements of the entire Act, the mission of the Refuge System, and the purposes of the refuge. A wildlife inventoring and monitoring plan and habitat management plan would be developed. All bird populations would be expected to increase or remain steady, except for waterfowl and some wetland-dependent birds. Populations of mammals would remain steady, but populations of bats would likely increase. Populations of rare, threatened, and endangered amphibians, reptiles, fish and invertebrates would increase or remain steady because of the increased information from surveys.

Under Alternative D, we would focus forest management to better achieve refuge goals and enhance habitat for rare, threatened, and endangered species. We would adapt our fire program to better achieve management goals in and out of the Piedmont Savanna focus area to benefit rare, threatened, and endangered species. Complying with Best Management Practices (Georgia Forestry Commission 2009) would maintain and improve the quality of stream, beaver pond, and swamp habitats. Scheduled drawdowns of impoundments and implementing a water management program would provide for better habitat management for rare, threatened, and endangered species. Conserving, restoring, and inventoring unique and rare habitat types that benefit rare, threatened, and endangered species would have a positive impact on those habitats; however, other rare habitats not suitable for rare, threatened, and endangered species may be ignored. Open lands would remain the same or increase by promoting desirable native shrubs and herbaceous ground cover for rare, threatened, and endangered species. Invasive species would decrease and native species would increase by implementing a more aggressive and strategic invasive species plan that would benefit rare, threatened, and endangered species. We would have a better understanding of the extent of impacts that climate change would have on our resources including those that benefit rare, threatened, and endangered species, enabling us to adjust management to mitigate, where possible, those negative consequences.

Under Alternative D, the visitor services plan would be updated, there would be increased and updated environmental education and interpretation programs and increased outreach program activities that emphasize rare, threatened, and endangered species. Improvements would be made to welcome and orient visitors, but because the emphasis of this alternative is on rare, threatened, and endangered species, some types of opportunities for hunting would increase while others would decrease. Opportunities for wildlife observations and photography would be improved with updated facilities, but this alternative may limit opportunities due to closings to avoid disturbance to nesting sites and critical habitat. This alternative may also limit fishing opportunities.

Under Alternative D, we would update the law enforcement plan. We would increase land acquisition plans to manage for rare, threatened, and endangered species. We would expand volunteer programs and increase staffing and equipment to provide resources to accomplish the needs of this alternative for rare, threatened, and endangered species.

Table 7. Summary of environmental effects by alternative, Piedmont NWR

Goal 1. Wildlife Population Management - Manage, enhance, and restore healthy and viable populations of migratory birds, native wildlife, and fish, including all federal and state threatened and endangered species found on the refuge.

Issues	Alternative A (Current Management – No Action Alternative)	Alternative B Wildlife and Habitat Diversity	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Wildlife Inventory and Monitoring Plan	Negative. Outdated plan.	Positive. Updated Wildlife Inventorying and Monitoring Plan.	Same as Alternative B.	Same as Alternative B.
Red-cockaded Woodpecker	Neutral to Positive. Continue to manage the RCW population according to Piedmont NWR RCW Plan.	Neutral to Positive. Increase in recruitment site could provide increase in population.	Neutral to Positive. Continue to manage the RCW population according to Piedmont NWR RCW Plan.	Neutral to Positive. A translocation program would allow for strategic placement of pairs in recruitment areas which increase chance of population increase.

Issues	Alternative A (Current Management – No Action Alternative)	Alternative B Wildlife and Habitat Diversity	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Migratory Birds	Neutral. Continue with current surveys.	Neutral to Positive. Increased information on breeding birds. Increased information to enhance decision-making.	Neutral to Positive. Increase information and habitat needs for breeding birds and woodcock. Increased information to enhance decision making. Reduction in predators and decrease in habitat destruction/competition.	Neutral to Positive. Increased information on breeding birds. Increased information to enhance decision-making.
Waterfowl	Negative to Neutral. Wood duck boxes not maintained. No management to support wintering waterfowl and larger wood duck population.	Neutral to Positive. Information from winter waterfowl surveys enhances state and flyway objectives.	Neutral to Positive. Enhanced management through partnerships.	Negative to Neutral. No management to support wintering waterfowl.
Wood Duck	Negative to Neutral. No active management.	Neutral to Positive. Maintaining existing boxes could improve nesting of wood ducks.	Positive. Information from wood duck banding enhance state and flyway objectives.	Negative. Wood duck boxes not maintained.

Issues	Alternative A (Current Management – No Action Alternative)	Alternative B Wildlife and Habitat Diversity	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Wetland-dependent birds	Negative to Neutral. No active management to benefit wetland dependant birds.	Neutral to Positive. Increased information to enhance decision-making and improve available habitat.	Positive. Increased information to enhance decision-making and increase available habitat.	Negative to Positive. Positive for wood storks, could be negative for some other wetland-dependent birds.
Raptors	Neutral to Negative. No current information.	Neutral to Positive. Contribute information on bald eagles for state and national use. Increase information on raptors in Piedmont Savanna focus area.	Neutral to Positive. Increased information on raptors. Increase nesting habitat for kestrels.	Same as Alternative B.
Resident Wildlife - Birds	Neutral. Continue to gather information through existing surveys.	Neutral to Positive. Increase information with additional surveys and establishment of Piedmont Savanna focus area.	Same as Alternative B.	Neutral to Positive. Increase information with additional surveys and intensive management of Piedmont Savanna focus area.

Issues	Alternative A (Current Management – No Action Alternative)	Alternative B Wildlife and Habitat Diversity	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Resident Wildlife - Mammals	Neutral. Maintain current hunt program and deer browse survey.	Neutral to Positive. Promote a healthy deer population and increase knowledge of furbearers.	Negative to Positive. Promote healthier furbearer populations.	Neutral to Positive. Increase information on bats and protect roosting habitat if found.
Reptiles and Amphibians	Negative. No active management. Species list is out of date.	Neutral to Positive. Annual surveys would increase information which would enhance decision- making.	Negative. No active management. Species list is out of date.	Same as Alternative B.
Fish	Negative to Positive. Lack of information of fish species in streams. No enhancements to ponds. Reduce nonpoint source pollution.	Neutral to Positive. Increase information on streams and improve habitat quality in ponds.	Negative to Neutral. An increase in weeds could result in decreased fish populations. Increase submerged vegetation for wintering waterfowl.	Neutral to Positive. Increase information on streams and increase connectivity.

Issues	Alternative A (Current Management – No Action Alternative)	Alternative B Wildlife and Habitat Diversity	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Invertebrates	<p>Negative to Positive.</p> <p>Current butterfly survey conducted but there is no other information on other invertebrates that occur on the refuge.</p>	<p>Neutral to Positive.</p> <p>Increase knowledge of other invertebrate occurring on the refuge to increase decision-making in habitat improvements to support these species.</p>	<p>Neutral.</p> <p>Increase knowledge of other invertebrate occurring on the refuge to increase decision-making in habitat improvements to increase foraging for migratory birds.</p>	<p>Neutral to Positive.</p> <p>Increase information on rare, threatened, and endangered invertebrates occurring on the refuge.</p>
Plants	<p>Neutral.</p> <p>Current Plant List</p>	<p>Positive.</p> <p>Updat list and develop a rare plant list</p>	<p>Positive.</p> <p>Increase knowledge of rare plants to benefit migratory birds.</p>	<p>Same as Alternative B.</p>

Goal 2. Habitat Management - Manage, enhance, and restore suitable habitat for the conservation of migratory birds, native wildlife, fish, and plants, including all federal and state threatened and endangered species endemic to the refuge.

Issues	Alternative A (Current Management – No Action Alternative)	Alternative B Wildlife and Habitat Diversity	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Habitat Management Plan	Neutral to Negative. No habitat management plan.	Positive. Develop habitat management plan.	Same as Alternative B.	Same as Alternative B.
Forest Management	Positive. Current management making progress toward existing refuge goals.	Positive. Adapting management to better achieve refuge goals and enhance wildlife and habitat diversity.	Positive. Focus management to better achieve refuge goals and enhance habitat for migratory birds.	Positive. Intensive management to better achieve refuge goals and enhance habitat for rare, threatened, and endangered species.
Fire Management	Positive. Current fire program achieving refuge management goals.	Positive. Adapting fire program to better achieve refuge management goals in focus area.	Positive. Adapting fire program to better achieve refuge management goals in and out of the focus area to benefit migratory bird habitat.	Positive. Adapting fire program to better achieve refuge management goals to enhance rare, threatened, and endangered species.

Issues	Alternative A (Current Management – No Action Alternative)	Alternative B Wildlife and Habitat Diversity	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Impoundments	Neutral. Periodic drawdowns provide for demonstration.	Neutral to Positive. Scheduled drawdowns provide for demonstration and habitat management.	Neutral to Positive. Scheduled drawdowns provide for demonstration and habitat management to benefit migratory birds.	Neutral to Positive. Scheduled drawdowns provide for demonstration and habitat management to benefit rare, threatened, and endangered species.
Unique and Rare Habitats (Cane and Rock Outcrops)	Neutral. Opportunistic enhancement of cane.	Neutral to Positive. Increased information and strategic management would improve decision-making quality.	Negative to Positive. Increased information would improve decision-making quality and management implementation for migratory birds. Some rare habitats may not be relevant for migratory birds and would not implement active management.	Negative to Positive. Increased information would improve decision-making quality and management implementation for rare, threatened, and endangered species. Some rare habitats may not be relevant for rare, threatened, and endangered species and would not implement active management.
Invasive Control	Negative to Neutral. No specific control efforts are in place.	Positive. More aggressive and strategic planning may result in better control of spread. Reducing invasive species should result in increase of native species.	Positive. Including other habitat types in invasive control would promote native species that benefit migratory birds.	Positive. Decreased existence of exotic, invasive, and nuisance species on the refuge, especially in high-priority habitats for rare, threatened, and endangered species.

Issues	Alternative A (Current Management – No Action Alternative)	Alternative B Wildlife and Habitat Diversity	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Open Land	Negative to Neutral. Limited maintenance of existing open lands.	Neutral to Positive. Enhance open lands by promoting desirable native shrubs and herbaceous ground cover with soft mast producers.	Neutral to Positive. Strategic management of open lands for migratory birds.	Neutral to Positive. Strategic management of open lands for rare, threatened, and endangered species.

Goal 3. Visitor Services - Provide wildlife-dependent public opportunities compatible with the refuge purposes that lead to greater understanding and enjoyment of fish, wildlife, and their habitats on the refuge.

Issues	Alternative A (Current Management – No Action Alternative)	Alternative B Wildlife and Habitat Diversity	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Visitor Services Plan	Negative. Plan is out-of-date.	Positive. Updated plan should improve visitor services program.	Same as Alternative B.	Same as Alternative B.

Issues	Alternative A (Current Management – No Action Alternative)	Alternative B Wildlife and Habitat Diversity	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Welcome and Orient Visitors	Neutral to Positive. Ongoing coordination to provide sufficient welcome and orientation to refuge visitors.	Positive. Ongoing and improved coordination to provide sufficient welcome and orientation to refuge visitors. Improved and updated materials.	Same as Alternative B.	Same as Alternative B.
Hunting	Neutral to Positive. Adequate hunt program.	Negative to Positive. Pending outcome of lawsuit.	Same as Alternative B.	Same as Alternative B.
Fishing	Neutral. No changes to current fishing opportunities.	Neutral to Positive. Increased quality of fishing opportunities and minimized impacts and associated wildlife and habitat disturbances.	Negative to Neutral. May reduce fishing opportunities.	Negative to Neutral. Increase knowledge to minimized impacts of rare, threatened, and endangered species. May reduce fishing opportunities.

Issues	Alternative A (Current Management – No Action Alternative)	Alternative B Wildlife and Habitat Diversity	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Wildlife Observation and Photography	Neutral to Positive. Opportunities and facilities would remain the same.	Neutral to Positive. Updated facilities and signs would benefit opportunities.	Negative to Positive. Updated facilities and signs would benefit opportunities. Closings to avoid disturbance would decrease viewing opportunity.	Same as Alternative C.
Environmental Education/ Interpretation (EE)	Negative to Neutral. Limited program.	Positive. Increase and update EE programs and provide additional information to reach more audiences.	Same as Alternative B.	Same as Alternative B.
Outreach	Neutral Limited outreach with once a year event.	Positive Increase in outreach activities.	Same as Alternative B.	Same as Alternative B.

Goal 4. Resource and Visitor Protection - Protect the natural and cultural resources of the refuge and ensure visitor safety and facility integrity and continue to acquire lands within the approved acquisition boundary.

Issues	Alternative A (Current Management – No Action Alternative)	Alternative B Wildlife and Habitat Diversity	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Law Enforcement (LE)	Neutral to positive. Refuge is in compliance with current regulations.	Positive. Updated LE plan.	Same as Alternative B.	Same as Alternative B.
Cultural Resources	Neutral to Positive. Refuge in compliance with the Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act and the national Historic Preservation Act.	Positive. Increased information improves management decisions.	Same as Alternative A.	Same as Alternative A.
Land Acquisition	Neutral to Positive. Opportunistic acquisitions could result in increased habitat.	Positive. Increased lands would increase area to manage for wildlife and habitat diversity.	Positive. Increased land would increase areas to manage for migratory birds.	Positive. Increased land would increase areas to manage for rare, threatened, and endangered species.

Goal 5. Climate Change - Understand the impacts of climate change on refuge resources to plan for and adapt management as necessary to protect the native wildlife and habitat of Piedmont NWR.

Issues	Alternative A (Current Management – No Action Alternative)	Alternative B Wildlife and Habitat Diversity	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Climate Change	Neutral to Positive. Information inadequate to assess the long term effects of climate change on the refuge. Current management activities sequester carbon.	Neutral to Positive. Refuge would have a better understanding of the extent of impacts that climate change would have on its resources, enabling it to adjust management to mitigate, where possible, those negative consequences.	Same as Alternative B.	Same as Alternative B.

Goal 6. Refuge Administration - Provide for sufficient staffing, facilities, and infrastructure to meet desired future conditions.

Issues	Alternative A (Current Management – No Action Alternative)	Alternative B Wildlife and Habitat Diversity	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Private Lands	Neutral to Positive. Coordination with private landowners results in potential improvements of habitat on lands adjacent to the refuge.	Same as Alternative A.	Same as Alternative A.	Same as Alternative A.
Partnerships	Neutral to Positive. Partnerships contribute to resource management.	Same as Alternative A.	Same as Alternative A.	Same as Alternative A.
Volunteer	Neutral to Positive. Limited volunteers and interns. No friends group.	Positive. Expand program and expand volunteer workforce.	Positive. Expand program and expand volunteer workforce to focus on migratory birds.	Positive. Expand program and expand volunteer workforce to focus on rare, threatened and endangered species.
Staffing Needs	Neutral. No change in the levels of information, programs, and wildlife and habitat management.	Positive. Increased staffing levels, information, programs, and wildlife and habitat management.	Same as Alternative B.	Same as Alternative B.

Issues	Alternative A (Current Management – No Action Alternative)	Alternative B Wildlife and Habitat Diversity	Alternative C Migratory Birds	Alternative D Rare, Threatened, and Endangered Species
Capital Equipment, Facilities, and Infrastructure	Neutral. Existing equipment, facilities, and infrastructure adequate for current refuge management.	Positive. Additional equipment, facilities, and infrastructure needed for increased refuge management.	Positive. Additional equipment, facilities, and infrastructure needed for increased refuge management for migratory birds.	Same as Alternative B.

UNAVOIDABLE IMPACTS AND MITIGATION MEASURES

Under Alternative A, the no-action alternative, there are numerous unavoidable impacts, including law enforcement that is not adequate for protecting any significant visitor use; continued degradation of the biological functions of native plant communities and wildlife habitat due to the invasion of exotic plants and nuisance animals; and a continued decrease in biodiversity. Over time, if these issues are not addressed, they will continue to impact refuge resources.

Alternative B, the proposed alternative, also has some unavoidable impacts. These impacts are expected to be minor and/or short-term in duration. However, we would attempt to minimize these impacts whenever possible. The following sections describe the measures we would employ to mitigate and minimize the potential impacts that would result from implementation of the proposed alternative.

Unavoidable impacts for Alternative C and Alternative D would be similar to those of Alternative B. With the emphasis of these alternatives placed on one wildlife group, other wildlife populations and habitats could suffer.

WATER QUALITY FROM SOIL DISTURBANCE AND USE OF HERBICIDES

Soil disturbance and siltation due to water management activities; road and levee maintenance; and the construction of observation towers, boat ramps, photo blinds, refuge quarters, and updating the visitor center is expected to be minor and of short duration. To further reduce potential impacts, the refuge would use best management practices (Georgia Forestry Commission 2009) to minimize the erosion of soils into water bodies.

Foot traffic on new and extended foot trails is expected to have a negligible impact on soil erosion. To minimize the impacts from public use, we would maintain trails for foot traffic only. Long-term herbicide use for exotic plant control could result in a slight decrease in water quality in areas prone to exotic plant infestation. Through the proper application of herbicides, however, this is expected to have a minor impact on the environment, with the benefit of reducing or eliminating exotic plant infestations.

WILDLIFE DISTURBANCE

Disturbance to wildlife is an unavoidable consequence of any public use program, regardless of the activity involved. While some activities such as wildlife observation may be less disturbing than others, all of the public use activities proposed under the proposed alternative will be planned to avoid unacceptable levels of impact.

The known and anticipated levels of disturbance from the proposed alternative are not considered to be significant. Nevertheless, we would manage public use activities to reduce impacts. Providing access for fishing opportunities allows the use of a renewable natural resource without adversely impacting other resources. Hunting would also be managed with restrictions that ensure minimal impact on other resources. General wildlife observation may result in minimal disturbance to wildlife. If we determine that impacts from the expected additional visitor uses are above the levels that are anticipated, those uses would be discontinued, restricted, or rerouted to other less sensitive areas.

VEGETATION DISTURBANCE

Negative impacts could result from the creation, extension, and maintenance of trails that require the clearing of nonsensitive vegetation along their length. This is expected to be a minor short-term impact.

Increased visitor use may increase the potential for the introduction of new exotic species into areas when visitors do not comply with boating regulations at the boat ramps and other access points, or with requests to stay on trails. We would minimize this impact by enforcing the regulations for access to the refuge's water bodies, and by installing informational signs that request users to stay on the trails.

USER GROUP CONFLICTS

As public use increases, unanticipated conflicts between different user groups could occur. If this should happen, we would adjust its programs, as needed, to eliminate or minimize any public use issues. We would use methods that have proven to be effective in reducing or eliminating public use conflicts. These methods include establishing separate use areas, different use periods, and limits on the numbers of users in order to provide safe, quality, appropriate, and compatible wildlife-dependent recreational opportunities.

EFFECTS ON ADJACENT LANDOWNERS

Implementation of the proposed alternative is not expected to negatively affect the owners of private lands adjacent to the refuge. Positive impacts that would be expected include higher property values, less intrusion of invasive exotic plants, and increased opportunities for viewing more diverse wildlife.

However, some negative impacts that may occur include a higher frequency of trespass onto adjacent private lands, and noise associated with increased traffic. To minimize these potential impacts, we would provide informational signs that clearly mark refuge boundaries; maintain the refuge's existing parking facilities; use law enforcement; and provide increased educational efforts at the visitor center.

LAND OWNERSHIP AND SITE DEVELOPMENT

Land acquisition efforts by the Service could lead to changes in land use and recreational use patterns. However, most of the non-Service-owned lands within the refuge's approved acquisition boundary are currently undeveloped. If these lands are acquired as additions to the refuge, they would be maintained in a natural state, managed for native wildlife populations, and opened to wildlife-compatible public uses, where feasible.

Potential development of the refuge's buildings, trails, and other improvements could lead to minor short-term negative impacts on plants, soils, and some wildlife species. When building the observation towers, efforts would be made to use recycled products and environmentally sensitive treated lumber. The visitor center would be constructed to be aesthetically pleasing to the community and to avoid any additional impacts to native plant communities. All construction activities would comply with the requirements of Section 404 of the Clean Water Act; the National Historic Preservation Act; Executive Order 11988, Floodplain Management; and other applicable regulatory requirements.

CUMULATIVE IMPACTS

A cumulative impact is defined as an impact on the natural or human environment, which results from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (federal or non-federal) or person undertakes such other actions (40 CFR 1508.7).

Cumulative impacts are the overall, net effects on a resource that arise from multiple actions. Impacts can “accumulate” spatially, when different actions affect different areas of the same resource. They can also accumulate over the course of time, from actions in the past, the present, and the future. Occasionally, different actions counterbalance one another, partially canceling out each other’s effect on a resource. But more typically, multiple effects add up, with each additional action contributing an incremental impact on the resource. In addition, sometimes the overall effect is greater than merely the sum of the individual effects, such as when one more reduction in a population crosses a threshold of reproductive sustainability, and threatens to extinguish the population.

A thorough analysis of impacts always considers their cumulative aspects, because actions do not take place in a vacuum: there are virtually always some other actions that have affected that resource in some way in the past, or are affecting it in the present, or will affect it in the reasonably foreseeable future. So any assessment of a specific action’s effects must in fact be made with consideration of what else has happened to that resource, what else is happening, or what else will likely happen to it.

The refuge is not aware of any past, present, or future planned actions that would result in a significant cumulative impact when added to the refuge’s proposed actions, as outlined in the proposed alternative.

Nevertheless, because of concerns expressed about the cumulative effects of hunting on certain national wildlife refuges, this section discusses in some detail the cumulative impacts of the hunting program at Piedmont NWR.

Home ranges of white-tailed deer are restricted so regional impacts to populations are not likely to occur. Deer hunting on the refuge is conducted within the frame work of the state season. White-tailed deer can become destructive to habitats when densities become too high for the habitat to support. High densities can also result in a negative impact on deer health. The management of deer through hunting is often necessary and also provides economic return for local economies and provides funding to state programs that benefit all wildlife (Schaefer and Main 1997). Furthermore, benefits to health and safety occur by reducing the potential for deer/automobile collisions. Archery and gun hunts are allowed on the refuge. Gun hunts are quota hunts that occur 12 days of the state’s deer hunting season. Hunter check stations are operated, allowing the collection of deer harvest data. Managers review the harvest data to guide future management decisions. Herd health checks are completed periodically by the Southeast Cooperative Wildlife Disease Study at the University of Georgia. Deer hunting on the refuge should have minimal effects on deer populations and potential beneficial effects on habitat and herd health. Since breeding seasons largely occur outside of deer hunting season, no cumulative effects are anticipated on resident wildlife, migratory birds, and non-hunted wildlife. Deer hunting on the refuge provides an opportunity for compatible recreation and is a historical use for middle Georgia and the refuge.

Georgia's wild turkey population is now about 300,000 birds, with huntable numbers of wild turkeys in all 159 counties of the state. In 2002, hunters harvested 27,418 turkeys (GADNR undated). Turkeys are non-migratory and therefore hunting only impacts the local population. Turkey hunting is allowed 15 days on the refuge in coordination with the State of Georgia's turkey hunt season. Gobbler-only spring hunting season has been shown not to be detrimental to turkey populations. The refuge should not cumulatively adversely impact the turkey population by providing limited hunts during the hunt season.

Small game (squirrel, rabbit, quail) hunting is conducted within the state season framework except during deer hunts. Given the low numbers of small game hunters, animals harvested from the refuge, and high natural mortality rate "turnover," no cumulative impacts to local or regional populations are anticipated from allowing hunting of these species on the refuge.

Furbearers such as raccoons and opossums receive little hunting pressure and population levels are driven by habitat not hunting. Given the low numbers of animals harvested from the refuge, no cumulative impacts to local or regional populations are anticipated from allowing hunting of these species on the refuge.

Non-hunted resident wildlife would include resident birds; small mammals such as voles, moles, mice, shrews, and bats; reptiles and amphibians such as snakes, turtles, salamanders, frogs and toads; and invertebrates such as butterflies, moths, insects and spiders. Due to limited home ranges of these animals, regional impacts would not occur. Locally there may be temporary displacement of resident birds. Disturbance of many small mammals, reptiles, or amphibians would be minimal due to inactivity during hunt seasons. Invertebrates also limit activity during the hunting season when temperatures are lower. The refuge anticipates no measureable negative cumulative impacts to resident non-hunting wildlife populations locally or regionally.

There are four federally endangered species that could occur on the refuge, including two species of birds and two species of plants. The use of refuge lands by these endangered bird species typically occurs after all refuge hunting seasons, with the exception of turkey season. An Intra-Service Section 7 Evaluation Consultation has been included in the Draft CCP as Appendix G. Under the Effects Determination section, the evaluation finds that impacts on listed species from the objective, strategies, programs, and projects proposed in the Draft CCP, in their entirety, would be "no effect."

With increased wildlife-dependent recreation opportunities, user group conflicts may occur. The refuge's visitor use programs would be adjusted as needed to eliminate or minimize occurrences to provide quality wildlife-dependent recreational opportunities.

Hunting on the refuge does not pose any threat to historic properties on and or near the refuge.

Literature Cited:

Schaefer, J. and Main M.B. 1997. Florida's White-Tailed Deer. Department of Wildlife Ecology and Conservation, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. WEC-133.

GADNR, undated. The Georgia Department of Natural Resources, Wildlife Resources Division, Eastern Wild Turkey Fact Sheet. <http://www.georgiawildlife.com/node/492>

DIRECT AND INDIRECT EFFECTS OR IMPACTS

Direct effects are caused by an action and occur at the same time as the action. Indirect effects are caused by an action but are manifested later in time or further removed in distance, but still reasonably foreseeable.

The actions proposed for implementation under the proposed alternative include facility development, wildlife and population management, resource protection, public use, and administrative programs. These actions would result in both direct and indirect effects. Facility development, for example, would most likely lead to increased public use, a direct effect; and it, in turn, would lead to indirect effects such as increased littering, noise, and vehicular traffic.

Other indirect effects that may result from implementing the proposed alternative include minor impacts from siltation due to the disturbance of soils and vegetation while expanding the water control structures, as well as expanding or creating new foot trails; construction of the observation tower and visitor center; and providing greater visitor access through improvements to the boat ramps.

SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY

The habitat protection and management actions proposed under the proposed alternative are dedicated to maintaining the long-term productivity of refuge habitats. The benefits of this CCP, when final, for long-term productivity far outweigh any impacts from short-term actions, such as the construction of observation towers and a visitor center, or creation of new trails. While these activities would cause short-term negative impacts, the educational values and associated public support gained from the improved visitor experience would produce long-term benefits for the refuge's entire ecosystem.

The key to protecting and ensuring the refuge's long-term productivity is to find the threshold where public uses do not degrade or interfere with the refuge's natural resources. The plans proposed under the proposed alternative have been carefully conceived to achieve that threshold. Therefore, implementing the proposed alternative would lead to long-term benefits for wildlife protection and land conservation that far outweigh any short-term impacts.

V. Consultation and Coordination

OVERVIEW

This chapter summarizes the consultation and coordination that has occurred to date in identifying the issues, alternatives, and proposed alternative, which are presented in this Draft CCP/EA. It lists the meetings that have been held with the various agencies, organizations, and individuals who were consulted in the preparation of this Draft CCP/EA.

The following meetings, contacts, and presentations were undertaken by the Service during the preparation of this Draft CCP/EA:

Biological Review

In preparation of the CCP, a refuge Biological Review was held November 27-29, 2007, at the refuge headquarters. Team members included:

- Andrew Hammond, Piedmont NWR
- Carolyn Johnson, Piedmont NWR
- Carl Schmidt, Piedmont NWR
- John Mason, Piedmont NWR
- Jason Kimbell, Piedmont NWR
- Thomas Payne, Piedmont NWR
- Styron Bell, Piedmont NWR
- Chuck Hunter, Regional Office
- Laura Housh, Okefenokee NWR
- David Richardson, Noxubee NWR
- Jimmy Rickard, Ecological Services, Athens, GA
- Mike Housh, Okefenokee NWR
- Jack Culpepper, Carolina Sandhills NWR
- David Brownlie, Regional Office
- Kenneth Outcalt, U.S. Forest Service
- Nick Nicholson, Georgia Department of Natural Resources
- Jim Ozier, Georgia Department of Natural Resources
- Reggie Thackston, Georgia Department of Natural Resources
- Charlie Killmaster, Georgia Department of Natural Resources
- Jerry Payne, Private Citizen
- John Moore, Hitichiti Experimental Forest
- Greg Boozer, National Wild Turkey Federation
- James Austin, National Wild Turkey Federation
- Mike Hurst, USDA Forest Service

CCP Team Meeting

The comprehensive conservation planning team met for the first time on December 12, 2007, for a tour of the refuge and an overview of its habitat and wildlife resources, public use programs, and facilities. The planning team members included:

Andrew Hammond, Refuge Manager, Piedmont NWR
Carolyn Johnson, Assistant Refuge Manager, Piedmont NWR
Carl Schmidt, Forester, Piedmont NWR
John Mason, Prescribed Fire Specialist, Piedmont NWR
Jason Kimbell, Biological Technician, Piedmont NWR
Thomas Payne, Law Enforcement, Piedmont NWR
Laura Housh, Regional Planner, Okefenokee NWR
Nannette Brodie, Contractor, Tennessee Valley Authority
Jimmy Rickard, Biologist, Athens Ecological Services
Charlie Killmaster, Biologist, Georgia Department of Natural Resources

Visitor Services Review

A visitor services review was conducted in February 2008 in preparation for the CCP. Team members included:

Garry Tucker, Visitor Services and Outreach, Regional Office
Deborah Jerome, Visitor Services and Outreach, Regional Office
Joan Stevens, Tennessee NWR
Laura Housh, Okefenokee NWR, Planner

Wilderness Review

A review of the refuge's wilderness areas and potential wilderness study areas was conducted by the comprehensive conservation planning team on December 13, 2007, and included the following team members:

Carolyn Johnson, Assistant Refuge Manager, Piedmont NWR
Laura Housh, Regional Planner, Okefenokee NWR
Nannette Brodie, Contractor, Tennessee Valley Authority

Tribal Governments

The listed Tribal entities were invited to the scoping process. The Miscosukee Tribe of Florida declined to be a part of the process since the refuge was located outside of Florida. No other comments have been received to date. Tribes invited to join in the CCP process included:

Muscogee (Creek) Nation, Okmulgee, Oklahoma
Thlopthlocco Tribal Town, Okemah, Oklahoma
Alabama-Quassarte Tribal Town, Henryetta, Oklahoma
Kialegee Tribal Town, Wetumka, Oklahoma
Poarch Band of Creek Indians of Alabama, Atmore, Alabama
Seminole Nation of Oklahoma, Wewoka, Oklahoma
Seminole Tribe of Florida, Hollywood, Florida
Micosukee Tribe of Indians of Florida, Miami, Florida

Intergovernmental Scoping Meeting

As part of the intergovernmental scoping, invitations were sent to federal, tribal, state, and local agencies, and a meeting was held at the refuge headquarters in Round Oak, Georgia, on May 13, 2008. Representatives from the Georgia Department of Natural Resources, Georgia Forestry Commission, and USDA Forest Service generated a list of priority issues to be considered in the development of a 15-year management plan for the refuge. The intergovernmental team included:

Erin Bronk, Chattahoochee-Oconee National Forest
Liz Caldwell, Chattahoochee-Oconee National Forest
David Epps, Georgia Forestry Commission
John Moore, Hitchiti Experimental Forest
Jim Ozier, Georgia Department of Natural Resources
Nathan Klaus, Georgia Department of Natural Resources
Jimmy Evans, Georgia Department of Natural Resources
Bufort Sandars, Georgia Forestry Commission
Jimmy Rickard, Ecological Services

Public Scoping Meeting

The notice of intent (NOI) to begin the Piedmont NWR CCP was published in the Federal Register on April 4, 2008. Following publication of the NOI, members of the public were informed and their input was solicited through a variety of mechanisms. CCP information was posted on the refuge's website and visitor center. In addition, notices regarding the refuge's CCP were submitted to 98 newspapers within Florida, Georgia, and Tennessee.

A public scoping meeting was held at the refuge headquarters on May 12, 2008. Attendees included two members of the public, six Service personnel, and one TVA contractor. The public was given the opportunity to submit comments and concerns regarding future management of the refuge at several thematic information booths (e.g., visitor services, biological resources, etc.) that were stationed around the facility, each manned by Service personnel. During the 30-day scoping period, the refuge received more than 1,200 public comments.

APPENDICES

Appendix A. Glossary

- Adaptive Management:** Refers to a process in which policy decisions are implemented within a framework of scientifically driven experiments to test predictions and assumptions inherent in a management plan. Analysis of results helps managers determine whether current management should continue as is or whether it should be modified to achieve desired conditions.
- Alluvial:** Sediment transported and deposited in a delta or riverbed by flowing water.
- Alternative:** 1. A reasonable way to fix the identified problem or satisfy the stated need (40 CFR 1500.2). 2. Alternatives are different sets of objectives and strategies or means of achieving refuge purposes and goals, helping fulfill the Refuge System mission, and resolving issues (Service Manual 602 FW 1.6B).
- Anadromous:** Migratory fishes that spend most of their lives in the sea and migrate to fresh water to breed.
- Biological Diversity:** The variety of life and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur (Service Manual 052 FW 1. 12B). The System's focus is on indigenous species, biotic communities, and ecological processes. Also referred to as biodiversity.
- Carrying Capacity:** The maximum population of a species able to be supported by a habitat or area.
- Categorical Exclusion:** A category of actions that does not individually or cumulatively have a significant effect on the human environment and have been found to have no such effect in procedures adopted by a federal agency pursuant to the National Environmental Policy Act (40 CFR 1508.4).
- CFR:** Code of Federal Regulations.
- Compatible Use:** A proposed or existing wildlife-dependent recreational use or any other use of a national wildlife refuge that, based on sound professional judgment, will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purpose(s) of the national wildlife refuge [50 CFR 25.12 (a)]. A compatibility determination supports the selection of compatible uses and identifies stipulations or limits necessary to ensure compatibility.

Comprehensive Conservation Plan:	A document that describes the desired future conditions of a refuge or planning unit and provides long-range guidance and management direction to achieve the purposes of the refuge; helps fulfill the mission of the Refuge System; maintains and, where appropriate, restores the ecological integrity of each refuge and the Refuge System; helps achieve the goals of the National Wilderness Preservation System; and meets other mandates (Service Manual 602 FW 1.6 E).
Concern:	See Issue
Cover Type:	The present vegetation of an area.
Cultural Resource Inventory:	A professionally conducted study designed to locate and evaluate evidence of cultural resources present within a defined geographic area. Inventories may involve various levels, including background literature search, comprehensive field examination to identify all exposed physical manifestations of cultural resources, or sample inventory to project site distribution and density over a larger area. Evaluation of identified cultural resources to determine eligibility for the National Register follows the criteria found in 36 CFR 60.4 (Service Manual 614 FW 1.7).
Cultural Resource Overview:	A comprehensive document prepared for a field office that discusses, among other things, its prehistory and cultural history, the nature and extent of known cultural resources, previous research, management objectives, resource management conflicts or issues, and a general statement on how program objectives should be met and conflicts resolved. An overview should reference or incorporate information from a field office's background or literature search described in Section VIII of the Cultural Resource Management Handbook (Service Manual 614 FW 1.7).
Cultural Resources:	The remains of sites, structures, or objects used by people in the past.
Designated Wilderness Area:	An area designated by the U.S. Congress to be managed as part of the National Wilderness Preservation System (Draft Service Manual 610 FW 1.5).
Disturbance:	Significant alteration of habitat structure or composition. May be natural (e.g., fire) or human-caused events (e.g., aircraft overflight).
Ecosystem:	A dynamic and interrelating complex of plant and animal communities and their associated non-living environment.
Ecosystem Management:	Management of natural resources using system-wide concepts to ensure that all plants and animals in ecosystems are maintained at viable levels in native habitats and basic ecosystem processes are perpetuated indefinitely.

Endangered Species (Federal):	A plant or animal species listed under the Endangered Species Act that is in danger of extinction throughout all or a significant portion of its range.
Endangered Species (State):	A plant or animal species in danger of becoming extinct or extirpated in the state within the near future if factors contributing to its decline continue. Populations of these species are at critically low levels or their habitats have been degraded or depleted to a significant degree.
Environmental Assessment (EA):	A concise public document, prepared in compliance with the National Environmental Policy Act, that briefly discusses the purpose and need for an action, alternatives to such action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an environmental impact statement or finding of no significant impact (40 CFR 1508.9).
Environmental Impact Statement (EIS):	A detailed written statement required by section 102(2)(C) of the National Environmental Policy Act, analyzing the environmental impacts of a proposed action, adverse effects of the project that cannot be avoided, alternative courses of action, short-term uses of the environment versus the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitment of resources (40 CFR 1508.11).
Estuary:	The wide lower course of a river into which the tides flow. The area where the tide meets a river current.
Finding of No Significant Impact (FONSI):	A document prepared in compliance with the National Environmental Policy Act, supported by an environmental assessment, that briefly presents why a federal action will have no significant effect on the human environment and for which an environmental impact statement, therefore, will not be prepared (40 CFR 1508.13).
Goal:	Descriptive, open-ended, and often broad statement of desired future conditions that conveys a purpose but does not define measurable units (Service Manual 620 FW 1.6J).
Habitat:	Suite of existing environmental conditions required by an organism for survival and reproduction. The place where an organism typically lives.
Habitat Restoration:	Management emphasis designed to move ecosystems to desired conditions and processes, and/or to healthy ecosystems.
Habitat Type:	See Vegetation Type.
Improvement Act:	The National Wildlife Refuge System Improvement Act of 1997.
Informed Consent:	The grudging willingness of opponents to “go along” with a course of action that they actually oppose (Bleiker).

Issue:	Any unsettled matter that requires a management decision [e.g., an initiative, opportunity, resource management problem, threat to the resources of the unit, conflict in uses, public concern, or other presence of an undesirable resource condition (Service Manual 602 FW 1.6K)].
Management Alternative:	See Alternative
Management Concern:	See Issue
Management Opportunity:	See Issue
Migration:	The seasonal movement from one area to another and back.
Mission Statement:	Succinct statement of the unit's purpose and reason for being.
Monitoring:	The process of collecting information to track changes of selected parameters over time.
National Environmental Policy Act of 1969 (NEPA):	Requires all agencies, including the Service, to examine the environmental impacts of their actions, incorporate environmental information, and use public participation in the planning and implementation of all actions. Federal agencies must integrate NEPA with other planning requirements, and prepare appropriate NEPA documents to facilitate better environmental decision-making (40 CFR 1500).
National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57):	Under the Refuge Improvement Act, the Fish and Wildlife Service is required to develop 15-year comprehensive conservation plans for all national wildlife refuges outside Alaska. The Act also describes the six public uses given priority status within the Refuge System (i.e., hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation).
National Wildlife Refuge System Mission:	The mission is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.
National Wildlife Refuge System:	Various categories of areas administered by the Secretary of the Interior for the conservation of fish and wildlife, including species threatened with extinction; all lands, waters, and interests therein administered by the Secretary as wildlife refuges; areas for the protection and conservation of fish and wildlife that are threatened with extinction; wildlife ranges; game ranges; wildlife management areas; or waterfowl production areas.

National Wildlife Refuge:	A designated area of land, water, or an interest in land or water within the Refuge System.
Native Species:	Species that normally live and thrive in a particular ecosystem.
Noxious Weed:	A plant species designated by federal or state law as generally possessing one or more of the following characteristics: aggressive or difficult to manage; parasitic; a carrier or host of serious insect or disease; or non-native, new, or not common to the United States. According to the Federal Noxious Weed Act (P.L. 93-639), a noxious weed is one that causes disease or had adverse effects on man or his environment and therefore is detrimental to the agriculture and commerce of the United States and to the public health.
Objective:	A concise statement of what we want to achieve, how much we want to achieve, when and where we want to achieve it, and who is responsible for the work. Objectives derive from goals and provide the basis for determining strategies, monitoring refuge accomplishments, and evaluating the success of strategies. Making objectives attainable, time-specific, and measurable (Service Manual 602 FW 1.6N).
Plant Association:	A classification of plant communities based on the similarity in dominants of all layers of vascular species in a climax community.
Plant Community:	An assemblage of plant species unique in its composition; occurs in particular locations under particular influences; a reflection or integration of the environmental influences on the site such as soils, temperature, elevation, solar radiation, slope, aspect, and rainfall; denotes a general kind of climax plant community.
Preferred Alternative:	This is the alternative determined (by the decision-maker) to best achieve the refuge purpose, vision, and goals; contributes to the Refuge System mission, addresses the significant issues; and is consistent with principles of sound fish and wildlife management.
Prescribed Fire:	The application of fire to wildland fuels to achieve identified land use objectives (Service Manual 621 FW 1.7). May occur from natural ignition or intentional ignition.
Priority Species:	Fish and wildlife species that require protective measures and/or management guidelines to ensure their perpetuation. Priority species include the following: (1) State-listed and candidate species; (2) species or groups of animals susceptible to significant population declines within a specific area or statewide by virtue of their inclination to aggregate (e.g., seabird colonies); and (3) species of recreation, commercial, and/or tribal importance.
Public Involvement Plan:	Broad long-term guidance for involving the public in the comprehensive conservation planning process.

Public Involvement:	A process that offers impacted and interested individuals and organizations an opportunity to become informed about, and to express their opinions on Service actions and policies. In the process, these views are studied thoroughly and thoughtful consideration of public views is given in shaping decisions for refuge management.
Public:	Individuals, organizations, and groups; officials of federal, state, and local government agencies; Indian tribes; and foreign nations. It may include anyone outside the core planning team. It includes those who may or may not have indicated an interest in service issues and those who do or do not realize that Service decisions may affect them.
Purposes of the Refuge:	“The purposes specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing, authorizing, or expanding a refuge, refuge unit, or refuge sub-unit.” For refuges that encompass congressionally designated wilderness, the purposes of the Wilderness Act are additional purposes of the refuge (Service Manual 602 FW 106 S).
Recommended Wilderness:	Areas studied and found suitable for wilderness designation by both the Director of the Fish and Wildlife Service and the Secretary of the Department of the Interior, and recommended for designation by the President to Congress. These areas await only legislative action by Congress in order to become part of the Wilderness System. Such areas are also referred to as “pending in Congress” (Draft Service Manual 610 FW 1.5).
Record of Decision (ROD):	A concise public record of decision prepared by the federal agency, pursuant to NEPA, that contains a statement of the decision, identification of all alternatives considered, identification of the environmentally preferable alternative, a statement as to whether all practical means to avoid or minimize environmental harm from the alternative selected have been adopted (and if not, why they were not), and a summary of monitoring and enforcement where applicable for any mitigation (40 CFR 1505.2).
Refuge Goal:	See Goal
Refuge Purposes:	See Purposes of the Refuge
Songbirds: (Also Passerines)	A category of birds that is medium to small, perching landbirds. Most are territorial singers and migratory.
Step-down Management Plan:	A plan that provides specific guidance on management subjects (e.g., habitat, public use, fire, and safety) or groups of related subjects. It describes strategies and implementation schedules for meeting CCP goals and objectives (Service Manual 602 FW 1.6 U).

Strategy:	A specific action, tool, technique, or combination of actions, tools, and techniques used to meet unit objectives (Service Manual 602 FW 1.6 U).
Study Area:	The area reviewed in detail for wildlife, habitat, and public use potential. For purposes of this CCP, the study area includes the lands within the currently approved refuge boundary and potential refuge expansion areas.
Threatened Species (Federal):	Species listed under the Endangered Species Act that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.
Threatened Species (State):	A plant or animal species likely to become endangered in the state within the near future if factors contributing to population decline or habitat degradation or loss continue.
Tiering:	The coverage of general matters in broader environmental impact statements with subsequent narrower statements of environmental analysis, incorporating by reference, the general discussions and concentrating on specific issues (40 CFR 1508.28).
U.S. Fish and Wildlife Service Mission:	The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people.
Unit Objective:	See Objective
Vegetation Type, Habitat Type, Forest Cover Type:	A land classification system based upon the concept of distinct plant associations.
Vision Statement:	A concise statement of what the planning unit should be, or what we hope to do, based primarily upon the Refuge System mission and specific refuge purposes, and other mandates. We will tie the vision statement for the refuge to the mission of the Refuge System; the purpose(s) of the refuge; the maintenance or restoration of the ecological integrity of each refuge and the Refuge System; and other mandates (Service Manual 602 FW 1.6 Z).

Wilderness Study Areas:

Lands and waters identified through inventory as meeting the definition of wilderness and undergoing evaluation for recommendation for inclusion in the Wilderness System. A study area must meet the following criteria:

- Generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable;
- Has outstanding opportunities for solitude or a primitive and unconfined type of recreation; and
- Has at least 5,000 contiguous roadless acres or is sufficient in size as to make practicable its preservation and use in an unimpaired condition (Draft Service Manual 610 FW 1.5).

Wilderness:

See Designated Wilderness

Wildfire:

A free-burning fire requiring a suppression response; all fire other than prescribed fire that occurs on wildlands (Service Manual 621 FW 1.7).

Wildland Fire:

Every wildland fire is either a wildfire or a prescribed fire (Service Manual 621 FW 1.3)

ACRONYMS AND ABBREVIATIONS

BCC	Birds of Conservation Concern
BMP	Best Management Practices
BRT	Biological Review Team
CCP	Comprehensive Conservation Plan
CFR	Code of Federal Regulations
cfs	cubic feet per second
DOI	Department of the Interior
DU	Ducks Unlimited
EA	Environmental Assessment
EE	Environmental Education
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FR	Federal Register
FTE	Full-time equivalent
FY	Fiscal Year
GIS	Global Information System
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
NWR	National Wildlife Refuge
NWRS	National Wildlife Refuge System
PFT	Permanent Full Time
PUNA	Public Use Natural Area
RM	Refuge Manual
RNA	Research Natural Area
ROD	Record of Decision
RONs	Refuge Operating Needs System
RRP	Refuge Roads Program
FWS	U.S. Fish and Wildlife Service (also Service)
TFT	Temporary Full Time
USC	United States Code

Appendix B. References and Literature Citations

- Atlantic Coast Joint Venture. 2005. The South Atlantic Migratory Bird Initiative Implementation Plan. Version 3.1.
- Bailey, R.G. 1995. Descriptions of the ecoregions of the United States. 2nd edition. USDA Forest Service Miscellaneous Publication 1391.
- Barden, L.S. 1997. Historic prairies in the Piedmont of North and South Carolina, USA. *Natural Areas Journal* 17(2):149-152.
- Boone, D.D. and B.A. Dowell. 1986. Catoctin Mountain Park bird study, 1985-1986. Final Report, Nat. Park Serv. Contract CX-3000-4-0152, Proj. No.2.
- Boudell, J, 2008. Dept of Natural Science, Clayton State University. annual report to refuge.
- Boyle, S.A. and F.B. Samson. 1985. Effects of nonconsumptive recreation on wildlife: a review. *Wildl. Soc. Bull.* 13:110-116.
- Brady, J.M. 2005. Louisiana Waterthrush Ecology and Conservation in the Georgia Piedmont. MS thesis. University of Georgia.
- Bratton, S.P. 1979. Impacts of white-tailed deer on the vegetation of Cades Cove, Great Smoky Mountains National Park. *Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies.* 33:305-312.
- Bratton, S.P. 1989. White-tailed deer workshop addresses inter-regional issues and conflicts. *Park Sci.* 9:4.
- Brender, E.V. 1974. Impact of past land use on the lower Piedmont Forest. *Journal of Forestry* 72:34-36.
- Brown, J.K. & J.K Smith, eds. 2000. Wildland fire in ecosystems: effects of fire on flora. USDA Forest Service General Technical Report RMRS-42-vol.2
- Carver, E., and J. Caudill. 2007. Banking on Nature 2006: The Economic Benefits to Local Communities on National Wildlife Visitation. Division of Economics, U. S. Fish and Wildlife Service, Washington, DC.
- Caudill, James and Andrew Laughland. 2003. Banking on Nature 2002. Division of Economics, U.S. Fish and Wildlife Service, Washington, D.C. 118p.
- Caudill, J., and E. Henderson. 2005. Banking on Nature 2004: The Economic Benefits to Local Communities of National Wildlife Visitation. Division of Economics, U.S. Fish and Wildlife Service, Washington, DC.
- Clayton, L.A., V.J. Knight Jr., and E.C. Moore, eds. 1993. The de Soto chronicles: the expedition of Hernando de Soto to North America in 1539-1543. The University of Alabama Press.

-
- Cleland, D.T., P.E. Avers, W.H. McNab, M.E. Jensen, R.G. Bailey, T. King, and W.E. Russell. 1997. National hierarchical framework of ecological units. Pp 181-200 *In* Boyce, M. S. and A. Haney, eds. *Ecosystem Management Applications for Sustainable Forest and Wildlife Resources*. Yale University Press.
- Cobb, James. 1983. "Proposed Land Exchange, Piedmont NWR, Jones County, Georgia." Letter report on file at the Office of the Regional Archaeologist, Savannah Coastal Refuges, Savannah, Georgia.
- Cobb, James. 1984. Archeological Survey of Land Exchange Tracts 248, 332A, 352, and 384, Piedmont NWR, Jones County, Georgia. Letter report on file at the Office of the Regional Archaeologist, Savannah Coastal Refuges, Savannah, Georgia.
- Cowell, C.M. 1995. Presettlement Piedmont forests: patterns of composition and disturbance in central Georgia. *Annals of the Association of American Geographers* 85(1):65-83.
- Cowell, C.M. 1998. Historical change in vegetation and disturbance on the Georgia Piedmont. *American Midland Naturalist* 140(1):78-89.
- Davis, L.S. and K.N. Johnson. 1987. *Forest management*. 3rd edition. McGraw-Hill, Inc., New York. 790 pp.
- Denevan, W.M. 1992. The pristine myth: the landscape of the Americas in 1492. *Annals of the Association of American Geographers* 82(3):369-385.
- deCalesta, D.S. 1994. Effect of white-tailed deer on songbirds within managed forests in Pennsylvania. *J. Wildl. Manage.* 58:711-718.
- De Vos, A. & H.S. Mosby. 1969. Habitat analysis and evaluation. Pp. 135-172 *In* R.H. Giles, Jr., ed. *Wildlife management techniques*. 3rd edition. The Wildlife Society, Washington, DC.
- Dunning, J.B. and B.D. Watts. 1990. Regional differences in habitat occupancy by Bachman's sparrow. *The Auk* 107(3):463-472.
- Edwards, M.B. 1987. Natural regeneration of loblolly pine. USDA Forest Service General Technical Report SE-47.
- Edwards, R.W. and D.V. Bell. 1987. The impact of angling on wildlife. Proc. 4th Brit. Freshwater Fish Conference, University of Liverpool.
- Evans, R. M., R.D. Forbes, E.H. Forthingham, J. Kittredge, E.F. McCarthy, L.J. Pessin, J. Spaeth, L. Wyman, and R.C. Hawley. 1932. Forest Cover Types of the Eastern United States – Report of the Committee on Forest Types. *Journal of Forestry* 30(4):451-498.
- Eyre, F.H., ed. 1980. *Forest cover types of the United States and Canada*. Society of American Foresters.
- Federal Committee on Research Natural Areas. 1968. *A directory of research natural areas on federal lands of the United States of America*. US Government Printing Office. 129 pp.

-
- Fettig, C.J., K.D. Klepzig, R.F. Billings, A.S. Munson, T.E. Nebeker, J.F. Negron, & J.T. Nowak. 2007. The effectiveness of vegetation management practices for prevention and control of bark beetle infestations in coniferous forests of the western and southern United States. *Forest Ecology and Management* 238:24-43.
- Franklin, J.F., T.A. Spies, R. Van Pelt, A.B. Carey, D.A. Thornburgh, D.R. Berg, D.B. Lindenmayer, M.E. Harmon, W.S. Keeton, D.C. Shaw, K. Bible, and J. Chen. 2002. Disturbances and structural development of natural forest ecosystems with silvicultural implications, using Douglas-fir forests as an example. *Forest Ecology and Management* 155:399-423.
- Frost, C.C., J. Walker, & R.K. Peet. 1986. Fire-dependent savannas and prairies of the southeast: original extent, preservation status, and management problems. *In* Kulhavy, D.L. & R.N. Conner, eds. *Wilderness and natural areas in the eastern United States; a management challenge*. Stephen F. Austin State University, School of Forestry, Center for Applied Studies
- Fulton, S. and B. West. 2002. Forestry impacts on water quality. pp. 501-518 *In* Wear, D.N. and J.G. Gries, eds. *Southern forest resource assessment*. USDA Forest Service General Technical Report SRS-GTR-53.
- Gabrielson, Ira N. 1943. *Wildlife Conservation*. The Macmillan Company, New York, New York. 250 pp.
- Garrison, G.A., A.J. Bjugstad, D.A. Duncan, M.E. Lewis, and D.R. Smith. 1997. Vegetation and environmental features of forest and range ecosystems. USDA Forest Service Agriculture Handbook No. 475.
- Georgia Department of Natural Resources. 2008. 2007 Ambient Air Surveillance Report. Environmental Protection Division, Air Protection Branch, Ambient Monitoring Program.
- Georgia Department of Natural Resources. 2003. Ocmulgee River Basin Management Plan. Environmental Protection Division.
- Georgia Department of Natural Resources. 2005. A Comprehensive Wildlife Conservation Strategy for Georgia. Wildlife Resources Division.
- Georgia Forestry Commission. 2009. Georgia's Best Management Practices for Forestry.
- Georgia State Climate Office. 1998. Climatology of the Georgia Piedmont. Georgia State Climate Office, Driftmier Engineering Center, University of Georgia, Athens, Georgia. Factsheet 98-03b. 2pp.
- Grano, C.X. 1970. Small hardwoods reduce growth of pine overstory. USDA Forest Service Research Paper SO-055.
- Griffith, G.E., J.M. Omernik, J.A. Comstock, J.A., Lawrence, and T. Foster. 2001. Ecoregions of Georgia: Corvallis, Oregon, U.S. Environmental Protection Agency (map scale 1:1,500,000).

-
- Grossman, D. H., D. Faber-Langendoen, A. S. Weakley, M. Anderson, P. Bourgeron, R. Crawford, K. Goodin, S. Landaal, K. Metzler, K. D. Patterson, M. Pyne, M. Reid, and L. Sneddon. 1998. International classification of ecological communities: terrestrial vegetation of the United States. Volume I. The National Vegetation Classification System: development, status, and applications. The Nature Conservancy, Arlington, Virginia, USA.
- Halls, L.K. 1978. White-tailed deer. Pages 43-65 *in* J.L. Schmidt and D. L. Gilbert, eds. Big game of North America: ecology and management. Stackpole Books, Harrisburg, Pa.
- Halls, L.K. 1984. White-tailed deer: ecology and management. Stackpole Books, Harrisburg, Pa.
- Hamel, P.B. 1992. The land manager's guide to birds of the south. The Nature Conservancy, Southeastern Region, Chapel Hill, NC. 437 pp.
- Hamel, P.B. & E.R. Buckner. 1998. How far could a squirrel travel in the treetops? A prehistory of the southern forest. Pp. 309-315 *in* Transactions of the 63rd North American Wildlife and Natural Resources Conference. Wildlife Management Institute.
- Hamel, P.B., H.E. LeGrand, Jr., M.R. Lennartz, and S.A. Gauthreaux, Jr. 1982. Bird-habitat relationships on southern forest lands. USDA Forest Service General Technical Report SE-22.
- Harper, F. 1998. The travels of William Bartram: naturalist's edition. The University of Georgia Press.
- Hawkins, B. 1916. Letters of Benjamin Hawkins, 1796-1806. Georgia Historical Society,
- Helms, J.A., editor. 1998. The dictionary of forestry. The Society of American Foresters, Bethesda, MD.
- Hesselton, W.T. and R.M. Hesselton. 1982. White-tailed Deer. Pages 878-901 *in* J.A. Chapman and G.A. Feldhamer, eds. Wild mammals of North America: biology, management, and economics. John Hopkins Univ. Press, Baltimore, Md.
- Hunter, M.L. 1990. Wildlife, forests, and forestry: principles of managing forests for biological diversity. Prentice-Hall, Inc., New York. 370 pp.
- Hu, Y, M.T. Odman, M.E. Chang, W. Jackson, S. Lee, E.S. Edgerton, K. Baumann, and A. G. Russell. 2008. Simulation of Air Quality Impacts from Prescribed Fires on an Urban Area. *Environmental Science & Technology* 42(10):3676-3682.
- Jackson, J.J., G.D. Walker, R.L. Shell and D. Heighes. 1981. Managing Timber and Wildlife in the Southern Piedmont. Univ. Ga. Coop. Ext. Ser. Bull. 845. 51pp.
- Jackson, J.A. 1971. The evolution, taxonomy, distribution, past populations, and current status of the red-cockaded woodpecker. Pp. 4-29 *in* R.L. Thompson, ed. Ecology and management of the red-cockaded woodpecker. U.S. Bureau of Sport Fishing and Wildlife and tall timbers research Station, Tallahassee, FL.

-
- Kanaski, Richard S. 2000. Archaeological Investigations of Proposed Little Rock Impoundment Rehabilitation Project, Piedmont National Wildlife Refuge, Jones County, Georgia: Management Summary. On file at the Office of the Regional Archaeologist, Savannah Coastal Refuges, Savannah, Georgia.
- Kanaski, Richard S. 2002-Present Ongoing Investigations for Proposed Fire Breaks, Native Grass Restoration Projects and Longleaf Pine-Wire Prescriptions, Piedmont National Wildlife Refuge, FY 2002 & 2009.
- Klein, M.L. 1989. Effects of high levels of human visitation on foraging waterbirds at J.N. Ding Darling National Wildlife Refuge. Florida Coop. Fish Wildl. Res. Unit, Univ. Fl. Gainesville. Final Res. Rep. No 42. 103p.
- Knight, R.L. and S.K. Skagen. 1988. Effects of recreational disturbance on birds of prey. Proc. Southwest Raptor Mangle. Symposium and Workshop. Nat. Wildl. Fed. Sci. Tech. Ser. No. 11. 355-359. 395pp.
- Kuchler, A.W. 1964. Potential natural vegetation of the conterminous United States. American Geographical Society, Special Publication No. 36.
- Lambeck, R.J. 1997. Focal species: a multi-species umbrella for nature conservation. Conservation Biology 11(4):849-856.
- Lane, M., ed. 1973. The rambler in Georgia. Beehive Press, Savannah, GA.
- Lang, J.D. 1998. Effects of thinning and prescribed burning in pine habitat on nesting success of fledgling dispersal and habitat use by wood thrushes. MS thesis University of Georgia
- Langdon, O.G. 1981. Some effects of prescribed fire on understory vegetation in loblolly pine stands. Pp. 143-153 *In* Wood, G.W., ed. Prescribed fire and wildlife in southern forests, proceedings of a symposium. The Belle W. Barauch Forest Science Institute, Clemson University, South Carolina.
- Lindenmayer, D.B., A.D. Manning, P.L. Smith, H.P. Possingham, J. Fischer, I Oliver, and M.A. McCarthy. 2002. The focal-species approach and landscape restoration: a critique. Conservation Biology 16(2):338-345.
- Lindenmayer, D.B., C.R. Margules, and D.B. Botkin. 2000. Indicators of biodiversity for ecologically sustainable forest management. Conservation Biology 14(4):941-950.
- Loeb, S.C., W.D. Pepper, and A.T. Doyle. Habitat characteristics of active and abandoned red-cockaded woodpecker colonies. Southern Journal of Applied Forestry 16(3):120-125.
- MacArthur, R.H. and J.W. MacArthur. 1961. On bird species diversity. Ecology 42(3):594-598.
- Macies, E.A. and L.A. Hermansen, eds. 2002. Human influences on forest ecosystems: the southern wildland-urban interface assessment. USDA Forest Service General Technical Report SRS-55.

-
- Malmsheimer, R.W., P. Heffernan, S. Brink, D. Crandall, F. Deneke, C. Galik, E. Gee, J.A. Helms, N. McClure, M. Mortimer, S. Ruddell, M. Smith, and J. Stewart. 2008. Forest management solutions for mitigating climate change in the United States: Reducing atmospheric GHGs through sequestration. *Journal of Forestry* 106(3):148-156.
- Mast, M. A., and J. T. Turk. 1999. Environmental Characteristics and Water Quality of Hydrologic Benchmark Network Stations in the Eastern United States, 1963–95. U.S. Geological Survey Circular 1173–A, 158p.
- McNab, W.H.; D.T. Cleland, J.A. Freeouf, J.E. Keys, Jr., G.J. Nowacki, and C.A. Carpenter, comps. 2007. Description of ecological subregions: sections of the conterminous United States [CD-ROM]. U.S.D.A. Forest Service General Technical Report WO-76B.
- National Invasive Species Council. 2001. Meeting the invasive species challenge: national invasive species management plan. 80 pp.
- Nebeker, T.E. 2004. Advances in the control and management of the southern pine bark beetles. Pp. 155-160 *In* Rauscher, H.M. & K. Johnsen, eds. Southern forest science: past, present, and future. USDA Forest Service General Technical Report SRS-75.
- Noss, R.F. 2001. Beyond Kyoto: Forest management in a time of rapid climate change. *Conservation Biology* 15(3):578-590.
- Noss, R.F., E.T. LaRoe, III, and J.M. Scott. 1995. Endangered ecosystems of the United States: a preliminary assessment of loss and degradation. US Department of the Interior, National Biological Service, Biological Report 28, Washington, DC. 58 pp.
- Ocmulgee-Piedmont Scenic Byway Committee 2005.
- Oliver, C.D. & B.C. Larson. 1996. Forest Stand Dynamics. Update Edition. John Wiley & Sons, Inc., New York
- Ozier, J.C., J.L. Bohannon and J.L. Anderson. 1999. Protected animals of Georgia. Georgia Department of Natural Resources, Wildlife Resources Division, Nongame-Natural Heritage Section.
- Palik, B.J., R.J. Mitchell, and J.K. Hiers. 2002. Modeling silviculture after natural disturbance to sustain biodiversity in the longleaf pine (*Pinus palustris*) ecosystem: balancing complexity and implementation. *Forest Ecology and Management* 155:347-356.
- Patrick, T.S., J.R. Allison, and G.A. Krakow. 1995. Protected plants of Georgia. Georgia Department of Natural Resources, Wildlife Resources Division, Georgia Natural Heritage Program.
- Payne, H.H. 1976. Soil Survey of Baldwin, Jones, and Putnam Counties, Georgia. U.S.D.A. Soil Conservation Service and Forest Service, in cooperation with the University of Georgia, College of Agriculture Experiment Stations.
- Powell, L.A. 1998. Experimental analysis of forest management effects on survival and movements of adult wood thrushes. University of Georgia Ph.D. Dissertation.

-
- Schroeder, R.L., W.J. King and J.E. Cornely. 1998. Selecting Habitat Management Strategies on Refuges. U.S. Geological Survey/Biological Resource Division/Information and Technology Report 1998-003.
- Shanklin, J.F., L.I. Barrett, C.F. Brockman, C.H. Coulter, R.D. Forbes, & S. Heiberg. 1947. Report of the committee on natural areas. *Journal of Forestry* 47:137-147.
- Smith, D.M. 1986. *The practice of silviculture*. 8th edition. John Wiley & Sons, Inc., New York. 527 pp.
- Smith, J.K., ed. 2000. *Wildland fire in ecosystems: effects of fire on fauna*. USDA Forest Service General Technical Report RMRS-42-vol.1
- Society of American Foresters. 1954. *Forest cover types of North America (exclusive of Mexico)*. Society of American Foresters, Washington, DC. 67 pp.
- Southern Forest Fire Laboratory. 1976. *Southern forestry smoke management guidebook*. USDA Forest Service General Technical Report SE-10.
- Southeast Quail Study Group. No date. *Northern Bobwhite Quail Initiative fact sheet*.
- Stankey, G.H., R.N. Clark, and B.T. Bormann. 2005. *Adaptive management of natural resources: theory, concepts, and management institutions*. USDA Forest Service General Technical Report PNW-GTR-654.
- The Southeast Regional Climate Center, University of North Carolina, Chapel Hill. "Historical Climate Summaries for Georgia." http://www.sercc.com/climateinfo/historical/historical_ga.html
- Thomas, Larissa A., J. L. Holland and W. F. Stanyard. 2000. *Phase I Archaeological Survey of the Level (3) Fiber Optic Line from Charlton County to Fulton County, Georgia*. TRC Garrow Associates, Inc., Atlanta, Georgia.
- University of Georgia. 2004. *Analysis of Water Quality and Biological Indicators Falling Creek on the Piedmont National Wildlife Refuge*. Biological and Agricultural Engineering Departments Watershed Group.
- U.S. Department of Energy. 1999. *Carbon Sequestration Research and Development*.
- U.S. Department of the Interior, Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. 2006 *National Survey of Fishing, Hunting, and Wildlife-Associated Recreation*.
- U.S. Environmental Protection Agency. 2006. Section 303(d) List Fact Sheet for Watershed-Upper Ocmulgee, Total Maximum Daily Loads. http://iaspub.epa.gov/tmdl/huc_rept.control?p_huc=03070103&p_huc_desc=UPPER%20OCMULGEE
- U.S. Fish and Wildlife Service. 1948. *Timber management plan. Piedmont National Wildlife Refuge, Round Oak, GA*.
- U.S. Fish and Wildlife Service. 1968. *Timber management plan. Piedmont National Wildlife Refuge, Round Oak, GA*.

-
- USWFS. 2006. Policy on Appropriate Refuge Uses. Fish and Wildlife Service Manual, 601 FW 3, Washington D.C.
- U.S. Fish and Wildlife Service. 2007. Management Plan for the Red-Cockaded Woodpecker and its Habitats on Piedmont National Wildlife Refuge. Piedmont National Wildlife Refuge, Round Oak, GA.
- U.S. Fish and Wildlife Service. 2008. Fire Management Plan. Piedmont National Wildlife Refuge, Round Oak, GA.
- U.S. Fish and Wildlife Service. 2003 Recovery Plan for the Red-Cockaded Woodpecker (*Picoides borealis*), Second Revision.
- U.S. Fish and Wildlife Service. 1982. Habitat Management Plan. Piedmont National Wildlife Refuge, Round Oak, GA.
- U.S. Fish and Wildlife Service. February 2008. "Piedmont National Wildlife Refuge, Visitor Services Review." Piedmont National Wildlife Refuge, Round Oak, GA.
- U.S. Fish and Wildlife Service. 2008. "Piedmont National Wildlife Refuge, Biological Review." Piedmont National Wildlife Refuge, Round Oak, GA.
- U.S. Geological Survey. 2008. USGS 02212600 Falling Creek near Juliette, GA. Water Data Report.
- Wade, D.D., D.R. Weise, & R. Shell. 1989. Some effect of periodic winter fire on plant communities on the Georgia Piedmont. USDA Forest Service General Technical Report SO-074
- Wade, D.D. 1993. Thinning young loblolly pine stands with fire. International Journal of Wildland Fire 3(3):169-178.
- Waldrop, T.A., D.H. Van Lear, F.T. Lloyd, and W.R. Harms. 1987. Long-term studied of prescribed burning in loblolly pine forests of the Southeastern Coastal Plain. USDA Forest Service General Technical Report SE-45.
- Warren, Robert J. 1991. Ecological justification for controlling deer populations in eastern National Parks. 56th North American Wildlife and Natural Resources Conference. Edmonton, Alberta, Canada.
- Wear, D.N. and J.G. Gries, eds. 2002. Southern forest resource assessment. USDA Forest Service General Technical Report SRS-GTR-53.
- West, B. 2002. Water quality in the south. Pp. 455-477 *In* Wear, D.N. and J.G. Gries, eds. Southern forest resource assessment. USDA Forest Service General Technical Report SRS-GTR-53.
- Westbrooks, R. 1998. Invasive plants, changing the landscape of America: fact book. Federal Interagency Committee for the Management of Noxious and Exotic Weeds, Washington, D.C.
- Williams, C.W. 1992. History of Jones County, Georgia 1807-1907. Wolf Publishing.
- Williams, G.W. 2000. Introduction to aboriginal use of fire. Fire Management Today 60(3):4-6.

-
- White, M.E. 2002. The archeology and history of the native Georgia tribes. The University Press of Florida.
- Worth, J.E. 1993. Before Creek and Cherokee: Georgia Indians during the early colonial era. *Fernbank Quarterly* 18(3): 18-27.
- Worth, J.E. 1994. Late Spanish military expeditions in the interior southeast, 1597-1628. Pp. 104-122 *In* Hudson, C. & C.C. Tesser, eds. *The forgotten centuries: Indians and Europeans in the American south, 1521-1704*. The University of Georgia Press.
- Wright, N. O. and J. S. Perry. 1978. *The Piedmont National Wildlife Refuge: A Cultural Resources Survey (Two Volumes)*. New World Research Report No. 7. New Orleans, Louisiana.
- Yoakum, J.D. 1979. "Habitat Improvement" *in* *Wildlife Conservation Principles and Practices* edited by R.D. Teague and E. Decker. The Wildlife Society. Pg132-139.

Appendix C. Relevant Legal Mandates and Executive Orders

STATUE	DESCRIPTION
Administrative Procedures Act (1946)	Outlines administrative procedures to be followed by federal agencies with respect to identification of information to be made public; publication of material in the Federal Register; maintenance of records; attendance and notification requirements for specific meetings and hearings; issuance of licenses; and review of agency actions.
American Antiquities Act of 1906	Provides penalties for unauthorized collection, excavation, or destruction of historic or prehistoric ruins, monuments, or objects of antiquity on lands owned or controlled by the United States. The Act authorizes the President to designate as national monuments objects or areas of historic or scientific interest on lands owned or controlled by the United States.
American Indian Religious Freedom Act of 1978	Protects the inherent right of Native Americans to believe, express, and exercise their traditional religions, including access to important sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites.
Americans With Disabilities Act of 1990	Intended to prevent discrimination of and make American society more accessible to people with disabilities. The Act requires reasonable accommodations to be made in employment, public services, public accommodations, and telecommunications for persons with disabilities.
Anadromous Fish Conservation Act of 1965, as amended	Authorizes the Secretaries of Interior and Commerce to enter into cooperative agreements with states and other non-federal interests for conservation, development, and enhancement of anadromous fish and contribute up to 50 percent as the federal share of the cost of carrying out such agreements. Reclamation construction programs for water resource projects needed solely for such fish are also authorized.
Archaeological Resources Protection Act of 1979, as amended.	This Act strengthens and expands the protective provisions of the Antiquities Act of 1906 regarding archaeological resources. It also revised the permitting process for archaeological research.
Architectural Barriers Act of 1968	Requires that buildings and facilities designed, constructed, or altered with federal funds, or leased by a federal agency, must comply with standards for physical accessibility.
Bald and Golden Eagle Protection Act of 1940, as amended	Prohibits the possession, sale or transport of any bald or golden eagle, alive or dead, or part, nest, or egg except as permitted by the Secretary of the Interior for scientific or exhibition purposes, or for the religious purposes of Indians.

STATUE	DESCRIPTION
Bankhead-Jones Farm Tenant Act of 1937	Directs the Secretary of Agriculture to develop a program of land conservation and utilization in order to correct maladjustments in land use and thus assist in such things as control of soil erosion, reforestation, conservation of natural resources and protection of fish and wildlife. Some early refuges and hatcheries were established under authority of this Act.
Cave Resources Protection Act of 1988	Established requirements for the management and protection of caves and their resources on federal lands, including allowing the land managing agencies to withhold the location of caves from the public, and requiring permits for any removal or collecting activities in caves on federal lands.
Clean Air Act of 1970	Regulates air emissions from area, stationary, and mobile sources. This Act and its amendments charge federal land managers with direct responsibility to protect the “air quality and related values” of land under their control. These values include fish, wildlife, and their habitats.
Clean Water Act of 1974, as amended	This Act and its amendments have as its objective the restoration and maintenance of the chemical, physical, and biological integrity of the Nation’s waters. Section 401 of the Act requires that federally permitted activities comply with the Clean Water Act standards, state water quality laws, and any other appropriate state laws. Section 404 charges the U.S. Army Corps of Engineers with regulating discharge of dredge or fill materials into waters of the United States, including wetlands.
Coastal Barrier Resources Act of 1982 (CBRA)	Identifies undeveloped coastal barriers along the Atlantic and Gulf Coasts and included them in the John H. Chafee Coastal Barrier Resources System (CBRS). The objectives of the act are to minimize loss of human life, reduce wasteful federal expenditures, and minimize the damage to natural resources by restricting most federal expenditures that encourage development within the CBRS.
Coastal Barrier Improvement Act of 1990	Reauthorized the Coastal Barrier Resources Act (CBRA), expanded the CBRS to include undeveloped coastal barriers along the Great Lakes and in the Caribbean, and established “Otherwise Protected Areas (OPAs).” The Service is responsible for maintaining official maps, consulting with federal agencies that propose spending federal funds within the CBRS and OPAs, and making recommendations to Congress about proposed boundary revisions.
Coastal Wetlands Planning, Protection, and Restoration (1990)	Authorizes the Director of the Fish and Wildlife Service to participate in the development of a Louisiana coastal wetlands restoration program, participate in the development and oversight of a coastal wetlands conservation program, and lead in the implementation and administration of a national coastal wetlands grant program.

STATUE	DESCRIPTION
Coastal Zone Management Act of 1972, as amended	Established a voluntary national program within the Department of Commerce to encourage coastal states to develop and implement coastal zone management plans and requires that “any federal activity within or outside of the coastal zone that affects any land or water use or natural resource of the coastal zone” shall be “consistent to the maximum extent practicable with the enforceable policies” of a state’s coastal zone management plan. The law includes an Enhancement Grants Program for protecting, restoring, or enhancing existing coastal wetlands or creating new coastal wetlands. It also established the National Estuarine Research Reserve System, guidelines for estuarine research, and financial assistance for land acquisition.
Emergency Wetlands Resources Act of 1986	This Act authorized the purchase of wetlands from Land and Water Conservation Fund moneys, removing a prior prohibition on such acquisitions. The Act requires the Secretary to establish a National Wetlands Priority Conservation Plan, required the states to include wetlands in their Comprehensive Outdoor Recreation Plans, and transfers to the Migratory Bird Conservation Fund amounts equal to import duties on arms and ammunition. It also established entrance fees at national wildlife refuges.
Endangered Species Act of 1973, as amended	Provides for the conservation of threatened and endangered species of fish, wildlife, and plants by federal action and by encouraging the establishment of state programs. It provides for the determination and listing of threatened and endangered species and the designation of critical habitats. Section 7 requires refuge managers to perform internal consultation before initiating projects that affect or may affect endangered species.
Environmental Education Act of 1990	This Act established the Office of Environmental Education within the U.S. Environmental Protection Agency to develop and administer a federal environmental education program in consultation with other federal natural resource management agencies, including the Fish and Wildlife Service.
Estuary Protection Act of 1968	Authorized the Secretary of the Interior, in cooperation with other federal agencies and the states, to study and inventory estuaries of the United States, including land and water of the Great Lakes, and to determine whether such areas should be acquired for protection. The Secretary is also required to encourage state and local governments to consider the importance of estuaries in their planning activities relative to federal natural resource grants. In approving any state grants for acquisition of estuaries, the Secretary was required to establish conditions to ensure the permanent protection of estuaries.

STATUE	DESCRIPTION
Estuaries and Clean Waters Act of 2000	This law creates a federal interagency council that includes the Director of the Fish and Wildlife Service, the Secretary of the Army for Civil Works, the Secretary of Agriculture, the Administrator of the Environmental Protection Agency and the Administrator for the National Oceanic and Atmospheric Administration. The council is charged with developing a national estuary habitat restoration strategy and providing grants to entities to restore and protect estuary habitat to promote the strategy.
Food Security Act of 1985, as amended (Farm Bill)	The Act contains several provisions that contribute to wetland conservation. The Swampbuster provisions state that farmers who convert wetlands for the purpose of planting after enactment of the law are ineligible for most farmer program subsidies. It also established the Wetland Reserve Program to restore and protect wetlands through easements and restoration of the functions and values of wetlands on such easement areas.
Farmland Protection Policy Act of 1981, as amended	The purpose of this law is to minimize the extent to which federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses. Federal programs include construction projects and the management of federal lands.
Federal Advisory Committee Act (1972), as amended	Governs the establishment of and procedures for committees that provide advice to the federal government. Advisory committees may be established only if they will serve a necessary, nonduplicative function. Committees must be strictly advisory unless otherwise specified and meetings must be open to the public.
Federal Coal Leasing Amendment Act of 1976	Provided that nothing in the Mining Act, the Mineral Leasing Act, or the Mineral Leasing Act for Acquired Lands authorized mining coal on refuges.
Federal-Aid Highways Act of 1968	Established requirements for approval of federal highways through national wildlife refuges and other designated areas to preserve the natural beauty of such areas. The Secretary of Transportation is directed to consult with the Secretary of the Interior and other federal agencies before approving any program or project requiring the use of land under their jurisdiction.
Federal Noxious Weed Act of 1990, as amended	The Secretary of Agriculture was given the authority to designate plants as noxious weeds and to cooperate with other federal, State and local agencies, farmers' associations, and private individuals in measures to control, eradicate, prevent, or retard the spread of such weeds. The Act requires each Federal land-managing agency, including the Fish and Wildlife Service, to designate an office or person to coordinate a program to control such plants on the agency's land and implement cooperative agreements with the states, including integrated management systems to control undesirable plants.

STATUE	DESCRIPTION
Fish and Wildlife Act of 1956	Establishes a comprehensive national fish, shellfish, and wildlife resources policy with emphasis on the commercial fishing industry but also includes the inherent right of every citizen and resident to fish for pleasure, enjoyment, and betterment and to maintain and increase public opportunities for recreational use of fish and wildlife resources. Among other things, it authorizes the Secretary of the Interior to take such steps as may be required for the development, advancement, management, conservation, and protection of fish and wildlife resources including, but not limited to, research, development of existing facilities, and acquisition by purchase or exchange of land and water or interests therein.
Fish and Wildlife Conservation Act of 1980, as amended	Requires the Service to monitor non-gamebird species, identify species of management concern, and implement conservation measures to preclude the need for listing under the Endangered Species Act.
Fish and Wildlife Coordination Act of 1958	Promotes equal consideration and coordination of wildlife conservation with other water resource development programs by requiring consultation with the Fish and Wildlife Service and the state fish and wildlife agencies where the “waters of a stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted...or otherwise controlled or modified” by any agency under federal permit or license.
Improvement Act of 1978	This act was passed to improve the administration of fish and wildlife programs and amends several earlier laws, including the Refuge Recreation Act, the National Wildlife Refuge System Administration Act, and the Fish and Wildlife Act of 1956. It authorizes the Secretary to accept gifts and bequests of real and personal property on behalf of the United States. It also authorizes the use of volunteers on Service projects and appropriations to carry out volunteer programs.
Fishery (Magnuson) Conservation and Management Act of 1976	Established Regional Fishery Management Councils comprised of federal and state officials, including the Fish and Wildlife Service. It provides for regulation of foreign fishing and vessel fishing permits.
Freedom of Information Act, 1966	Requires all federal agencies to make available to the public for inspection and copying administrative staff manuals and staff instructions; official, published and unpublished policy statements; final orders deciding case adjudication; and other documents. Special exemptions have been reserved for nine categories of privileged material. The Act requires the party seeking the information to pay reasonable search and duplication costs.
Geothermal Steam Act of 1970, as amended	Authorizes and governs the lease of geothermal steam and related resources on public lands. Section 15 c of the Act prohibits issuing geothermal leases on virtually all Service-administrative lands.

STATUE	DESCRIPTION
Lacey Act of 1900, as amended	Originally designed to help states protect their native game animals and to safeguard U.S. crop production from harmful foreign species, this Act prohibits interstate and international transport and commerce of fish, wildlife or plants taken in violation of domestic or foreign laws. It regulates the introduction to America of foreign species.
Land and Water Conservation Fund Act of 1948	This Act provides funding through receipts from the sale of surplus federal land, appropriations from oil and gas receipts from the outer continental shelf, and other sources for land acquisition under several authorities. Appropriations from the fund may be used for matching grants to states for outdoor recreation projects and for land acquisition by various federal agencies, including the Fish and Wildlife Service.
Marine Mammal Protection Act of 1972, as amended	The 1972 Marine Mammal Protection Act established a federal responsibility to conserve marine mammals with management vested in the Department of the Interior for sea otter, walrus, polar bear, dugong, and manatee. The Department of Commerce is responsible for cetaceans and pinnipeds, other than the walrus. With certain specified exceptions, the Act establishes a moratorium on the taking and importation of marine mammals, as well as products taken from them.
Migratory Bird Conservation Act of 1929	Established a Migratory Bird Conservation Commission to approve areas recommended by the Secretary of the Interior for acquisition with Migratory Bird Conservation Funds. The role of the commission was expanded by the North American Wetland Conservation Act to include approving wetlands acquisition, restoration, and enhancement proposals recommended by the North American Wetlands Conservation Council.
Migratory Bird Hunting and Conservation Stamp Act of 1934	Also commonly referred to as the "Duck Stamp Act," requires waterfowl hunters 16 years of age or older to possess a valid federal hunting stamp. Receipts from the sale of the stamp are deposited into the Migratory Bird Conservation Fund for the acquisition of migratory bird refuges.
Migratory Bird Treaty Act of 1918, as amended	This Act implements various treaties and conventions between the United States and Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Except as allowed by special regulations, this Act makes it unlawful to pursue, hunt, kill, capture, possess, buy, sell, purchase, barter, export or import any migratory bird, part, nest, egg, or product.
Mineral Leasing Act for Acquired Lands (1947), as amended	Authorizes and governs mineral leasing on acquired public lands.

STATUE	DESCRIPTION
Minerals Leasing Act of 1920, as amended	Authorizes and governs leasing of public lands for development of deposits of coal, oil, gas, and other hydrocarbons; sulphur; phosphate; potassium; and sodium. Section 185 of this title contains provisions relating to granting rights-of-way over federal lands for pipelines.
Mining Act of 1872, as amended	Authorizes and governs prospecting and mining for the so-called “hardrock” minerals (i.e., gold and silver) on public lands.
National and Community Service Act of 1990	Authorizes several programs to engage citizens of the U.S. in full- and/or part-time projects designed to combat illiteracy and poverty, provide job skills, enhance educational skills, and fulfill environmental needs. Among other things, this law establishes the American Conservation and Youth Service Corps to engage young adults in approved human and natural resource projects, which will benefit the public or are carried out on federal or Indian lands.
National Environmental Policy Act of 1969	Requires analysis, public comment, and reporting for environmental impacts of federal actions. It stipulates the factors to be considered in environmental impact statements, and requires that federal agencies employ an interdisciplinary approach in related decision-making and develop means to ensure that unqualified environmental values are given appropriate consideration, along with economic and technical considerations.
National Historic Preservation Act of 1966, as amended	It establishes a National Register of Historic Places and a program of matching grants for preservation of significant historical features. Federal agencies are directed to take into account the effects of their actions on items or sites listed or eligible for listing in the National Register.
National Trails System Act (1968), as amended	Established the National Trails System to protect the recreational, scenic, and historic values of some important trails. National recreation trails may be established by the Secretaries of Interior or Agriculture on land wholly or partly within their jurisdiction, with the consent of the involved state(s), and other land managing agencies, if any. National scenic and national historic trails may only be designated by Congress. Several national trails cross units of the National Wildlife Refuge System.
National Wildlife Refuge System Administration Act of 1966	Prior to 1966, there was no single federal law that governed the administration of the various national wildlife refuges that had been established. This Act defines the National Wildlife Refuge System and authorizes the Secretary of the Interior to permit any use of a refuge provided such use is compatible with the major purposes(s) for which the refuge was established.

STATUE	DESCRIPTION
National Wildlife Refuge System Improvement Act of 1997	This Act amends the National Wildlife Refuge System Administration Act of 1966. This Act defines the mission of the National Wildlife Refuge System, establishes the legitimacy and appropriateness of six priority wildlife-dependent public uses, establishes a formal process for determining compatible uses of Refuge System lands, identifies the Secretary of the Interior as responsible for managing and protecting the Refuge System, and requires the development of a comprehensive conservation plan for all refuges outside of Alaska.
Native American Graves Protection and Repatriation Act of 1990	Requires federal agencies and museums to inventory, determine ownership of, and repatriate certain cultural items and human remains under their control or possession. The Act also addresses the repatriation of cultural items inadvertently discovered by construction activities on lands managed by the agency.
Neotropical Migratory Bird Conservation Act of 2000	Establishes a matching grant program to fund projects that promote the conservation of neotropical migratory birds in the United States, Latin America, and the Caribbean.
North American Wetlands Conservation Act of 1989	Provides funding and administrative direction for implementation of the North American Waterfowl Management Plan and the Tripartite Agreement on wetlands between Canada, the United States, and Mexico. The North American Wetlands Conservation Council was created to recommend projects to be funded under the Act to the Migratory Bird Conservation Commission. Available funds may be expended for up to 50 percent of the United States' share cost of wetlands conservation projects in Canada, Mexico, or the United States (or 100 percent of the cost of projects on federal lands).
Refuge Recreation Act of 1962, as amended	This Act authorizes the Secretary of the Interior to administer refuges, hatcheries, and other conservation areas for recreational use, when such uses do not interfere with the area's primary purposes. It authorizes construction and maintenance of recreational facilities and the acquisition of land for incidental fish and wildlife-oriented recreational development or protection of natural resources. It also authorizes the charging of fees for public uses.
Partnerships for Wildlife Act of 1992	Establishes a Wildlife Conservation and Appreciation Fund to receive appropriated funds and donations from the National Fish and Wildlife Foundation and other private sources to assist the state fish and game agencies in carrying out their responsibilities for conservation of non-game species. The funding formula is no more than 1/3 federal funds, at least 1/3 foundation funds, and at least 1/3 state funds.

STATUE	DESCRIPTION
Refuge Revenue Sharing Act of 1935, as amended	Provided for payments to counties in lieu of taxes from areas administered by the Fish and Wildlife Service. Counties are required to pass payments along to other units of local government within the county, which suffer losses in tax revenues due to the establishment of Service areas.
Rehabilitation Act of 1973	Requires nondiscrimination in the employment practices of federal agencies of the executive branch and contractors. It also requires all federally assisted programs, services, and activities to be available to people with disabilities.
Rivers and Harbors Appropriations Act of 1899, as amended	Requires the authorization by the U.S. Army Corps of Engineers prior to any work in, on, over, or under a navigable water of the United States. The Fish and Wildlife Coordination Act provides authority for the Service to review and comment on the effects on fish and wildlife activities proposed to be undertaken or permitted by the Corps of Engineers. Service concerns include contaminated sediments associated with dredge or fill projects in navigable waters.
Sikes Act (1960), as amended	Provides for the cooperation by the Departments of Interior and Defense with state agencies in planning, development, and maintenance of fish and wildlife resources and outdoor recreation facilities on military reservations throughout the United States. It requires the Secretary of each military department to use trained professionals to manage the wildlife and fishery resource under his jurisdiction, and requires that federal and state fish and wildlife agencies be given priority in management of fish and wildlife activities on military reservations.
Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948	This Act provides that upon determination by the Administrator of the General Services Administration, real property no longer needed by a federal agency can be transferred, without reimbursement, to the Secretary of the Interior if the land has particular value for migratory birds, or to a state agency for other wildlife conservation purposes.
Transportation Equity Act for the 21st Century (1998)	Established the Refuge Roads Program, requires transportation planning that includes public involvement, and provides funding for approved public use roads and trails and associated parking lots, comfort stations, and bicycle/pedestrian facilities.
Uniform Relocation and Assistance and Real Property Acquisition Policies Act (1970), as amended	Provides for uniform and equitable treatment of persons who sell their homes, businesses, or farms to the Service. The Act requires that any purchase offer be no less than the fair market value of the property.

STATUE	DESCRIPTION
Water Resources Planning Act of 1965	Established Water Resources Council to be composed of Cabinet representatives including the Secretary of the Interior. The Council reviews river basin plans with respect to agricultural, urban, energy, industrial, recreational and fish and wildlife needs. The act also established a grant program to assist States in participating in the development of related comprehensive water and land use plans.
Wild and Scenic Rivers Act of 1968, as amended	This Act selects certain rivers of the nation possessing remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values; preserves them in a free-flowing condition; and protects their local environments.
Wilderness Act of 1964, as amended	This Act directs the Secretary of the Interior to review every roadless area of 5,000 acres or more and every roadless island regardless of size within the National Wildlife Refuge System and to recommend suitability of each such area. The Act permits certain activities within designated wilderness areas that do not alter natural processes. Wilderness values are preserved through a "minimum tool" management approach, which requires refuge managers to use the least intrusive methods, equipment, and facilities necessary for administering the areas.
Youth Conservation Corps Act of 1970	Established a permanent Youth Conservation Corps (YCC) program within the Departments of Interior and Agriculture. Within the Service, YCC participants perform many tasks on refuges, fish hatcheries, and research stations.

EXECUTIVE ORDERS	DESCRIPTIONS
EO 11593, Protection and Enhancement of the Cultural Environment (1971)	States that if the Service proposes any development activities that may affect the archaeological or historic sites, the Service will consult with Federal and State Historic Preservation Officers to comply with Section 106 of the National Historic Preservation Act of 1966, as amended.
EO 11644, Use of Off-road Vehicles on Public Land (1972)	Established policies and procedures to ensure that the use of off-road vehicles on public lands will be controlled and directed so as to protect the resources of those lands, to promote the safety of all users of those lands, and to minimize conflicts among the various uses of those lands.
EO 11988, Floodplain Management (1977)	The purpose of this Executive Order is to prevent federal agencies from contributing to the “adverse impacts associated with occupancy and modification of floodplains” and the “direct or indirect support of floodplain development.” In the course of fulfilling their respective authorities, federal agencies “shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains.”
EO 11989 (1977), Amends Section 2 of EO 11644	Directs agencies to close areas negatively impacted by off-road vehicles.
EO 11990, Protection of Wetlands (1977)	Federal agencies are directed to provide leadership and take action to minimize the destruction, loss of degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.
EO 12372, Intergovernmental Review of Federal Programs (1982)	Seeks to foster intergovernmental partnerships by requiring federal agencies to use the state process to determine and address concerns of state and local elected officials with proposed federal assistance and development programs.
EO 12898, Environmental Justice (1994)	Requires federal agencies to identify and address disproportionately high and adverse effects of its programs, policies, and activities on minority and low-income populations.

EXECUTIVE ORDERS	DESCRIPTIONS
EO 12906, Coordinating Geographical Data Acquisition and Access (1994), Amended by EO 13286 (2003). Amendment of EOs and other actions in connection with transfer of certain functions to Secretary of DHS.	Recommended that the executive branch develop, in cooperation with state, local, and tribal governments, and the private sector, a coordinated National Spatial Data Infrastructure to support public and private sector applications of geospatial data. Of particular importance to comprehensive conservation planning is the National Vegetation Classification System (NVCS), which is the adopted standard for vegetation mapping. Using NVCS facilitates the compilation of regional and national summaries, which in turn, can provide an ecosystem context for individual refuges.
EO 12962, Recreational Fisheries (1995)	Federal agencies are directed to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities in cooperation with states and tribes.
EO 13007, Native American Religious Practices (1996)	Provides for access to, and ceremonial use of, Indian sacred sites on federal lands used by Indian religious practitioners and direction to avoid adversely affecting the physical integrity of such sites.
EO 13061, Federal Support of Community Efforts Along American Heritage Rivers (1997)	Established the American Heritage Rivers initiative for the purpose of natural resource and environmental protection, economic revitalization, and historic and cultural preservation. The Act directs Federal agencies to preserve, protect, and restore rivers and their associated resources important to our history, culture, and natural heritage.
EO 13084, Consultation and Coordination With Indian Tribal Governments (2000)	Provides a mechanism for establishing regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications.
EO 13112, Invasive Species (1999)	Federal agencies are directed to prevent the introduction of invasive species, detect and respond rapidly to and control populations of such species in a cost effective and environmentally sound manner, accurately monitor invasive species, provide for restoration of native species and habitat conditions, conduct research to prevent introductions and to control invasive species, and promote public education on invasive species and the means to address them. This EO replaces and rescinds EO 11987, Exotic Organisms (1977).

EXECUTIVE ORDERS	DESCRIPTIONS
EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds. (2001)	Instructs federal agencies to conserve migratory birds by several means, including the incorporation of strategies and recommendations found in Partners in Flight Bird Conservation plans, the North American Waterfowl Plan, the North American Waterbird Conservation Plan, and the United States Shorebird Conservation Plan, into agency management plans and guidance documents.

Appendix D. Public Involvement

SUMMARY OF PUBLIC SCOPING COMMENTS

Intergovernmental Scoping: As part of the intergovernmental scoping, invitations were sent to federal, tribal, state, and local agencies, and a meeting was held at the refuge headquarters in Round Oak, Georgia, during the morning hours on May 13, 2008. Representatives from the Georgia Department of Natural Resources, Georgia Forestry Commission, and USDA Forest Service generated a list of priority issues to be considered in the development of a 15-year management plan for the refuge.

Public Involvement Process: The notice of intent (NOI) to begin the Piedmont NWR CCP was published in the Federal Register on April 4, 2008. Following publication of the NOI, the public was informed and their input was solicited through a variety of mechanisms. CCP information was posted on the refuge's website and visitor center. In addition, notices regarding the refuge's CCP were submitted to 98 newspapers within Florida, Georgia, and Tennessee.

A public scoping meeting was held at the refuge headquarters on May 12, 2008. Attendees included two members of the public, six Service personnel, and one TVA contractor. The public was given the opportunity to submit comments and concerns regarding future management of the refuge at several thematic information booths (e.g., visitor services, biological resources, etc.) that were stationed around the facility, each manned by Service personnel. During the 30-day scoping period, the refuge received over 1,200 public comments.

Major Issues:

Listed are the issues identified during the scoping process.

Georgia Department of Natural Resources

As part of the intergovernmental coordination planning team, the GADNR identified a variety of issues, ideas, and concerns regarding future management of the refuge. The top priorities identified by GADNR are listed.

- Reevaluate goals for red-cockaded woodpecker populations and habitat interrelations of surrounding populations
- Coordinate with private landowners and habitat management across boundaries
- Explore potential for land acquisition
- Develop a groundcover working group (sweet gum control) for recovery of more appropriate groundcovers.
- Increase invasive species management
- Increase biological staffing (permanent biologist)
- Maintain cane brake restoration
- Educate about fire

Tribal Governments

The listed Tribal entities were invited to the scoping process. The Misccosukee Tribe of Florida declined to be a part of the process since the refuge was located outside of Florida. No other comments have been received to date.

- Muscogee (Creek) Nation, Okmulgee, Oklahoma
- Thlopthlocco Tribal Town, Okemah, Oklahoma
- Alabama-Quassarte Tribal Town, Henryetta, Oklahoma
- Kialegee Tribal Town, Wetumka, Oklahoma
- Poarch Band of Creek Indians of Alabama, Atmore, Alabama
- Seminole Nation of Oklahoma, Wewoka, Oklahoma
- Seminole Tribe of Florida, Hollywood, Florida
- Miccosukee Tribe of Indians of Florida, Miami, Florida

Intergovernmental Partners

The intergovernmental scoping team identified a range of issues and developed a list of the top priorities.

- Reevaluate goals for red-cockaded woodpecker populations and habitat interrelations of surrounding populations
- Reevaluate managing for red-cockaded woodpeckers considering southern pine beetle threat. (Compatibility)
- Invasive weed including aquatic species control working with partners (target species)
- Identify imperiled species and critical habitat (inventory) and correct habitat loss in streams
- Explore potential for expanding acquisition boundary.
- Groundcover working group (sweet gum control) recovery of more appropriate groundcovers work in partnership for research
- Increase biological staffing (permanent biologist)
- Reinstate assistant forester, park ranger, equipment operator, [reinstate abolished position-identify resource issues from loss of position (capabilities)].
- Manage for non-red-cockaded woodpecker woodlands for other priority species habitats (cane, or hardwood/mast producers)
- Emphasize diversity/mosaic in the landscape

Public

The issues, ideas, concerns, and comments raised by the public are diverse and range from those addressing biological resources to those involving public use and administration of the refuge. A summary of comments is provided, organized by category.

Fish and Wildlife Population Management

General Fish and Wildlife Population Management:

- Continue to allow hunting (202).
- Support current hunting and fishing programs (111).
- Continue the managed hunts (24).
- Continue to allow deer hunting (8).
- Need more emphasis on quality deer management.
- Continue the quota hunt system as is (3).

-
- Increase hunting opportunities (20).
 - Balance all hunting opportunities—small game and big game hunting (2).
 - Increase opportunities for hunting small game (4).
 - Open up Piedmont NWR for dog training out of season.
 - Conventional hunting seasons for small game and birds.
 - Open additional opportunities during the small game seasons.
 - Increase opportunities for hog and predator hunting (7).
 - Encourage recreational hunting—not simply management hunting (2).
 - Reduce the number of hunts and the number of hunters (2).
 - Need quality deer management—have a vote by hunters on this issue.
 - QDMA should be practiced/encourage participation of the Quality Deer Management Association in maintaining a healthy deer herd (13).
 - Allow sufficient harvesting of wildlife to maintain a safe carrying capacity of the land. (2)
 - Allow more time for scouting and allow for stand placement a week before hunts.
 - Provide quail and dove hunting.
 - Need greater efforts to increase the turkey population.
 - State hunting rules should apply to this refuge.
 - Duck boxes and geese areas need to be maintained and upgraded.
 - Would like to see Native American species that are extinct in the area restored, i.e., bison, elk, red stag, a herd of axis and fallow deer.
 - Wildlife, especially wild turkey habitat, should be top priority. (2)
 - Reintroduce the eastern elk, cougar, and wolf packs to help control sick and injured animals.
 - Need wild hog study to see their impacts.
 - Let scientists/professionals decide how to manage. (11)
 - Qualified biologist should monitor wildlife. (3)
 - For deer hunting, sign in and deer check should be required.
 - Should allow a hunting lottery like some WMAs do.
 - Continue aggressive public hunting program to control deer herd.
 - Improve quail habitat.
 - Need efforts to recover deer population to historical numbers.
 - Need more hunting to control deer over population.
 - Increase numbers of hunted species to improve hunting conditions.
 - Change the charter to include deer, turkey, and quail.
 - Increase the number of turkey hunts and hunters.
 - Go back to one turkey per hunter/hunt.
 - Increase turkey population.
 - Allow full access of hog hunters, trapping to control feral animals, or predator control for non-game wild dogs, pigs, including for non-specific predator animals such as red tail hawks, skunks, snakes, and vermin as needed.
 - Full-time access for hunters pursuing hogs and small game.
 - Allow sportsmen to trap the refuge.
 - Coyotes should be trapped (either professional trappers or a public hunt. (2)
 - Allow coyote hunting—too many on refuge with no predators. (2)
 - Should be able to take coyotes during the managed hunts.
 - Continue to allow harvesting of feral hogs on a regular basis. (2)
 - Keep the current multiple deer and turkey hunts and promote small game hunting.
 - Need managed hunts for all game species.
 - Provide more opportunities to hunt small game and waterfowl.

-
- Improve waterfowl hunting and management—partner with Ducks Unlimited.
 - More doe days allowed on the property during the draw rifle hunts.
 - Need easier access for all hunters, regardless of species being pursued.
 - Add some quota duck hunts on some of the lakes or create more habitat for ducks.
 - Service involvement in the conservation of middle Georgia's black bears needs to greatly increase and include efforts to secure habitat. (2)

Comments About Having Trophy/Mature Animals:

- Have a trophy deer program. (7)
- Manage for trophy bucks.
- Manage for trophy hunts only for large game deer hunts. Access to other hunting or land use with daily fees, limited to specific numbers of hunters and days.
- Put more emphasis on trophy animals. (6)
- Apply quality buck rules to future deer hunts.
- Increase the average age and antler size of the bucks taken. (2)
- Have more restrictions on antlered deer. (2)
- A portion of the refuge should be designated a trophy area.
- Increase big game hunting
- Age limit for deer taken should be 3 ½ years and older.
- Each hunter should take only mature bucks and his/her fair share of does.
- Make Piedmont a quality buck refuge—grow bigger bucks. (2)
- Need a check-in station on all big game animals taken from Piedmont NWR.
- Have size and age restrictions for game taken—preserve the younger populations.
- Let juvenile turkeys mature.
- Close the season on bucks for at least two years, and then establish trophy harvest regulations after that period; importation of better blood lines from Texas, Kansas, etc., is suggested.

Archery, Bow, Muzzleloader Hunting:

- Increase archery deer hunts.
- More bow hunts.
- Open public archery hunts.
- Allow archery hunters full access.
- Archery season should be allowed the last two weeks of the season.
- Continue to allow open bow hunting.
- Bow, primitive weapon, and gun hunts should be allowed.
- Emphasize archery and muzzleloader hunting over rifle hunting.
- Would like to see the first deer hunt to be a muzzleloader hunt.
- Could stop rifle hunting altogether and allow only bow, crossbow, and muzzleloaders.
- Gun season needs to be first and the black powder hunt second.
- Increase time of bow hunt season.
- Need a bow hunt only area.

Quotas, Limits on Hunting, Etc.:

- Keep the quota with a few additional hunts. (2)
- Need more and longer hunts.
- Keep quota hunts. (5)

-
- Quota system should be used for deer and turkeys.
 - Make sure quota hunts are filled.
 - Have fewer hunts so that the hunts are higher quality. Use a quota and preference points system.
 - Have the one-buck hunts (because of low numbers of deer).
 - Allow more than one buck on the buck only hunt.
 - Be more generous on the amount of game harvested.
 - Lower quotas on the deer hunts because of safety factors.
 - Keep a count on the deer harvest and have check-in and check-out requirements.
 - Need a limit on the amount of deer harvested and antler restrictions for all bucks harvested.
 - Limit hunters to certain sections (too many hunters can end up in the same area).
 - Assign segments to hunters to stay within so that hunters do not run into each other during hunts. (2).
 - Need antler restrictions during hunts.
 - Need fewer hunters per quota hunts. (2)
 - The total number of quota permits for turkeys should be reduced for each hunt; however, allow more hunts.
 - Reduce the hunter quota on wild turkey hunts to 150 hunters and increase the number of hunts to provide same opportunity at a higher quality.
 - Don't like the larger quota during turkey season. Go back to what you were doing several years ago.
 - End quota hunts.
 - Limit amount of wildlife to be taken during hunts.
 - Piedmont should draw for their hunts at the same time other quota hunts are being drawn.
 - Would like to see an "earn a buck" tag implemented on the refuge, where one must harvest a doe and then be able to kill a buck. (2)
 - Allow the taking of one buck for every one to two does.
 - Increase the doe harvest, and put a restriction on all bucks less than 4 ½ years old. If a hunter harvests a buck less than 4, that hunter should be banned from Piedmont for a minimum of 2 years.
 - Need more selective hunting—maybe make the dates longer for the hunts but limit the buck kills to 100 or better, 4 per side—if a hunter fails to follow, that hunter loses privileges for 5 years.
 - Limit the deer hunts to quality hunts—four on one side or better for bucks (15" inside or 16" beams are too hard to call resulting in ground checking and waste of deer).
 - Need quality buck hunt (four points on one side) to encourage bigger deer management and a slowing of doe permits to allow growth of herd.
 - Require bucks taken to be eight points or better.
 - Establish some sort of buck management program prior to harvesting, either 4-points or better on one side, or 16-inch outside spread, etc., and have doe-only hunts.
 - Continue the two-deer limit, but if both are bucks, one must have four points on one side.
 - Only two deer per hunter per year.
 - Limit to one deer per person per hunt, or more strictly limit the number of hunters.
 - Would like to see half as many permits given on the firearm quota hunts over twice as many weekends (would allow the same number of total hunters, but reduce hunter density on any given hunt).
 - Enact a "long beards only" turkey harvest program.
 - Smaller quota system for turkey season.
 - Increase turkey hunt quotas and space earlier in the season
 - Limit each turkey hunt to one gobbler (mature or jake), or if you keep the two bird limit, make a fee of \$25 or \$50 for a second bird
 - Have a no-jake rule placed on adult hunters. Youth hunters could harvest a jake.
 - Would like to see the turkey quota broken up into a few different dates with a more limited number of hunters.

Hunting Boundaries/Number of Hunters:

- Limit the number of people on turkey hunts to no more than 200 per hunt.
- Allow more access to some areas that have been locked out in the past.
- Safety is an issue--know how many hunters could be safely hunting a section. Let your draw be for a certain section, with your groups knowing one another or meeting before hunting.

Hunting/Fishing Season and Length of Hunts:

- Allow hunters to come in earlier (~4:00 a.m.).
- Limit turkey hunts to three per year—the last week in March, and the first two weeks in April, with four days per hunt.
- Go back to having the 3-day turkey hunts.
- The quota hunts for turkey should include one more hunt with fewer days and fewer people like a few years back.
- Keep hunting open throughout legal seasons for all game. (6)
- Expand hunting seasons.
- Have hunts later in the season during cooler weather—possibly by moving one of the earlier hunts. This will create greater participation.
- Hold archery hunts during cooler weather.
- If the game population numbers could tolerate it, would like an extra day added to the either sex hunts.
- Fishing season could come in a bit earlier than it has in the past.
- Open the refuge to hunters during the season using a sign-in or quota hunt. (2)
- Fishing should be allowed year-round.
- Need year-round large caliber hog season.
- Allow hog hunting year-round.
- Need full turkey season.
- Need to open raccoon hunting earlier and keep it open longer. (2)
- Limited deer hunting in the fall with emphasis on quality deer management.
- Allow more hunting dates.
- Want extended season without quotas but quality restrictions on the game taken.
- Have the hunts go through at least Saturday instead of just the week days.
- Hunts should occur when more people are off from work.
- Add later hunt dates for draw dates.

Permits/Fees and Applications/Hunting Rules:

- Create a stamp similar to the WMA to support any needs.
- Computerize the antiquated system for hunt approvals.
- Need a 4 point on one side like B.F. Grant WMA (for the first three days, and one doe harvest on the last day of the hunt). Hunt permit application should cover all four hunts and not just a priority 1,2,3,4 hunt.
- Raise the permit fee to \$15 to \$20 a hunt for the purpose of planting food plots year-round for the deer and turkey habitat
- Increase the fee for hunting permits to \$15 per hunt drawn.
- Raise the refuge hunt fee to \$25.
- Raise quota hunt fees by \$5 or \$10 per hunter to secure additional funds.
- Increase hunting fees to provide more funding. (3)
- Hold more hunts for a fee to provide more funding.

-
- Increase fees for hunting and non-hunting uses by 10-25% to cover cost of operating and protecting Piedmont NWR from urban sprawl.
 - Hunting fees need to be increased and expanded to include fishing and archery permits, and increase the available days for archery hunting to make the archery permits more attractive.
 - Applications should remain on paper so “old-timers” can keep hunting.
 - Continue the pay for deer and turkey hunts at the current level
 - There can be quotas or drawings, but charging hunters per day when they are already paying a license and WMA stamp is too much.
 - Fees for hunting need to be significantly increased to fund staffing and wildlife management. \$12.50 is way too low—even \$125 wouldn’t be too much.
 - Reduce the cost of acquiring hunt permits.
 - Need to better publicize deer hunting rules and regulations—many don’t know what to do to hunt at Piedmont. Publish requirements for hunting in the GON. (2)

Food Plots/Wildlife Habitat:

- Maintain food plots. (8)
- Increase food plots. (15)
- More food plots planted in more than just grasses
- Plant more and better food plots. (3)
- More diversified plantings in wildlife openings and bring back the bicolor lespedeza on which small animals and turkeys flourish.
- Increase food plots for deer and turkey. (9)
- More food plots for deer, turkeys, and bears.
- Plant the food plots for quail.
- Plant more habitat for quail.
- Plant food plots that benefit all wildlife.
- Need additional food plots for wild game, large and small.
- Decrease food plots to save money—they are not needed. (2)
- Add clay peas and sorghum to food plots.
- Plant some food plots in clover for the assistance of hens and particularly poults. Consider closing these food plots to hunting.
- Need greater emphasis on turkey and deer habitat enhancements, including hardwood stands and food plots
- More plantings that provide food and cover for wildlife.
- Add food plots where the pines have been taken from pine beetle timber cuttings. A variety of plantings might help (beans, peas, corn, millet, clover, wheat, etc.) and seeds could be purchased from left over agricultural seed from last year’s supply.
- Would like to see Chufa plots.
- Need better utilization of the transmission lines through the property to plant with beneficial food sources for game and nongame species.
- Put out minerals in all areas.
- Plant fruit trees.
- Plant species desirable to deer, turkey, rabbit, and quail.
- Plant strips of clover and rye in openings.
- Plant food plots to support game species (and especially quail and dove) where timber clearing activity occurred.

Special Hunts/Programs/Classes:

- Re-establish handicapped or “physically challenged” hunts (one person says to have volunteers assist the hunters). (4)
- Offer special hunts for handicapped individuals and veterans.
- Offer hunting and fishing programs for children/youth (several specifically requested parent/child hunts; one said specifically like “Marsh Project”). (5)
- Offer special hunt for seniors. (7)
- Need more ladies’ hunts.
- Offer archery classes for children.

Habitat Conservation and Management

General Habitat Conservation and Management Comments:

- Keep current management techniques. (147)
- Habitat and wildlife management have been excellent. No changes suggested. (416)
- More pond and lake management is needed to promote fishing opportunities.
- Manage for mixed use with emphasis on hunting.
- Manage for the protection and restoration of long leaf pine and red cockaded woodpecker.
- Current management emphasizes timber over wildlife—should switch to wildlife before timber—don’t plant all southern pine beetle spots.
- Minimize all human activity in sensitive areas.
- Should be less pressure to restrict forest management tools such as logging and burning that forest and wildlife need for survival. (2)
- Let forest managers manage the forest—not public interest groups. A forest requires young and middle-aged trees and plants to be productive.
- Continue or increase forest management practices such as prescribed burns, logging, clearing, food plots, etc., to maintain/improve habitat for maximum numbers of native fauna per acre.
- Keep undergrowth under control.
- Pine beetles are the larger problem at the refuge—keep practicing recommended forest management to keep them at bay. (3)
- To best manage the habitat, incorporate opinions from QDME, The National Wild Turkey Federation, The Quail Initiative, UGA, and local and national biologists and historians.
- Need species diversity and native species habitat restoration and maintenance.
- Get local volunteers to help manage the refuge.
- Eradicate non-native species of wildlife and plants through hunting of non-native species and herbicide treatment of non-native vegetation.
- Organizations such as the Ruffed Grouse Society, Ducks Unlimited, and Quail Unlimited should be solicited for assistance in creating and maintaining specific sections of habitat for specific species. Awards should be given to those organizations making the biggest improvement to overall habitat for all native species.
- Should enlist the help of a seed company such as Pennington Seed to test food plot items.
- Keep habitat as wild and natural as possible. (4)
- Preserving wildlife habitat and the ecology of the landscape is most important.
- Stream restoration can be used to improve the quality of the ecosystem.
- Let scientists/professionals decide how to manage. (5)
- Manage according to best management practices.
- Limited harvest of both forest and game is the best approach.

-
- Would like to see the forest restored to its original state.
 - Refuge should be managed for hunting and fishing.
 - Refuge should be managed by and for hunters. (2)
 - Needs to be managed by DNR.
 - Erosion or other damage to the soil, waterways, or plant life should be restricted or controlled. (2)
 - Habitat should be managed for maximum diversity. (2)
 - Clear or thin more areas to better manage for small game (quail).
 - The old home sites, farm fields, and unmarked gravesites should be maintained in some manner that would preserve the history of Piedmont; these areas should not be turned into feed plots, but maybe some annual cultivation to prevent them from being lost to natural or planted pine plantations.

Red Cockaded Woodpecker/Birds:

- Manage for more than red-cockaded woodpecker—need more balanced approach. (30)
- Manage for deer and turkey and other wildlife but not for woodpeckers.
- Continue current management for red-cockaded woodpecker.
- Define and limit red cockaded woodpecker acreage that is necessary to stabilize red-cockaded woodpecker populations. (4)
- Manage for red cockaded woodpecker, in ways that include timber harvest.
- Ensure preservation and enhancement of habitat for the red-cockaded woodpecker. (2)
- Have more nest box inserts.
- Consider maintaining enough mature loblolly pines to support birds like the red crossbill (they have been found on the refuge and need pine cones to survive). Continue work to enhance the red-cockaded woodpecker and Bachman's sparrow habitat.
- Continue to work the refuge for a variety of bird species.
- Expand efforts to promote habitat for the red-cockaded woodpecker, Bachman's sparrow, brown-headed nuthatch, northern bobwhite, Swainson's warbler, and Kentucky warbler. (2)
- The refuge should use species prioritization schemes, as developed by Partners-In-Flight, to guide them in the management of bird species, particularly neotropical migrants that utilize hardwood forests, wetlands, and grasslands, and not become too focused on listed species to the exclusion of declining populations of migrants. (2)
- Should more aggressively promote and publicize the refuge's status as an Important Bird Area (IBA), to increase public awareness concerning the role Piedmont plays in protecting bird species. (2)

Comments Regarding Timber Harvesting/Tree and Other Plantings:

- Need more selective cutting. (7)
- Concern over clear-cutting and over cutting on refuge.
- Need 80-year pine rotation.
- Cut pines infected with Southern pine beetle.
- Don't cut the trees just to generate profits or benefit the red-cockaded woodpecker—manage for all wildlife.
- Hardwood management for mast production.
- Need more hardwoods.
- Protect the hardwoods; pines should be select cut and clear cut as necessary for the benefit of wildlife.
- Curtail hardwood harvesting.

-
- In open areas or fields, manage on a 3-year cycle where 1/3 is cut each year and the oldest growth is 3 years old.
 - Conduct heavy pine thinnings and regeneration cuts on the pine uplands to balance timber age classes.
 - A timber harvest plan should be in place to promote a variety of different habitats for all wildlife. (2)
 - A sound timber management plan should be put in place.
 - Use fire wood cutters instead of timber companies to harvest problem trees.
 - Harvest timber every 75 years or more.
 - Stop cutting down the beautiful trees.
 - Timber should be cut and managed according to best management practices.
 - Timber harvesting is most important.
 - More timber cutting to benefit wildlife.
 - Continue to allow reasonable timber harvest.
 - Opposed to clear-cutting.
 - No logging, unless it protects and restores longleaf pine and red-cockaded woodpecker.
 - Need to restore all lost trees and vegetation.
 - Replant with like kind in most cleared areas—some areas could be maintained as “open” forage.
 - Timber management programs should exclude any old growth hardwood harvest.
 - Encourage mast-producing species and select against sweetgum and maple.
 - Plant something besides pines. (2)
 - Native plants and trees should be planted. (2)
 - Should have aggressive effort to restore Chestnut Trees to Piedmont NWR, even if this involves utilizing a hybrid of the American/Chinese Chestnut—don’t exclude non-native plants that might be beneficial (One says that he would also like longleaf pine.) (18)
 - Require timber companies to clean up the areas where timber has been cut to prevent loss of habitat (including disposing of hydraulic fluid/oil cans and tree debris), and plant grass to minimize erosion until natural growth occurs.
 - Clean up areas that have been logged.
 - Provide sound timber harvest management to ensure a diverse ecosystem that can be used by all forms of native wildlife.
 - More logging to improve the habitat. (3)
 - More clear cutting.
 - More timber cutting to create openings for food plots and fields.
 - Need timber thinning and small clear cuts in appropriate areas.
 - Need concerted effort for reforestation where wise with proven beneficial trees. (2)
 - Restore beetle-damaged pine forests, storm-damaged areas, and where harvest of mature timber has occurred with a balance including acorn-bearing trees. Don’t strip our forest of all hardwoods.
 - Periodic removal of trees and planting wildlife food plots makes a better habitat.
 - Limit mid-story removal to increase vertical diversity and overall diversity.
 - Balance habitat for game animals—don’t save all trees.
 - Plant more for wildlife throughout the refuge.
 - Food plots and agriculture fields need to be better maintained.
 - Increase the areas planted for wildlife.
 - Plant some crops and fruit bearing trees for the wildlife.

Comments Regarding Burning:

- Burning practices need to be examined, prescribed burns with emphasis on habitat manipulation. Current practices burn too hot ultimately causing undesirable plant species to flourish. (3)
- Reduce the hot controlled burns—they reduce the desired vegetation that benefits wildlife, including dogwoods, and also the beautiful wisteria.
- Stop burning so late in the season—no burning after March 1—fires are too big, and too hot, and are destroying a lot of wildlife, especially turkey nests.
- Stop burning dogwoods—would like to see them protected.
- Need more controlled burns.
- Need more controlled burning in predominantly pine-type acreage.
- Continue controlled burns. (8)
- Continue a strong prescribed fire program but target it more toward bobwhites.
- Do not agree with any form of burning to take place during the periods of all ground nesting birds, especially the wild turkey ground nesting.
- Need controlled burns and protection of both upland and wetlands.
- Burning practices need to be examined, prescribed burns with emphasis on habitat manipulation. Current practices burn too hot ultimately causing undesirable plant species to flourish.
- Controlled burning in hardwood areas should be avoided. (2)
- Suggestion that burning practices change to night burns with 30 to 40% humidity.

Refuge Habitat Should Be Managed for Predominantly What:

- Manage for all species—game and non-game. (2)
- Manage for wild turkey via burning and hunting
- The habitat should be managed for all the types of wildlife (wetlands, open areas, and various stages of tree growth). (2)
- Should be managed for deer and turkey.
- Manage mostly for deer. (3)
- Manage for hunting. (2)
- Manage for both flora and fauna.
- Would like to see more habitat managed for quail.
- Coordinate with Quail Unlimited, Quail Forever, and other conservation organizations to determine how to improve quail habitat.
- Improve habitat and food for ducks.
- Create waterfowl impoundments and water control structures for better habitat for migrating ducks.
- Would like to see a duck impoundment built.
- Need more waterfowl and turkey habitat.
- Need continued game management, especially for non-game species such as coyote and feral hog.
- Would like to see additional emphasis placed on management for bobwhite quail, Georgia's state gamebird, which has declined by well over 70% since the 1960s.

Visitor and Education Services

General Comments About Visitor and Education Services:

- Satisfied with current public use and visitation opportunities. (687)
- Not satisfied with current public use and visitation opportunities. Too much emphasis on red-cockaded woodpecker.
- Visitor center needs to be open on weekends, when many families and youth groups, etc. could visit (one comment says, “even if it’s just one weekend a month”)(one response says, “if this is not possible, we ask that outside bathroom facilities be made available for use on weekends”). (4)
- The refuge should establish another wildlife drive, similar to Little Rock Wildlife drive, in an area(s) currently underutilized by the public. (2)
- Request that rangers treat everyone with respect and not like they are criminals.
- Would like to see an increase in disabled users.
- Refuge should be mostly sportsman oriented.
- Refuge should be a wildlife refuge, not a multi-use “green space” or park.
- Maps are not to scale and not accurate enough to keep visitors away from hunters.
- Difficult for hunters to see out of boundary markings on trees in early dawn hours—maps should be upgraded to include defined boundaries (topographical and aerial maps).
- Need more publicity about hunts—a simple schedule and a simple map, not via a website only.
- Need to have a board up where hunters can identify where they will be hunting to help them avoid run-ins with other hunters and reduce the risk of being shot
- Need to better promote hunting.
- Provide a long-range (500 yards?) rifle range. (2)
- Hunters should be made to feel welcome and wanted at Piedmont, with special courtesies and appreciation shown.
- Need to spray for seed ticks.
- Some activities that could occur to help balance uses: wildlife photo contest, bird watch count; food bank donations from the refuge (venison, pork), fishing events for all types of skill levels, and wildlife art exhibits.
- Piedmont should institute programs, acquire funding for more brochures and signage, and recruit more volunteers in an effort to better educate the public about the natural resources protected within the refuge. Example programs include guided butterfly walks, guided bird walks, dragonfly identification days, owl prowls, frog call identification, reptile exhibitions, wildflower rambles, and tree identification walks. Members of the Georgia Ornithological Society would be willing to assist. (2)
- Why are ponds, particularly 2-A, closed until May 1st? If it’s due to turkey hunting, make that area off limits to hunting.
- Advertise the museum more to get the children in to see some wildlife.
- There should be absolutely no alcohol in areas where hunting or fishing are allowed, or in the campsites and campgrounds.
- Need better boundary marking during deer hunts.
- The lakes should be opened more (sooner and later).
- Increase hunting opportunities.
- Promote more hunting on refuge.
- Promote the use of non violent activities on the Refuge such as mountain biking and cyclocross.
- The refuge should be utilized by cyclists and hikers without the risk of getting shot. Ban all hunting.
- More guided nature walks on Saturdays and Sundays.
- Hold events similar to the Christmas bird count and butterfly count that are currently held.

-
- More emphasis should be placed on events and activities that attract the general public, not just hunters, and these events should be well-publicized.
 - Work to open Browns Mount area to public and allow groups like the Ocmulgee Archeological Society to assist in improving grounds and to help with public tours.

Camping:

- Need year-round camping.
- Need annual scouting retreat or camp.
- Should be a new camping area with water and electrical hookups and drive through spots for motor homes—could be a year-round campground for non-hunters during the off-season. (2)
- More area for camping (with power).
- Update the camping area to include electricity and water during scheduled hunting periods.
- Improve the facilities at Pippin Lake campground to include modernized showers and hookups for campers on a pay as you go basis.
- Maintaining the campground is the most important refuge mgmt. issue – create a volunteer group and sponsor workdays for this purpose
- Increase camping opportunities
- Continue to allow camping.
- Need an additional camping area with restrooms and showers.
- Reopen the shower facilities in the campground.
- Install one more bathroom/shower combo at the far end of the campground.
- There should be days set aside for hunting, and camping, and also be no hunting at times to allow non-hunters to enjoy nature.
- Improve the campground with hook-ups for campers and charge visitors a camping fee to use it.
- Need more camping and trails for out-of-hunting-season use.
- Campground should be more accessible during bow season and small game season.
- Allow camping several days in advance of hunts.
- No alcohol in camping areas. Make sure all violations are stopped.
- Open the refuge campground for periods during the small game seasons to improve access for hunters who travel a good distance to reach the refuge.

Access (Roads, Paths, Boat Launches, etc.):

- Look at restricting vehicular traffic on some to the access roads. (2)
- Restrict vehicular traffic where necessary, but do not eliminate it.
- The refuges should allow less vehicle access and more foot travel.
- Do not allow the use of 4-wheelers. (3)
- Allow vehicle (not ATVs) access on all roads for retrieval of deer kills
- Allow off-road travel by ATVs and/or off-road vehicles on logging-type roads.
- Restrict ATV travel to designated areas and main roads only.
- Walking impaired persons should be able to use a four wheeler—perhaps the permit could be signed by a doctor certifying that the person needs to use a four wheeler to obtain adequate access to the refuge. Otherwise these persons have no use for Piedmont NWR.
- Allow access to the Ocmulgee River with either a launching ramp or slide access for a small boat
- Open river access—pursue opening Falling Creek Road for boat launch.
- Open/keep open easy access roads for hunters and fishermen.
- Keep roads and access open year-round. (2)
- Improve access to off-road areas.

-
- Need more access and foot travel roads.
 - Need more and easier access, i.e., paths and trails.
 - Nature trails on the refuge could use improvement and yearly maintenance.
 - Need more interpretive walking trails in underutilized areas of the refuge, with minimum disruption to existing habitat. (2)
 - Access to the property needs to be simple—foot trails and roadways are important, but do not need to be overdone—low impact usage is desirable—maps need to be available.
 - More fishing ponds should be created and access for bank fishermen should be encouraged.
 - Allow disabled or elderly hunters more available access, such as with 4-wheelers.
 - More access for the elderly.
 - More roads should be open year round if they meet certain criteria, which would help mature hunters have access to more remote areas; could sell access permits.
 - Designate areas where foot travel is the only form of transportation.
 - Public should have access to walk the land year round.
 - Need up to date maps of roads.
 - Increase public access for appropriate activities.
 - Improve public access.
 - Improve access for handicapped hunters.
 - Need to add 4-wheeler areas.
 - The Overlook of Macon needs to be handicapped accessible for views of the sunset on most evenings.
 - Need greater canoe access and primitive camping opportunities, which perhaps could be achieved through increasing public ownership of the river corridor.

Access (Types of Uses Allowed):

- Allow horseback riding in refuge. (3)
- Open up Piedmont NWR for equine trail riding. (5)
- Need trails for education about the area and the animals that live there (with signs identifying habitats and historic areas), and also for hiking and horseback riding.
- Develop multiuse concept/balance all uses. (3)
- Need greater emphasis on non-game wildlife—more viewing areas, etc.
- Recommend that at least one aquatic habitat used by wintering waterfowl on the refuge be deemed a no-hunting area, and that birders and other non-consumptive wildlife users be allowed safe access to the refuge on some weekends during fall and winter hunting seasons. (2)
- During hunts, non-hunting access should be limited. (2)
- Hunting on refuge lands should be allowed to all persons owning land joining refuge boundaries.
- No hiking during gun season.
- No other types of public use should be permitted within one month prior to and after hunting seasons.
- Full access to birders and wildlife watchers should be provided in addition to access for hunters.
- Put more emphasis on providing bird watching opportunities.
- Each type of activity should have its own season to avoid conflicts between hunters and other users, such as hikers.
- Increase in nontraditional use of forest areas such as horseback riding, orienteering, mountain biking, etc. (as opposed to hunting).
- Hikers, bikers, horseback riders, etc. should not be permitted during hunting season.
- Would be in favor of having a marked cycle loop for mountain biking that the Ocmulgee Mountain Bike Association, MTB chapter would be willing to help lay out—would be willing to ride only on non-hunting days

-
- Allow mountain bike clubs access on non-hunt days.
 - Would like to see the gates closed so that mountain biking can be enjoyed without vehicle use.
 - Allow orienteering. (One says, “Would like to see school and community groups such as JROTC and Scouts orienteering in Piedmont—it is not appropriate to ban such a wildlife refuge-friendly activity”)
 - Should be restrictions on forms of recreation such as scavenger hunts/orienteering. (2)
 - Geocaching, extreme sports, marathons, etc., do not have a place on the refuge—limit uses to nature-based, such as hiking fishing, hunting, bird watching, etc.
 - Increase all public use/visitation
 - Recreational usage should be done on foot—horseback riding is destructive and can’t coexist with hunting
 - Numbers and amounts of public use and visitation should be reduced and limited.
 - Allow students full access to areas during hunting’s off-season.
 - Limit or restrict access by any group having a negative impact in supporting national wildlife refuges (on a case-by-case basis).
 - The refuge should be for hunting quality bucks only.
 - Continue to allow any citizen to use the refuge as long as they do not destroy it.
 - Public uses and visitation pertaining to hunting only are appropriate
 - Make hunting the main priority.
 - Piedmont should be mainly for the purpose of wildlife observation.

Education/Training

- Expand current educational outreach programs to reach more young adults. (2)
- Need summer nature camps for children.
- Need more outreach for school aged children in the way of field trips.
- Facts sheets should be posted and provided on how hunting helps manage healthy wildlife and how many other outdoor programs are supported by revenue from hunting and fishing.
- Need to educate the public about the refuge’s work in conserving wildlife and the positive impact hunters have in the conservation and enhancement of wildlife and its environment. (2)
- Expand education programs to for children and teens.
- Increase promotional activities of refuge opportunities. (2)
- Develop additional educational programs.
- Need wildlife seminars or presentations for the public, which might include guided or unguided walking trails.

Resource Protection

- Keep development in and around the area at bay. (2)
- Oppose residential and commercial development on bordering properties.
- Put a management plan together that can be shared and abided by both private landowners and the WMA.
- Concerned about encroachment from neighboring home developments, which might create a population who would pressure change to the current successful management practices (hunting, logging, and fire management). (3)
- Concerned about encroachment from development—expand the area to offer a buffer against this threat.
- The refuge should not consider neighboring developments in its management of the refuge.

-
- Affected counties should go on record in recognizing the importance of the tools of management used on Piedmont NWR, and that they support the continued use of these tools, and consider these tools when addressing zoning issues. (2)
 - Service should take a leadership role in a regional conservation effort. (2)
 - The refuge needs to do a better job of identifying and protecting its archaeological resources, in partnership with the National Park Service. (2)
 - The Browns Mount site should be transferred to the Ocmulgee National Monument and managed by the National Park Service. (2)
 - Service should collaborate with the historically indigenous Muscogee (Creek) Nation to protect historic cultural and sacred sites. (2)
 - Service needs to engage in the process of developing policies regarding the identification, valuation, and management of carbon stocks on federal refuge lands—local governments could accrue carbon credits for conserved lands to offset losses in property taxes due to the existence of nontaxable federal lands within local jurisdictional boundaries. (2)
 - The Service should better manage its archaeological resources, including Browns Mount.
 - The Service should unite with the National Park Service, the USDA Forest Service, the Muscogee (Creek) Nation, and interested organizations and individuals to acquire ownership and/or management rights to properties that protect and enhance the following: Black bear, waterfowl, migratory birds, endangered species, virgin timber, the Ocmulgee Oil Fields TCP, the paleontology resources of the Ocmulgee River valley, scientific research, and recreational resources.

Refuge Administration

Funding/Staffing/Purchasing:

- Concerned about lack of government funding. (68)
- A greater public awareness of the danger of inadequate funding issues should be emphasized.
- Concerned about budget constraints. (3)
- Concern about lack of personnel. (2)
- Ensure the proper number of rangers and other required personnel are assigned to Piedmont for its care and protection.
- Increase the salaries of the technicians and rangers every year.
- Consider more funds to improve wildlife habitat.
- Income from tree cutting should go back to the refuge. (4)
- All user fees should be returned to Piedmont.
- When timber is harvested off the different refuges throughout the country, use the profits exclusively to purchase more land.
- Additional funding should be provided by Congress based on the dollar amount of the timber harvest and taxes paid on hunting and fishing equipment.
- Double the price for the hunts.
- Support higher usage fees provided they are used to support Piedmont, and not placed in a general fund.
- Increase use fees and allocate more government spending towards forest management.
- Charge fees and limit use for non-hunting activities also, and use these to fund Piedmont NWR.
- Stop those opposed to hunting from filling out a permit and then failing to pay.
- Concerned about funding and staffing. (12)
- Replace the staff that has been lost to allow more management activity.
- Need to add a ranger.

-
- Need more money to police the lands, (which are being overtaken by poaching, litter, and off road abuse). (2)
 - Allow individual endowments along with state and federal funding increases.
 - Concern over outsourcing of license sales.
 - Stop the outsourcing of license sales and use the extra money to hire more rangers.
 - Need to lobby the legislative branch of state government for more money
 - Talk to the Senator in the district and see if an “earmark” can be secured for Piedmont.
 - Charge more fees or have a national sales tax to support refuges, national parks, and forests
 - Find a way to purchase additional land.
 - Add more land to the refuge.
 - Spend more of the license revenue on management of refuges.
 - Find more funding to manage the property and purchase more property.
 - Expand fish and wildlife service’s property.
 - Charge fees for all recreational uses.
 - Raise fees for hunting and other activities.
 - Use Georgia revenue collected from wildlife tags and hunting and fishing license fees to be used to offset the costs of operation.
 - Use all resources and funds generated by the refuge to go directly back into maintaining and securing more land for future use.
 - Don’t sell the land.
 - Any revenue gained by the use of the facility should be retained for the management of the facility.
 - Government should do what is necessary to protect the system and keep it the way it is now.
 - Let DNR manage.
 - Need for more law enforcement personnel.
 - Raise the cost of permits.
 - Need more money for the development/management of property for hunters throughout hunting season, while maintaining a viable visitation area for non-hunters during the longer off-season.
 - Concerns that adequate habitat management cannot be implemented and that public recreational opportunities will be restricted due to lack of funding. (417)
 - If recreational opportunities are reduced because of budget cuts, hunting and fishing should be the priority since hunters and fishermen provide most of the funding for wildlife conservation in America thru their license purchases and excise taxes paid on hunting and fishing equipment. (420)
 - Other users (non-hunters) of the refuge need to pay a fee to use the refuge as well.
 - No changes in management recommended. Keep emphasis on opportunities for the sportsmen. (396)
 - Keep emphasis on sportsmen and maintaining rare habitat.
 - Need to expand existing public lands like Piedmont through land purchases from willing sellers and public-private partnerships.
 - The refuge should focus on acquisitions that expand linkages to the Ocmulgee River and the Oconee National Forest. (2)

Fees/Activities That Would Generate Funds:

- The pay to use the system should be expanded to cover all recreational uses. (55)
- Fees for all except school groups for educational purposes.
- Have fundraising dinners with prizes or special hunts or bow or gun shooting contests in a contained area to help increase funding and awareness.
- Sell a seasonal stamp or parking pass, for hunters and everyone else who uses the land.
- Suggests a day use pay system. (3)

Partnering/Community Involvement

- Partner with other entities to accomplish more tasks on the refuge. (3)
- Include State wildlife personnel in management system.
- Encourage community involvement in the upkeep of the refuge/utilize local groups to accomplish specific goals such as planting trees and food plots, duck box construction, etc. (3)
- Allow public work days, including those involving Boy and Girl Scouts and schools.
- Develop public ownership in area.
- Should be public meetings that allow hunter feedback, like those arranged for hunting regulations.
- Keep an open ear to the public's wishes through comment and open forum input.
- Establish a "Friends for Piedmont" group like the state WMAs have done to get users involved in projects.
- Host BBQ during hunt season to promote hunting.

Concerns About "Special Interest" Groups/Need to Educate "Public":

- Public right to visit, hunt, and fish should be protected from special interest groups who oppose (one person says we should have a vote on this issue). (7)
- Do not let those who live nearby and use the refuge for a private retreat harass hunters and campers.
- Need to educate animal rights groups/ anti-hunting groups about need for hunting for wildlife management. (2)
- Undergo an aggressive education program with surrounding communities on the benefits of the current management practices. (3)
- Generate public awareness of the uses of the land.
- Individuals who try to disrupt hunting should be prosecuted.
- Improve communication between naturalist/conservationist groups and hunters. Manage for the equal enjoyment for naturalist and hunters. (3)
- Need a more balanced management program geared toward all groups that share the refuge.
- Concerned over hunters footing the bill for the majority of the funding within the refuges. Would like to see a more equal fee system for other activities.

Legislation Issues:

- Make sure the refuge is permanent. (2)
- Adopt new regulations to balance the use of the refuge system while at the same time maintaining or expanding core uses such as hunting.
- Need a Federal law or mandate to allow hunting and fishing on these areas. (2)
- State regulators or other parties need to regulate issues, and plans need to be adjusted accordingly by managers.

-
- Pass legislation that protects the right to hunt (one says, “a petition should be sent to Congress; could maybe hire a lobbyist”). (2)

General Refuge Administration Comments:

- Plant food plots as gardens with corn and other vegetables and harvest and feed area hungry children and families.
- Concerned about housing encroachment and lack of public access.
- Don't change anything about how the refuge is managed.
- Need more advertising about the refuge. (4)
- Need more ads in the Georgia Outdoor Network. (2)
- Have a public hearing concerning hunting.
- Have town-hall type meetings to find out what hunters want out of Piedmont.
- Refuge needs to be managed by committee with some sort of oversight.
- Needs to be managed by a regional decision-making committee which understands what forest management is best for the land.
- All people going onto the refuge should be required to have a hunting safety course.
- All people going onto the refuge should be required to purchase a WMA stamp.
- Diminish commercial use of the refuge.
- Increase cost to timber companies for harvesting in the refuge.
- Manage timber for what is best for the refuge and not just cutting for money.
- Promote hunting as main recreation in the area.
- Let surrounding counties vote on management issues such as hunting use and prescribed burning.
- Law enforcement should focus on wooded areas and not traffic and highways.
- No fees to hunt, only the Wildlife Stamp.
- Hunting license sales should not be sent to an outside bank and should stay within Georgia to preserve Georgia hunting properties.
- Have a board of directors made up of hunters that do not work for the USDA Forest Service to help with decisions and to ensure that decisions made by the Service are not one-sided.
- Purchase more land and make hunts last longer even if you have to raise fees to hunt.
- Publish approved budgets for habitat improvement and seek outside assistance for shortfalls.
- Make all violators of the federal land laws pay the maximum price for offenses.

Appendix E. Appropriate Use Determinations

Piedmont National Wildlife Refuge Appropriate Use Determinations

An appropriate use determination is the initial decision process a refuge manager follows when first considering whether or not to allow a proposed use on a refuge. The refuge manager must find that a use is appropriate before undertaking a compatibility review of the use. This process clarifies and expands on the compatibility determination process by describing when refuge managers should deny a proposed use without determining compatibility. If a proposed use is not appropriate, it will not be allowed and a compatibility determination will not be undertaken.

Except for the uses noted below, the refuge manager must decide if a new or existing use is an appropriate refuge use. If an existing use is not appropriate, the refuge manager will eliminate or modify the use as expeditiously as practicable. If a new use is not appropriate, the refuge manager will deny the use without determining compatibility. Uses that have been administratively determined to be appropriate are:

- Six wildlife-dependent recreational uses - As defined by the National Wildlife Refuge System Improvement Act of 1997, the six wildlife-dependent recreational uses (hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation) are determined to be appropriate. However, the refuge manager must still determine if these uses are compatible.
- Take of fish and wildlife under state regulations - States have regulations concerning take of wildlife that includes hunting, fishing, and trapping. The Service considers take of wildlife under such regulations appropriate. However, the refuge manager must determine if the activity is compatible before allowing it on a refuge.

Statutory Authorities for this Policy:

National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, 16 U.S.C. §668dd-668ee. This law provides the authority for establishing policies and regulations governing refuge uses, including the authority to prohibit certain harmful activities. The Act does not authorize any particular use, but rather authorizes the Secretary of the Interior to allow uses only when they are compatible and “under such regulations as he may prescribe.” This law specifically identifies certain public uses that, when compatible, are legitimate and appropriate uses within the Refuge System. The law states “. . . it is the policy of the United States that . . . compatible wildlife-dependent recreation is a legitimate and appropriate general public use of the System . . . compatible wildlife-dependent recreational uses are the priority general public uses of the System and shall receive priority consideration in refuge planning and management; and . . . when the Secretary determines that a proposed wildlife-dependent recreational use is a compatible use within a refuge, that activity should be facilitated . . . the Secretary shall . . . ensure that priority general public uses of the System receive enhanced consideration over other general public uses in planning and management within the System” The law also states “in administering the System, the Secretary is authorized to take the following actions: . . . issue regulations to carry out this Act.” This policy implements the standards set in the Act by providing enhanced consideration of priority general public uses and ensuring other public uses do not interfere with our ability to provide quality, wildlife-dependent recreational uses.

Refuge Recreation Act of 1962, 16 U.S.C. 460k. The Act authorizes the Secretary of the Interior to administer refuges, hatcheries, and other conservation areas for recreational use, when such uses do not interfere with the area's primary purposes. It authorizes construction and maintenance of recreational facilities and the acquisition of land for incidental fish and wildlife oriented recreational development or protection of natural resources. It also authorizes the charging of fees for public uses.

Other Statutes that Establish Refuges, including the Alaska National Interest Lands Conservation Act of 1980 (ANILCA) (16 U.S.C. §410hh - 410hh-5, 460 mm - 460mm-4, 539-539e, and 3101 - 3233; 43 U.S.C. 1631 et seq.).

Executive Orders. The Service must comply with Executive Order 11644 when allowing use of off-highway vehicles on refuges. This order requires the Service to designate areas as open or closed to off-highway vehicles in order to protect refuge resources, promote safety, and minimize conflict among the various refuge users; monitor the effects of these uses once they are allowed; and amend or rescind any area designation as necessary based on the information gathered. Furthermore, Executive Order 11989 requires the Service to close areas to off-highway vehicles when it is determined that the use causes or will cause considerable adverse effects on the soil, vegetation, wildlife, habitat, or cultural or historic resources. Statutes, such as ANILCA, take precedence over executive orders.

Definitions:

Appropriate Use

A proposed or existing use on a refuge that meets at least one of the following four conditions.

- 1) The use is a wildlife-dependent recreational use as identified in the Improvement Act.
- 2) The use contributes to fulfilling the refuge purpose(s), the Refuge System mission, or goals or objectives described in a refuge management plan approved after October 9, 1997, the date the Improvement Act was signed into law.
- 3) The use involves the take of fish and wildlife under state regulations.
- 4) The use has been found to be appropriate as specified in section 1.11.

Native American. American Indians in the conterminous United States and Alaska Natives (including Aleuts, Eskimos, and Indians) who are members of federally recognized tribes.

Priority General Public Use. A compatible wildlife-dependent recreational use of a refuge involving hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation.

Quality. The criteria used to determine a quality recreational experience include:

- Promotes safety of participants, other visitors, and facilities.
- Promotes compliance with applicable laws and regulations and responsible behavior.
- Minimizes or eliminates conflicts with fish and wildlife population or habitat goals or objectives in a plan approved after 1997.
- Minimizes or eliminates conflicts with other compatible wildlife-dependent recreation.
- Minimizes conflicts with neighboring landowners.
- Promotes accessibility and availability to a broad spectrum of the American people.
- Promotes resource stewardship and conservation.

-
- Promotes public understanding and increases public appreciation of America's natural resources and the Service's role in managing and protecting these resources.
 - Provides reliable/reasonable opportunities to experience wildlife.
 - Uses facilities that are accessible and blend into the natural setting.
 - Uses visitor satisfaction to help define and evaluate programs.

Wildlife-Dependent Recreational Use. As defined by the Improvement Act, a use of a refuge involving hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Piedmont NWR

Use: Boating

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes: X No:**

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate:

Appropriate: X

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Piedmont NWR

Use: Camping (Associated with Big Game Quota Hunts Only)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes: X No:**

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate:

Appropriate: X

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Piedmont NWR

Use: Firewood Cutting

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes: X No:**

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate:

Appropriate: X

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Piedmont NWR

Use: Forest Management

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes: X No:**

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate:

Appropriate: X

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Piedmont NWR

Use: Horseback Riding

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?		X
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		X
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?		X
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?		X
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?		X

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes:** **No: X**

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate: X

Appropriate:

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Piedmont NWR

Use: Off Road Vehicles (Handicapped Use Only)

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes: X No:**

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate:

Appropriate: X

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Piedmont NWR

Use: Research

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes: X No:**

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate:

Appropriate: X

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Piedmont NWR

Use: Training

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes: X No:**

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate:

Appropriate: X

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Piedmont NWR

Use: Walk, Jog, Biking

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes: X No:**

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate:

Appropriate: X

Refuge Manager: _____

Date: _____

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____

Date: _____

A compatibility determination is required before the use may be allowed

Appendix F. Compatibility Determinations

Piedmont National Wildlife Refuge Compatibility Determination

Uses: The following uses were found to be appropriate and evaluated to determine their compatibility with the mission of the Refuge System and the purposes of the refuge.

1. Hunting
2. Fishing
3. Environmental Education and Interpretation
4. Wildlife Observation and Photography
5. Boating
6. Camping (Associated with Big Game Hunts, Scouts of America and other Youth Organizations Only)
7. Firewood Cutting
8. Forest Management
9. Off Road Vehicles (Handicapped use only)
10. Research
11. Training
12. Walking, Jogging, Bicycling

Refuge Name: Piedmont National Wildlife Refuge.

Date Established: January 18, 1939

Establishing and Acquisition Authorities: Migratory Bird Conservation Act, Bankhead-Jones Farm Tenant Act, Executive Order Additional acquisition authority: Refuge Administration Act

Refuge Purpose(s): "... as a refuge and breeding ground for birds and other wildlife: ..." Executive Order 8037, dated Jan. 18, 1939

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. 715d (Migratory Bird Conservation Act)

"... conservation, management, and restoration of the fish, wildlife, and plant resources and their habitats for the benefit of present and future generations of Americans ..." 16 U.S.C. 668dd(a)(2) (National Wildlife Refuge System Administration Act)

Additional purposes: "... conservation, management, and restoration of the fish, wildlife, and plant resources and their habitats ... for the benefit of present and future generations of Americans..." 16 U.S.C. 668dd(a)(2) (National Wildlife Refuge System Administration Act)

"...purposes of a land-conservation and land-utilization program ..." 7 U.S.C. 1011 (Bankhead-Jones Farm Tenant Act)

National Wildlife Refuge System Mission:

The mission of the Refuge System, as defined by the National Wildlife Refuge System Improvement Act of 1997, is:

... to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Other Applicable Laws, Regulations, and Policies:

Antiquities Act of 1906 (34 Stat. 225)
Migratory Bird Treaty Act of 1918 (15 U.S.C. 703-711; 40 Stat. 755)
Migratory Bird Conservation Act of 1929 (16 U.S.C. 715r; 45 Stat. 1222)
Migratory Bird Hunting Stamp Act of 1934 (16 U.S.C. 718-178h; 48 Stat. 451)
Criminal Code Provisions of 1940 (18 U.S.C. 41)
Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d; 54 Stat. 250)
Refuge Trespass Act of June 25, 1948 (18 U.S.C. 41; 62 Stat. 686)
Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j; 70 Stat. 1119)
Refuge Recreation Act of 1962 (16 U.S.C. 460k-460k-4; 76 Stat. 653)
Wilderness Act (16 U.S.C. 1131; 78 Stat. 890)
Land and Water Conservation Fund Act of 1965
National Historic Preservation Act of 1966, as amended (16 U.S.C. 470, et seq.; 80 Stat. 915)
National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd, 668ee; 80 Stat. 927)
National Environmental Policy Act of 1969, NEPA (42 U.S.C. 4321, et seq; 83 Stat. 852)
Use of Off-Road Vehicles on Public Lands (Executive Order 11644, as amended by Executive Order 10989)
Endangered Species Act of 1973 (16 U.S.C. 1531 et seq; 87 Stat. 884)
Refuge Revenue Sharing Act of 1935, as amended in 1978 (16 U.S.C. 715s; 92 Stat. 1319)
National Wildlife Refuge Regulations for the Most Recent Fiscal Year (50 CFR Subchapter C; 43 CFR 3101.3-3)
Emergency Wetlands Resources Act of 1986 (S.B. 740)
North American Wetlands Conservation Act of 1990
Food Security Act (Farm Bill) of 1990 as amended (HR 2100)
The Property Clause of the U.S. Constitution Article IV 3, Clause 2
The Commerce Clause of the U.S. Constitution Article 1, Section 8
The National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57, USC668dd)
Executive Order 12996, Management and General Public Use of the National Wildlife Refuge System. March 25, 1996
Title 50, Code of Federal Regulations, Parts 25-33
Archaeological Resources Protection Act of 1979
Native American Graves Protection and Repatriation Act of 1990

Compatibility determinations for each description listed were considered separately. Although for brevity, the preceding sections from “Uses” through “Other Applicable Laws, Regulations and Policies” and the succeeding sections, “Literature Cited,” “Public Review,” and the “Approval of Compatibility Determinations” are only written once within the plan, they are part of each descriptive use and become part of that compatibility determination if considered outside of the comprehensive conservation plan.

Description of Use: Hunting

Recreational hunting of white-tailed deer, eastern wild turkey, northern bobwhite quail, gray and fox squirrels, eastern cottontail and swamp rabbits, raccoon, opossum, and feral hogs occurs in accordance with State of Georgia regulations and refuge specific regulations.

Availability of Resources: Minimal funding in the amount of \$30,000 annually must be available to fully implement the current hunting program. Funding is necessary to provide initial protection to the resources, implement hunt programs, provide and ensure safe access for all users, and collect biological data to ensure compliance. Based on a review of the refuge budget allocated for recreational use management, there is adequate funding to ensure compatibility and to administer and manage the recreational use(s).

Anticipated Impacts of the Use: White-tailed deer and eastern wild turkey are the most sought after game species on the refuge. The local area has a long standing tradition of hunting deer and turkey. Hunting for these species has occurred on the refuge since 1960s. Limited deer, turkey, quail, squirrel, rabbit, raccoon, opossum, and feral hog hunting can provide the public with compatible wildlife-dependent recreation through the use of a renewable resource.

Regulated white-tailed deer hunting can be used as a management tool designed to control herbivore population levels to ensure that these animals do not adversely impact the environment. White-tailed deer have the ability to overpopulate areas, which can result in heavy browsing on native forest communities and habitat destruction (Halls 1978, Hesselton and Hesselton 1982, Halls 1984, Bratton 1989). If left uncontrolled, white-tailed deer can become so numerous that they may adversely affect their habitat to the point of altering ecological diversity and succession (Warren 1991). Research has documented that increasing deer populations can alter vegetation composition and diversity, threaten abundance of less common plant species, and alter unique habitats (Bratton 1979). In addition, research has documented that changes in vegetation attributed to increasing deer populations affect other wildlife species. Studies have documented declines in songbird species density and diversity and bird species richness and abundance where overbrowsing of understory and shrub-layer vegetation occurred. (Boone and Dowell 1986, deCalesta 1994). Impacts of white-tailed deer population on the environment have been well documented and accepted through research over a period of many years. A list of literature reviewed to help make this compatibility determination is included.

Piedmont NWR is mandated to manage for native wildlife species and their associated habitats. The presence of feral and non-native species is inconsistent with this objective. Therefore, it is refuge policy to control or eliminate all non-native and feral animal species. There is currently not a viable population of feral hogs on the refuge. However, the refuge must remain vigilant to try to keep feral hogs from establishing a population.

The annual spring turkey hunts averaged 48 birds harvested per year over the last ten years. The biological impact of spring gobbler hunting on Piedmont NWR's wild turkey population is insignificant. The refuge contains good turkey habitat. Turkeys are observed throughout the refuge. There are no indications in the literature reviewed that legal spring hunting has a negative impact on turkeys. There will be some disturbance to other species of refuge wildlife. This disturbance will be of short duration and there has been no indication that it will cause biological problems for other species.

The impact of sport hunting of upland species, squirrel, rabbit, quail, raccoon, and opossum, on Piedmont NWR is considered to be insignificant. These are all small animal species with high annual turnover rates in their populations. There are no adverse population impacts from public hunting of any of these upland game species under the current hunting program. There will be some

disturbance to other species of refuge wildlife. There has been no indication that this disturbance will cause biological problems for these species. Hunter densities are low during refuge upland game hunting. This reduces potential disturbance to both other wildlife and to non-hunting visitors.

Properly regulated recreational hunting of certain game species should not have any adverse impacts on either the wildlife resources or other natural resources of the refuge. There may be some limited disturbance to certain non target species of wildlife. However, this should be short-lived and relatively minor, and is not expected to negatively impact the wetland values of the refuge. Problems associated with littering and illegal take of game (non-authorized species or over bag limit, etc.) will be controlled through effective law enforcement and education. Some sensitive areas of the refuge may have limited access and use

Hunting in this area is considered to be a traditional form of wildlife-dependent recreation. Allowing the public to hunt on the refuge will result in a positive public opinion and will help build support for the Service and its natural resource conservation agenda. It will also be allowed and managed on the refuge to assure biological sound use of a renewable resource. The hunt program will help the refuge manage the deer and hog populations to prevent habitat destruction and negative impacts on other wildlife species.

Public Review and Comment:

This draft compatibility determination will be available for review and comment during the public review period established for the Draft Comprehensive Conservation Plan and Environmental Assessment for Piedmont National Wildlife Refuge. All comments will be addressed in the final determination.

Determination (check one below)

Use is Not Compatible

Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility: Hunting may be permitted in accordance with special refuge and State of Georgia regulations and licensing/permitting requirements, with the following exceptions:

- The refuge will be open for public use during daylight hours only, except during the limited raccoon and opossum hunts.
- Vehicle use will be limited to open, maintained roads.
- Some areas of the refuge may be zoned or restricted to season of use while others areas may be closed to all public use.
- Vehicles, boats or other personal equipment may not be left on the refuge overnight, except during deer and turkey season when tree stands and hunting blinds may be placed the day before each hunt and removed by 11 a.m. the day after the hunt.
- No gasoline boat motors or gasoline engines will be allowed in ponds.
- Firearms/bows will be prohibited except during permitted refuge hunts.
- Biological data will be collected and analyzed for deer and turkey to ensure that the hunts are biologically sound and annual hunt evaluation reports will be prepared by refuge staff.
- An active refuge law enforcement program will ensure regulation compliance and protect refuge resources.

- No public camping will be allowed except in the designated campground during deer and turkey hunts with a valid refuge hunt permit.
- When the refuge’s comprehensive conservation plan is completed, additional refuge-specific regulations may be implemented.

Justification: The Service’s current policy is to expand and enhance opportunities for quality hunting and fishing on national wildlife refuges. Hunting is considered to be compatible with the refuge purpose and meets one of the refuge objectives, to provide for compatible wildlife-dependent recreation. Allowing hunting follows current Service policy to expand and enhance opportunities for quality fishing and hunting on refuges. Allowing hunting also helps to maintain and build support for the Service and other wildlife conservation efforts. There has been substantial historical use of these upland areas for hunting. Based on the available information, there is no indication of adverse biological impacts associated with these activities.

Allowing well managed hunting of white-tailed deer, turkey, quail, squirrels, rabbits, raccoon, opossum, and feral hogs is consistent with refuge objectives and follows current Service policy. The interim hunt plan is conservatively based and designed to meet management needs. The primary purpose of allowing public hunting of white-tailed deer and feral hogs is to control herbivore populations in balance with their habitat and other wildlife species. The proposed hunt program will provide quality public recreation through the harvesting of a renewable natural resource.

During the comprehensive conservation planning process, which will be completed with appropriate public input, the Service will consider additional and expanded public use opportunities. Adjustments to the public use program may be made at that time. There are a number of situations where refuge closures or restrictions may be warranted. Examples of these situations include, but are not limited to, the protection of endangered species, protection of colonial bird rookeries, establishment of sanctuary areas for waterfowl, or conflicts with other refuge management programs.

Based on the available information, it has been determined that the expected level of public hunting of white-tailed deer, turkey, quail, squirrels, rabbits, raccoon, opossum, and feral hogs that will occur within the Piedmont NWR is compatible with the purposes for which the refuge was established and is biologically sound.

NEPA Compliance for Refuge Use Description: *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
- Categorical Exclusion and Environmental Action Statement
- Environmental Assessment and Finding of No Significant Impact
- Environmental Impact Statement and Record of Decision

Mandatory 15-year Re-evaluation Date:

Description of Use: Fishing

Recreational fishing in accordance with State of Georgia regulations and refuge specific regulations.

Availability of Resources: Minimal funding in the amount of \$10,000 annually must be available to fully implement the current fishing program. Funding is necessary to provide initial protection to the resources, implement fishing programs, provide and ensure safe access for all users, and collect biological data to ensure compliance. Based on a review of the refuge budget allocated for recreational use management, there is adequate funding to ensure compatibility and to administer and manage the recreational use.

Anticipated Impacts of the Use: Fish found on the refuge are warm water species. Bass, bream, catfish, rough fish, darters, and minnows are common to the area. The local area has a long standing tradition of fishing. Limited fishing has occurred on the refuge since 1950s. Fishing can provide the public with compatible wildlife oriented recreation through the use of a renewable resource.

Species of concern which might be impacted by the sport fishing program are migratory and resident waterfowl. Waterfowl behavioral changes and movements to less disturbed areas in response to boating, especially wintering and migratory waterfowl, have been documented (Boyle and Samson 1985). Edwards and Bell (1987) suggested that wildlife areas free from disturbance be expanded at refuges during critical stages of overwintering and breeding. The refuge fishing season is closed during the greatest period of use by migratory waterfowl, from October 1 to March 31, to protect both wintering and nesting waterfowl from disturbance.

The intensity of fishing and related boating at Piedmont NWR is at a level that does not cause significant siltation or add significant levels of other contaminants to the aquatic environment. Fishing paths that become established are very narrow and separated from the waterlines by strips of grasses and aquatic vegetation. There is such a low level of fishing use on refuge streams it is unlikely that any possible effects would be measureable.

Properly regulated recreational fishing of certain game species should not have any adverse impacts on either the wildlife resources or other natural resources of the refuge. There may be some limited disturbance to certain non-target species of wildlife. However, this should be short-lived and relatively minor, and is not expected to negatively impact the biological values of the refuge. Problems associated with littering and illegal take of fish (non-authorized species, under the size limit, etc) will be controlled through effective law enforcement and education. Some sensitive areas of the refuge may have limited access and use.

Fishing in this area is considered to be a traditional form of wildlife-dependent recreation. Allowing the public to fish on the refuge will result in a positive public opinion and will help build support for the Service and its natural resource conservation mission. It will also be allowed and managed on the refuge to assure biological sound use of a renewable resource.

Public Review and Comment:

This draft compatibility determination will be available for review and comment during the public review period established for the Draft Comprehensive Conservation Plan and Environmental Assessment for Piedmont National Wildlife Refuge. All comments will be addressed in the final determination.

Determination (check one below):

Use is Not Compatible

Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility: Fishing may be permitted in accordance with special refuge and State of Georgia regulations and licensing/permitting requirements, with the following exceptions:

- The refuge will be open for public use during daylight hours only.
- Fishing will be allowed only during the period from April 1 to September 30, although some ponds in the future may be open for fishing year-round.
- Vehicle use will be limited to open maintained roads.
- Some areas of the refuge may be zoned or restricted to season of use while others areas may be closed to all public use.
- No gasoline boat motors or other gasoline engines will be permitted. Electric motors may be used.
- An active refuge law enforcement program will ensure regulation compliance and protect refuge resources.
- When the refuge's comprehensive conservation plan is completed, additional refuge-specific regulations may be implemented.

Justification: The Service's current policy is to expand and enhance opportunities for quality fishing on national wildlife refuges. Fishing is considered to be compatible with the refuge purpose and meets one of the refuge objectives, to provide for compatible wildlife-dependent recreation. Allowing fishing follows current Service policy to expand and enhance opportunities for quality fishing on refuges. Allowing fishing also helps to maintain and build support for the Service and other wildlife conservation efforts. There has been substantial historical use of this area for fishing. Based on the available information, there is no indication of adverse biological impacts associated with this activity.

Allowing well managed fishing is consistent with refuge objectives, and follows current Service policy. Continuing the fishing program will provide quality public recreation through the harvesting of a renewable natural resource.

During the comprehensive conservation planning process, which will be completed with appropriate public input, the Service will consider additional and expanded public use opportunities. Adjustments to the public use program may be made at that time. There are a number of situations where refuge closures or restrictions may be warranted. Examples of these situations include, but are not limited to, the protection of endangered species, protection of colonial bird rookeries, establishment of sanctuary areas for waterfowl, or conflicts with other refuge management programs.

Based on the available information, it has been determined that the expected level of public sport fishing that will occur within the Piedmont NWR is compatible with the purposes for which the refuge was established and is biologically sound.

NEPA Compliance for Refuge Use Description: *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
- Categorical Exclusion and Environmental Action Statement
- Environmental Assessment and Finding of No Significant Impact
- Environmental Impact Statement and Record of Decision

Mandatory 15-year Re-evaluation Date:

Description of Use: Environmental Education and Interpretation

Environmental education and interpretation are those activities which seek to increase the public's knowledge and understanding of wildlife, national wildlife refuges, ecology, cultural and historical significance, and land management, as well as contribute to the conservation of natural resources. Environmental education/interpretation activities have been given only upon request in prior years. In the future, these programs will be structured around activities conducted by staff or trained volunteers. The staff will develop and provide curriculum and support materials to area teachers for use both on and off the refuge. Informational kiosks and interpretive panels will be developed at key refuge entrance points, at current interpretative sites, and at the wildlife observation platforms as part of the environmental education/interpretation program.

Availability of Resources: No additional fiscal resources are needed to conduct this use at the current level. The existing staff can administer, manage and monitor this limited use as part of the environmental education/interpretation program. Reinstatement of the park ranger interpretive position will be needed to fully implement this program.

Anticipated Impacts of the Use: Construction of facilities, such as boardwalks, kiosks and observation platforms, will alter small portions of the natural environment on the refuge. Proper planning and placement of facilities will ensure that wetlands, threatened or endangered species, or species of special concern are not negatively impacted. Proper permits through the county, state, and federal regulatory agencies will be obtained prior to construction to ensure resource protection. The use of on-site, hands-on, action-oriented activities to accomplish environmental education and interpretive tours may impose a low-level impact on the sites used for these activities. These low-level impacts may include trampling of vegetation and temporary disturbance to wildlife species in the immediate area. Educational activities held off-refuge will not create any biological impacts on the resource.

Public Review and Comment:

This draft compatibility determination will be available for review and comment during the public review period established for the Draft Comprehensive Conservation Plan and Environmental assessment for Piedmont National Wildlife Refuge. All comments will be addressed in the final determination.

Determination (check one below):

Use is Not Compatible

Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility: Zoning of visitor activities by time and space, clustering public use facilities, proper monitoring, educating visitors, and enforcing laws will ensure compatibility with the purposes of the refuge and mission of the National Wildlife Refuge System. Through periodic evaluation of trails and visitor contact points, the visitor services program will assess resource impacts. If future human impacts are determined through evaluation to be detrimental to important natural resources, actions will be taken to reduce or eliminate those impacts. Major portions of the refuge will remain undeveloped, without public interpretive facilities.

Justification: Interpretation and environmental education are identified in the National Wildlife Refuge System Improvement Act of 1997 as activities that should be provided and expanded on refuges. Educating and informing the public through structured environmental education courses, interpretive materials, and guided tours about migratory birds, endangered species, wildlife and habitat management, cultural and historic events and artifacts, and ecosystems will lead to improved support of the Service's mission to protect our natural resources.

NEPA Compliance for Refuge Use Description: *Place an X in appropriate space.*

Categorical Exclusion without Environmental Action Statement

Categorical Exclusion and Environmental Action Statement

Environmental Assessment and Finding of No Significant Impact

Environmental Impact Statement and Record of Decision

Mandatory 15-year Re-evaluation Date:

Description of Use: Wildlife Observation and Photography

Wildlife observation and photography are public uses that will allow the visiting public to enjoy, experience, and learn about native wildlife, plants, and habitats. Wildlife observation and photography on the 34,967 acres currently managed by the refuge will have negligible impacts on the refuge unit's resources. Non-consumptive wildlife observation uses, such as bird watching, auto tour routes, hiking, and nature photography, are minimal at this time due to the area's distance from large metropolitan areas. It is estimated that 28,000 visits/year are attributed to wildlife observation and related activities. There are six dedicated hiking trails, one 6-mile auto tour, and two observation platforms, as well as many unmarked abandoned roads, logging roads, and trails located throughout the refuge.

It is anticipated that an increase in non-consumptive wildlife-dependent uses will occur over the next few years as facilities and access are improved and especially as the public and conservation groups become aware of the excellent birding/wildlife viewing opportunities on the refuge.

Information regarding wildlife observation and photography opportunities will be placed in the general refuge brochure available at the visitor center, entrance to the wildlife drive, and at the kiosk located at Allison Lake. The trails will be marked to allow for self-guided tours. The refuge will be open during daylight hours for the entire year, except for certain locations which may closed from time to time due to various management operations.

Availability of Resources: Refuge staff plan and implement all wildlife observation and photography activities. The refuge has sufficient staff to accomplish these activities. There are six designated trails located on the refuge that facilitate wildlife observation and photography by the public. No improvements are needed to conduct the use. All maintenance costs associated with the upkeep of the trails will be borne by the refuge. It is anticipated that the yearly maintenance cost will be \$5,000. Monitoring wildlife observation and photography activities is an administrative function; costs are accounted for in personnel salaries.

Anticipated Impacts of the Use: *Short-term impacts:* Wildlife observation and photography activities may result in some disturbance to wildlife. Refuge road systems, foot trails, photo blinds, boardwalks, and wildlife observation platforms will be located to minimize disturbance that occurs in these sensitive areas. If unacceptable levels of disturbance are identified at any time, sensitive sites will be closed to public entry. Some minimal trampling of vegetation also may occur.

Long-term impacts: Construction of foot trails, boardwalks, observation platforms, and the upgrading of refuge roads will alter small portions of the natural environment. Proper planning prior to construction, sediment retention, and grade stabilization features will reduce negative impacts to wetlands, threatened and endangered species, and species of special concern. Impacts, such as trampling vegetation and wildlife disturbance by refuge visitors, do occur but are presently not significant. Other potential negative impacts are caused by visitors violating refuge regulations, such as littering or illegally taking plants or wildlife. Refuge roads are maintained for habitat and biological management programs and law enforcement. Use of roads by the public does incur added maintenance costs.

Cumulative impacts:

Wildlife observation and photography should not contribute substantially to negative cumulative impacts on the habitat and associated wildlife. Some disturbance will occur but should not cause impacts beyond the immediate vicinity of the activity.

Public Review and Comment:

This draft compatibility determination will be available for review and comment during the public review period established for the Draft Comprehensive Conservation Plan and Environmental Assessment for Piedmont National Wildlife Refuge. All comments will be addressed in the final determination.

Determination (check one below):

Use is Not Compatible

Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility: Wildlife observation and photography may be permitted in accordance with special refuge and State of Georgia regulations and licensing/permitting requirements, with the following exceptions:

- The refuge will be open for public use during daylight hours only.
- Vehicle use will be limited to open, maintained roads.
- Some areas of the refuge may be zoned or restricted to season of use while others areas may be closed to all public use.
- An active refuge law enforcement program will ensure compliance with regulations and protect refuge resources.
- When the refuge's comprehensive conservation plan is completed, additional refuge-specific regulations may be implemented.

Justification: Wildlife observation and photography are important and encouraged public uses at Piedmont NWR and the National Wildlife Refuge System. The National Wildlife Refuge System Improvement Act of 1997 identified wildlife observation and photography as a priority public recreational use to be facilitated on refuges. It is through permitted, compatible public uses such as this that the public becomes aware of and provides support for our national wildlife refuges.

NEPA Compliance for Refuge Use Description: *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
- Categorical Exclusion and Environmental Action Statement
- Environmental Assessment and Finding of No Significant Impact
- Environmental Impact Statement and Record of Decision

Mandatory 15-year Re-evaluation Date:

Description of Use: Boating

The use of non-motorized boats and boats with electric motors for recreational purposes during the refuge fishing season at Piedmont NWR is a minor use which occurs on the refuge. Although it is not a priority public use, it is associated with several priority uses such as hunting, fishing, and wildlife observation.

Availability of Resources: No additional fiscal resources are needed to conduct this use. Funding for this program is borne by annual operation and maintenance funds, which include activities involving the public such as recreation, interpretation, environmental education, and conduct of refuge hunting and fishing programs. Existing staff can administer permits and monitor use as part of routine management duties.

Anticipated Impacts of the Use: Short-term impacts: Most of the impacts that could occur will involve some violation of refuge regulations such as deliberate disturbance of wildlife or plants, littering, or vandalism. Disturbance to trust species during critical wintering periods is mitigated by seasonal closure. Short-term impacts to facilities such as roads and structures can be avoided by special closures due to unsafe conditions.

Long-term impacts: No long-term negative impacts are anticipated.

Cumulative impacts: No cumulative negative impacts are anticipated, however, programs may be modified in the future to mitigate unforeseen impacts.

Public Review and Comment:

This draft compatibility determination will be available for review and comment during the public review period established for the Draft Comprehensive Conservation Plan and Environmental Assessment for Piedmont National Wildlife Refuge. All comments will be addressed in the final determination.

Determination (check one below)

Use is Not Compatible

Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility: Zoning of visitor activities by time and space, clustering public use facilities, proper monitoring, educating visitors, and enforcement will ensure compatibility with the purposes of the refuge and mission of the National Wildlife Refuge System. Through periodic evaluation of boating effects on wildlife, the visitor services program will assess resource impacts. If future human impacts are determined through evaluation to be detrimental to important natural resources, actions will be taken to reduce or eliminate those impacts. Boating will be allowed seasonally so as not to adversely interfere with wintering and nesting waterfowl usage patterns.

The refuge will be open for public use during daylight hours only.

Boating will be allowed only during the period from April 1 to September 30 during refuge fishing season, although some ponds in the future may be open for fishing year-round.

Vehicle use will be limited to open maintained roads.

Some areas of the refuge may be zoned or restricted to season of use while others areas may be closed to all public use.

No gasoline boat motors or other gasoline engines will be permitted. Electric motors may be used.

An active refuge law enforcement program will ensure regulation compliance and protect refuge resources.

When the refuge's comprehensive conservation plan is completed, additional refuge-specific regulations may be implemented.

Justification: The primary objective for which the refuge was established is to provide the public with wildlife-oriented recreational opportunities. Non-motorized boating and boating with electric motors at the refuge, which adheres to established regulations, is an activity that is compatible with that purpose.

NEPA Compliance for Refuge Use Description: *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
- Categorical Exclusion and Environmental Action Statement
- Environmental Assessment and Finding of No Significant Impact
- Environmental Impact Statement and Record of Decision

Mandatory 10-year Re-evaluation Date:

Description of Use: Camping (associated with big game hunting, Scouts of America, or other children’s organizations, only)

Camping associated with the big game (white-tailed deer and wild turkey), Scouts of America and other youth organizations on Piedmont NWR is a use which occurs on the refuge. Although it is not a priority public use, it is associated with several priority uses such as hunting, environmental education, interpretation, and wildlife observation.

Availability of Resources: Minimal fiscal resources of \$2,500, annually, are needed to conduct this use. Funding for this program is borne by the refuge recreational fee program and annual station and maintenance funds, which include activities involving the public such as recreation, interpretation, environmental education, and conduct of refuge hunting and fishing programs. Existing staff can administer permits and monitor use as part of routine management duties.

Anticipated Impacts of the Use: Short-term impacts: Most of the impacts that could occur will involve some violation of refuge regulations such as deliberate disturbance of wildlife or plants, littering, or vandalism. Disturbance to trust species during critical wintering periods is mitigated by seasonal closure. Short-term impacts to facilities such as roads and structures can be avoided by special closures due to unsafe conditions.

Long-term impacts: No long-term negative impacts are anticipated.

Cumulative impacts: No cumulative negative impacts are anticipated, however, programs may be modified in the future to mitigate unforeseen impacts.

Public Review and Comment:

This draft compatibility determination will be available for review and comment during the public review period established for the Draft Comprehensive Conservation Plan and Environmental Assessment for Piedmont National Wildlife Refuge. All comments will be addressed in the final determination.

Determination (check one below):

Use is Not Compatible

Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility: Zoning of visitor activities by time and space, clustering public use facilities, proper monitoring, educating visitors, and enforcement will ensure compatibility with the purposes of the refuge and mission of the National Wildlife Refuge System. Through periodic evaluation of camping effects on wildlife, the visitor services program will assess resource impacts. If future human impacts are determined through evaluation to be detrimental to important natural resources, actions will be taken to reduce or eliminate those impacts. Camping will be restricted to the Pippin Lake Campground only. Camping will only be allowed during the big game hunts and only by those individuals possessing a valid refuge hunt permit for those hunts. Camping by Scouts of America and other youth organizations will only be allowed by the issuance of a special use permit specifying date and time of camping event. In order to be issued a special use permit, these groups will have to perform a designated service project, such as cleaning/clearing hiking trails, painting boundaries and/or red-cockaded woodpecker cluster sites, and other such projects, on the refuge. The project will be determined by the refuge staff.

Justification: The primary objective for which the refuge was established is to provide the public with wildlife oriented recreational opportunities. Camping associated with big game hunting, Scouts of America, and other youth organizations at the designated campground on the refuge is an activity that is compatible with that purpose.

NEPA Compliance for Refuge Use Description: *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
 Categorical Exclusion and Environmental Action Statement
 Environmental Assessment and Finding of No Significant Impact
 Environmental Impact Statement and Record of Decision

Mandatory 10-year Re-evaluation Date:

Description of Use: Firewood Cutting

Cutting firewood for personal use through a special use permit system is allowed on the refuge. It is limited by permitting the cutting of only dead and downed trees. The nature of the use restricts the activity to fresh downed trees adjacent to roads open to vehicles. Standing dead or live trees cannot be cut and permittees cannot travel off a regular maintained road. It is a self limiting activity that primarily involves rural neighbors. Permit numbers are often dependent upon the occurrence of storms that increase the availability of downed trees.

This use would take place along roads that are open to vehicles. Firewood cutting would be allowed year-round. However, requests for permits usually occur in the late fall and winter. Individuals would be able to obtain a permit from the refuge headquarters during normal business hours.

This activity would allow the public to utilize a renewable resource to help heat homes and save fossil fuel while still protecting refuge micro-habitats. Firewood cutting on the refuge primarily would involve trees, adjacent to main roads, downed due to storms or other events. Standing trees and snags would be protected. The use would have no real cost to the refuge and will not materially interfere with, nor detract from the purposes for which the refuge was established.

Availability of Resources: The station has adequate resources to cover the cost of the proposed use. No special equipment, facilities, or improvements are needed to support the use. There would be no maintenance or monitoring costs.

Anticipated Impacts of the Use: Short-term impacts: Firewood cutting as proposed would not impact the refuge mission or management activities. The activity would cause some temporary disturbance to wildlife from noise and trampling of vegetation. The impact would be short in duration and limited in scope. As proposed, firewood cutting would have minimal impact on refuge resources. Disturbance to wildlife from automobile and foot traffic associated with firewood cutting is not known to be a problem.

Long-term impacts: The primary biological impact of firewood cutting as proposed would be the removal of downed timber and limbs. Dead and decaying ground logs and deadfalls are an important forest ecosystem micro-habitat. Fallen dead trees provide insects and other food for small animals like salamanders, lizards, snakes, mice, and insects, which, in turn, provide food for larger animals. (Jackson et al. 1981). Communities of micro-fauna found in decaying wood play a critical role in forest decomposition and nutrient cycling. Firewood cutting as proposed on the refuge would not materially impact these important micro-habitats, because only relatively newly fallen trees would be removed. These trees would be within close proximity to main roads and found in limited numbers. Valuable snags and standing dead trees would be protected from any cutting.

Cumulative impacts: Firewood cutting as proposed would not contribute to any substantive impacts to the refuge forest system. The use is self limiting to roadsides. The removal of downed trees from roadsides would reduce maintenance associated with other habitat management activities such as prescribed burning and mowing.

Public Review and Comment:

This draft compatibility determination will be available for review and comment during the public review period established for the Draft Comprehensive Conservation Plan and Environmental Assessment for Piedmont National Wildlife Refuge. All comments will be addressed in the final determination.

Determination (check one below):

Use is Not Compatible

Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

- Firewood cutting for personal use will be conducted through a special use permit system.
- Parts of the refuge will be closed to public access to avoid user conflicts with other management programs. Areas closed to public use will be posted and patrolled.
- An active refuge law enforcement program will ensure regulation and permit compliance and will protect refuge resources and the public.
- Only dead and downed trees will be cut.
- The activity will be monitored to ensure it does not reach a level to materially impact micro-habitats.
- Vehicle use will be limited to roads designated as open.

Justification: A limited number of firewood permits will be issued to permit the public to utilize a renewable resource. Firewood is used to help heat homes and save fossil fuels. This activity involves storm downed trees next to main roads. Standing trees and snags are protected. The use has no real cost to the refuge and will not materially interfere with, or detract from the purposes for which the refuge was established.

NEPA Compliance for Refuge Use Description: *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
 Categorical Exclusion and Environmental Action Statement
 Environmental Assessment and Finding of No Significant Impact
 Environmental Impact Statement and Record of Decision

Mandatory 10-year Re-evaluation Date:**Description of Use: Forest Management**

This is an ongoing historical use that provides a tool to manage refuge lands for the benefit of wildlife, both resident and migratory, by improving and manipulating their habitats through forest thinnings and regeneration methods.

Forest management objectives support refuge objectives:

- 1) Restore and maintain good quality red-cockaded woodpecker (RCW) habitat.
- 2) Improve habitat for other resident and migratory wildlife:
 - a. Restore and maintain upland oak-pine and bottomland hardwood habitat throughout the refuge.
 - b. Restore habitat diversity, especially canebrakes, throughout refuge bottomlands.
- 3) Reduce hazardous fuels, especially in the Wildland-Urban Interface.
- 4) Address southern pine beetle outbreaks.

The RCW, as endangered species, has first priority in forest management. The RCW prefers mature, open canopy pine stands with little midstory and a herbaceous understory. Management is aimed at creating and maintaining cluster sites and restoring and improving foraging habitat. Refuge pine stands are managed using the two-aged system with a 100-year rotation. Two-aged stands are

created by modified seed tree and irregular shelterwood regeneration methods. Thinning is important to reduce stand density to the desired basal area range.

Managing the hardwood stands for acorn production is another forest management objective. Acorn-producing hardwoods stands are an important wildlife resource. Larger diameter oaks with crowns fully exposed to sunlight produce more acorns than trees with crowns partially or totally shaded. Thinning is important to increase acorn production.

Canebrakes are associated with rich bottomlands and streambanks. They can be shaded out or greatly reduced by hardwoods following the complete suppression of fire. Once a canebrake is gone, another is unlikely to replace it, and the wildlife dependent on it will disappear. Thinning is an important part of an integrated program to restore canebrakes and bottomland diversity.

Some silvicultural techniques employed to achieve management objectives may meet the Hazard Fuel Reduction and/or Wildland-Urban Interface (WUI) mitigation goals of the 10-year Comprehensive Strategy and the key points of the 2001 National Fire Plan. The WUI communities around the refuge listed in the Federal Register (66 FR 160) are Dames Ferry, East Juliette, Round Oak, and Wayside.

There are approximately 25,000 acres of uplands dominated by pine-hardwood stands on Piedmont NWR that are potential RCW habitat. There are approximately 9,000 acres of upland and bottomland hardwoods. These hardwood stands will be treated opportunistically rather than systematically.

Forest management activities happen year round. Inventory and tree marking activities are conducted by and silvicultural prescriptions written by refuge staff. Prescriptions are reviewed by the regional office and then implemented by refuge staff through a public bid process and special use permits. A Section 7 Endangered Species Consultation and a Section 106 Request for Cultural Resource Compliance are sent to their respective offices for review and concurrence.

Under the Endangered Species Act there are legislative requirements to actively manage endangered species on Federal lands. The first stated objective of the refuge is the conservation, restoration, and enhancement of endangered or threatened species of plants and animals. Managing the forest will also benefit other migratory and resident wildlife.

Availability of Resources: Refuge staff plan and implement all forest management activities. The refuge has sufficient staff to accomplish these activities. There is no special equipment, facilities, or improvements necessary to support this use. All maintenance costs associated with a commercial timber sale or salvage operation will be borne by the special use permit holder. Monitoring forest management activities is an administrative function; costs are accounted for in personnel salaries.

Anticipated Impacts of the Use: *Short-term impacts:* Forest management activities may disturb the soil, causing concerns about non-point source pollution (i.e., soil erosion and stream sedimentation). The Federal Water Pollution Control Act mandated states to develop a program to protect and improve the physical, chemical, and biological integrity of the nation's waterways. The practices developed are called Best Management Practices (BMPs). Using BMPs to control soil erosion and stream sedimentation is the most appropriate forestry practice to attain a silvicultural goal while protecting the integrity of waterways. BMP implementation is a mandatory practice on the refuge.

Long-term impacts: Managing the pine and pine-hardwood stands will greatly improve the habitat for the RCW, as well as associated species, including species of concern such as the Bachman's sparrow, prairie warbler, and brown-headed nuthatch.

Several pine beetle species, including southern pine beetle (SPB), Ips beetle, and the black turpentine beetle, can threaten both pine and pine-hardwood stands. The highest threat is from SPB outbreaks. Thinning these stands to a desired basal area lowers the risk from SPB infestation.

Drought stresses trees, reducing their vigor and increasing susceptibility to insects and diseases. Pine stands with a high basal area cease growth under conditions of low available water. However, pine stands thinned to within a desirable basal area range for RCW management grow continuously, even during severe drought. This greatly reduces the susceptibility of a stand to insect or disease outbreaks, even during drought.

Intensively managing habitat for the RCW may be a concern for certain neotropical migratory birds. Most high-priority neotropical migratory birds are best managed for in bottomland hardwoods. The wood thrush is an example of a neotropical migratory bird of concern that occurs on the refuge. It prefers hardwood or hardwood and pine overstory with a dense mid- and under-story, on lower slopes near streams. Research indicates there are no negative effects from thinning operations, regeneration operations using irregular shelterwood harvests, or prescribed fire operations for RCW on wood thrushes. Birds are not the only animals that benefit from RCW management. Rodents and shrews increase in relative abundance an average of three times the first growing season after a prescribed burn in thinned stands compared to unthinned, unburned stands.

Cumulative impacts:

Forest management is producing a sustained yield of resources and benefits from the forest. The sustained, uniform flow of RCW habitat through time can be provided with a managed forest approach. Indeed, RCW populations decline dramatically in forests that do not use state-of-the-art forest management practices as compared to those in unmanaged forests. The highest potential negative impact of the use is not having the use. This will lead to the decline and even extirpation of an endangered species from the refuge.

Public Review and Comment:

This draft compatibility determination will be available for review and comment during the public review period established for the Draft Comprehensive Conservation Plan and Environmental Assessment for Piedmont National Wildlife Refuge. All comments will be addressed in the final determination.

Determination (check one below):

Use is Not Compatible

Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility: All management actions will be in accordance with Service and regional policies and guidelines, and with approved forest management prescriptions. Refuge staff will monitor all permitted forest management operations to ensure they are in compliance with special use permit conditions. Any special use activity not in compliance will be immediately stopped. Georgia's Best Management Practices for Forestry will be used as a guide to protect refuge resources.

Justification: Forest management, including thinning and regeneration of the pine and pine-hardwood forest on Piedmont NWR, is required to create and maintain the habitat needed by the endangered red-cockaded woodpecker. Thinning is necessary to improve mast production in upland oaks and to encourage canebrake expansion in the bottomlands. This is necessary to manage for other migratory and resident wildlife on the refuge. Silviculture is an important component in meeting Hazard Fuel Reduction (HFR) and/or Wildland-Urban Interface (WUI) mitigation goals of the 10-Year Comprehensive Strategy and the key points of the 2001 National Fire Plan. Forest Management is compatible, is justified, and is a vital part of refuge management.

The Code of Federal Regulations states, "We may only authorize public or private economic use of the natural resources of any national wildlife refuge ... where we determine that the use contributes to the achievement of the national wildlife refuge purposes or the National Wildlife Refuge System mission" (50 CFR 29.1). The first purpose of the refuge is to "Conserve, restore, and enhance in their natural ecosystems (when practicable) all species of animals and plants that are endangered or threatened with becoming endangered." The second purpose is to "Perpetuate the migratory bird resource." Managing the pine and pine-hardwood forests will greatly improve the habitat for the RCW, as well as associated species, including species of concern such as the Bachman's sparrow, prairie warbler, and brown-headed nuthatch. Forest management not only contributes to the achievement of refuge purposes but is necessary to the achievement of refuge purposes. The only cost effective way to do this forest management is through a public bid process and special use permits.

NEPA Compliance for Refuge Use Description: *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
- Categorical Exclusion and Environmental Action Statement
- Environmental Assessment and Finding of No Significant Impact
- Environmental Impact Statement and Record of Decision

Mandatory 10-year Re-evaluation Date:

Description of Use: Off Road Vehicles (confined to wheelchair for mobility only)

Use of off-road vehicles (4-6 wheel ATVs or vehicles) by mobility impaired disabled hunters is essential in providing adequate hunting opportunities for these individuals. The use of ATVs is the most cost-effective method of providing access for disabled hunters. Use is restricted to transportation to and from designated hunting locations, including the transport of personal gear and game taken by the disabled hunter. Carrying one permitted assistant is also permitted.

This use would be allowed in designated areas open to hunting on the refuge. Use is only allowed during established refuge hunting seasons with a refuge permit.

Off-road access by disabled hunters is allowed to wheelchair bound persons with written documentation from a physician stating that they are mobility impaired and confined to a wheelchair permanently or temporarily, with date of impairment. A refuge special use permit is issued for a specified hunt period, and access is restricted to a designated route of travel along existing foot travel, and/or management access road. No access is given for roads open to vehicles, power lines, or other rights-of-way. The request of hunting location is taken on a first-come, first-served basis and

coordinated with other refuge activities. Sensitive areas, hazardous areas, and inclement weather are factors considered in restricting use at discretion of the refuge manager. This permit grants no other privileges other than access by ATV or vehicle on designated routes on the refuge. The permittee must comply with all other refuge and State hunting regulations.

This use supports the Americans with Disabilities Act by facilitating quality hunting opportunities to wheelchair bound persons. The use of ATVs is essential in providing a safe and enjoyable opportunity for these individuals.

Availability of Resources: Resources involved in the administration and management of the use include review and issuance of special use permits. No special equipment, facilities, or improvements are necessary to support the use. Maintenance costs such as mowing and clearing refuge foot travel roads prior the hunt would be minimal. These roads are normally maintained on a 2-year cycle if not used during the special hunt and support other management and recreational activities. Monitoring costs include all monitoring conducted in conjunction with the refuge hunting program, and no additional costs will be attributed to this program.

Anticipated Impacts of the Use: Short-term impacts: Impacts to wildlife, plants, and habitat by the use of off-road vehicles are well documented and some disturbance to wildlife, plants, and their habitats is expected to occur. However, this minor impact is acceptable in providing suitable access to disabled hunters who use ATVs or vehicles to access hunting opportunities on the refuge. Permits are issued for 3 to 5 days and limit one hunter to a location.

Long-term impacts: No long-term impacts are expected due to the short duration and limited scope of anticipated use.

Cumulative: No cumulative impacts are anticipated with this use.

Public Review and Comment:

This draft compatibility determination will be available for review and comment during the public review period established for the Draft Comprehensive Conservation Plan and Environmental Assessment for Piedmont National Wildlife Refuge. All comments will be addressed in the final determination.

Determination (check one below):

Use is Not Compatible

Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility: The refuge has established a policy for the level of disability that necessitates the use of ATVs for hunting on the refuge. Prior to issuance of a special use permit, persons applying for disabled hunter status must provide written proof of mobility impaired disability from their physician which is reviewed. All other refuge regulations apply.

Justification: A primary objective for which the refuge was established is to provide the public with wildlife-oriented recreation. Allowing disabled hunters to use off-road vehicles to pursue their sport provides this group with no more opportunity than that which is afforded to the general public.

Provided this activity adheres to the refuge regulations, it is an activity which is compatible with refuge objectives.

NEPA Compliance for Refuge Use Description: *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
- Categorical Exclusion and Environmental Action Statement
- Environmental Assessment and Finding of No Significant Impact
- Environmental Impact Statement and Record of Decision

Mandatory 10-year Re-evaluation Date:

Description of Use: Research

This use is research or other ecological investigations not conducted by the Service or Service-authorized agent. Research by non-Service personnel, is conducted by colleges, universities, federal, state, and local agencies. We also consider research for other purposes that may not relate directly to refuge-specific objectives, but contribute to the broader enhancement, protection, use, preservation, or management of native populations of fish, wildlife and plants, and their natural diversity in the region or the Atlantic Flyway. All proposals must comply with Service policy on compatibility.

Specific areas open for research will be stipulated in conditions of a special use permit, including access points. Research could potentially occur throughout the year. The mechanics of the research will depend entirely on the individual research project. We will carefully scrutinize the objectives, methods, and approach of each research project before allowing it on the refuge. The refuge will not allow any research project that lacks an approved study plan and protocol or compromises public health and safety.

Availability of Resources: Refuge support for research may take the form of funding; in-kind services such as housing, the use of other refuge facilities, vehicles, boats, or equipment; management treatments; or providing other assistance as appropriate. Generally, however, we incur the bulk of the cost for research in staff time to review research proposals, coordinate with researchers, and write special use permits. On some cases, a research project may require only a few hours of staff time to review the proposal, coordinate with other reviewers, and write a special use permit.

For projects conducted entirely by non-Service researchers, the following staff resources would be typical: Proposal review, coordination, and special use permit preparation; Refuge Manager, 2 hours at \$101.57; Assistant Manager, 2 hours at \$ 93.64; Wildlife Refuge Specialist, 8 hours at \$197.20.

Anticipated Impacts of the Use: Short-term impacts: There may be short-term disturbance to plants and wildlife during field investigations, but this is unavoidable in most cases. We will conduct Intra-Service Section 7 Biological Evaluations for any proposal that could be anticipated to have an impact on any federally threatened or endangered species. We will ensure that the refuge or any non-Service researchers obtain any special permits, including collection and banding permits, required by State or Federal law prior to issuing a special use permit.

Long-term impacts: The primary biological impact from research would be the temporary disturbance to wildlife from sight and sounds. Since this activity would occur at minimal levels and for short durations, any disturbance of wildlife is expected to be minimal.

Cumulative impacts: Since this activity occurs at minimal levels and is short in duration, any disturbance of wildlife is expected to be minimal. There is no indication that the level of disturbance would create any long term problems.

Public Review and Comment:

This draft compatibility determination will be available for review and comment during the public review period established for the Draft Comprehensive Conservation Plan and Environmental Assessment for Piedmont National Wildlife Refuge. All comments will be addressed in the final determination.

Determination (check one below):

Use is Not Compatible

Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility: We will require all researchers to submit a detailed research proposal that follows Service Policy (Refuge Manual 4 RM 6). Research must give the refuge at least 45 days to review proposals before the research begins. If the research involves the collection of wildlife, the refuge must be given 60 days to review the proposal. Researchers must obtain all necessary scientific collecting or other permits before starting the research. We will prioritize and approve proposals based on the need, benefit, compatibility, and funding required for the research.

We require researchers to submit a final report to the refuge on completing their work. For long-term studies, we may also require interim progress reports. We also expect that research will be published in peer-reviewed publications. All reports, presentations, posters, articles, or other publications will acknowledge the Refuge System and Piedmont Refuge as partners in the research.

Justification: The Service encourages research on national wildlife refuges to promote new information which will improve the quality of the refuge and other Service management decisions, to expand the body of scientific knowledge about fish and wildlife, their habitats, the use of these resources, appropriate resources management and the environment in general, and to provide the opportunity for students and others to learn the principles of field research.

In accordance with 50 CFR 26.41, research conducted by non-Services personnel, as described in this compatibility determination, will not materially interfere with, or detract from, the fulfillment of the National Wildlife Refuge System mission or the purposes for which the refuge was established.

NEPA Compliance for Refuge Use Description: *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
- Categorical Exclusion and Environmental Action Statement
- Environmental Assessment and Finding of No Significant Impact
- Environmental Impact Statement and Record of Decision

Mandatory 10-year Re-evaluation Date:

Description of Use: Training

This use is training not conducted by the Service or Service-authorized agent. Training by non-Service personnel, is conducted by colleges, universities, federal, state, and local agencies, military, and Scouts of America and other youth organizations. We also consider training for other purposes that may not relate directly to refuge-specific objectives, but contribute to the broader enhancement, protection, use, conservation, or management of native populations of fish, wildlife and plants, and their natural diversity in the region or the Atlantic Flyway, and to the benefit of the local population. All proposals must comply with Service policy on compatibility.

Specific areas open for training will be stipulated in conditions of a special use permit, including access points. Training could occur throughout the year. The mechanics of the training will depend entirely on the agency or group. We will carefully scrutinize the objectives, methods, and approach of each training event before allowing it on the refuge. The refuge will not allow any training event that compromises public health and safety.

Availability of Resources: Refuge support for training is generally confined to providing assistance in the form of advice as to timing or methods, best locations for desired results or conditions, or providing other assistance as appropriate. In most cases, a training program will require less than an hour of staff time to review the proposal and write a special use permit.

For training programs conducted entirely by non-Service personnel, the following staff resources would be typical: Proposal review, coordination, and special use permit preparation - Refuge Manager, 1 hour at \$50.78; or Assistant Manager, 1 hour at \$46.82.

Anticipated Impacts of the Use: Short-term impacts: There may be short-term disturbance to plants and wildlife during field training, but this is unavoidable in most cases. We will conduct Intra-Service Section 7 Biological Evaluations for any proposal that could be anticipated to have an impact on any federally threatened or endangered species. We will ensure that the refuge or any non-Service trainers obtain any special permits required by State or Federal law prior to issuing a special use permit.

Long-term impacts: The primary biological impact from training would be the temporary disturbance to wildlife from sight and sounds. Since this activity would occur at minimal levels and for short durations, any disturbance of wildlife is expected to be minimal.

Cumulative impacts: Since this activity occurs at minimal levels and is short in duration, any disturbance of wildlife is expected to be minimal. There is no indication that the level of disturbance would create any long term problems.

Public Review and Comment:

This draft compatibility determination will be available for review and comment during the public review period established for the Draft Comprehensive Conservation Plan and Environmental Assessment for Piedmont National Wildlife Refuge. All comments will be addressed in the final determination.

Determination (check one below):

Use is Not Compatible

Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility: We will require all training coordinators to submit a proposal. Training organizations must provide the refuge at least fourteen days to review proposals before the training begins. Trainers must obtain all necessary permits before starting the training. We will prioritize and approve proposals based on the need, benefit, compatibility, and funding required for the training.

Justification: The Service allows training on national wildlife refuges to promote new information which will improve the quality of the refuge and other Service management decisions, the use of these resources, appropriate resources management and the environment in general, to provide the opportunity for students and others to learn the principles of field training, and for organizations to be better equipped to handle emergencies and day-to-day operations. Such training may include search and rescue, orientation, habitat evaluations, or wetland determinations.

Training will not materially interfere with, or detract from, the fulfillment of the National Wildlife Refuge System mission or the purposes for which the refuge was established.

NEPA Compliance for Refuge Use Description: *Place an X in appropriate space.*

Categorical Exclusion without Environmental Action Statement

Categorical Exclusion and Environmental Action Statement

Environmental Assessment and Finding of No Significant Impact

Environmental Impact Statement and Record of Decision

Mandatory 10-year Re-evaluation Date:

Description of Use: Walking, Jogging, Bicycling

Walking, jogging, and bicycling are all activities currently open to the public on the refuge. These activities are not necessarily wildlife-dependent recreation, but can be used in support of wildlife observation, photography, and environmental education. These activities would require the maintenance of existing trails and roads.

Walking and jogging activities primarily would occur on established foot trails. However, walking and jogging would be allowed anywhere on the refuge that is not marked as closed. Bicycling would be limited to refuge roads that are open to vehicles. Currently, most of the bicycle use occurs on county roads passing through the refuge. Bicycles would not be permitted on foot trails or through the woods. The refuge would be open for walking, jogging, and bicycling during daylight hours. These activities would be conducted year-round except when closed during big game firearm hunts. An active refuge law enforcement program would ensure regulation compliance and protect refuge resources.

Availability of Resources: Funding for these programs is borne by annual operation and maintenance funds, which include activities involving the public such as recreation, interpretation, environmental education, and conduct of refuge hunting and fishing programs. The refuge has adequate resources to cover the cost of the proposed use. No special equipment, facilities, or improvements are needed to support the use. Maintenance of existing facilities would include mowing road sides and maintaining signs, kiosks, and designated hiking trails. These facilities are maintained for refuge management and other public use activities on the refuge. No monitoring costs are anticipated.

Anticipated Impacts of the Use: Short-term impacts: Walking, jogging, and bicycling, as proposed, would not impact the refuge mission or management activities. The activities would cause some temporary disturbance to wildlife from noise and trampling of vegetation. The impact would be short in duration and limited in scope. As proposed, these activities would have minimum impact on refuge resources. Disturbance to wildlife from the current level of walking, jogging, and bicycling is not known to be a problem.

Long-term impacts: The primary biological impact from walking, jogging, and bicycling, as proposed, would be the temporary disturbance to wildlife from sight and sounds. Some possible long-term effects of disturbance to wildlife from recreational activity are: reducing productivity; causing abandonment or altering of breeding territories; altering distribution; altering flight behavior; causing energy depletion; and disruption of nest and brood rearing attentiveness (Klein 1989 and Knight et al. 1988). Since these activities occur at minimal levels and are short in duration, any disturbance of wildlife is expected to be minimal.

Cumulative impacts: Since these activities occur at minimal levels and are short in duration, any disturbance of wildlife is expected to be minimal. There is no indication that the current level of disturbance would create any long-term problems.

Public Review and Comment:

This draft compatibility determination will be available for review and comment during the public review period established for the Draft Comprehensive Conservation Plan and Environmental Assessment for Piedmont National Wildlife Refuge. All comments will be addressed in the final determination.

Determination (check one below):

Use is Not Compatible

Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility: Some areas on the refuge may be closed to avoid user conflicts and conflicts with other management programs such as big game hunting. Areas closed to public use will be posted and patrolled.

An active refuge law enforcement program will ensure regulation compliance and will protect refuge resources and the public.

Field interpretive services will help educate visitors on the disturbance effects of the use.

Vehicle or bicycle use will be limited to regularly maintained roads open to vehicle use. Some roads will be closed during periods of other uses.

Justification: Recreational foot travel and bicycling as proposed are compatible with the purposes for which Piedmont NWR was established. The 1939 Executive Order states that any activity on the refuge which disturbs wildlife will be controlled by special regulations. These uses are currently being allowed and have been for a long time. The primary purpose for allowing walking, jogging, and bicycling is to provide the public with additional recreational opportunity to observe wildlife and to enjoy non-urban environments. The use is biologically sound. Walking, jogging, and bicycling at the levels found on Piedmont NWR do not cause negative impacts to refuge wildlife and help develop appreciation for the refuge and its resources.

NEPA Compliance for Refuge Use Description: *Place an X in appropriate space.*

- Categorical Exclusion without Environmental Action Statement
- Categorical Exclusion and Environmental Action Statement
- Environmental Assessment and Finding of No Significant Impact
- Environmental Impact Statement and Record of Decision

Mandatory 10-year Re-evaluation Date:

Approval of Compatibility Determinations

The signature of approval is for all compatibility determinations considered within the Comprehensive Conservation Plan for Piedmont NWR. If one of the descriptive uses is considered for compatibility outside of the comprehensive conservation plan, the approval signature becomes part of that determination.

Refuge Manager: _____
(Signature/Date)

Regional Compatibility
Coordinator: _____
(Signature/Date)

Refuge Supervisor: _____
(Signature/Date)

Regional Chief, National
Wildlife Refuge System,
Southeast Region: _____
(Signature/Date)

Appendix G. Intra-Service Section 7 Biological Evaluation

REGION 4 INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

Originating Person: Carolyn Johnson, Assistant Refuge Manager

Telephone Number: 478-986-5441 **E-Mail:** Carolyn_Johnson@fws.gov

Date: October 20, 2009

PROJECT NAME: Piedmont NWR's Comprehensive Conservation Plan

I. Service Program:

- Ecological Services
- Federal Aid
 - Clean Vessel Act
 - Coastal Wetlands
 - Endangered Species Section 6
 - Partners for Fish and Wildlife
 - Sport Fish Restoration
 - Wildlife Restoration
- Fisheries
- Refuges/Wildlife

II. State/Agency: Georgia/U.S. Fish and Wildlife Service

III. Station Name: Piedmont National Wildlife Refuge

IV. Description of Proposed Action: Implement the Comprehensive Conservation Plan for Piedmont NWR by adopting the proposed alternative. This plan directs the management of the refuge for the next 15 years.

V. Pertinent Species and Habitat:

- Include species/habitat occurrence map:
- Complete the following table:

SPECIES/CRITICAL HABITAT	STATUS ¹
Red-cockaded woodpecker (<i>Picoides borealis</i>)	E
Wood stork (<i>Mycteria americana</i>)	E
Relict trillium (<i>Trillium reliquum</i>)	E
Fringed campion (<i>Silene polypetala</i>)	E

¹STATUS: E=endangered, T=threatened, PE=proposed endangered, PT=proposed threatened, CH=critical habitat, PCH=proposed critical habitat, C=candidate species

VI. Location:

- **Ecoregion Number and Name:** Ecosystem 31 - Altamaha Ecosystem
- **County and State:** Jasper and Jones Counties, Georgia
- **Section, township, and range:**
Bernier, Dames Ferry and Hillsboro Quadrangle (7.5 minute series), Georgia.

D. Distance and direction to nearest town: 11 miles north of Gray, Georgia.

E. Species/habitat occurrence: In 2009 the refuge had 44 active red-cockaded woodpecker clusters. The population goal is 60-70 active clusters within the next 15 years. The refuge actively manages 22,500 acres of upland pine to meet the refuge's red-cockaded woodpecker population goal. Wood storks may occasionally use the open wetland habitats for post-breeding foraging. Relict trillium and fringed campion may have suitable habitat on the refuge although their presence has not been documented to date.

VII. Determination of Effects:

Explanation of effects of the action on species and critical habitats in item V.B:

SPECIES/CRITICAL HABITAT	EFFECTS OF THE ACTION ON SPECIES/CRITICAL HABITAT ¹
Red-cockaded woodpecker (<i>Picoides borealis</i>)	The plan strives to manage and enhance and upland pine forest on the refuge. This plan proposes to increase potential nesting and foraging habitat to meet established recovery goals for the red-cockaded woodpecker. Proposed public use levels should not impact this species.
Wood stork (<i>Mycteria americana</i>)	The hydrology of the area governs the wetlands on the refuge and thus, the potential use patterns of the wood stork. The plan strives to protect and enhance wetlands. Proposed public use levels should not impact this species. The area is not used for nesting and only occasional sightings are observed in the area each year.
Relict trillium (<i>Trillium reliquum</i>) Fringed campion (<i>Silene polypetala</i>)	Enhanced monitoring efforts to identify potential habitat and possibly locate these species will enhance protection efforts.

¹DEFINITIONS FOR EFFECTS OF THE ACTION:

Direct Effects - those that are an immediate result of the action.

Indirect Effects - those caused by the action later in time but are still reasonably certain to occur. They include the effects of future activities that are induced by the original action and that occur after the action is completed.

Interrelated - those that are part of a larger action and depend on the larger action for their justification.

Interdependent - those that have no significant effect independent utility apart from the action under consideration.

Cumulative Effects - the effects of state or private activities, not involving federal activities that are reasonably certain to occur within the action area.

B. Explanation of Actions to be Implemented to Reduce Adverse Effects:

SPECIES/CRITICAL HABITAT	ACTIONS TO MITIGATE/MINIMIZE EFFECTS
Red-cockaded woodpecker (<i>Picoides borealis</i>)	This plan proposes to increase the species population through monitoring and implementing active habitat management. All management actions will be coordinated to ensure any potential conflicts are minimized or eliminated.
Wood stork (<i>Mycteria americana</i>)	Increased surveys of aquatic parameters may increase detection of impacts to the system from outside sources. Understanding the distribution and use patterns of these animals may help in protecting the species from impacts. Enhancement of wetlands may increase foraging activity. The refuge will minimize human disturbance to any identified foraging areas.
Relict trillium (<i>Trillium reliquum</i>)	Implementation of surveys to locate potential habitat may increase detection of species. State Natural Heritage recommendations for management include avoid disturbance in areas where this species is found. It will only tolerate hand thinning of trees in the vicinity. Control exotics, especially Japanese honeysuckle.
Fringed campion (<i>Silene polypetala</i>)	Implementation of surveys to locate potential habitat may increase detection of species.

VII. Effect Determination and Response Requested:

SPECIES/ CRITICAL HABITAT	DETERMINATION ¹			RESPONSE REQUESTED
	NE	NA	AA	
Red-cockaded woodpecker (<i>Picoides borealis</i>)	X			concurrence
Wood stork (<i>Mycteria americana</i>)	X			concurrence
Relict trillium (<i>Trillium reliquum</i>)	X			concurrence
Fringed campion (<i>Silene polypetala</i>)	X			concurrence

¹DETERMINATION/RESPONSE REQUESTED:

NE = no effect. This determination is appropriate when the proposed action will not directly, indirectly, or cumulatively impact, either positively or negatively, any listed, proposed, candidate species or designated/proposed critical habitat. Response Requested is optional but a "Concurrence" is recommended for a complete Administrative Record.

NA = not likely to adversely affect. This determination is appropriate when the proposed action is not likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat or there may be beneficial effects to these resources. Response Requested is a "Concurrence".

AA = likely to adversely affect. This determination is appropriate when the proposed action is likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat. Response Requested for listed species is "Formal Consultation". Response Requested for proposed or candidate species is "Conference".

Signature

date

Title

X. Reviewing Ecological Services Office Evaluation:

A. Concurrence _____ Nonconcurrence _____

B. Formal consultation required _____

C. Conference required _____

D. Informal conference required _____

E. Remarks:

Signature

Date

Title

Office

Appendix H. Wilderness Review

The Wilderness Act of 1964 defines a wilderness area as an area of federal land that retains its primeval character and influence, without permanent improvements or human inhabitation, and is managed so as to preserve its natural conditions and which:

1. generally appears to have been influenced primarily by the forces of nature, with the imprint of man's work substantially unnoticeable;
2. has outstanding opportunities for solitude or primitive and unconfined types of recreation;
3. has at least 5,000 contiguous roadless acres or is of sufficient size to make practicable its preservation and use in an unimpeded condition; or is a roadless island, regardless of size;
4. does not substantially exhibit the effects of logging, farming, grazing, or other extensive development or alteration of the landscape, or its wilderness character could be restored through appropriate management at the time of review; and
5. may contain ecological, geological, or other features of scientific, educational, scenic, or historic value.

The lands within Piedmont NWR were reviewed for their suitability in meeting the criteria for wilderness, as defined by the Wilderness Act of 1964. No lands in the refuge were found to meet these criteria. Therefore, the suitability of refuge lands for wilderness designation is not further analyzed in this plan.

Appendix I. Refuge Biota

Piedmont National Wildlife Refuge – Birds

<u>Common Name</u>	<u>Scientific Name</u>	
Grebes		
Pied-billed grebe	<i>Podilymbus</i>	<i>podiceps</i>
Cormorants and Darters		
Double crested Cormorant	<i>Phalacrocorax</i>	<i>auritus</i>
Anhinga	<i>Anhinga</i>	<i>anhinga</i>
American Bittern	<i>Botaurus</i>	<i>lentiginosus</i>
Least Bittern	<i>Tigrisoma</i>	<i>mexicanum</i>
Great Blue Heron	<i>Ardea</i>	<i>herodias</i>
Great Egret	<i>Ardea</i>	<i>alba</i>
Snowy Egret	<i>Egretta</i>	<i>thula</i>
Little Blue Heron	<i>Egretta</i>	<i>caerulea</i>
Tricolored Heron	<i>Egretta</i>	<i>tricolor</i>
Cattle Egret	<i>Bubulcus</i>	<i>ibis</i>
Green Heron	<i>Butorides</i>	<i>virescens</i>
Black crowned Night Heron	<i>Nycticorax</i>	<i>nycticorax</i>
Yellow crowned Night Heron	<i>Nyctanassa</i>	<i>violacea</i>
White Ibis	<i>Eudocimus</i>	<i>albus</i>
Geese and Ducks		
Snow Goose	<i>Chen</i>	<i>caerulescens</i>
Canada Goose	<i>Branta</i>	<i>canadensis</i>
Wood Duck	<i>Aix</i>	<i>sponsa</i>
Green winged Teal	<i>Anas</i>	<i>crecca</i>
American Black Duck	<i>Anas</i>	<i>rubripes</i>
Mallard	<i>Anas</i>	<i>platyrhynchos</i>
Northern Pintail	<i>Anas</i>	<i>acuta</i>
Blue winged Teal	<i>Anas</i>	<i>discors</i>
Northern Shoveler	<i>Anas</i>	<i>clypeata</i>
Gadwall	<i>Anas</i>	<i>strepera</i>
American Wigeon	<i>Anas</i>	<i>americana</i>
Canvasback	<i>Aythya</i>	<i>valisineria</i>
Redhead	<i>Aythya</i>	<i>americana</i>
Ring necked Duck	<i>Aythya</i>	<i>collaris</i>
Lesser Scaup	<i>Aythya</i>	<i>affinis</i>
Bufflehead	<i>Bucephala</i>	<i>albeola</i>
Common Merganser	<i>Mergus</i>	<i>merganser</i>
Hooded Merganser	<i>Lophodytes</i>	<i>cucullatus</i>
Red breasted Merganser	<i>Mergus</i>	<i>serrator</i>
Ruddy Duck	<i>Oxyura</i>	<i>jamaicensis</i>

Vultures, Hawks and Eagles

Black Vulture	<i>Coragyps</i>	<i>atratus</i>
Turkey Vulture	<i>Cathartes</i>	<i>aura</i>

Piedmont National Wildlife Refuge – Birds

<u>Common Name</u>	<u>Scientific Name</u>	
Vultures, Hawks and Eagles		
Osprey	<i>Pandion</i>	<i>Haliaeetus</i>
Bald Eagle	<i>Haliaeetus</i>	<i>Leucocephalus</i>
Northern Harrier	<i>Circus</i>	<i>Cyaneus</i>
Sharp shinned Hawk	<i>Accipiter</i>	<i>Striatus</i>
Cooper's Hawk	<i>Accipiter</i>	<i>Cooperii</i>
Red shouldered Hawk	<i>Buteo</i>	<i>Lineatus</i>
Broad winged Hawk	<i>Buteo</i>	<i>Platypterus</i>
Red-tailed Hawk	<i>Buteo</i>	<i>Jamaicensis</i>
Golden Eagle	<i>Aquila</i>	<i>Chrysaetos</i>
American Kestrel	<i>Falco</i>	<i>Sparverius</i>
Turkeys and New World Quail		
Wild Turkey	<i>Meleagris</i>	<i>Gallopavo</i>
Northern Bobwhite	<i>Colinus</i>	<i>Virginianus</i>
Rails, Gallinules, Coots and Cranes		
King Rail	<i>Rallus</i>	<i>Elegans</i>
Purple Gallinule	<i>Porphyrio</i>	<i>Martinica</i>
Common Moorhen	<i>Gallinula</i>	<i>Chloropus</i>
American Coot	<i>Fulica</i>	<i>Americana</i>
Sandhill Crane	<i>Grus</i>	<i>Canadensis</i>
Plovers, Sandpipers and Phalaropes		
Killdeer	<i>Charadrius</i>	<i>Vociferous</i>
Spotted Sandpiper	<i>Actitis</i>	<i>Macularius</i>
Solitary Sandpiper	<i>Tringa</i>	<i>Solitaria</i>
Upland Sandpiper	<i>Bartramia</i>	<i>Longicauda</i>
Least Sandpiper	<i>Calidris</i>	<i>Minutilla</i>
Common Snipe	<i>Gallinago</i>	<i>Gallinago</i>
American Woodcock	<i>Scolopax</i>	<i>Minor</i>
Greater Yellowlegs	<i>Tringa</i>	<i>Melanoleuca</i>
Lesser Yellowlegs	<i>Tringa</i>	<i>Flavipes</i>
Gulls		
Ring billed Gull	<i>Larus</i>	<i>Delawarensis</i>
Pigeons and Doves		
Rock Dove	<i>Columba</i>	<i>Livia</i>
Mourning Dove	<i>Zenaida</i>	<i>Macroura</i>
Cuckoos		
Yellow billed Cuckoo	<i>Coccyzus</i>	<i>Americanus</i>

Owls

Eastern Screech Owl	<i>Megascops</i>	<i>Asio</i>
Great Horned Owl	<i>Bubo</i>	<i>Virginianus</i>
Barred Owl	<i>Strix</i>	<i>Varia</i>

Piedmont National Wildlife Refuge – Birds

<u>Common Name</u>	<u>Scientific Name</u>	
Nightjars		
Common Nighthawk	<i>Chordeiles</i>	<i>Minor</i>
Chuck will's Widow	<i>Caprimulgus</i>	<i>Carolinensis</i>
Whip poor will	<i>Caprimulgus</i>	<i>Vociferous</i>
Swifts		
Chimney Swift	<i>Chaetura</i>	<i>Pelagica</i>
Hummingbirds		
Ruby throated Hummingbird	<i>Archilochus</i>	<i>Colubris</i>
Kingfishers		
Belted Kingfisher	<i>Ceryle</i>	<i>Alcyon</i>
Woodpeckers		
Red headed Woodpecker	<i>Melanerpes</i>	<i>Erythrocephalus</i>
Red bellied Woodpecker	<i>Melanerpes</i>	<i>Carolinus</i>
Yellow bellied Sapsucker	<i>Sphyrapicus</i>	<i>Varius</i>
Downy Woodpecker	<i>Picoides</i>	<i>Pubescens</i>
Hairy Woodpecker	<i>Picoides</i>	<i>Villosus</i>
Northern Flicker	<i>Colaptes</i>	<i>Auratus</i>
Pileated Woodpecker	<i>Dryocopus</i>	<i>Pileatus</i>
Red-cockaded Woodpecker	<i>Picoides</i>	<i>Borealis</i>
Tyrant Flycatchers		
Eastern Wood Pewee	<i>Contopus</i>	<i>Virens</i>
Acadian Flycatcher	<i>Empidonax</i>	<i>Virescens</i>
Eastern Phoebe	<i>Sayornis</i>	<i>Phoebe</i>
Great Crested Flycatcher	<i>Myiarchus</i>	<i>Crinitus</i>
Eastern Kingbird	<i>Tyrannus</i>	<i>Tyrannus</i>
Shrikes		
Loggerhead Shrike	<i>Lanius</i>	<i>Ludovicianus</i>
Swallows		
Purple Martin	<i>Progne</i>	<i>Subis</i>
Tree Swallow	<i>Tachycineta</i>	<i>Bicolor</i>
Northern Rough-winged Swallow	<i>Stelgidopteryx</i>	<i>Serripennis</i>
Barn Swallow	<i>Hirundo</i>	<i>Rustica</i>

Vireos

White eyed Vireo	<i>Vireo</i>	<i>Griseus</i>
Yellow throated Vireo	<i>Vireo</i>	<i>Flavifrons</i>
Blue headed Vireo	<i>Vireo</i>	<i>Solitarius</i>
Red-eyed Vireo	<i>Vireo</i>	<i>Olivaceus</i>

Jays and Crows

Blue Jay	<i>Cyanocitta</i>	<i>Cristata</i>
American Crow	<i>Corvus</i>	<i>Brachyrhynchus</i>
Fish Crow	<i>Corvus</i>	<i>Ossifragus</i>

Piedmont National Wildlife Refuge – Birds

<u>Common Name</u>	<u>Scientific Name</u>	
Chickadees and Titmice		
Carolina Chickadee	<i>Poecile</i>	<i>Carolinensis</i>
Tufted Titmouse	<i>Baeolophus</i>	<i>Bicolor</i>
Nuthatches and Creepers		
Red breasted Nuthatch	<i>Sitta</i>	<i>Canadensis</i>
White breasted Nuthatch	<i>Sitta</i>	<i>Carolinensis</i>
Brown headed Nuthatch	<i>Sitta</i>	<i>Pusilla</i>
Brown Creeper	<i>Certhia</i>	<i>Americana</i>
Wrens		
Carolina Wren	<i>Thryothorus</i>	<i>Ludovicianus</i>
Bewick's Wren	<i>Thryomanes</i>	<i>Bewickii</i>
House Wren	<i>Troglodytes</i>	<i>Aedon</i>
Winter Wren	<i>Troglodytes</i>	<i>Troglodytes</i>
Sedge Wren	<i>Cistothorus</i>	<i>Platensis</i>
Marsh Wren	<i>Cistothorus</i>	<i>Palustris</i>
Gnatcatchers, Kinglets and Thrushes		
Golden crowned Kinglet	<i>Regulus</i>	<i>Satrapa</i>
Ruby crowned Kinglet	<i>Regulus</i>	<i>Calendula</i>
Blue-gray Gnatcatcher	<i>Poliophtila</i>	<i>Caerulea</i>
Eastern Bluebird	<i>Sialia</i>	<i>Sialis</i>
Veery	<i>Catharus</i>	<i>Fuscescens</i>
Gray cheeked Thrush	<i>Catharus</i>	<i>Minimus</i>
Swainson's Thrush	<i>Catharus</i>	<i>Ustulatus</i>
Hermit Thrush	<i>Catharus</i>	<i>Guttatus</i>
Wood Thrush	<i>Hylocichla</i>	<i>Mustelina</i>
American Robin	<i>Turdus</i>	<i>Migratorius</i>
Mockingbirds and Thrashers		
Gray Catbird	<i>Dumetella</i>	<i>Carolinensis</i>
Northern Mockingbird	<i>Mimus</i>	<i>Polyglottos</i>
Brown Thrasher	<i>Toxostoma</i>	<i>Rufum</i>

Pipits	American Pipit	<i>Anthus</i>	<i>Rubescens</i>
Waxwings	Cedar Waxwing	<i>Bombycilla</i>	<i>Cedrorum</i>
Starlings	European Starling	<i>Sturnus</i>	<i>Vulgaris</i>
Wood Warblers	Golden winged Warbler	<i>Vermivora</i>	<i>Chrysoptera</i>
	Tennessee Warbler	<i>Vermivora</i>	<i>Peregrine</i>
	Northern Parula	<i>Parula</i>	<i>Americana</i>
	Yellow Warbler	<i>Dendroica</i>	<i>Petechia</i>

Piedmont National Wildlife Refuge - Birds

<u>Common Name</u>	<u>Scientific Name</u>	
Wood Warblers		
Chestnut sided Warbler	<i>Dendroica</i>	<i>Pensylvanica</i>
Magnolia Warbler	<i>Dendroica</i>	<i>Magnolia</i>
Cape May Warbler	<i>Dendroica</i>	<i>Tigrina</i>
Black throated Blue Warbler	<i>Dendroica</i>	<i>Caerulescens</i>
Yellow rumped Warbler	<i>Dendroica</i>	<i>Coronata</i>
Black throated Green Warbler	<i>Dendroica</i>	<i>Virens</i>
Blackburnian Warbler	<i>Dendroica</i>	<i>Fusca</i>
Yellow throated Warbler	<i>Dendroica</i>	<i>Dominica</i>
Pine Warbler	<i>Dendroica</i>	<i>Pinus</i>
Prairie Warbler	<i>Dendroica</i>	<i>Discolor</i>
Palm Warbler	<i>Dendroica</i>	<i>Palmarum</i>
Bay breasted Warbler	<i>Dendroica</i>	<i>Castanea</i>
Blackpoll Warbler	<i>Dendroica</i>	<i>Striata</i>
Cerulean Warbler	<i>Dendroica</i>	<i>Cerulean</i>
Black and white Warbler	<i>Mniotilta</i>	<i>Varia</i>
American Redstart	<i>Setophaga</i>	<i>Ruticilla</i>
Prothonotary Warbler	<i>Protonotaria</i>	<i>Citrea</i>
Worm eating Warbler	<i>Helmitheros</i>	<i>Vermivorum</i>
Ovenbird	<i>Seiurus</i>	<i>Aurocapilla</i>
Northern Waterthrush	<i>Seiurus</i>	<i>Noveboracensis</i>
Louisiana Waterthrush	<i>Seiurus</i>	<i>Motacilla</i>
Kentucky Warbler	<i>Oporornis</i>	<i>Formosus</i>
Common Yellowthroat	<i>Geothlypis</i>	<i>Trichas</i>
Hooded Warbler	<i>Wilsonia</i>	<i>Citrine</i>
Swainson's Warbler	<i>Limnothlypis</i>	<i>Swainsonii</i>
Yellow breasted Chat	<i>Icteria</i>	<i>Virens</i>

Tanagers

Summer Tanager	<i>Piranga</i>	<i>Rubra</i>
Scarlet Tanager	<i>Piranga</i>	<i>Olivacea</i>

Grosbeaks, Sparrows and Buntings

Northern Cardinal	<i>Cardinalis</i>	<i>Cardinalis</i>
Rose breasted Grosbeak	<i>Pheucticus</i>	<i>Ludovicianus</i>
Blue Grosbeak	<i>Passerina</i>	<i>Caerulea</i>
Indigo Bunting	<i>Passerina</i>	<i>Cyanea</i>
Eastern Towhee	<i>Pipilo</i>	<i>Erythrophthalmus</i>
Bachman's Sparrow	<i>Aimophila</i>	<i>Aestivalis</i>
Chipping Sparrow	<i>Spizella</i>	<i>Passerine</i>
Field Sparrow	<i>Spizella</i>	<i>Pusilla</i>
Vesper Sparrow	<i>Pooecetes</i>	<i>Gramineus</i>
Savannah Sparrow	<i>Passerculus</i>	<i>Sandwichensis</i>
Fox Sparrow	<i>Passerella</i>	<i>Iliaca</i>
Song Sparrow	<i>Melospiza</i>	<i>Melodia</i>

Piedmont National Wildlife Refuge - Birds

<u>Common Name</u>	<u>Scientific Name</u>	
Grosbeaks, Sparrows and Buntings		
Swamp Sparrow	<i>Melospiza</i>	<i>Georgiana</i>
White throated Sparrow	<i>Zonotrichia</i>	<i>Albicollis</i>
White crowned Sparrow	<i>Zonotrichia</i>	<i>Leucophrys</i>
Dark eyed Junco	<i>Junco</i>	<i>Hyemalis</i>
Blackbirds and Orioles		
Bobolink	<i>Dolichonyx</i>	<i>Oryzivorus</i>
Red winged Blackbird	<i>Agelaius</i>	<i>Phoeniceus</i>
Eastern Meadowlark	<i>Sturnella</i>	<i>Magna</i>
Rusty Blackbird	<i>Euphagus</i>	<i>Carolinus</i>
Common Grackle	<i>Quiscalus</i>	<i>Quiscalus</i>
Brown headed Cowbird	<i>Molothrus</i>	<i>Ater</i>
Orchard Oriole	<i>Icterus</i>	<i>Spurius</i>
Finches		
Purple Finch	<i>Carpodacus</i>	<i>Purpureus</i>
House Finch	<i>Carpodacus</i>	<i>Mexicanus</i>
Pine Siskin	<i>Carduelis</i>	<i>Pinus</i>
American Goldfinch	<i>Carduelis</i>	<i>Tristis</i>
Evening Grosbeak	<i>Coccothraustes</i>	<i>Vespertinus</i>
Old World Sparrows		
House Sparrow	<i>Passer</i>	<i>Domesticus</i>

Other - Accidental or casual occurrences

Wood stork	<i>Mycteria</i>	<i>Americana</i>
Merlin	<i>Falco</i>	<i>Columbarius</i>
Red-necked Phalarope	<i>Phalaropus</i>	<i>Lobatus</i>
Scissor Tailed Flycatcher	<i>Tyrannus</i>	<i>Forficatus</i>
Tundra Swan	<i>Cygnus</i>	<i>Columbianus</i>
Yellow Rail	<i>Coturnicops</i>	<i>Noveboracensis</i>
Laughing Gull	<i>Larus</i>	<i>Atricilla</i>
Northern Oriole	<i>Icterus</i>	<i>Galbula</i>

Piedmont National Wildlife Refuge - Amphibians & Reptiles

<u>Common Name</u>	<u>Scientific Name</u>	
Turtles		
Snapping turtle	<i>Chelydra</i>	<i>Serpentine</i>
Stinkpot	<i>Sternotherus</i>	<i>Odoratus</i>
Loggerhead musk turtle	<i>Sternotherus</i>	<i>Minor</i>
Eastern mud turtle	<i>Kinosternon</i>	<i>Subrubrum</i>
Eastern Box turtle	<i>Terrapene</i>	<i>Carolina</i>
Yellow-bellied turtle	<i>Chrysemys</i>	<i>Scripta</i>
River cooter	<i>*Chrysemys</i>	<i>Concinna</i>
Eastern painted turtle	<i>Chrysemys</i>	<i>Picta</i>
Eastern spiny softshell	<i>Trionyx</i>	<i>Spiniferus</i>
Lizards		
Green anole	<i>Anolis</i>	<i>Carolinensis</i>
Fence lizard	<i>sceloporus</i>	<i>Undulates</i>
Six-lined racerunner	<i>Cnemidophorus</i>	<i>Sexlineatus</i>
Ground skink	<i>Leiolopisma</i>	<i>Laterale</i>
Five-lined skink	<i>Emeces</i>	<i>Fasciatus</i>
Broad headed skink	<i>Eumeces</i>	<i>Laticeps</i>
Southeastern five-lined skink	<i>Eumeces</i>	<i>Inexpectatus</i>
Eastern glass lizard	<i>Ophisaurus</i>	<i>Ventralis</i>
Slender glass lizard	<i>Ophisaurus</i>	<i>Attenuatus</i>
Snakes		
Brown water snake	<i>*Nerodia (=Natrix)</i>	<i>Taxispilota</i>
Red-bellied water snake	<i>Nerodia (=Natrix)</i>	<i>Erythrogaster</i>
Midland water snake	<i>Nerodia (=Natrix)</i>	<i>Sipidon</i>
Queen snake	<i>Regina (=Natrix)</i>	<i>Septemvittata</i>
Northern brown snake	<i>Storeria</i>	<i>Dekayi</i>
Eastern garter snake	<i>Thamnophis</i>	<i>Sirtalis</i>
Easter ribbon snake	<i>Thamnophis</i>	<i>Saurtitus</i>
Smooth earth snake	<i>Virginia</i>	<i>Valeriae</i>
Rough earth snake	<i>Virginia</i>	<i>Striatula</i>

Eastern hognose snake	<i>Heterodon</i>	<i>Playtyrhinos</i>
Southern ringneck snake	<i>Diadophis</i>	<i>Punctatus</i>
Eastern worm snake	<i>Carphophis</i>	<i>Amoenus</i>
Black racer	<i>Coluber</i>	<i>Constrictor</i>
Eastern coachwhip	<i>Masticophis</i>	<i>Flagellum</i>
Rough green snake	<i>Opheodrys</i>	<i>Aestivus</i>
Corn snake	<i>Elaphe</i>	<i>Guttata</i>
Black rat snake	<i>Elaphe</i>	<i>Obsolete</i>
Northern pine snake	<i>Pituophis</i>	<i>Melanoleucas</i>
Eastern kingsnake	<i>Lampropeltis</i>	<i>Getulus</i>
Scarlet king snake	<i>Lampropeltis</i>	<i>Triangulum</i>
Mole snake	<i>*Lampropeltis</i>	<i>Calligaster</i>

Piedmont National Wildlife Refuge - Amphibians & Reptiles

<u>Common Name</u>	<u>Scientific Name</u>	
Snakes		
Redbelly snake	<i>Storeria</i>	<i>Occipitomaculate</i>
Scarlet snake	<i>Cemophora</i>	<i>Coccinea</i>
Southeastern crowned snake	<i>Tantilla</i>	<i>Coronata</i>
Eastern coral snake	<i>*Micrurus</i>	<i>Fulvius</i>
Northern copperhead	<i>Agkistrodon</i>	<i>Contortrix</i>
Eastern cottonmouth	<i>*Agkistrodon</i>	<i>Piscivorus</i>
Canebrake rattlesnake	<i>*Crotalus</i>	<i>Horridus</i>
Salamanders		
Mole salamanders	<i>Ambystomatidae</i>	
Marbled salamander	<i>Ambystoma</i>	<i>Opacum</i>
Spotted salamander	<i>*Ambystoma</i>	<i>Maculatum</i>
Eastern tiger salamander	<i>*Ambystoma</i>	<i>Tigrinum</i>
Red-spotted newt	<i>Notophthalmus</i>	<i>Viridescens</i>
Spotted dusky salamander	<i>Desmognathus</i>	<i>Fuscus</i>
Southern dusky salamander	<i>Desmognathus fuscus</i>	<i>Auriculatus</i>
Red-backed salamander	<i>*Plethodon</i>	<i>Cinereus</i>
Slimy salamander	<i>Plethodon</i>	<i>Glutinosus</i>
Four-toed salamander	<i>Hemidactylium</i>	<i>Scutatatum</i>
Eastern mud salamander	<i>*Pseudotriton</i>	<i>Montanus</i>
Southern red salamander	<i>*Pseudotriton</i>	<i>Rubber</i>
Southern two-lined salamander	<i>Eurycea</i>	<i>Bislineata</i>
Long-tailed salamander	<i>Eurycea</i>	<i>Longicauda</i>
Toads and Frogs		
Eastern spadefoot	<i>*Scaphiopus</i>	<i>Holbrooki</i>
American toad	<i>Bufo</i>	<i>Americanus</i>
Fowler's toad	<i>Bufo woodhousei</i>	<i>Fowleri</i>
Southern cricket frog	<i>Acris</i>	<i>Gryllus</i>

Northern cricket frog	<i>Acris</i>	<i>Crepitans</i>
Spring peeper	<i>Hyla</i>	<i>Crucifer</i>
Green treefrog	<i>Hyla</i>	<i>Cinerea</i>
Barking treefrog	<i>Hyla</i>	<i>Gratiosa</i>
Gray treefrog	<i>Hyla versicolor</i>	<i>Chrysoscelis</i>
Upland chorus frog	<i>Pseudacris</i>	<i>Triseriata</i>
Southern chorus frog	<i>*Pseudacris</i>	<i>Nigrita</i>
Eastern narrow-mouthed toads	<i>Gastrophryne</i>	<i>Carolinensis</i>
Bullfrog	<i>Rana</i>	<i>Catesbeiana</i>
Greenfrog	<i>Rana</i>	<i>Clamitans</i>
Southern leopard frog	<i>Rana</i>	<i>Utricularia</i>

**Species that should occur on the Refuge but have not been collected to date.*

Piedmont National Wildlife Refuge - Mammals

<u>Common Name</u>	<u>Scientific Name</u>	
Marsupials		
Opposum	<i>Didelphia</i>	<i>marsupialis</i>
Moles and Shrews		
Southeastern shrew	<i>Sorex</i>	<i>longirostris</i>
Short-tailed shrew	<i>Blarina</i>	<i>brevicauda</i>
Least shrew	<i>Cryptotis</i>	<i>parva</i>
Eastern mole	<i>Scalopus</i>	<i>aquaticus</i>
Bats		
Little brown myotis	<i>Myotis</i>	<i>lucifugus</i>
Keen's myotis	<i>Myotis</i>	<i>keenii</i>
Silver-haired bat	<i>Lasionycteris</i>	<i>noctivagans</i>
Eastern pipistrelle	<i>Pipistrellus</i>	<i>subflavus</i>
Big brown bat	<i>Eptesicus</i>	<i>fuscus</i>
Red bat	<i>Lasiurus</i>	<i>borealis</i>
Seminole bat	<i>Lasiurus</i>	<i>seminolus</i>
Hoary bat	<i>Lasiurus</i>	<i>cinereus</i>
Eastern yellow bat	<i>Lasiurus</i>	<i>intermedius</i>
Evening bat	<i>Nycticeius</i>	<i>humeralis</i>
Easter eared bat	<i>Plecotus</i>	<i>refinesquei</i>
Mexican free-tailed bat	<i>Tadarida</i>	<i>brasiliensis</i>
Rabbits		
E. cottontail rabbit	<i>Sylvilagus</i>	<i>floridanus</i>
Swamp rabbit	<i>Sylvilagus</i>	<i>aquaticus</i>

Rodents

Eastern chipmunk	<i>Tamias</i>	<i>striatus</i>
Gray squirrel	<i>Sciurus</i>	<i>carolinensis</i>
Fox squirrel	<i>Sciurus</i>	<i>niger</i>
S. flying squirrel	<i>Glaucomys</i>	<i>volans</i>
Beaver	<i>Castor</i>	<i>canadensis</i>
Rice rat	<i>Oryzomys</i>	<i>palustris</i>
Harvest mouse	<i>Reithrodontomys</i>	<i>humulis</i>
White-footed mouse/wood mouse	<i>Peromyscus</i>	<i>leucopus</i>
Cotton mouse	<i>Peromyscus</i>	<i>gossypinus</i>
Golden mouse	<i>Peromyscus</i>	<i>nuttalli</i>
Hispid cotton rat	<i>Sigmodon</i>	<i>hispidus</i>
Eastern woodrat	* <i>Neotoma</i>	<i>floridana</i>
Pine vole	<i>Microtus</i> (= <i>Pitymys</i>)	<i>pinetorum</i>
Muskrat	<i>Ondatra</i>	<i>zibethica</i>

Piedmont National Wildlife Refuge - Mammals

<u>Common Name</u>	<u>Scientific Name</u>	
Rodents		
Norway rat	<i>Rattus</i>	<i>norvegicus</i>
House mouse	<i>Mus</i>	<i>musculus</i>
Meadow jumping mouse	<i>Zapus</i>	<i>hudsonius</i>
Carnivores		
Red fox	<i>Vulpes</i>	<i>fulva</i>
Gray fox	<i>Urocyon</i>	<i>cinereoargenteus</i>
Coyote	<i>Canis</i>	<i>latrans</i>
Raccoon	<i>Procyon</i>	<i>lotor</i>
Long-tailed weasel	<i>Mustela</i>	<i>frenata</i>
Mink	<i>Mustela</i>	<i>vison</i>
Spotted skunk	* <i>Spilogale</i>	<i>putorius</i>
Striped skunk	<i>Mephitis</i>	<i>mephitis</i>
River otter	<i>Lutra</i>	<i>canadensis</i>
Bobcat	<i>Lynx</i>	<i>rufus</i>
Deer		
white tailed deer	<i>Odocoileus</i>	<i>virginianus</i>

*Probably occurs on the Refuge but not collected.

Piedmont National Wildlife Refuge – Butterflies

<u>Common Name</u>	<u>Scientific Name</u>	
Swallowtails	<i>(Family Papilionidae)</i>	
True Swallowtails	<i>(Subfamily- Papilioninae)</i>	
Pipevine Swallowtail	<i>Battus</i>	<i>Philenor</i>
Zebra Swallowtail	<i>Eurytides</i>	<i>Marcellus</i>
Black Swallowtail	<i>Papilio</i>	<i>Polyxenes</i>
Giant Swallowtail	<i>Papilio</i>	<i>Cresphontes</i>
Eastern Tiger Swallowtail	<i>Papilio</i>	<i>Glaucus</i>
Spicebush Swallowtail	<i>Papilio</i>	<i>Troilus</i>
Palamedes Swallowtail	<i>Papilio</i>	<i>Palamedes</i>
Whites and Sulphurs	<i>(Family Pieridae)</i>	
Whites	<i>(Subfamily-Pierinae)</i>	
Cabbage White	<i>Pieris</i>	<i>Rapae</i>
Southern Dogface	<i>Colias</i>	<i>Cesonia</i>
Orange Sulphur	<i>Colias</i>	<i>Eurytheme</i>
Cloudless Sulphur	<i>Phoebis</i>	<i>Sennae</i>
Little Yellow	<i>Eurema</i>	<i>Lisa</i>
Sleepy Orange	<i>Eurema</i>	<i>Nicippe</i>
Gossamer-Wings	<i>(Family- Lycaenidae)</i>	
Harvesters	<i>(Subfamily-Miletinae)</i>	
Harvester	<i>Feniseca</i>	<i>Tarquinius</i>
Hairstreaks	<i>(Subfamily- Theclinae)</i>	
Banded Hairstreak	<i>Satyrum</i>	<i>Calanus</i>
Striped Hairstreak	<i>Satyrum</i>	<i>Liparops</i>
Olive' Juniper Hairstreak	<i>Callophrys</i>	<i>Gryneus</i>
Great Purple Hairstreak	<i>Atlides</i>	<i>Halesus</i>
Gray Hairstreak	<i>Strymon</i>	<i>Melinus</i>
Red-banded Hairstreak	<i>Calycopis</i>	<i>Cecrops</i>
Blues	<i>(Subfamily-Polyommata)</i>	
Eastern Tailed-Blue	<i>Everes</i>	<i>Comyntas</i>
Summer' Spring Azure	<i>Celastrina</i>	<i>ladon neglecta</i>
Brushfoots	<i>(Family Nymphalidae)</i>	
Snouts	<i>(Subfamily- Libytheinae)</i>	
American Snout	<i>Libytheana</i>	<i>Carinenta</i>
Heliconians and Fritillaries	<i>(Subfamily- Heliconiinae)</i>	
Gulf Fritillary	<i>Agraulis</i>	<i>Vanillae</i>
Variegated Fritillary	<i>Euptoieta</i>	<i>Claudia</i>
True Brushfoots	<i>(Subfamily- Nymphalinae)</i>	
Sivory Checkerspot	<i>Chlosyne</i>	<i>Nycteris</i>
Pearly Crescent	<i>Phycoides</i>	<i>Tharos</i>
Question Mark	<i>Polygonia</i>	<i>Interrogationis</i>
Eastern Comma	<i>Polygonia</i>	<i>Comma</i>

Piedmont National Wildlife Refuge – Butterflies

<u>Common Name</u>	<u>Scientific Name</u>	
Mourning Cloak	<i>Nymphalis</i>	<i>Antiopa</i>
American Lady	<i>Vanessa</i>	<i>Virginiensis</i>
Painted Lady	<i>Vanessa</i>	<i>Cardui</i>
Red Admiral	<i>Vanessa</i>	<i>Atalanta</i>
Common Buckeye	<i>Juonia</i>	<i>Coenia</i>
Admirals and Relatives	<i>(Subfamily- Limenitidinae)</i>	
Red-spotted Purple	<i>Limenitis</i>	<i>arthemis astyanax</i>
Viceroy	<i>Limenitis</i>	<i>Archippus</i>
Hackberry Butterflies	<i>(Subfamily-Apaturinae)</i>	
Hackberry Emperor	<i>Asterocampa</i>	<i>Celtis</i>
Tawny Emperor	<i>Asterocamp</i>	<i>Clyton</i>
Satyrs and Wood-Nymphs	<i>(Subfamily-Satyrinea)</i>	
Southern Pearly-eye	<i>Enodia</i>	<i>Prtlandia</i>
Creole Pearly-eye	<i>Enodia</i>	<i>Creola</i>
Appalachian Brown	<i>Satyrodes</i>	<i>Appalachia</i>
Gemmed Satyr	<i>Cyllopsis</i>	<i>Gemma</i>
Carolina Satyr	<i>Hermeuptychia</i>	<i>Sosybius</i>
Little Wood-Satyr	<i>Megisto</i>	<i>Cymela</i>
Common Wood Nymph	<i>Cercyonia</i>	<i>Pegala</i>
Milkweek Butterflies	<i>(Subfamily Danainae)</i>	
Monarch	<i>Danaus</i>	<i>Plexippus</i>
Skippers	<i>(Family Hesperidae)</i>	
Spread-Winged Skippers	<i>(Subfamily-Pyrginae)</i>	
Silver-spotted Skipper	<i>Epargyreus</i>	<i>Clarus</i>
Long-tailed Skipper	<i>Urbanus</i>	<i>Proteus</i>
Hoary Edge	<i>Achalarus</i>	<i>Lyciades</i>
Southern Cloudywing	<i>Thorybes</i>	<i>Bathyllus</i>
Northern Cloudywing	<i>Throybes</i>	<i>Pylades</i>
Confused Couldywing	<i>Thorybes</i>	<i>Confuses</i>
Hayhurst's Scallopwing	<i>Stafphylus hayhurstii</i>	<i>Hayhurstii</i>
Juvenal's Duskywing	<i>Erynnis</i>	<i>Juvenalis</i>
Horace's Duskywing	<i>Erynnis</i>	<i>Hoatius</i>
Mottled Duskywing	<i>Erynnis</i>	<i>Martialis</i>
Pacuvius Duskywing	<i>Erynnis</i>	<i>Pacuvius</i>
Zarucco Duskywing	<i>Erynnis</i>	<i>Zarucco</i>
Wild Indigo Duskywing	<i>Erynnis</i>	<i>Baptisiae</i>
Common/White Checkered Skipper	<i>Pyrgus sp.</i>	
Common Sootywing	<i>Pholisora</i>	<i>Catullus</i>
Grass Skippers	<i>(Subfamily Hesperinae)</i>	
Swarthy Skipper	<i>Nastra</i>	<i>Lherminier</i>
Clouded Skipper	<i>Lerema</i>	<i>Accius</i>
Least Skipper	<i>Ancyloxypha</i>	<i>Numitor</i>

Piedmont National Wildlife Refuge – Butterflies

<u>Common Name</u>	<u>Scientific Name</u>	
Southern Skipperling	<i>Copaeodes</i>	<i>Minimus</i>
Fiery Skipper	<i>Hylephila</i>	<i>Phyleus</i>
Crossline Skipper	<i>Polites</i>	<i>Origenes</i>
Tawny-edged Skipper	<i>Polites</i>	<i>Themistocles</i>
Whirlabout	<i>Polites</i>	<i>Vibex</i>
Southern Broken-Dash	<i>Wallengrenia</i>	<i>Otho</i>
Northern Broken-Dash	<i>Wallengrenia</i>	<i>Egeremet</i>
Little Glassywing	<i>Pompeius</i>	<i>Verna</i>
Sachem	<i>Atalopedes</i>	<i>Compestris</i>
Delaware Skipper	<i>Anatrytone</i>	<i>Logan</i>
Dyssus Skipper	<i>Problema</i>	<i>Byssus</i>
Hobomok Skipper	<i>Poanes</i>	<i>Hobomok</i>
Zabulon Skipper	<i>Poanes</i>	<i>Zabulon</i>
Yehl Skipper	<i>Poanes</i>	<i>Yehl</i>
Dion Skipper	<i>Euphyes</i>	<i>Dion</i>
Dun Skipper	<i>Euphyes</i>	<i>Vestries</i>
Lace-winged Roadside Skipper	<i>Amblyscirtes</i>	<i>Aesculapius</i>
Dusky Roadside Skipper	<i>Amblyscirtes</i>	<i>Atteranata</i>
Ocola Skipper	<i>Panoquina</i>	<i>Ocola</i>
Eufala Skipper	<i>Lerodea</i>	<i>Eufala</i>
Twin-spot Skipper	<i>Oligoria</i>	<i>Maculate</i>
Dusted Skipper	<i>Atrytonopsis</i>	<i>Hianna</i>

Piedmont National Wildlife Refuge - Common Plants

<u>Common Name</u>	<u>Scientific Name</u>	
Green ash	<i>Fraxinus</i>	<i>pennsylvanica</i>
Sweetgum	<i>Liquidambar</i>	<i>styraciflua</i>
Yellow-poplar	<i>Liriodendron</i>	<i>tulipifera</i>
Black willow	<i>Salix</i>	<i>nigra</i>
Black walnut	<i>Juglans</i>	<i>nigra</i>
Swamp chestnut oak	<i>Quercus</i>	<i>michauxii</i>
Water oak	<i>Quercus</i>	<i>nigra</i>
Willow oak	<i>Quercus</i>	<i>phellos</i>
Shumard oak	<i>Quercus</i>	<i>shumardii</i>
Southern red oak	<i>Quercus</i>	<i>falcata</i>
White oak	<i>Quercus</i>	<i>alba</i>
Post oak	<i>Quercus</i>	<i>stellata</i>
Black oak	<i>Quercus</i>	<i>velutina</i>
Shagbark hickory	<i>Carya</i>	<i>Ovata</i>
Pignut hickory	<i>Carya</i>	<i>glabra</i>
Mockernut hickory	<i>Carya</i>	<i>tomentosa</i>
Red maple	<i>Acer</i>	<i>rubrum</i>
Red mulberry	<i>Morus</i>	<i>rubra</i>
Boxelder	<i>Acer</i>	<i>negundo</i>
American hornbeam	<i>Carpinus</i>	<i>caroliniana</i>
Eastern hophornbeam	<i>Ostrya</i>	<i>virginiana</i>
American elm	<i>Ulmus</i>	<i>americana</i>
Georgia hackberry	<i>Celtis</i>	<i>tenuifolia</i>
Persimmon	<i>Diospyros</i>	<i>virginiana</i>
Winged elm	<i>Ulmus</i>	<i>alata</i>
American beech	<i>Fagus</i>	<i>grandifolia</i>
Dogwood	<i>Cornus</i>	<i>florida</i>
Black cherry	<i>Prunus</i>	<i>serotina</i>
Loblolly pine	<i>Pinus</i>	<i>taeda</i>
Shortleaf pine	<i>Pinus</i>	<i>echinata</i>
Sassafras	<i>Sassafras</i>	<i>albidum</i>
Redbud	<i>Cercis</i>	<i>canadensis</i>
Rusty blackhaw	<i>Viburnum</i>	<i>rufidulum</i>
Possumhaw	<i>Virburnum</i>	<i>nudum</i>
Hawthorn	<i>Crataequs</i>	<i>spp.</i>
Sumac	<i>Rhus</i>	<i>spp.</i>
Buttonbush	<i>Cephalanthus</i>	<i>occidentalis</i>
Southern bayberry	<i>Myrica</i>	<i>cerifera</i>
Japanese honeysuckle	<i>Lonicera</i>	<i>japonica</i>
Blueberry	<i>Vaccinium</i>	<i>spp.</i>

Piedmont National Wildlife Refuge - Common Plants

<u>Common Name</u>	<u>Scientific Name</u>	
American beautyberry	<i>Callicarpa</i>	<i>americana</i>
Greenbrier	<i>Smilax</i>	<i>supp.</i>
Trumpet-creeper	<i>Campsis</i>	<i>radicans</i>
Blackberry	<i>Rubus</i>	<i>spp.</i>
Muscadine	<i>Vitis</i>	<i>rotundifolia</i>
Partridge pea	<i>Cassia</i>	<i>fasciculata</i>
Ragweed	<i>Ambrosia</i>	<i>artemisiifolia</i>
Beggarweed	<i>Desmodium</i>	<i>spp.</i>
Aster	<i>Aster</i>	<i>spp.</i>
Fern	<i>Spp.</i>	
Switch cane	<i>Arundinaria</i>	<i>tecta</i>
Wild sunflower	<i>Helianthus</i>	<i>spp.</i>
Bluestem grass	<i>Andropogon</i>	<i>spp.</i>
Uniola	<i>Uniola</i>	<i>spp.</i>
Panicum	<i>Panicum</i>	<i>spp.</i>
Plumegrass	<i>Erianthus spp.</i>	<i>spp.</i>
Poison-Ivy	<i>Rhus</i>	<i>radicans</i>
Strawberry	<i>Fragaria</i>	<i>Virginiana</i>

Appendix J. Budget Requests

(Will be included in Final CCP)

REFUGE OPERATING NEEDS SYSTEM (RONS)

MAINTENANCE MANAGEMENT SYSTEM NEEDS

Appendix K. List of Preparers

Andrew Hammond, Refuge Manager, *Piedmont NWR*

Carolyn Johnson, Assistant Refuge Manager, *Piedmont NWR*

Carl Schmidt, Forester, *Piedmont NWR*

John Mason, Prescribed Fire Specialist, *Piedmont NWR*

Jason Kimbell, Biological Technician, *Piedmont NWR*

Thomas Payne, Law Enforcement, *Piedmont NWR*

Laura Housh, Regional Planner, *Okefenokee NWR*

Nannette Brodie, Contractor, *Tennessee Valley Authority*

Jimmy Rickard, Biologist, *Athens Ecological Services*

Charlie Killmaster, Biologist, *Georgia Department of Natural Resources*

Evelyn Nelson, Editor, *Southeast Regional Office*

Randy Musgraves, Graphics, *Southeast Regional Office*

Rose Hopp, Chief of Planning, *Southeast Regional Office*