

**CAT ISLAND**  
**National Wildlife Refuge**  
*Draft*  
**Comprehensive Conservation Plan**  
**and Environmental Assessment**

*Photo Credit: Bob Strader*

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**DRAFT COMPREHENSIVE CONSERVATION PLAN  
AND ENVIRONMENTAL ASSESSMENT**

**CAT ISLAND NATIONAL WILDLIFE REFUGE**

*West Feliciana Parish, Louisiana*

**U.S. Department of the Interior  
Fish and Wildlife Service  
*Southeast Region*  
Atlanta, Georgia**

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## TABLE OF CONTENTS

### SECTION A. DRAFT COMPREHENSIVE CONSERVATION PLAN

|  |          |
|--|----------|
| <b>Chapter I. Background.....</b>  | <b>1</b> |
| Introduction.....  | 1        |
| Purpose And Need For The Plan.....   | 1        |
| U.S. Fish and Wildlife Service.....  | 1        |
| National Wildlife Refuge System.....   | 2        |
| Legal and Policy Context.....  | 3        |
| Legal Mandates, Administrative and Policy Guidelines, and<br>Other Special Considerations..... | 3        |
| National and International Conservation Plans and Initiatives.....                             | 4        |
| Relationship To State Wildlife Agency.....   | 6        |
| <b>Chapter II. Refuge Overview.....</b>  | <b>7</b> |
| Refuge History and Purpose.....  | 7        |
| Establishment.....   | 7        |
| Refuge Purpose and System Roles.....   | 7        |
| Special Designations.....  | 10       |
| Conservation Priority.....   | 10       |
| Hydrocarbon Extraction.....  | 12       |
| Ecosystem Context.....   | 12       |
| Regional Conservation Plans and Initiatives.....   | 12       |
| Ecological Threats and Problems.....   | 14       |
| Altered Flow Regimes.....  | 14       |
| Habitat Loss.....  | 15       |
| Habitat Fragmentation.....   | 15       |
| Habitat Alteration.....  | 16       |
| Physical Resources.....  | 17       |
| Climate.....   | 17       |
| Geology and Topography.....  | 19       |
| Soils.....   | 19       |
| Hydrology.....   | 23       |
| Air Quality.....   | 24       |
| Water Quality.....   | 24       |

---

|   |           |
|---|-----------|
| Biological Resources.....                                 | 24        |
| Habitat .....   | 24        |
| Wildlife .....  | 25        |
| Cultural Resources.....                                   | 28        |
| Socioeconomic Environment .....                           | 28        |
| Refuge Administration and Management.....                 | 29        |
| Land Protection and Conservation .....                    | 29        |
| Visitor Services .....                                    | 29        |
| Personnel, Operations, and Maintenance .....              | 30        |
| <b>Chapter III. Plan Development .....</b>                | <b>33</b> |
| Summary of Issues, Concerns, and Opportunities.....       | 33        |
| Fish and Wildlife Population and Habitat Management ..... | 33        |
| Resource Protection.....                                  | 34        |
| Visitor Services .....                                    | 35        |
| Refuge Administration.....                                | 36        |
| Wilderness Review.....                                    | 37        |
| <b>Chapter IV. Management Direction.....</b>              | <b>39</b> |
| Vision .....  | 39        |
| Goals, Objectives, and Strategies .....                   | 39        |
| Goal A: Fish and Wildlife Population Management.....      | 39        |
| Goal B: Habitat Management .....                          | 47        |
| Goal C: Resource Protection.....                          | 50        |
| Goal D: Visitor Services .....                            | 52        |
| Goal E: Refuge Administration .....                       | 55        |
| <b>Chapter V. Plan Implementation .....</b>               | <b>59</b> |
| Introduction .....  | 59        |
| Proposed Projects.....                                    | 59        |
| Fish And Wildlife Population Management .....             | 59        |
| Habitat Management.....                                   | 59        |
| Resource Protection.....                                  | 60        |
| Visitor Services .....                                    | 60        |
| Refuge Administration.....                                | 60        |

---

|  |    |
|--|----|
| Partnership/Volunteers Opportunities ..... | 62 |
| Step-Down Management Plans .....           | 62 |
| Strategic Habitat Conservation .....       | 62 |
| Plan Review and Revision .....             | 63 |

**SECTION B. ENVIRONMENTAL ASSESSMENT**

|   |           |
|---|-----------|
| <b>Chapter I. Background.....</b>                                       | <b>65</b> |
| Introduction.....   | 65        |
| Purpose and Need for Action .....                                       | 65        |
| Purpose.....  | 65        |
| Need.....   | 67        |
| Decision Framework .....  | 68        |
| Planning Study Area .....   | 68        |
| Authority, Legal Compliance, and Compatibility .....                    | 68        |
| Compatibility.....  | 68        |
| Public Involvement and the Planning Process .....                       | 69        |
| <b>Chapter II. Affected Environment.....</b>                            | <b>71</b> |
| <b>Chapter III. Description of Alternatives .....</b>                   | <b>73</b> |
| Formulation of Alternatives .....                                       | 73        |
| Description of Alternatives .....                                       | 73        |
| Alternative A - (Current Management - No Action).....                   | 73        |
| Alternative B - Active Resource Management (Proposed Alternative).....  | 74        |
| Alternative C - Full Resource Management with Enhanced Public Use ..... | 74        |
| Features Common to All Three Alternatives.....                          | 75        |
| Wildlife and Habitat Management .....                                   | 75        |
| Resource Protection .....   | 76        |
| Public Use .....  | 76        |
| Administration.....   | 76        |
| Environmental Justice.....  | 76        |
| Comparison of the Alternatives by Issue.....                            | 77        |

---

|   |           |
|---|-----------|
| <b>Chapter IV. Environmental Consequences</b> .....                     | <b>87</b> |
| Overview .....  | 87        |
| Summary of Effects by Alternative.....                                  | 87        |
| Alternative A - No Action (Current Management) .....                    | 87        |
| Alternative B - Active Resource Management (Proposed Alternative) ..... | 88        |
| Alternative C - Full Resource Management with Enhanced Public Use ..... | 89        |
| Comparison of Effects by Issue for the Three Alternatives .....         | 90        |
| Goal A. Fish and Wildlife Population Management .....                   | 101       |
| Effects Common to All Alternatives .....                                | 101       |
| Effects of Alternative A.....   | 101       |
| Effects of Alternative B.....   | 101       |
| Effects of Alternative C.....   | 101       |
| Goal B. Habitat Management .....  | 101       |
| Effects Common to All Alternatives .....                                | 101       |
| Effects of Alternative A.....   | 102       |
| Effects of Alternative B.....   | 102       |
| Effects of Alternative C.....   | 102       |
| Goal C. Resource Protection.....  | 103       |
| Effects Common to All Alternatives .....                                | 103       |
| Effects of Alternative A.....   | 103       |
| Effects of Alternative B.....   | 104       |
| Effects of Alternative C.....   | 104       |
| Goal D. Visitor Services.....   | 104       |
| Effects Common to All Alternatives .....                                | 104       |
| Effects of Alternative A.....   | 106       |
| Effects of Alternative B.....   | 106       |
| Effects of Alternative C.....   | 106       |
| Goal E. Refuge Administration .....                                     | 107       |
| Effects Common to All Alternatives .....                                | 107       |
| Effects of Alternative A.....   | 107       |
| Effects of Alternative B.....   | 108       |
| Effects of Alternative C.....   | 108       |

---

|  |            |
|--|------------|
| Climate Change.....  | 108        |
| Effects Common to All Alternatives.....                                | 108        |
| Effects of Alternative A .....   | 109        |
| Effects of Alternative B .....   | 109        |
| Effects of Alternative C .....   | 109        |
| Cumulative Impacts .....   | 109        |
| Hunting and Fishing.....   | 110        |
| General Public Use.....  | 110        |
| Road and Trail Maintenance.....  | 111        |
| Forest Management .....  | 111        |
| Environmental Justice.....   | 111        |
| <b>Chapter V. Consultation and Coordination .....</b>                  | <b>113</b> |
| Overview.....  | 113        |
| <br><b>APPENDICES</b>  |            |
| <b>Appendix A. Glossary.....</b>                                       | <b>115</b> |
| Acronyms and Abbreviations .....                                       | 123        |
| <b>Appendix B. Literature Cited.....</b>                               | <b>125</b> |
| <b>Appendix C. Relevant Legal Mandates and Executive Orders.....</b>   | <b>129</b> |
| <b>Appendix D. Public Involvement.....</b>                             | <b>143</b> |
| Summary Of Public Scoping Comments .....                               | 143        |
| Summary of Discussion with the Choctaw Nation of Oklahoma .....        | 144        |
| <b>Appendix E. Appropriate Use Determinations .....</b>                | <b>145</b> |
| <b>Appendix F. Compatibility Determinations .....</b>                  | <b>159</b> |
| <b>Appendix G. Intra-Service Section 7 Biological Evaluation .....</b> | <b>175</b> |
| <b>Appendix H. Wilderness Review .....</b>                             | <b>187</b> |
| Introduction.....  | 187        |
| Wilderness Inventory .....   | 188        |
| <b>Appendix I. Cultural Resource Review .....</b>                      | <b>191</b> |

---

**Appendix J. Refuge Biota .....199**

- Birds of Cat Island National Wildlife Refuge .....199
- Common Forest Trees of Cat Island National Wildlife Refuge .....206
- Fish Which May Occur on Cat Island National Wildlife Refuge .....207
- Reptiles and Amphibians known or expected on Cat Island National Wildlife Refuge.....212
- Mammals present or historically known from Cat Island National Wildlife Refuge .....217

**Appendix K. List of Preparers .....219**

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## LIST OF FIGURES

|             |  |     |
|-------------|--|-----|
| Figure 1.   | Location of Cat Island NWR .....   | 8   |
| Figure 2.   | Fee-title lands and approved acquisition boundary, Cat Island NWR .....  | 9   |
| Figure 3.   | Landscape conservation cooperatives .....  | 11  |
| Figure 4.   | Protected lands near Cat Island NWR .....  | 13  |
| Figure 5.   | Mean monthly temperature with minima and maxima (°F) for Baton Rouge, Louisiana, and mean monthly precipitation, (inches) for St. Francisville, Louisiana, for the period 1981-2010 (National Climate Data Center, 2014) ..... | 17  |
| Figure 6.   | Soil Map Units on Cat Island NWR; map unit symbol (MUSYM) names and descriptions are provided in Table 1 (Natural Resources Conservation Service, 2014) .....  | 22  |
| Figure 7.   | Mississippi River hydrographs before and after completion of mainline levees and cutoffs, at Vicksburg, MS. Reproduced from Schramm (2004) .....   | 23  |
| Figure 8.   | Generalized habitat types on Cat Island NWR .....  | 26  |
| Figure 9.   | Visitor Services on Cat Island NWR .....   | 31  |
| Figure I-1. | Cat Island NWR, fee-title holdings.....  | 191 |
| Figure I-2. | Location of archaeological sites near Cat Island National Wildlife Refuge. THIS FIGURE HAS BEEN REDACTED .....   | 192 |
| Figure I-3. | Geological features of Cat Island and surrounding area.....  | 193 |
| Figure I-4. | Mississippi River channel configurations from 1765-1932.....   | 194 |
| Figure I-5. | Soils of Cat Island National Wildlife Refuge. ....   | 195 |
| Figure I-6. | Wetlands on Cat Island National Wildlife Refuge. ....  | 197 |

## LIST OF TABLES

|            |   |     |
|------------|---|-----|
| Table 1.   | Soil map units (Natural Resources Conservation Service, 2014) on Cat Island NWR with taxonomic classifications and selected properties..... | 20  |
| Table 2.   | Generalized habitat types found on Cat Island NWR, with corresponding classifications and approximate acreages .....                        | 24  |
| Table 3.   | Summary of projects proposed for Cat Island NWR .....   | 61  |
| Table 4.   | National wildlife refuge step-down management plans related to the goals and objectives of the comprehensive conservation plan.....         | 62  |
| Table 5.   | Comparison of alternatives by management issues for Cat Island NWR .....  | 77  |
| Table 6.   | Summary of environmental effects by alternative, Cat Island NWR .....   | 91  |
| Table I-1. | Archaeological Sites recorded on the lower portion of Bayou Sara. THIS TABLE HAS BEEN REDACTED. ....  | 192 |
| Table I-2. | Soil mapping units on Cat Island National Wildlife Refuge. ....   | 195 |



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## SECTION A. DRAFT COMPREHENSIVE CONSERVATION PLAN

### *Chapter I. Background*

#### INTRODUCTION

This Draft Comprehensive Conservation Plan and Environmental Assessment (Draft CCP/EA) for Cat Island National Wildlife Refuge (NWR, refuge) was prepared by the U.S. Fish and Wildlife Service (FWS, Service) 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 Service's 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, 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 purposes, attains the vision and goals developed for the refuge, contributes to the 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

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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 Fish and Wildlife 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 the 150-million-acre Refuge System, which encompasses more than 560 national wildlife refuges, thousands of small wetlands, and other special management areas. It also operates 70 national fish hatcheries, 65 fish and wildlife conservation offices, and 86 ecological services field stations. The agency enforces federal wildlife laws; administers the Endangered Species Act; manages migratory bird populations; restores nationally significant fisheries; conserves and restores wildlife habitat such as wetlands; and helps foreign governments with their conservation efforts. It also oversees the Federal Assistance program, which 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 (Improvement Act) 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 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.

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National wildlife refuges connect visitors to their natural resource heritage and provide them with an understanding and appreciation of fish and wildlife ecology to help them understand their role in the environment. Wildlife-dependent recreation on refuges also generates economic benefits to local communities. According to the report, *Banking on Nature: The Economic Benefits to Local Communities of National Wildlife Refuge Visitation*, approximately 46.5 million people visited national wildlife refuges in Fiscal Year 2011, generating \$2.4 billion in total economic activity and creating 35,000 private sector jobs, producing about \$792.7 million in employment income. Additionally, recreational spending on refuges generated \$342.9 million in tax revenue at the local, county, state, and federal levels (Carver & Caudill, 2013). As the number of visitors grows, significant economic benefits are realized by local communities. In 2011, nearly 72 million people, 16 years and older, fished, hunted, or observed wildlife, spending \$54.9 billion (U.S. Fish and Wildlife Service and U.S. Census Bureau, 2012).

Volunteers and friends groups continue to be major contributors to the success of the Refuge System. In 2012, 56,133 volunteers contributed more than 2.1 million hours on refuges nationwide, a service valued at more than \$46 million and representing a full-time employee equivalent of over 1,036. The number of station-specific Friends organizations has steadily increased and is now more than 230 (U.S. Fish and Wildlife Service, 2013).

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 of 1997 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. Brief descriptions of selected federal statutes and executive orders relevant to administration of the Refuge System and management of the Cat Island NWR are provided in Appendix C.

Treaties, laws, administrative guidelines, and policies 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. They provide a framework for cooperation between Cat Island NWR and other partners such as the Louisiana Department of Wildlife and

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Fisheries, The Nature Conservancy, West Feliciana Parish Tourist Commission, Louisiana State Historic Preservation Office, U.S. Geological Survey, Louisiana State University, Louisiana Hiking Club, volunteers, and private landowners. Treaties and federal law also govern the role of tribal governments, such as the Choctaw Nation of Oklahoma, in land management and planning.

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 with refuge purposes. 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 its 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, landscape, national, and international 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.

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This Draft CCP supports, among others, the Partners-in-Flight Plan, the North American Waterfowl Management Plan, the Western Hemisphere Shorebird Reserve Network, Gulf Coastal Plains and Ozarks Landscape Conservation Cooperative, Lower Mississippi River Ecosystem Plan, and the National Wetlands Priority Conservation Plan.

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. In response to new threats and a broader vision of conservation in North America, the North American Waterfowl Management Plan (NAWMP) was revised in 2012 (NAWMP Plan Committee, 2012) to set out three goals for waterfowl conservation:

- “Abundant and resilient waterfowl populations to support hunting and other uses without imperiling habitat.
- Wetlands and related habitats sufficient to sustain waterfowl populations at desired levels, while providing places to recreate and ecological services that benefit society.
- Growing numbers of waterfowl hunters, other conservationists, and citizens who enjoy and actively support waterfowl and wetlands conservation.”

Like previous versions of NAWMP, the 2012 plan focuses on waterfowl populations and habitat conservation. However, the new plan formally adds the human dimension, explicitly recognizing the importance of waterfowl hunters and others who appreciate and support this important natural resource. Cat Island NWR will continue to provide high-quality habitat for the thousands of waterfowl that breed, stop over, and winter there, and will also continue to be a destination for waterfowl-related recreation.

Partners-in-Flight Bird Conservation Plan. The Partners in Flight North American Landbird Conservation Plan (Rich et al., 2004) was developed during the 1990s with funding from the National Fish and Wildlife Foundation. Continental in scope, this plan identifies landbird species of conservation concern and gives quantitative goals for their conservation. In addition to the North American plan, a series of regional plans focused on bird conservation regions (BCRs) have been written. Cat Island NWR addresses the threat of forest habitat fragmentation and loss, identified in the PIF Bird Conservation Plan for the Mississippi Alluvial Valley (Twedt et al., 1999).

U.S. Shorebird Conservation Plan. The U.S. Shorebird Conservation Plan (Parker, 1999) 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 (Kushlan et al., 2002) 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. Federally listed waterbirds in the

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United States include southeastern U.S. breeding populations of wood storks (*Mycteria americana*), Mississippi sandhill cranes (*Grus canadensis pulla*), whooping cranes (*Grus americana*), and interior-breeding populations of the least tern (*Sternula antillarum*). A key objective of this plan is the standardization of data collection efforts to better recommend effective conservation measures.

**Landscape Conservation Cooperatives.** The Service will implement strategic habitat conservation through Landscape Conservation Cooperatives (LCCs), which are landscape-scale partnerships between the Service, other federal agencies, states, tribes, non-governmental organizations, and universities (U.S. Fish and Wildlife Service, 2014). These partnerships provide technical and scientific support for conservation planning at landscape scales, and then facilitate conservation actions by partners. Cat Island NWR lies within the Gulf Coastal Plains and Ozarks LCC.

**Lower Mississippi River Ecosystem (LMRE) Plan.** This plan (U.S. Fish and Wildlife Service, 2002) provides goals for conservation, enhancement, protection, and monitoring of migratory bird populations and their habitats; protection, restoration, and management of the wetlands of the LMRE; protection and/or restoration of imperiled habitats and viable populations of all endangered, threatened, and candidate species and species of concern in the LMRE; protection, restoration, and management of the fisheries, hatcheries, and other aquatic resources historically associated with the wetlands and waters of the LMRE; an increase in public awareness and support for LMRE resources and their management; enforcement of natural resource laws; and protection, restoration, and enhancement of water and air quality.

**American Woodcock Conservation Plan.** This plan was published by the Wildlife Management Institute in 2008 to document changes in woodcock densities and habitats that have occurred since the early 1970s (Wildlife Management Institute, 2008). Population density deficits were calculated and specific habitat acreage goals for erasing such deficits were developed for various BCRs.

## **RELATIONSHIP TO STATE WILDLIFE AGENCY**

The Improvement Act and subsequent agency policy provide that the Service shall ensure timely and effective cooperation and collaboration with 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 Louisiana.

The Louisiana Department of Wildlife and Fisheries (LDWF) is responsible for management and protection of wildlife and fisheries resources in the State of Louisiana. It is responsible for executing state laws “for the control and supervision of programs relating to the management, protection, conservation, and replenishment of wildlife, fish, and aquatic life, and the regulation of the shipping of wildlife, fish, furs, and skins” (Lester et al., 2005). LDWF managed 59 wildlife management areas, 7 wildlife refuges, and 5 fish hatcheries in 2013. The mission of the LDWF is “to manage, conserve, and promote wise utilization of Louisiana’s renewable fish and wildlife resources and their supporting habitats through replenishment, protection, enhancement, research, development, and education for the social and economic benefit of current and future generations; to provide opportunities for knowledge of and use and enjoyment of these resources; and to promote a safe and healthy environment for the users of the resources” (Louisiana Department of Wildlife and Fisheries, 2014).

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 Louisiana. An essential part of comprehensive conservation planning is integrating common mission objectives where appropriate.

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## *Chapter II. Refuge Overview*

### **REFUGE HISTORY AND PURPOSE**

#### *ESTABLISHMENT*

Cat Island NWR was established in October 2000, as the 526<sup>th</sup> refuge in the Refuge System. It is located in West Feliciana Parish, Louisiana, near the town of St. Francisville, 25 miles north of Baton Rouge (Figure 1).

Acquisition has occurred in stages, beginning in 2000 when The Nature Conservancy of Louisiana (TNC) made the first purchase of about 9,500 acres of forested wetlands. That and subsequent acquisitions by TNC were purchased by the Service using both the Land and Water Conservation Fund and Migratory Bird Conservation Fund. Today, the refuge encompasses 10,473 acres. The congressionally approved acquisition boundary encloses 36,500 acres (Figure 2).

#### *REFUGE PURPOSE AND SYSTEM ROLES*

The Improvement Act and subsequent policy requires that each refuge be managed to fulfill both its establishment purpose and the mission of the Refuge System. Cat Island NWR was created by Congress through Public Law 106-369, which states: “The purposes for which the Refuge is established and shall be managed are— (1) to conserve, restore, and manage habitats as necessary to contribute to the migratory bird population goals and habitat objective [sic] as established through the Lower Mississippi Valley Joint Venture; (2) to conserve, restore, and manage the significant aquatic resource values associated with the area’s forested wetlands and to achieve the habitat objectives of the “Mississippi River Aquatic Resources Management Plan;” (3) to conserve, enhance, and restore the historic native bottomland community characteristics of the lower Mississippi alluvial valley and its associated fish, wildlife, and plant species; (4) to conserve, enhance, and restore habitat to maintain and assist in the recovery of endangered and threatened plants and animals; and (5) to encourage the use of volunteers and facilitate partnerships among the United States Fish and Wildlife Service, local communities, conservation organizations, and other non-Federal entities to promote public awareness of the resources of the Refuge and the National Wildlife Refuge System and public participation in the conservation of those resources.” Cat Island NWR Establishment Act, 114 STAT. 1418. October 27, 2000.

Cat Island NWR is part of the LMRE and is located on the southeastern edge of the Mississippi Alluvial Valley (MAV) Bird Conservation Region, which is incorporated into the Gulf Coastal Plains and Ozarks Landscape Conservation Cooperative (Figure 3). The MAV lies along one of four migratory flyways utilized by millions of waterfowl, songbirds, and other birds each spring and fall. This region is also one of North America’s most ecologically altered landscapes; of the 24 million acres of bottomland hardwood forest that greeted European explorers in the 17<sup>th</sup> century, only 7 million acres remain. Much of what is left is on the lowest, wettest sites and has been high-graded, fragmented, drained, flood-protected, and otherwise ecologically compromised (King et al., 2006).

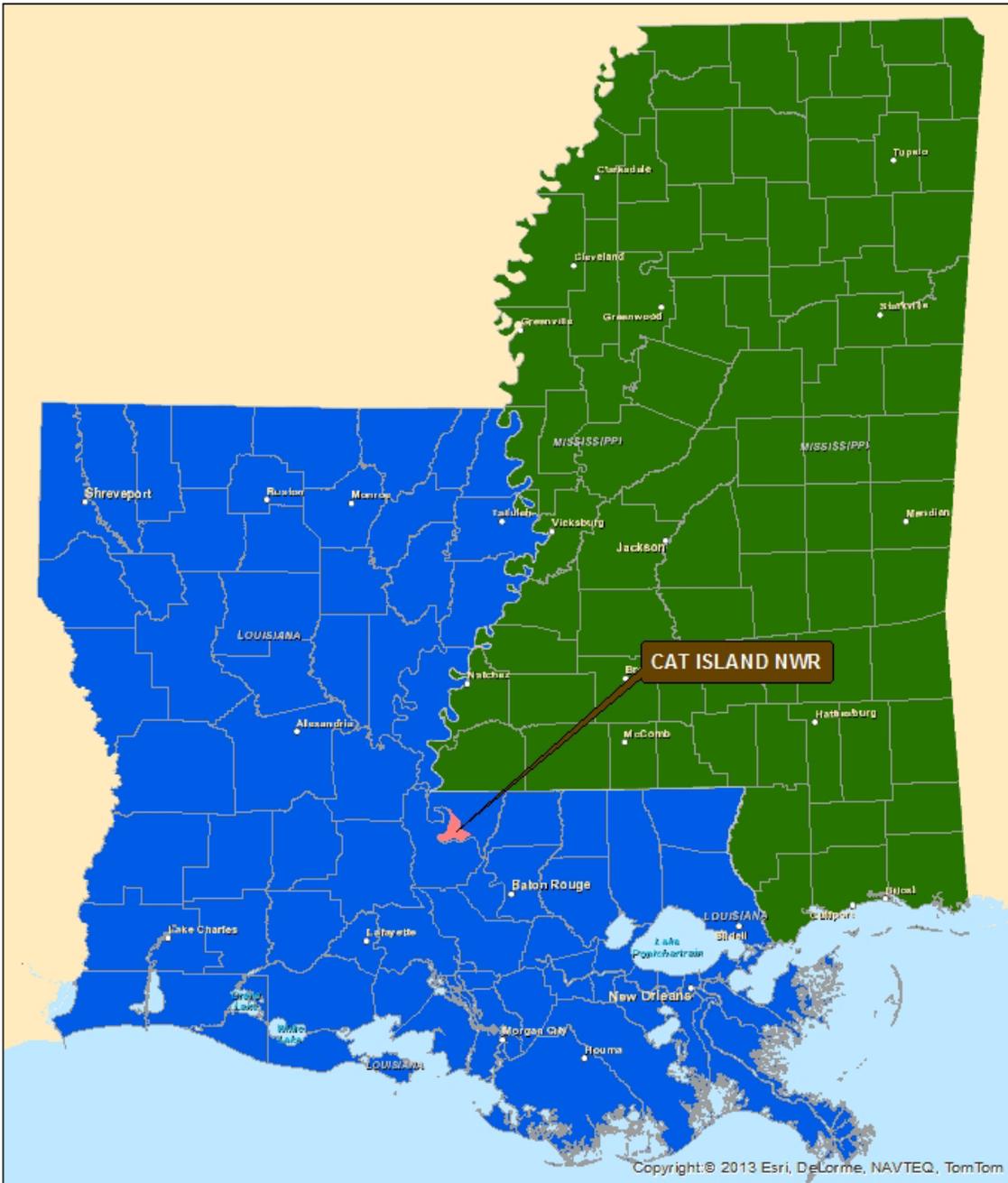
The Service uses an integrated, ecosystem approach rather than focusing on individual species. This approach promotes “the effective conservation of natural biological diversity through perpetuation of dynamic, healthy ecosystems” (052 FW 1). Bottomland hardwood forest management, for example, can benefit Neotropical migratory forest birds, wintering waterfowl, and resident wildlife. As a result, outdoor recreational activities, such as hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation, are maintained and enhanced by refuge management programs.

Figure 1. Location of Cat Island NWR



U.S. Fish & Wildlife Service  
Cat Island National Wildlife Refuge  
West Feliciana Parish, Louisiana

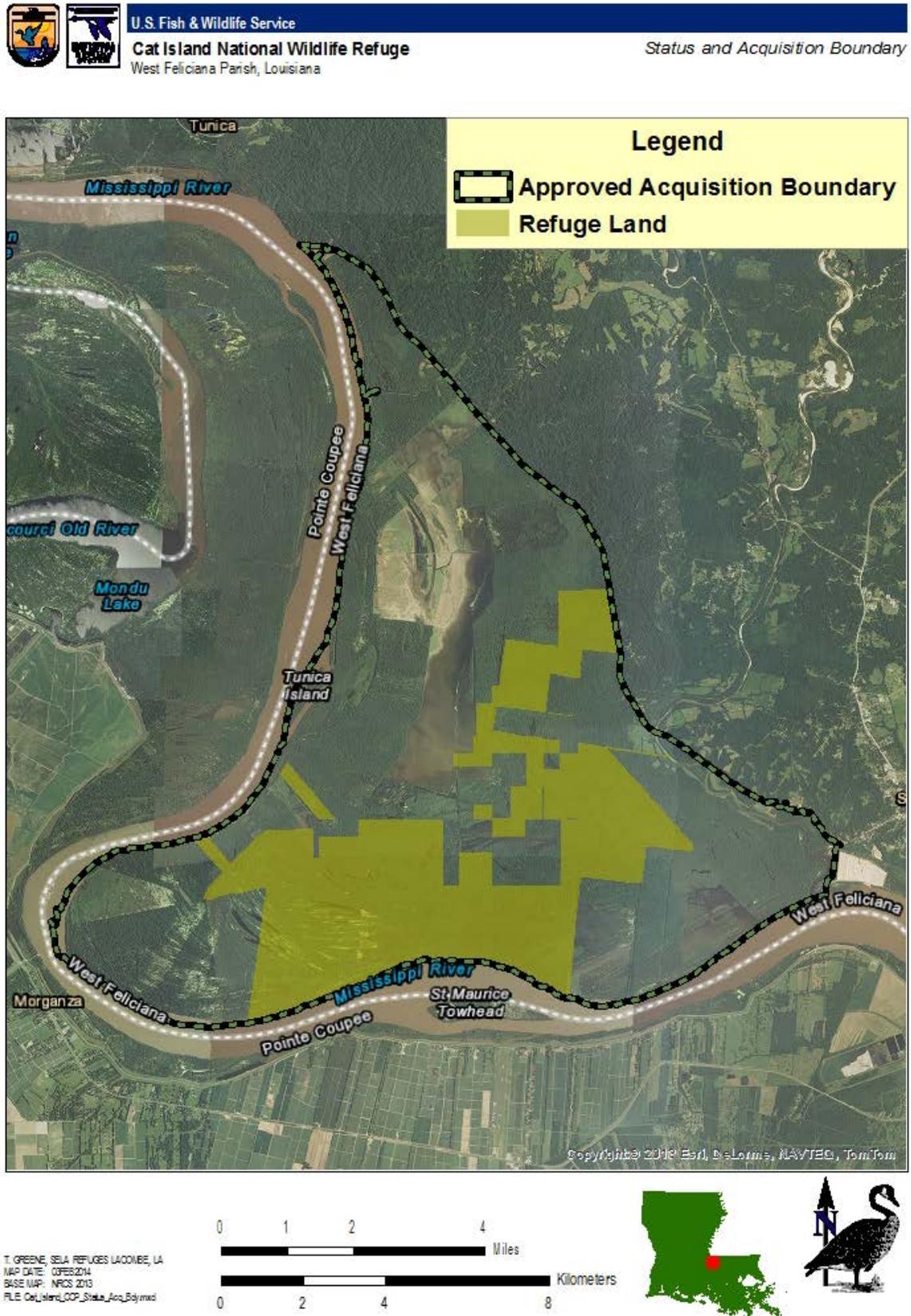
Vicinity Map



T. GREENE, SELA REFUGES LACOMBE, LA  
MAP DATE: 07JUN2014  
FILE: Cat\_Island\_GCP\_Location\_Map.mxd



Figure 2. Fee-title lands and approved acquisition boundary, Cat Island NWR



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Cat Island NWR contains a number of relict baldcypress trees, including the world's largest known baldcypress tree, which was not cut when the old-growth forest was logged in the early 20<sup>th</sup> Century. Many of these trees are estimated to be 500 to 1,000 years old. Habitat types range from baldcypress/tupelo swamp to bottomland hardwoods and scrub/shrub swamps.

Mallards, gadwalls, ring-necked ducks, green-winged teal, and other migratory waterfowl use the refuge during the fall and winter. The area is also used by thousands of wood ducks and serves as an important breeding ground for this species. A great variety of wading birds and shorebirds makes their home in the area. Cat Island NWR is also recognized by the Partners in Flight program as an important area for many species of priority Neotropical migratory birds, including the swallow-tailed kite, a species of special concern.

Cat Island NWR is also known for white-tailed deer, squirrel, and rabbit, as well as furbearers such as bobcat, raccoon, and mink. Its numerous natural lakes and bayous support a diverse fishery that offers excellent sport fishing opportunities for largemouth bass, crappie, bream, and catfish. The refuge also ranks high on the habitat suitability index for spawning habitat for alligator gar, a species of concern. Recreational crawfishing is permitted on the refuge during the spring and early summer months.

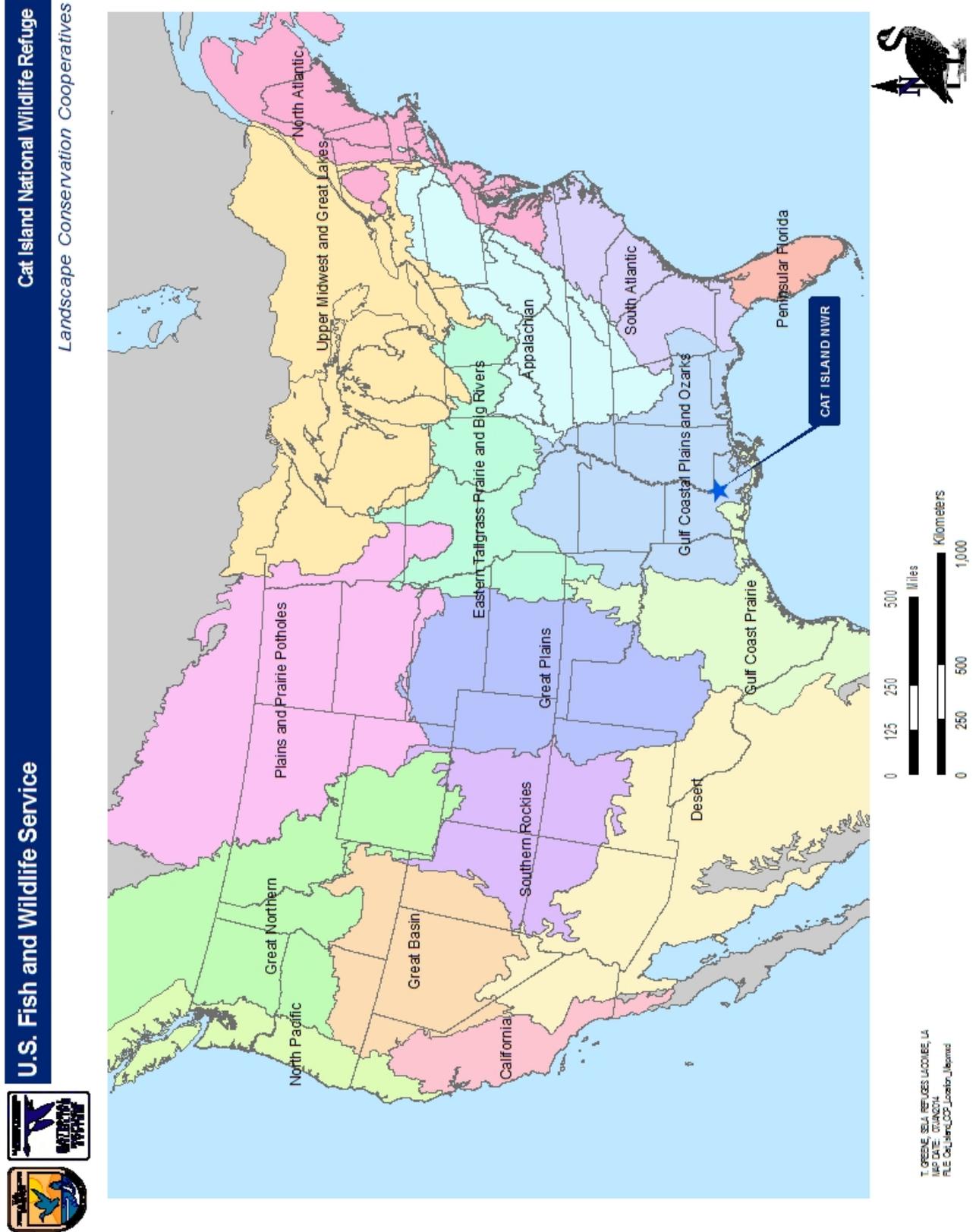
## **SPECIAL DESIGNATIONS**

### *CONSERVATION PRIORITY*

The Partners in Flight (PIF) Bird Conservation Plan for the Lower Mississippi Alluvial Valley (LMAV) (Twedt et al., 1999) identified 36 patches of bottomland hardwood habitat where, with restoration, it would be feasible to re-create a contiguous block of at least 8,000 ha (20,000 acres). One of these areas, the Cat Island Forest Bird Conservation Area, is coextensive with the refuge-approved acquisition boundary (which covers 36,500 acres).

Three other conservation prioritization models have been published for the MAV since the PIF plan: the Forest Breeding Bird model produced by the Lower Mississippi Valley Joint Venture (LMVJV) (Twedt et al., 2006), and a Wetland Restoration Suitability Model and an Easement Protection Priority model, both developed by Ducks Unlimited (Ducks Unlimited, 2013). These three models each identify high-priority areas for conservation within the LMAV. The Forest Breeding Bird model emphasizes increasing the size and number of existing forest core areas, and therefore the priority areas in that model tend to be located adjacent to large areas of forested habitat. While this model was devised to benefit interior-breeding (area-dependent) forest birds, it also identifies high-priority restoration lands for the benefit of Louisiana black bear. The Ducks Unlimited Wetland Restoration Suitability Model is primarily based on hydrology (flooding probability, soil hydricity, topography, riparian zones), and identifies low and wet places on the landscape where wetlands could most easily be restored. This model focuses on areas that have been cleared since 1972. It was developed in response to habitat deficiencies for wintering waterfowl in the LMAV, which were highlighted by the identification of statewide and step-down goals for waterfowl food production and habitat acreage developed by the LMVJV. Ducks Unlimited's other model, the Easement Protection Priority Model, like the Forest Breeding Bird model, is focused on increasing the size of protected areas, and therefore identifies high-priority areas which are in natural vegetation and which would add to existing protected areas. All three of these more recent models identify the unprotected areas within and surrounding the Cat Island NWR approved acquisition boundary as high priority (top 20 percent) for conservation action, either restoration or protection.

Figure 3. Landscape conservation cooperatives



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The refuge protects the national co-champion baldcypress tree, as designated by American Forests in its Fall 2013 edition of the *National Register of Big Trees* (American Forests, 2013). This tree draws a large number of visitors and is a source of pride for the staff and the local community.

### *HYDROCARBON EXTRACTION*

No current oil or gas extraction activities are taking place on Cat Island NWR. There are four known oil/gas wells on the refuge which are not in production. No pipelines cross the refuge (Louisiana Department of Natural Resources, 2013).

### **ECOSYSTEM CONTEXT**

Cat Island NWR is located near the southern end of the LMAV, on the east bank of the Mississippi River. Situated as it is inside a meander loop of the river and adjacent to loess hills to the east, Cat Island is within the approximately 10 percent of the historic floodplain of the Mississippi not protected by levees. Annual flooding by the Mississippi River decreases its value as farmland and renders it unfit for permanent human habitation. The town of St. Francisville, Louisiana, is located on Pleistocene loess (windblown silt) deposits immediately adjacent to the refuge to the east which are higher in elevation and not subject to flooding from the river. Portions of these uplands are protected by the State of Louisiana as the Tunica Hills Wildlife Management Area, just to the north of the refuge. These and other nearby conservation lands are depicted in Figure 4.

### **REGIONAL CONSERVATION PLANS AND INITIATIVES**

The State of Louisiana completed its Comprehensive Wildlife Conservation Strategy (CWCS), also known as the State Wildlife Action Plan, in 2005 (Lester et al., 2005). This 10-year plan identifies wildlife conservation priorities for Louisiana; its stated purpose is “to develop a blueprint for guiding LDWF in the development of management actions for Louisiana’s fish and wildlife species with emphasis on species of conservation concern and associated habitats they depend upon.”

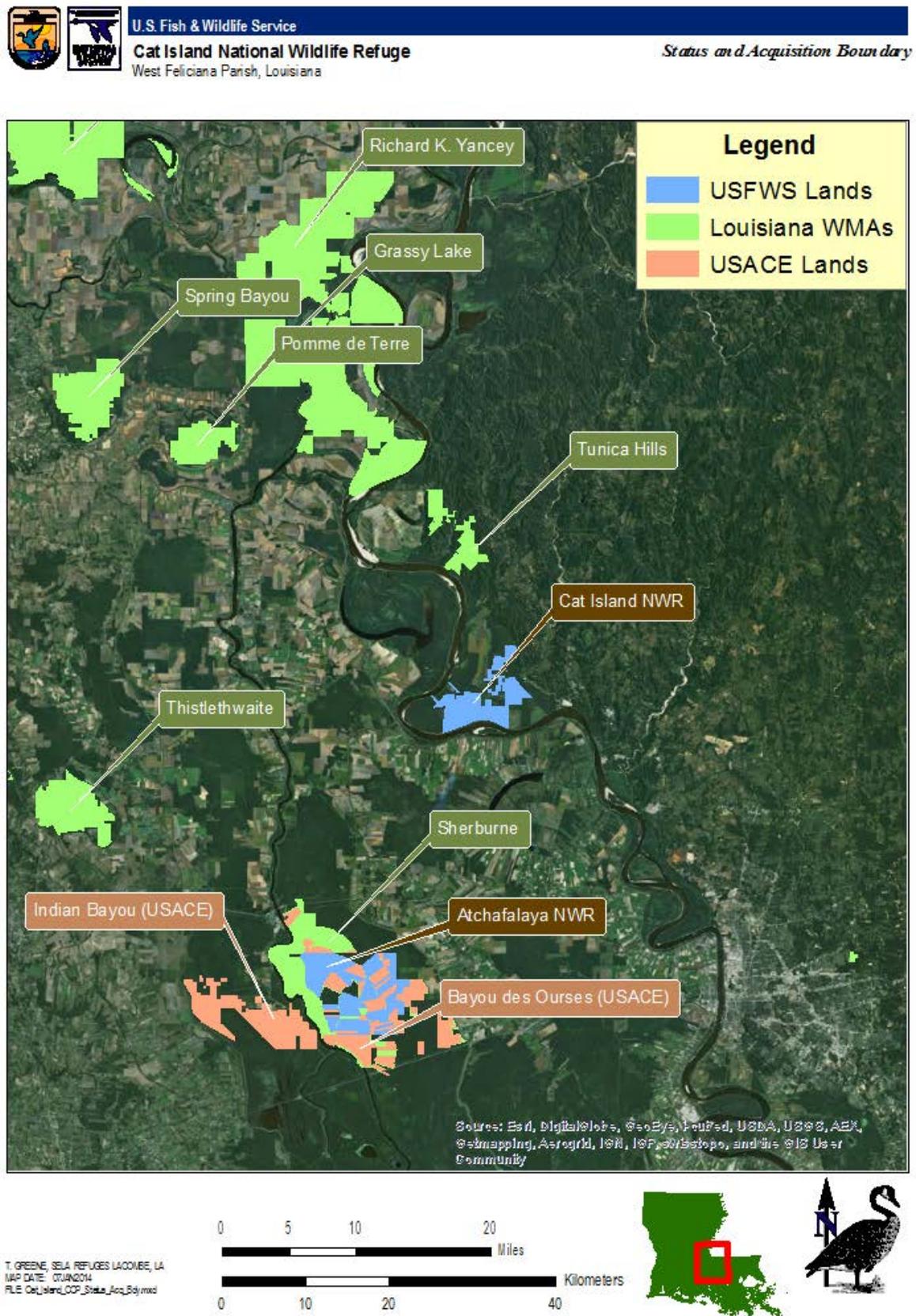
Cat Island NWR is in the Mississippi River Alluvial Plain ecoregion. Two habitat types described in the CWCS predominate on Cat Island NWR: Bottomland Hardwood Forest and Cypress-Tupelo-Blackgum Swamp. The CWCS identifies National Vegetation Classification System (NVCS) ecological systems which correspond to these habitat types and occur on Cat Island NWR: CES203.512, Lower Mississippi River Bottomland and Floodplain Forest and CES203.490 Lower Mississippi River Bottomland Depression system. The NVCS has been revised, and the corresponding new classifications are: G034 Oak - Sweetgum Floodplain Forest Group and G033 Bald-cypress - Tupelo Floodplain Forest Group (NatureServe, 2013). For simplicity, hereinafter they will be referred to as bottomland hardwood forest and baldcypress-tupelo swamp.

The CWCS identified 27 species of conservation concern in the bottomland hardwood forests of the MRAP and 17 in the baldcypress-tupelo swamps in that ecoregion. Conservation strategies recommended for these two vegetation types were:

#### **Bottomland Hardwood Forest**

1. Continue to monitor nuisance species (nutria, beaver, etc.), and control them as needed.
2. Promote use of appropriate silvicultural techniques to restore/manage BLH forests for wildlife (include importance of tree species diversity), den trees for birds and mammals, etc.
3. Encourage the use of Best Management Practices in the conservation of this habitat type.
4. Work with NRCS and LFA to promote economic value of hardwood lumber to encourage the management/restoration of this habitat.

Figure 4. Protected lands near Cat Island NWR



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5. Support research regarding palmetto abundance in bottomlands and effects on wildlife species and habitat structure.
  6. Work with adjoining states to address water management issues that affect bottomland hardwood habitat in Louisiana.
  7. Work with BBCC, Louisiana Department of Transportation and Development (DOTD), NRCS, USFWS, USDA Forest Service (USFS), private landowners, etc., to promote corridors of bottomland hardwood forests for wildlife species.
  8. Work with oil and gas corporations to encourage the use of directional drilling to minimize the environmental impacts to this habitat.

### **Baldcypress-Tupelo Swamp**

1. Work with landowners/land managers to promote conservation of habitat sites that may not regenerate naturally after logging due to changes in hydrology, herbivory, and other factors. Promote use of “condition classes” as defined by the Governor’s Science Working Group on Coastal Wetland Forest Conservation and Use to identify these target swamp habitat areas in need of conservation attention.
2. Work with and support efforts of LCA, CWPPRA, and Governor’s Commission on Coastal Wetland Forest Conservation and Use regarding coastal restoration (specifically swamp habitat restoration, regeneration, and sustainability) and to establish and maintain long-term monitoring sites within coastal wetland forests.
3. Promote use of appropriate silvicultural techniques to restore/manage swamps for wildlife (include importance of tree species diversity, den trees for birds and mammals, etc.).
4. Work with Cypress Legacy Program and other environmental groups to identify old-growth areas where conservation actions can be implemented.
5. Support research to determine the importance of Spanish moss to species of conservation concern and determine if moss is declining in Louisiana.
6. Work with adjoining states to address water management issues that affect cypress-tupelo- blackgum swamps in Louisiana.
7. Work with Corps of Engineers (COE), Ducks Unlimited, and other groups to enhance swamp hydrologic conditions to control invasive species on Caddo and Catahoula lakes.
8. Work with COE to influence water levels in the Atchafalaya Basin to benefit this habitat type.
9. Continue to monitor nuisance species (nutria, beaver, etc.), and control them as needed.
10. Partner with state and federal agencies and other interested groups to conduct surveys and develop GIS data on the extent and condition of swamps throughout Louisiana.

## **ECOLOGICAL THREATS AND PROBLEMS**

The Nature Conservancy has conducted an ecoregional planning process for the Lower Mississippi Alluvial Valley (The Nature Conservancy, 2002). Cat Island was identified as one of 24 Action Sites in the ecoregion. The ecoregional planning process identified five major threats common to many or most of the sites included in the plan: altered flow regimes, habitat loss and fragmentation, habitat alteration, decreased water quality (from nutrient enrichment, sediment, and toxins from runoff), and direct take (of individuals of target species).

### *ALTERED FLOW REGIMES*

Conversion to agriculture and urban uses within the MAV has required the implementation of flood control measures and the resulting system of levees, dikes, diversions, and canals which regulate the Mississippi River, making it the world’s largest flood control system. The result is a much-altered landscape, largely cut off from the river’s natural flood cycles, lacking the ecological integrity to support floodplain-dependent fish and wildlife or provide other ecosystem services. In addition, locks and dams, channelization, bend

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cuts, and other modifications have been made to facilitate shipping. These changes have obvious consequences for the lands outside the levees where flooding is prevented, but there are also consequences for lands which still flood either because they are inside the levees or are un-leveed, as is Cat Island NWR, and for aquatic habitats. Flooding regimes inside the levees and in un-leveed sections of the MAV have changed since the construction of the flood control system. In the lower MAV, flood durations and depths have decreased due to the operation of locks and dams in the upper part of the basin. Upstream of the locks and dams, both in the Mississippi River and in its major tributaries, the opposite pattern is observed; floods are deeper and last longer because the flood pulse is held back and released slowly (Schramm, 2004; Schramm et al., 2009). As a result, vegetation communities are changing, certain habitats like sandbars are less available (above the locks and dams), and in-stream aquatic habitats are altered (The Nature Conservancy, 2002).

### *HABITAT LOSS*

The LMAV, which stretches from the confluence of the Ohio and Mississippi rivers to the Gulf of Mexico, supported as much as 24 million acres of floodplain forests, swamps, sloughs, and riverine habitat at its peak extent in 1600 (Stanturf et al., 2000; Hamel & Buckner, 1998). However, this region's fertile soils have proven to be its undoing; it now has the distinction of being the Southeast's most deforested region. More than 75 percent of its forest has been lost since European settlement, mostly to agriculture, but increasingly, to urban sprawl as well. Timber resources were exploited beginning in the late 19<sup>th</sup> Century and through the first half of the 20<sup>th</sup> Century, with little thought of sustainable product flow or conservation. Conversion of timberlands to agriculture accelerated during the 1960s and 1970s in response to commodity price fluctuations, which in turn were the result of changes in U.S. government export policy and global demand. Today, of the original 24 million acres of bottomland hardwood forest in the LMAV, only 7 million remain, and much of that is in small, isolated tracts which have limited conservation value (King et al., 2006).

### *HABITAT FRAGMENTATION*

Habitat fragmentation occurs when large blocks of continuous habitat are broken up into smaller blocks by the creation of breaks consisting of different kinds of habitat. Habitat fragmentation can obviously be a consequence of habitat conversion, but its effects are distinct, and the difference is important to management and restoration efforts. In bottomland hardwood systems, fragmentation can result from human activities including construction of roads and other rights-of-way, forest management which incorporates large-scale clearcutting, conversion to agriculture or other, non-forest uses, and engineered hydrologic management structures such as levees and ditches.

Fragmentation affects ecosystem structure and function in a number of ways, and the effects depend on the pattern and spatial properties of the remaining fragments, as well as their size. For example, blocks of forest which are separated by a road or pipeline right-of-way may retain much of their shared function as habitat for species which are able to cross short distances of inhospitable habitat, while similar-sized blocks that are separated by large distances may effectively isolate those same species (Robbins et al., 1989). However, species composition or other elements of ecosystem structure may change as a result of the presence of a corridor of open habitat, even if the total size of the habitat block does not appreciably change. Species which are adapted to ecotones and open habitat will have access to the interior of a previously inhospitable (to them) area, and the total area of forest interior habitat (i.e., that which is more than some minimum distance from edges) will decrease by much more than the area converted. In a study in Vermont, interior-nesting Neotropical migratory birds appeared to be sensitive to the presence of increased edge habitat created by small, patch clearcuts, despite the absence of increased predation or nest parasitism; the mechanism for this sensitivity was not clear (Germaine et al., 1997). However, patch clearcuts may not have

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negative impacts on most forest-interior nesting Neotropical migratory birds in the LMRV (Pashley & Barrow, 1993). Given that pre-settlement conditions likely included openings caused by natural disturbances, it is reasonably certain that managing bottomland hardwood forests in the LMAV with patch clearcuts will benefit most Neotropical migratory breeding birds (Hunter et al., 2001).

Habitat fragmentation can result in decline or loss of wide-ranging and interior-dependent species (U.S. Fish and Wildlife Service, 1995), increased invasion by exotic plants and animals, decreased (or increased) species diversity (Rudis, 1995), and changes in predator, parasite, and pathogen populations and effects. In bottomland forests of the LMAV, documented effects of fragmentation include declines in forest interior breeding bird species such as swallow-tailed kite, prothonotary warbler, and Acadian flycatcher (Rich et al., 2004). Habitat restoration in existing habitat breaks and wildlife-oriented forest management can provide a high quality mix of interior, gap, and edge habitats in bottomland forest which will support a diverse bird community (Heltzel & Leberg, 2006; LMVJV Forest Resource Conservation Working Group, 2007).

### *HABITAT ALTERATION*

Forest condition throughout the LMAV has been degraded by unsustainable forest harvesting practices, changes in hydrologic regime, and exotic invasive species such as Chinese tallow (*Triadica sebifera*), Japanese climbing fern (*Lygodium japonicum*), and feral hog (*Sus scrofa*). High-grading, or removing high-value stems and/or species while leaving cull stems and economically less valuable species, has been widely practiced throughout the region for more than a century. This practice changes forest structure and composition, favoring poorly formed or hollow stems of commercially valuable species such as oaks (*Quercus* spp.) and ash (*Fraxinus* spp.), and a general increase in the dominance of less valuable species such as sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), boxelder (*A. negundo*), sugarberry (*Celtis laevigata*), and elms (*Ulmus* spp.). Other silvicultural practices which can result in altered forest composition include artificial regeneration and afforestation on agricultural fields, a very common practice on Wetland Reserve Program (WRP) lands. Often these practices favor mast-producing species and species with higher commercial value at the expense of less favored tree species (The Nature Conservancy, 2002; Allen, 1997). More recent reforestation on WRP lands has incorporated practices such as using more diverse species mixes and varying planting densities to allow for natural regeneration of light-seeded species (King et al., 2009).

It is important to note that some of these changes can be viewed as favorable for wildlife species. For example, large old cull trees are valuable as den trees, and mast-producing trees benefit a range of important wildlife species. Maintaining a diverse forest consisting of patches with different canopy structure and species composition is a good way to ensure that the needs of all native wildlife are met (LMVJV Forest Resource Conservation Working Group, 2007).

Changes in hydrology (flood duration, depth, and timing) will result in changes in forest composition over time. Bottomland hardwood forest communities are particularly sensitive to hydrology, and even small changes can have dramatic effects on recruitment in woody plant communities (Denslow & Battaglia, 2002; Day et al., 2006; King et al., 2009).

Exotic invasive plants are changing the composition of bottomlands in the LMAV. Probably the most troublesome of these in the southern end of the region is Chinese tallow, which invades disturbed areas such as roadsides and clearings, and then can become very abundant after regeneration cuts and other silvicultural practices which allow light to reach the forest floor (Denslow & Battaglia, 2002). Other exotic plant species which invade bottomland hardwood forests in the LMAV include Japanese climbing fern (*Lygodium japonicum*), chinaberry (*Melia azedarach*), Japanese honeysuckle (*Lonicera*

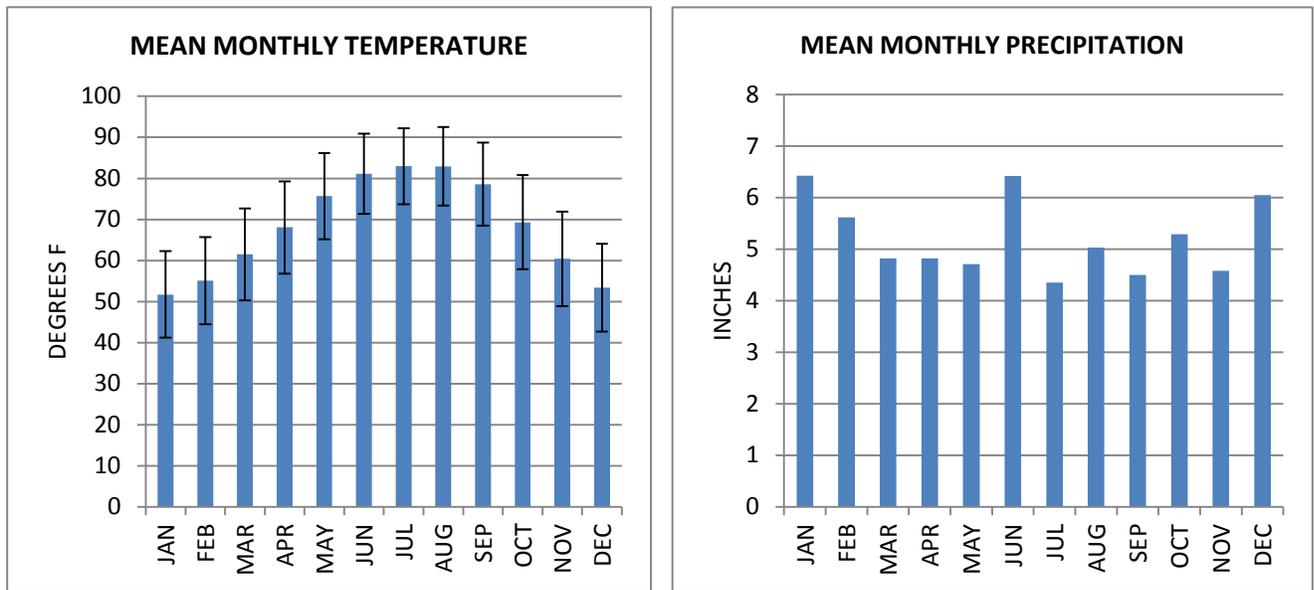
*japonica*), and trifoliolate orange (*Poncirus trifoliolata*). The premier invasive exotic animal in the LMAV, as in much of North America, is the feral hog. Swine were first brought to the Americas by European explorers in the 16<sup>th</sup> Century, and they have become ubiquitous in a wide range of habitats due to their adaptability and fecundity (Timmons et al., 2012). Feral hogs compete with native wildlife for food resources (Campbell & Long, 2009), prey on a wide variety of native animals (Dreibelbis et al., 2008; Campbell & Long, 2009; Schaefer, 2004; Taylor & Hellgren, 1997), disturb and degrade native plant communities, damage soil and accelerate erosion and soil loss in riparian areas, among many other negative effects (Barrios-Garcia & Ballari, 2012). In aquatic habitats, Asian carp (*Hypophthalmichthys molitrix*, *H. nobilis*), invasive fish species first introduced to the Mississippi watershed in the 1970s, compete directly with native filter-feeding fish species including shad, bigmouth buffalo, paddlefish, and the larval stages of many sport fish.

## PHYSICAL RESOURCES

### CLIMATE

Climate in southern Louisiana is humid subtropical, with warm, wet summers and short, mild winters. Precipitation at St. Francisville is relatively even throughout the year; small peaks occur in December-January and in June. Mean monthly temperatures at Baton Rouge (the nearest weather station for which data are available), range from 51.7°F in January to 83°F in July. Minima and maxima fluctuate about  $\pm 10^\circ\text{F}$  throughout the year (Figure 5).

**Figure 5. Mean monthly temperature with minima and maxima (°F) for Baton Rouge, Louisiana, and mean monthly precipitation, (inches) for St. Francisville, Louisiana, for the period 1981-2010 (National Climate Data Center, 2014)**



The region is subject to tropical cyclones (tropical storms, hurricanes). A tropical cyclone impacted the coast of Louisiana on average approximately once every 1.7 years during the 20<sup>th</sup> Century, and hurricanes strike Louisiana approximately every 3 years (Stone et al., 1997). In inland areas, such as Cat Island NWR, these events can result in extensive breakage and blow-down of timber, as well as local flooding.

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In 2010, the Fish and Wildlife Service published *Rising to the Urgent Challenge: Strategic Plan for Responding to Accelerating Climate Change* (U.S. Fish and Wildlife Service, 2010). This plan provides an overview of the causes and major effects of anthropogenic climate change and details the Service's strategic response. The Service concludes its assessment of the crisis we face by stating: "Climate change has the potential to cause abrupt ecosystem changes and increased species extinctions. These changes will reduce the ability of natural systems to provide many societal goods and services—including the availability of clean water, our planet's lifeblood—which in turn will impact local, regional, and national economies and cultures. Clearly we cannot delay in addressing climate change effects on fish and wildlife. They demand urgent attention and aggressive action."

The southeastern United States may be particularly hard-hit by climate change because of its biodiversity, low-lying coast, and highly fragmented landscape (Smith, 2004; Karl et al., 2009). The Service (U.S. Fish and Wildlife Service, 2010) has listed some of the observed consequences of climate change which are important to refuge managers. Particularly relevant to refuges in the southeastern United States are temperature increases, rising sea level, shifts in precipitation patterns resulting in droughts and floods, changes in wildfire frequency, insect outbreaks, and shifts in phenology which disrupt the timing between the arrival of migratory animals and the availability of food sources. The plan goes on to state that: "[t]hese changes will have predominantly negative consequences for biodiversity and ecosystem goods and services (e.g., water and food)."

Predicted rates of change for climate variables through the end of the 21<sup>st</sup> Century are higher than recently observed rates. Sea level is expected to rise faster during the balance of the 21<sup>st</sup> Century than during the period 1970-2010, with the most likely increase totaling 0.5-1.0 m above current levels (IPCC, 2013). Also predicted for southern Louisiana are changes in overall precipitation, in seasonal distribution of precipitation, and in temperature averages and extremes. Changes in annual precipitation totals may not be as dramatic as shifts in seasonal distribution in Louisiana, but within the watershed of the Mississippi River, climate models generally predict a 10-25 percent increase in total precipitation (Girvetz et al., 2009; Girvetz et al., 2013). Warming will continue, with more days over 90°F, fewer freezes, and longer frost-free periods. Mean global surface temperature increases (over baseline from 1850-1900) are predicted to exceed 2°C (3.6°F) by the end of the 21<sup>st</sup> Century (IPCC, 2013). Precipitation will continue to decrease and to become more unevenly distributed throughout the year, with more fall precipitation and less precipitation during spring, summer, and winter (Karl et al., 2009).

In summary, climate change effects that can be expected on Cat Island NWR include increased temperatures, increased fall precipitation coupled with decreased summer precipitation, increased frequency and severity of droughts, changes (likely increases) in annual flood duration and depth due to increased precipitation throughout the watershed of the Mississippi, and increased intensity of hurricanes. Management of the refuge will certainly be affected by these changes, though the details are uncertain. Some likely scenarios, however, include the following:

- Increased temperatures and concomitant decreases in severity of cold weather may lead to changes in species composition, including increases in tropical and subtropical exotic invasives such as water hyacinth, giant salvinia, Chinese tallow, Japanese climbing fern, and nutria. Additional management actions may be required to control these species in this case.
- Droughts may increase the frequency and severity of wildfires.
- If rainfall distribution becomes more uneven, water level fluctuations in wetland habitat may be wider, leading to changes in plant and animal communities which may or may not be desirable from a management perspective.
- If flood duration increases, forest species composition and productivity may be affected.

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- More intense tropical storms will lead to recurring impacts including damage to refuge infrastructure and breakage/blow-down of timber.
  - Longer growing seasons coupled with higher CO<sub>2</sub> concentrations may increase forest productivity and have unpredictable effects on forest species composition.

Near-term effects of these changes on the habitats of Cat Island NWR are unclear; however, certain management actions are called for by the Service (U.S. Fish and Wildlife Service, 2010) which will promote adaptation to changes in climate, regardless of their nature or magnitude.

Most pertinent among the goals set forth in this document for refuges is the third, which states: “We will plan and deliver landscape conservation actions that support climate change adaptations by fish and wildlife of ecological and societal significance.” Objectives under this goal include the following:

- Take conservation action for climate-vulnerable species
- Promote habitat connectivity and integrity
- Reduce non-climate change ecosystem stressors
- Identify and fill priority freshwater needs
- Conserve coastal and marine resources
- Manage genetic resources
- Reduce susceptibility to diseases, pathogens, and pests
- Address fish and wildlife needs in renewable energy development, and
- Foster international collaboration for landscape conservation

Several of these objectives are directly relevant to Cat Island NWR. For example, migratory birds are thought to be vulnerable to shifts in climate because the resulting changes in phenology along their migration routes may cause mismatches in the timing of their arrival and the availability of food or other resources (Root et al., 2003; Staudt et al., 2013). Actions such as increasing habitat diversity and promoting habitat connectivity and integrity are ways to mitigate threats such as this.

### *GEOLOGY AND TOPOGRAPHY*

Cat Island NWR is located in the floodplain of the Mississippi River. Surface geology in the valley consists of Holocene alluvial deposits overlying Pleistocene and older deposits from the Mississippi River and its antecedents, which have existed on the North American continent at least since the Rocky Mountains began to form 150 million years ago (Roberts, 2010). Immediately adjacent to the refuge to the east, loessial deposits dating to the Pleistocene underlie the higher ground on which the city of St. Francisville was built. The refuge is within an accreting meander loop and exhibits the characteristic ridge and swale topography of this land form. Swales on the refuge support baldcypress and baldcypress-tupelo types, while hardwood types generally grow on the ridges.

### *SOILS*

Soils on Cat Island NWR are all formed in alluvial deposits and are subject to occasional to frequent flooding. Soil series (Natural Resources Conservation Service, 2010) on the refuge encompass a range of textures from sand to clay and drainage classes from excessive to very poorly drained. Map units with taxonomic descriptive information taken from the Natural Resources Conservation Service (2014) are presented in Table 1.

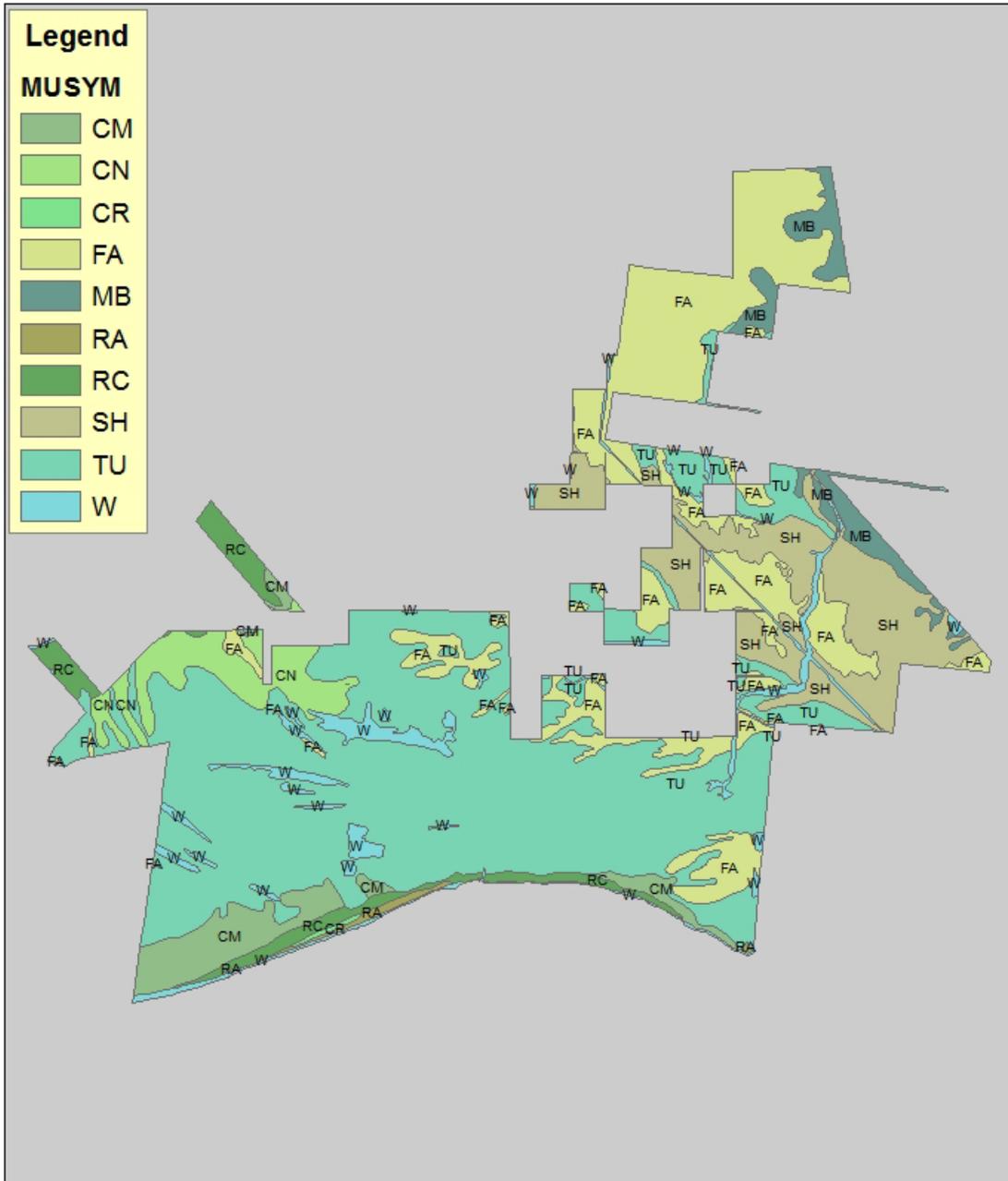
**Table 1. Soil map units (Natural Resources Conservation Service, 2014) on Cat Island NWR with taxonomic classifications and selected properties**

| MAP UNIT  | MAP UNIT SYMBOL | ACRES <sup>1</sup> | SOIL TAXONOMIC CLASSIFICATION   | PROPERTIES AND DESCRIPTIVE INFORMATION  |
|---|-----------------|--------------------|---|---|
| Commerce soils, gently undulating, frequently flooded   | CM              | 469                | Fine-silty, mixed, superactive, nonacid, thermic Fluvaquentic Endoaquepts   | Forms in silty alluvium on natural levees; somewhat poorly drained; not prime farmland  |
| Commerce soils, gently undulating, occasionally flooded | CN              | 457                | Fine-silty, mixed, superactive, nonacid, thermic Fluvaquentic Endoaquepts   | Forms in silty alluvium on natural levees; somewhat poorly drained; prime farmland  |
| Crevasse loamy sand, frequently flooded                 | CR              | 12                 | Mixed, thermic Typic Udipsamments   | Forms on point bars; excessively drained; not prime farmland  |
| Fausse soils  | FA              | 2136               | Very-fine, smectitic, nonacid, hyperthermic Vertic Endoaquepts  | Forms in clayey alluvium in backswamps; very poorly drained; not prime farmland   |
| Morganfield and Bigbee soils, frequently flooded        | MB              | 343                | Morganfield: Coarse-silty, mixed, active, nonacid, thermic Typic Udifluvents;<br>Bigbee: Thermic, coated Typic Quartzipsamments | Morganfield: Forms in thick silty alluvium in floodplains; well drained; not prime farmland<br>Bigbee: Forms in sandy alluvium on terraces; excessively drained; not prime farmland |
| Riverwash   | RA              | 41                 | N/A   | Recent sand deposits; excessively drained; not prime farmland   |

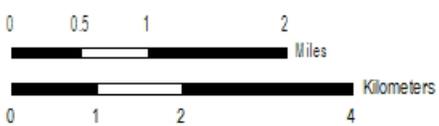
| MAP UNIT   | MAP UNIT SYMBOL | ACRES <sup>1</sup> | SOIL TAXONOMIC CLASSIFICATION  | PROPERTIES AND DESCRIPTIVE INFORMATION  |
|--|-----------------|--------------------|--|---|
| Robinsonville and Convent soils, occasionally flooded    | RC              | 340                | Robinsonville: Coarse-loamy, mixed, superactive, nonacid, thermic Typic Udifluvents;<br>Convent: Coarse-silty, mixed, superactive, nonacid, thermic fluvaquentic Endoaquepts | Robinsonville: Forms in loamy alluvium on natural levees; well drained; prime farmland<br>Convent: Forms in silty alluvium on natural levees; somewhat poorly drained; prime farmland |
| Sharkey soils, frequently flooded                        | SH              | 1215               | Very-fine, smectitic, thermic Chromic Epiaquepts   | Forms in clayey alluvium on natural levees; poorly drained; not prime farmland  |
| Tunica and Sharkey soils, undulating, frequently flooded | TU              | 5035               | Tunica: Clayey over loamy, smectitic over mixed, superactive, nonacid, thermic Vertic Epiaquepts;<br>Sharkey: Very-fine, smectitic, thermic Chromic Epiaquepts               | Tunica: Forms in clayey over loamy alluvium; poorly drained; not prime farmland<br>Sharkey: Forms in clayey alluvium on natural levees; poorly drained; not prime farmland            |
| Water  | W               | 481                | N/A  | N/A   |

<sup>1</sup>Acre figures are derived from geographic information systems and are thus approximate.

Figure 6. Soil Map Units on Cat Island NWR; map unit symbol (MUSYM) names and descriptions are provided in Table 1 (Natural Resources Conservation Service, 2014)



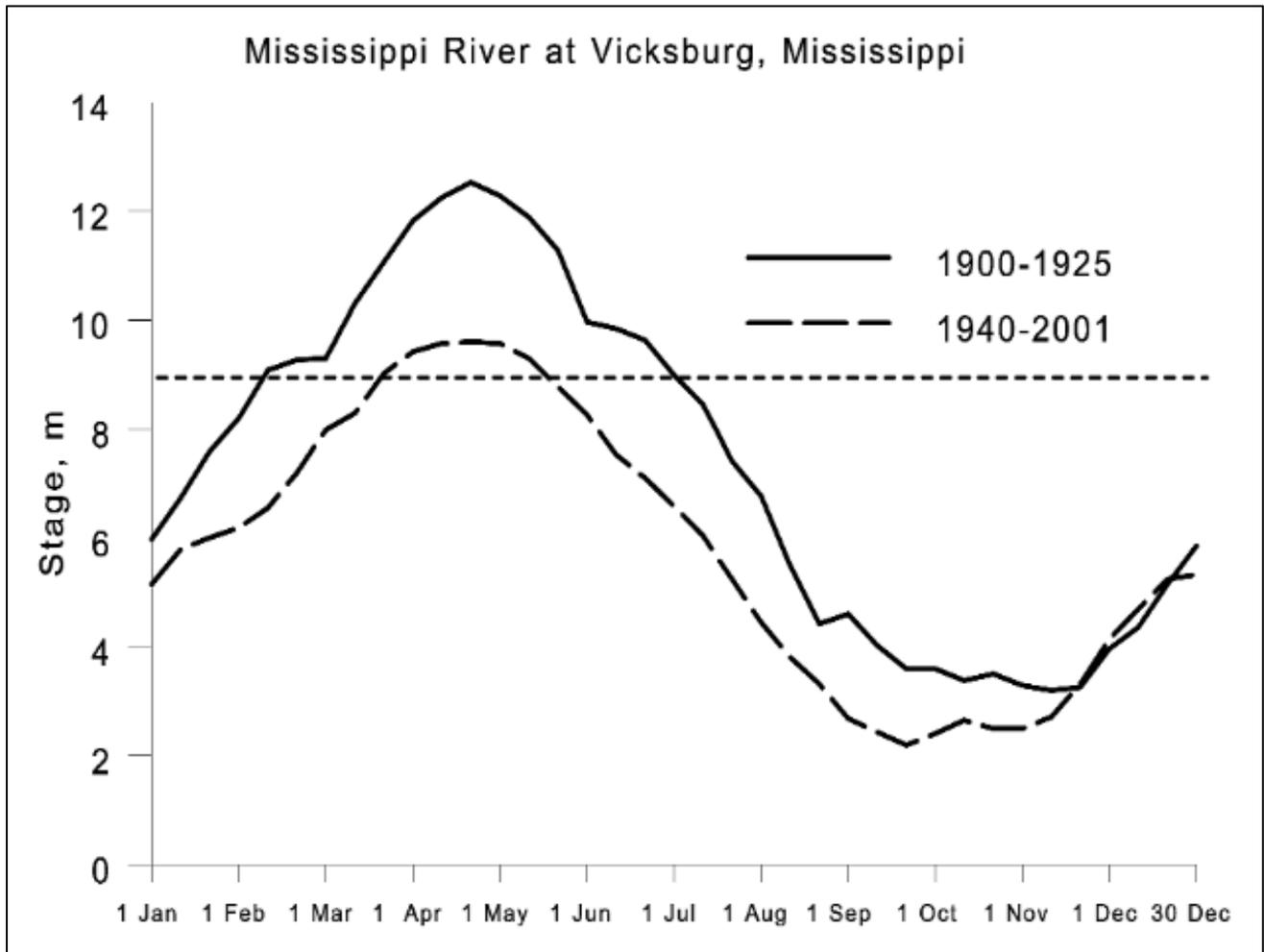
T. GREENE, SELA REFUGES LACOMBE, LA  
 MAP DATE: 07JAN2014  
 FILE: Cat\_Island\_GOP\_Strike\_Acc\_Bolymd



## HYDROLOGY

Prior to the construction of levees along the lower Mississippi River, spring floods typically covered large portions of the floodplain each year. Now, the Mississippi River is an intensively managed hydrologic system, and levee-protected parts of the former floodplain have been converted to farmland, which rarely floods. Inside the levees, however, flooding continues, albeit with decreased duration and depth (Figure 7) (Schramm et al., 2009; Schramm, 2004).

**Figure 7. Mississippi River hydrographs before and after completion of mainline levees and cutoffs, at Vicksburg, MS. Reproduced from Schramm (2004)**



*From the original figure caption: "1900-1925 is before mainline levee and cutoff construction; 1940-2002 is after mainline levee and cutoff construction. Horizontal dashed line is bank full stage, the state at which floodplain inundation begins."*

The meander loop in which Cat Island NWR is located is not levee-protected. Loessial hills to the east of the refuge block the spread of floodwaters beyond the approximately 37,000 acres of alluvial deposits inside the loop. Floodwaters cover the refuge for a variable length of time each year, but flooding typically begins in December and ends by June.

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## AIR QUALITY

Air quality at Cat Island NWR is generally good. The refuge is considered to be a Class II clean air area, under the Clean Air Act. This means that limited development (i.e., additional sources of pollution) can be permitted near the refuge as long as the levels of particulate matter, sulfur dioxide, and nitrogen dioxide do not exceed the Class II increments. Air quality impacts occur from transportation sources in Baton Rouge, petrochemical facilities and paper mills to the east and southeast of the refuge along the Mississippi River, and transportation-related emissions on US 61.

## WATER QUALITY

Section 303(d) of the Clean Water Act requires that states identify water bodies, including stream reaches that do not meet applicable water quality standards. The state designated the Mississippi River reach from the Old River Structure to Monte Sano Bayou, which includes Cat Island NWR, as impaired due to mercury, pesticides, priority organics including dioxin, and siltation (Louisiana Department of Environmental Quality, 2002). No other water body on the refuge has been designated as impaired. Bayou Sara, which flows through the approved acquisition boundary east of refuge lands, has been designated as impaired in past years, but in 2010 its status for designated uses of fish and wildlife propagation, primary contact recreation, and secondary contact recreation were listed as “Good” (US Environmental Protection Agency, 2010).

## BIOLOGICAL RESOURCES

### HABITAT

Cat Island NWR supports a range of habitats typical of the LMAV. Except for open water areas and a few small cleared areas, the refuge is forested. Predominant hardwood species include green ash, water hickory, Nuttall oak, overcup oak, and sugarberry. Bottomland hardwood types including Sugarberry-American Elm-Green Ash (93) and Overcup Oak-Water Hickory (96) (Eyre, 1980) are found on better-drained areas of the refuge, while sloughs and ponds support Baldcypress (101) or Baldcypress-Tupelo (102) types. Recently regenerated old fields and other cleared areas, as well as new alluvial deposits along the Mississippi River, are dominated by willow and cottonwood (Table 2, Figure 8).

**Table 2. Generalized habitat types found on Cat Island NWR, with corresponding classifications and approximate acreages**

| HABITAT TYPE             | SAF FOREST TYPE(S) <sup>1</sup> | NVCS CLASSIFICATION <sup>2</sup>                            | ACRES <sup>3</sup> |
|--------------------------|---------------------------------|---|--------------------|
| Bottomland Hardwoods     | 93, 96                          | G034. Oak - Sweetgum Floodplain Forest Group                | 6345               |
| Baldcypress-Tupelo Swamp | 101, 102                        | G033. Bald-cypress - Tupelo Floodplain Forest Group         | 2862               |
| Black Willow, Cottonwood | 63, 95                          | G041. Eastern Cottonwood-Black Willow Flooded & Swamp Group | 1132               |
| Open Water               | N/A                             | N/A   | 480                |

<sup>1</sup> (Eyre, 1980)

<sup>2</sup> (NatureServe, 2013)

<sup>3</sup> Acre figures are derived from geographic information systems and are thus approximate.

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The current forest condition not only reflects site potential but also management history and hydrologic modifications, which have been extensive. Prior to its acquisition by the Service, Cat Island was owned and managed for commercial timber production. Much of the refuge is in relatively young age classes of regrowth (25-60 years) from timber harvests, old fields, or storm-related disturbance, while other portions support high-graded second-growth stands which were subjected to diameter-limit cuts in the past. A few areas still contain relict components of the old-growth forest, mostly very large, old baldcypress individuals. Although Cat Island is not levee-protected, its hydrology has been modified, both by local structures and as a result of the confinement of the Mississippi River flood pulse. Over time, these modifications have almost certainly affected forest regeneration, structure, and productivity, although these changes are not well documented on the refuge. Younger forest stands on Cat Island have regenerated since the modern flood control system was put in place in the 1940s and give some indication of the successional patterns under the new hydrologic regime.

## *WILDLIFE*

### **Waterfowl**

Because of its location within the LMAV and its forested habitat, Cat Island NWR provides good quality migration stopover and wintering grounds for mallards, green-winged teal, gadwall, and American wigeon. Wood ducks and hooded mergansers are year-round residents whose breeding populations are augmented in the winter by migrants from further north. These resident species of the refuge must satisfy all of their habitat requirements with local resources. Both species nest in tree cavities throughout most of their range and are dependent on flooded habitat with low cover (shrubs or emergent vegetation) for brood habitat. Sloughs and ponds on the refuge provide brood habitat, while red oaks, mostly Nuttall oak, water oak, and willow oak provide hard mast.

### **Colonial Waterbirds**

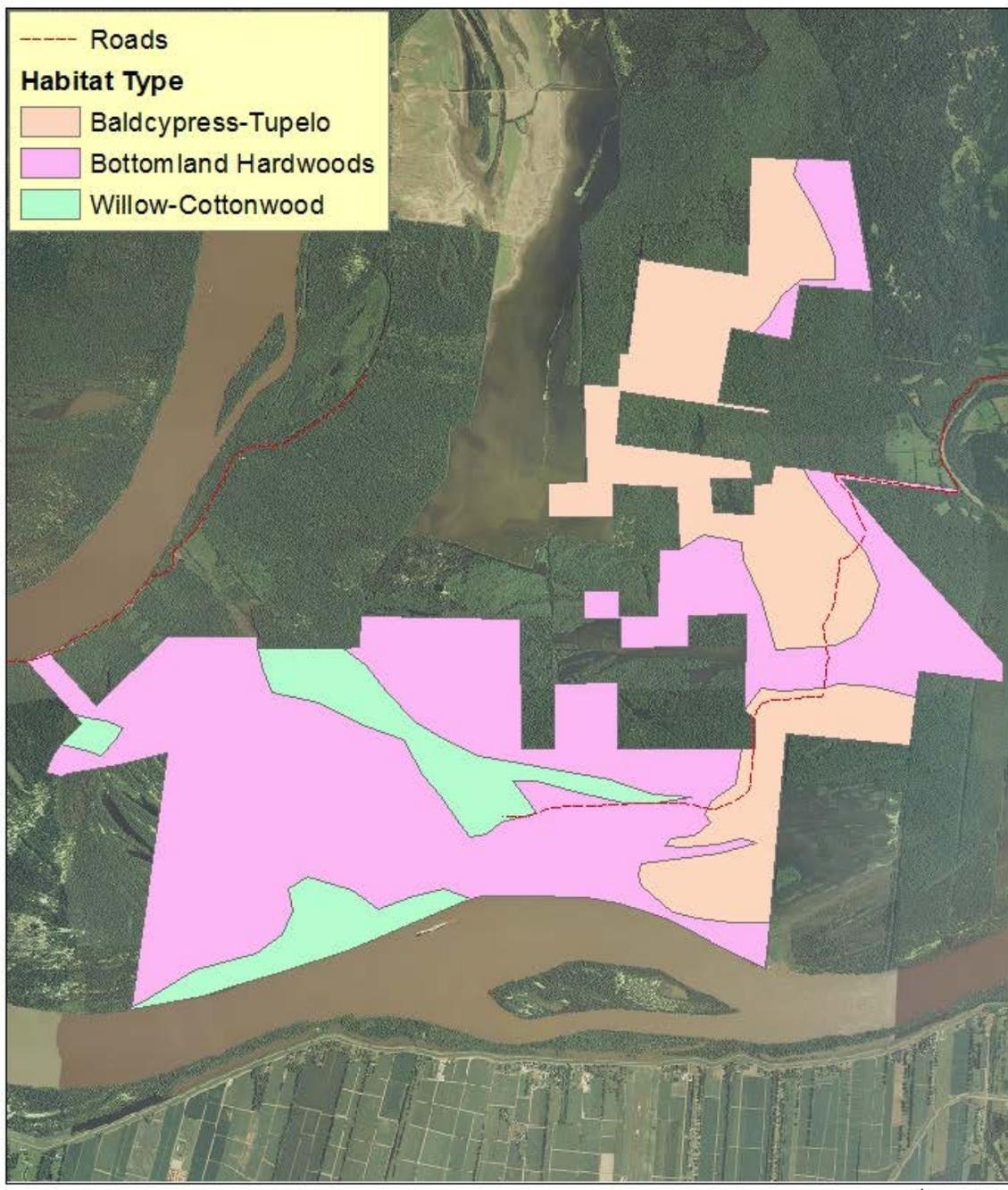
Flooding by the Mississippi River provides abundant food resources for wading birds at Cat Island NWR. As the river recedes, fish are restocked within drains and sloughs across the floodplain. As these wetlands dry, food resources become concentrated, providing good foraging habitat. Species commonly observed on the refuge include great blue herons, great egrets, snowy egrets, and white ibises. Less common, but occasionally seen, are little blue herons, tricolored herons, cattle egrets, green herons, black-crowned night-herons, yellow-crowned night-herons, roseate spoonbills, and wood stork.

Waterbirds roost and breed colonially in rookeries and forage in shallow water. Rookeries need to be near adequate amounts of good foraging habitat (Fasola & Barbieri, 1978; Gibbs, 1991) and must offer protection from predators, disturbance, and the elements (Hafner, 1997). Rookery sites typically are used for a few years and then abandoned, so it is important for replacement sites to be available.

### **Forest-breeding Birds**

Cat Island NWR provides bottomland hardwood forest habitat for forest-breeding land birds. Of particular concern are those species which depend on forest interior habitat and whose populations decline as a result of forest fragmentation. Many of these "area-dependent breeders" have undergone population declines in recent years. Cat Island NWR contributes to the conservation of large, intact blocks of forest which are important for providing the appropriate habitat for these species. Area-dependent forest breeding birds which are known or likely to breed on the refuge include red-shouldered hawk, broad-winged hawk, yellow-billed cuckoo, pileated woodpecker, Acadian flycatcher, great-crested flycatcher, yellow-throated vireo, red-eyed vireo, blue-gray gnatcatcher, wood thrush, northern parula, yellow-throated warbler, American redstart, prothonotary warbler, Swainson's warbler, Kentucky warbler, and hooded warbler. Swallow-tailed kites, although not

Figure 8. Generalized habitat types on Cat Island NWR



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MAP DATE: 07JAN2014  
FILE: CatIsland\_COP\_State\_Area\_Body.mxd

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confirmed to breed on the refuge, have been observed during the breeding season. Swallow-tailed kites are a priority for the refuge because they have suffered declines in recent years and because they have been suggested as a surrogate for the most highly area-dependent species in the LMAV.

### **American Woodcock**

This member of the sandpiper family is unique in that it inhabits inland, forested habitats, feeding almost exclusively on earthworms. During the day, woodcocks require fairly dense shrub or understory cover with sparse forest floor. At night, they venture into more open habitats, foraging for earthworms in fields, pastures, and shrubby openings. Woodcock utilize these habitats during the winter on Cat Island NWR. Woodcock numbers have declined throughout their range in recent decades, although the latest surveys indicate that this decline may have slowed or halted (Cooper & Rau, 2012).

### **Resident Game Species**

The refuge supports populations of white-tailed deer, turkey, cottontail and swamp rabbits, raccoons, and gray and fox squirrels. Annual floods limit use of the refuge by turkeys and terrestrial mammals to summer and fall months, but they are able to migrate to higher ground during winter and spring, when the refuge is typically under water. All of these game animals, with the exception of turkeys, are hunted on Cat Island NWR.

### **Bats**

Several species of bats are known or thought to use habitats on Cat Island NWR. Rafinesque's big-eared bats (*Corynorhinus rafinesquii*) and southeastern myotis (*Myotis austroriparianus*), both species of concern, roost in large, hollow water tupelo and baldcypress trees. Nationwide, bats are threatened by loss of habitat and disease. Maintaining high-quality habitat at Cat Island NWR will contribute to providing appropriate forest habitat for several bat species.

### **Threatened and Endangered Species and Species of Concern**

At least four listed species potentially use refuge habitats. The Louisiana black bear (*Ursus americanus luteolus*), which is listed as threatened under the Endangered Species Act (ESA), is known from Cat Island NWR. Bears use the refuge's habitats opportunistically as transients. The closest breeding population of Louisiana black bear is the upper Atchafalaya River Basin population, primarily within the Morganza Floodway and the upper reaches of the Atchafalaya Floodway in Pointe Coupee Parish. Least terns (interior population), which are listed as endangered in Louisiana for the Mississippi River and its tributaries north of Baton Rouge, may use sandbar habitat on Cat Island NWR, although the refuge is not listed among those where the species is known to occur (U.S. Fish and Wildlife Service, 2014). In addition to these two species, the Mississippi River adjacent to Cat Island may support pallid sturgeon (*Scaphirhynchus albus*), listed as endangered. Fat pocketbook mussels (*Potamilus capax*), also listed endangered, have recently been discovered in side channels and secondary channels of the Mississippi River near Cat Island NWR. This species may persist on or near the refuge. Sprague's pipit, which is a candidate for listing, occurs in West Feliciana Parish, but has not been recorded on the refuge.

Wood stork (*Mycteria americana*) has been recorded from Cat Island. These birds, whose populations in Alabama, Florida, Georgia, and South Carolina are listed threatened under the ESA, are colonial wading birds which forage in shallow water and roost in rookeries. Wood storks have expanded their range in recent decades and were recently down-listed from endangered status by the Fish and Wildlife Service. Wood storks found throughout Louisiana are not federally listed. This separate population disperses from breeding grounds in Mexico to exploit food resources which are available during certain times of the year. Wood storks on Cat Island NWR find food such as fish and crawfish as the river recedes.

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## **Fisheries**

Cat Island NWR has about 480 acres of open water habitat (Natural Resources Conservation Service, 2014). Most of this habitat consists of natural sloughs which occur in swales although there are also borrow pits which retain water through the summer and fall. Because the refuge is subject to annual flooding, active management of fisheries in these ponds is not practical. However, receding floodwaters seasonally stock wetland areas, thus the refuge is able to support recreational fishing.

## **CULTURAL RESOURCES**

The body of Federal historic preservation laws has grown dramatically since the enactment of the Antiquities Act of 1906. Several themes recur in these laws, their promulgating regulations, and more recent executive orders. They include:

- 1) each agency is to systematically inventory the historic properties on its holdings and to scientifically assess each property's eligibility for the National Register of Historic Places;
- 2) federal agencies are to consider the impacts to cultural resources during the agencies' management activities and seek to avoid or mitigate adverse impacts;
- 3) the protection of cultural resources from looting and vandalism are to be accomplished through a mix of informed management, law enforcement efforts, and public education; and
- 4) the increasing role of consultation with groups, such as Native American tribes, in addressing how a project or management activity may impact specific archaeological sites and landscapes deemed important to those groups.

The Fish and Wildlife Service, like other federal agencies, is legally mandated to inventory, assess, and protect cultural resources located on those lands that the agency owns, manages, or controls. The Service's cultural resource policy is delineated in 614 FW 1-5 and 126 FW 1-3. In the Service's Southeast Region, the cultural resource review and compliance process is initiated by contacting the Regional Historic Preservation Officer/Regional Archaeologist (RHPO/RA). The RHPO/RA will determine whether the proposed undertaking has the potential to impact cultural resources, identify the "area of potential effect," determine the appropriate level of scientific investigation necessary to ensure legal compliance, and initiate consultation with the pertinent State Historic Preservation Office (SHPO) and federally recognized Native-American tribes.

A review of the archaeological potential of Cat Island NWR was conducted by Richard Kanaski, the Region 4 RHPO/RA. The review, which is reproduced in this Draft CCP/EA as Appendix I, indicates that the refuge proper has fairly low potential for archaeological sites owing to its geology (recent alluvial origin) and flood regime. The planning team also consulted with the government of the Choctaw Tribe of Oklahoma regarding cultural resources and other issues relevant to this Draft CCP/EA. A summary of the topics discussed during this consultation is presented in Appendix D.

## **SOCIOECONOMIC ENVIRONMENT**

West Feliciana Parish has a population of approximately 15,405 people (2012 estimate, U.S. Census Bureau), of whom approximately 5,000 are prisoners in the Louisiana State Penitentiary at Angola. The parish covers 426 square miles (403 square miles of land area) and borders Pointe Coupee Parish to the west, West Baton Rouge Parish to the south, East Feliciana Parish to the east, and Concordia and Avoyelles Parishes and Wilkinson County, Mississippi, to the north. The parish seat and largest town is Saint Francisville, which is situated just to the east of Cat Island NWR. Population density in the parish is 38.8 persons per-square-mile of land area.

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At \$20,475, annual per-capita income (2012) for the parish was significantly lower than the state average of \$24,264; however, this number includes inmates at the State Penitentiary. Median household income, which excludes inmates at the prison, is \$58,212, well above the state median. Persons living below the poverty level as a percent of the population were 15.3 percent, below the statewide average of 18.7 percent.

Educational levels in the parish lag those in the state as a whole; 71.8 percent of the population over the age of 25 has a high school diploma or equivalent, while 18.7 percent have at least a 4-year college degree. Statewide averages are 82.2 percent and 21.4 percent.

In 2011, there were 193 private, non-farm establishments which employed 2,531 people in West Feliciana Parish. The parish is classified by the U.S. Census Bureau as an "outlying parish" in the sprawling nine-parish Baton Rouge Metropolitan Statistical Area (MSA), which means that at least 25 percent of the workers in the parish work in one of the five central parishes in the MSA. The Louisiana State Penitentiary employs approximately 1,200 people, while Entergy Corporation employs 675 people at its River Bend Nuclear Station in St. Francisville.

## **REFUGE ADMINISTRATION AND MANAGEMENT**

### *LAND PROTECTION AND CONSERVATION*

As of 2014, Cat Island NWR consisted of 10,473 acres of fee-title land within an approved acquisition boundary (AAB) of 36,500 acres (Figure 2). Inholdings in the AAB were mostly undeveloped and either forested or in agriculture. Future acquisition will be prioritized on tracts that provide significant conservation benefits and contribute toward achieving the purposes for which the refuge was created. By policy, the U.S. Fish and Wildlife Service only acquires refuge lands from willing sellers.

### *VISITOR SERVICES*

The Improvement Act deemed six priority wildlife-dependent recreational activities to be appropriate for refuges: hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation. Cat Island NWR is open to the public for all of these uses. During 2013, the refuge estimated there were 14,000 visitors, of whom 7,630 were specifically identified as hunters and 3,200 as anglers. Visitors who came to observe wildlife numbered about 2,500 and 120 came to photograph wildlife. No visitors were recorded as participating in environmental education or interpretation, although school groups and tours do use the refuge from time to time.

Visitor services facilities on Cat Island NWR consist of roads, all-terrain vehicle trails, 2 hiking trails, parking areas, a kiosk, and a deer check station (Figure 9). Maintenance of these facilities is currently conducted by refuge complex staff, volunteers, and partners. The refuge complex staff maintains roads and ATV trails. Funding for this activity comes from sales of annual public use permits. The Louisiana Hiking Club uses volunteers to maintain the Black Fork Trail and, along with the Friends of Cat Island National Wildlife Refuge, the Big Cypress trail. The refuge complex staff maintains the kiosk and supplies it with brochures and maps. The refuge complex staff operates the deer check station during the 3-day primitive firearm and 3-day modern firearm deer hunts conducted each year. The Service partners with LDWF and the West Feliciana Parish Sheriff's Office to provide law enforcement and public safety for the refuge. The primary responsibility for law enforcement on Cat Island NWR, however, lies with the federal wildlife officer stationed at the complex.

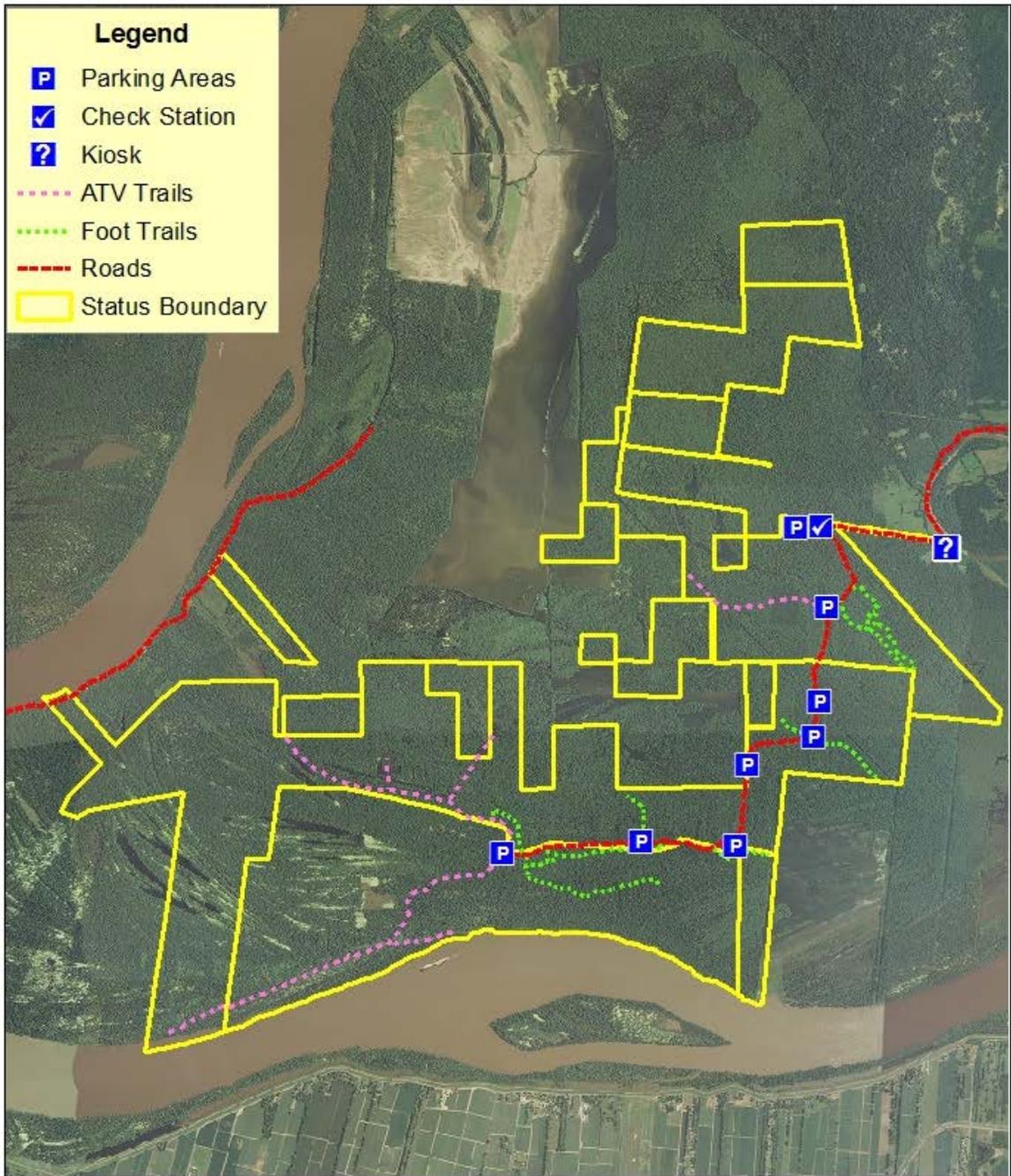
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The West Feliciana Parish Tourist Commission partners with the refuge to provide off-site visitor information services at the West Feliciana Historical Society Museum and Tourist Information Center, located at 11757 Ferdinand Street in Saint Francisville. Brochures, maps, and other refuge publications are available there. The center also sells annual public use permits which are required for hunting and fishing on the refuge.

*PERSONNEL, OPERATIONS, AND MAINTENANCE*

Cat Island NWR is administered by the Lower Mississippi River Refuge Complex, headquartered at St. Catherine Creek NWR, in Sibley, Mississippi. No personnel are currently assigned to Cat Island NWR. Refuge operations and maintenance are conducted by complex staff, aided by volunteers and partners.

Figure 9. Visitor Services on Cat Island NWR



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 MAP DATE: 03FEB2014  
 BASE MAP: NRCS, 2013  
 FILE: Cat\_Island\_COP\_visitor\_services.mxd





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## *Chapter III. Plan Development*

### **SUMMARY OF ISSUES, CONCERNS, AND OPPORTUNITIES**

Primary responsibility for preparation of this Draft CCP/EA was delegated to a planning team which consisted of refuge complex staff, a representative of the Service's Baton Rouge Fish and Wildlife Conservation Office, a Service field planner, a representative of the Service's Region 4 Division of Migratory Birds, and a representative of LDWF. These individuals met regularly to coordinate preplanning, gather and share information, and solicit comments and assistance. Members of the planning team are listed in Appendix K.

The planning team met on September 18, 2013, and identified a number of issues, concerns, and opportunities related to fish and wildlife protection, management of invasive exotic species, habitat restoration, recreation and management of threatened and endangered species. Additionally, the planning team considered federal and state mandates, as well as applicable local ordinances, regulations, and plans. At the request of the Choctaw Nation of Oklahoma, the team and the Service's Regional Historic Preservation Officer met with representatives of the government of the Choctaw Nation on November 12, 2013, to consult on issues of interest to the tribe. The team also solicited public input during a public scoping period (October 22-December 21, 2013), which incorporated one public scoping meeting held at the St. Francisville Town Hall on November 18, 2013. Approximately 23 members of the public attended the meeting. Comments were received in written and verbal form at the meeting and via email and U.S. Postal mail. All public, intergovernmental, and advisory team comments were considered; however, some issues important to the public fall outside the scope of the decisions to be made within this planning process. The team considered all issues that were raised throughout the planning process and developed a Draft CCP/EA that attempts to balance competing ideas and interests regarding important issues. The team identified those issues that, in its best professional judgment, are most significant to the refuge. A summary of the significant issues, organized by general topic, follows.

#### *FISH AND WILDLIFE POPULATION AND HABITAT MANAGEMENT*

The planning team discussed a number of issues related to the management of fish and wildlife populations on Cat Island NWR. Elements of Strategic Habitat Conservation, particularly outcome-based monitoring and biological planning, figured prominently. Monitoring concerns included determining priority and methodology for data collection on deer populations (through check station data), inventory of aquatic species on the refuge, including possible listed species of mussels, whether and how to assess the value of the refuge for pallid sturgeon, how frequently and intensively to monitor breeding bird populations on the refuge, and how to catalog, store, and make decisions based on monitoring data. Biological planning questions included how to decide which habitats and wildlife species should receive priority with limited management resources, and when the refuge would develop a habitat management plan. Questions about how to manage forest habitat to benefit priority species on the refuge dominated discussions of conservation delivery. Likewise, public comments concerned with fish and wildlife population management were focused on the conservation delivery aspects of game species management. We received public comments also concerning potential forest management actions. Each of these questions, suggestions, or concerns will be briefly summarized below.

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## **Monitoring Questions**

1. How should surveys for migratory birds, fish, mussels, and other species of concern be conducted? This question not only involves technical and statistical aspects of data acquisition and archival, but also encompasses the assignment of priorities to various monitoring activities, given scarce resources. For example, should data collection for listed species, waterfowl, or other trust species be prioritized over that for resident game species?
2. How should the refuge address the issue of possible use of refuge habitats by pallid sturgeon? How should data on this species be collected? Is there a potential for refuge management actions to have a meaningful impact on this species?
3. How should the current programs for monitoring populations of forest-breeding songbirds on Cat Island NWR (point counts), collecting deer harvest data at check stations, acoustical surveys for bats, and monitoring of wading birds be integrated into refuge inventory and monitoring activities in the future?
4. How should habitats be assessed on the refuge, and how should the data be managed?
5. What is the decision-making process that should lead from outcome-based monitoring to conservation delivery actions? How can refuge managers be sure that all relevant data have been considered, priorities properly assigned, and management options considered?

## **Biological Planning Questions**

1. Given limited resources for management, how should refuge staff prioritize management actions?
2. How should active forest management be targeted towards species of concern? How do we ensure that potentially conflicting habitat needs are considered and addressed?
3. Which step-down plans should receive the highest priority, and when should they be prepared?

## **Conservation Delivery Questions**

1. What should active forest management on the refuge look like? Which wildlife species should be targeted, and what habitat characteristics should be created and maintained?
2. What is the best way to manage deer and other resident game hunts so that game populations are healthy, hunting experiences are of quality, and refuge resources are maintained?
3. How can the refuge improve the structure, species composition, and other characteristics of the forest to benefit wildlife? Is active silvicultural manipulation appropriate on Cat Island NWR, or should the refuge habitats be allowed to develop along a more “natural” trajectory?

## *RESOURCE PROTECTION*

Multiple stakeholders weighed in on resource protection issues during the scoping phase of preplanning for this Draft CCP/EA. The refuge staff was concerned with how to protect natural and cultural resources from illegal activity as well as how to ensure adequate protection for habitats and wildlife. Comments from the general public indicated that they are concerned about law enforcement issues on the refuge as well as ensuring public access. Protection and management of cultural resources were the major concerns of the Choctaw Nation of Oklahoma, although they also discussed possible uses of natural resources.

## **Natural Resources**

1. How can the refuge ensure the protection of the big cypress tree, as well as cypress-tupelo habitat in general? Is it appropriate to designate no-cut zones or Research Natural Areas for some or all of this or other habitat types?

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2. Can the refuge provide resources such as switchcane (*Arundinaria gigantea*), mussel shells, or bloodroot (*Sanguinaria canadensis*) for traditional uses by Choctaw or other Native American people?
  3. What should be done with old drainage structures such as ditches? Should they be removed or left in place?
  4. What is the best way to protect natural resources and allow access? Should the refuge strictly enforce restrictions on off-trail ATV use, allow an exception for disabled hunters, or allow off-trail use by everyone?

### **Cultural Resources**

1. Will the refuge conduct a refuge-wide archaeological survey, and if so, how would it be funded, when is it likely to be done, and who would do it?
2. Will the Final CCP contain due-dates for archaeological surveys and other cultural resource management actions?
3. How does the refuge manage archaeological permits for surveys or research? Are there any active permits? Can the Choctaw Nation be notified if permits are issued?
4. How is law enforcement for cultural resource issues handled? Is the refuge aware of any current looting activity? How are evidence and court records maintained in looting and other cultural resource-related prosecutions managed?
5. What efforts is the refuge making to educate the public about cultural resource issues?

### **VISITOR SERVICES**

Perhaps not surprisingly, visitor service issues resonated strongly with the public during the scoping period. Cat Island NWR is a well-loved destination for hunters and anglers, as well as non-consumptive users such as birders and hikers. Also not surprisingly, members of the public had differing opinions and suggestions about which direction the visitor services program should go, especially with respect to hunting and fishing regulations. Visitor services are also important to state partners; LDWF weighed in on hunting and fishing regulations, urging the refuge to consider broadening access for those activities where consistent with refuge purposes. The partnership with West Feliciana Parish Tourist Commission (WFPTC) gives the refuge a communication channel to reach the public, and the refuge is a tourist destination important to the commission and to the economy of the parish. Aspects of this and other partnerships were discussed in all forums. Comments and questions are summarized below.

### **Partnerships and Volunteers**

1. How will the refuge work with partners and volunteers in the future?
2. Can the Friends group be resurrected? What functions would it perform?
3. Does the partnership with the WFPTC need to be changed or enhanced?
4. Can a volunteer coordinator and/or visitor services position at the complex be assigned at least part-time duty for the refuge?

### **Visitor Information**

1. Can the refuge provide more information through the WFPTC office?
2. Can/should kiosks, signs, brochures be augmented or upgraded?
3. Can additional resources be allocated for boundary marking so that visitors, including hunters, are aware of the locations of boundaries?

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## Hunting and Fishing

1. Should the hunting program on Cat Island NWR be changed? Should gun hunts for deer be curtailed or eliminated? Should feral hog hunts be allowed? Can the no-hunting zones be moved periodically?
2. How should access to the refuge for hunters be managed during periods of high water? Can waterfowl hunting continue when the refuge is flooded?
3. Can the refuge enhance access for disabled hunters without jeopardizing resources? How would enhanced ATV use for disabled hunters be managed from a law enforcement perspective?
4. Can the trail along the river front be opened year-round to provide for anglers who wish to access the river?
5. Can additional check stations be added so that hunters can exit the refuge via the river or on Cat Island Road (on the western side of the refuge)?
6. How can the refuge balance the needs and safety of small game hunters with those of other hunters/users? Should the refuge, for example, require tree-stand bow hunters to flag the trees they are in so that small game hunters will be able to avoid them?
7. Can the refuge provide access to more remote areas for hunters by, for example, purchasing land inside the acquisition boundary that has road frontage and is contiguous with current refuge property?
8. Can the refuge use different standards for primitive weapons than the state? For example, can Cat Island NWR restrict primitive weapons to muzzle-loading firearms only?

## Non-consumptive Uses

1. How can the refuge ensure that the partnership with the Louisiana Hiking Club stays strong and the two hiking trails continue to be marked and maintained? How can the refuge publicize the existence, status, and condition of these trails?

## *REFUGE ADMINISTRATION*

Currently, the refuge is challenged by a lack of resources. In this context, refuge administration comments received during scoping and generated by the planning team reflect the lack of resources and point out fairly basic needs which are going unmet, as well as suggest alternative sources of resources or ways to engage volunteers.

1. Can the refuge step up community involvement by, for example, establishing a point of contact in the community to coordinate volunteer activities on the refuge?
2. Are there ways to engage scout groups, conservation organizations, or others to maintain trails on the refuge?
3. Should the price of public use permits be increased to provide additional funds for maintenance of refuge infrastructure?
4. Should the Service continue to administer the refuge as part of the Lower Mississippi River Refuge Complex?
5. If additional resources for staff are provided, what is the priority order for hiring positions?
6. Should the refuge consider establishing an office, either on site or in St. Francisville?
7. How can the refuge remove old camp structures to enhance public safety?
8. How can the refuge ensure that road maintenance is adequate to provide safe access for all permitted public use and management?

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## **WILDERNESS REVIEW**

Refuge planning policy requires a wilderness review as part of the comprehensive conservation planning process. The results of the wilderness review are included in Appendix H.



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## Chapter IV. Management Direction

### VISION

Located within the natural floodplain of the LMRAV, Cat Island NWR conserves some of the region's last remaining bottomland hardwood forest habitat. The Mississippi River carved the unique landscape consisting of ridges and swales, cypress-tupelo swamps, meandering drains, and backwater sloughs. These landscape features, coupled with annual flooding, provide highly productive habitat for an array of fish and wildlife resources including backwater fisheries, migratory songbirds, wintering waterfowl, Louisiana black bear, and other resident wildlife. The Service will facilitate the use of volunteers and partners to promote public awareness and conduct effective management of refuge resources. Management of the refuge will focus on conserving the natural diversity of plants and animals, preserving cultural resources, and providing opportunities for research, environmental education, and quality outdoor recreation for the American public.

### 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, Plan Implementation, 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 Cat Island NWR. The Service intends to accomplish these goals, objectives, and strategies within the next 15 years.

#### GOAL A: FISH AND WILDLIFE POPULATION MANAGEMENT

**Manage and protect migratory and native wildlife populations on Cat Island NWR to contribute to the purposes for which the refuge was established as well as to fulfill the mission of the National Wildlife Refuge System.**

*Discussion:* Cat Island NWR supports a diversity of fish and wildlife species. The refuge is located within a major bird migration corridor of high importance for Neotropical and other migratory birds. In combination with active management, the inherent potential within refuge habitats ensures a variety of food and cover options for biodiversity.

#### **Objective A.1: Waterfowl**

Each year of the planning period, contribute to the population goals of the North American Waterfowl Management Plan by providing 10,473 acres of forested wetland habitat for migrating and wintering waterfowl and breeding wood ducks.

*Discussion:* The MAV is used by millions of migrating and wintering ducks and geese each year. Cat Island NWR provides important foraging and resting habitats within the MAV for wintering ducks and year-round habitat for resident wood ducks. Annually flooded forested wetlands provide food for wintering ducks in the form of acorns, moist-soil seeds, and invertebrates, as well as cover where ducks can rest and form pair bonds with minimal disturbance.

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The quality of forested wetland habitat for waterfowl in the LMAV depends on stand age and species composition, stem density, and understory cover, as well as the timing and depth of flooding. Oaks, particularly the red oaks, provide high-quality hard mast which is used by wood ducks and mallards. In forest openings, early successional vegetation will be present, including the large-seeded annual plants characteristic of moist-soil habitat, along with associated invertebrates.

In 2007, the LMVJV published a report recommending silvicultural manipulation of bottomland hardwoods in the LMV to achieve a set of desired forest conditions to benefit priority forest-breeding landbirds and other priority species (LMVJV Forest Resource Conservation Working Group, 2007). Active forest management of this type will create conditions beneficial for waterfowl as well as mammals and other resident wildlife. Forest openings produce soft mast and provide cover in addition to functioning as moist-soil areas for the first few years after harvest. Silvicultural treatments which increase the density and vigor of oaks will result in higher hard mast production useful for waterfowl and other wildlife.

Beaver ponds and associated wet scrub/shrub cover provide excellent habitat for wood ducks (nesting, brooding, and wintering) and numerous other wetland-dependent species such as prothonotary warblers, otters, reptiles, amphibians, and many species of fishes.

*Strategies:*

- Develop a Habitat Management Plan which provides for the achievement of desired forest conditions through active forest management, taking into account individual site characteristics and habitat conditions, geomorphology, degree of past disturbance, and hydrology.
- On suitable sites, implement silvicultural treatments which increase pecan and oak regeneration and survival to enhance winter waterfowl foraging habitat.
- Allow some beaver ponds to develop and mature, not to exceed 5 percent of the refuge forested land.
- Develop and implement an Inventory and Monitoring plan.
- Provide periods of sanctuary for migratory waterfowl by maintaining a limit of hunting days per week.
- Maintain areas closed to hunting and ATV/UTV usage to provide areas of solitude for wildlife.

**Objective A.2: Colonial Waterbirds/Wading Birds**

Contribute annually to objectives set for long-legged wading and other colonially nesting water birds in the Southeast U.S. Regional Waterbird Conservation Plan (Hunter et al. 2006) by ensuring that active rookeries are known and protected from disturbance.

*Discussion:* Cat Island NWR provides foraging and roosting habitat for colonial waterbirds, especially during summer breeding and post-breeding periods when water levels drop, concentrating food. Although this group of birds is not a major priority for the refuge, the semi-natural hydrologic regime on Cat Island NWR should continue to provide foraging habitat for these species. Surveys should be conducted to identify rookery sites and record breeding bird numbers, consistent with the step-down Inventorying and Monitoring Plan to be developed for this refuge. These areas may need to be protected from disturbance throughout the nesting season.

*Strategies:*

- As part of a comprehensive Inventorying and Monitoring plan, implement surveys to identify rookery locations and monitor nesting activities.
- Provide for protective closures when colonial nesting wading birds are found (Hunter et al. 2006).

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### Objective A.3: Forest Breeding Birds

Each year, apply adaptive management principles to support priority forest-breeding birds by providing 10,473 acres of diverse forest habitat which is moving toward the desired forest conditions described in *Restoration, management, and monitoring of Forest Resources in the Mississippi Alluvial Valley: recommendations for enhancing wildlife habitat* (LMVJV Forest Resource Conservation Working Group, 2007), or in subsequent guidance.

*Discussion:* Bottomland hardwood forest habitat in the LMAV has been reduced by 80 percent over the past two centuries. The tracts that remain are generally small, fragmented, and skewed toward younger age classes, thus lacking the diverse structure of mature stands. These conditions threaten populations of landbirds which breed in the LMAV. Small block size and fragmentation may cause increases in predation by avian, mammalian, and reptilian predators and nest parasitism by brown-headed cowbirds. Blocks that are below a minimum size (which varies by species) cannot support source populations, and may instead support sink populations whose replacement rate is not high enough to sustain them, and which are only sustained by in-migration. Young stands that have uniform structure and dense canopy cover support fewer breeding bird species than those which have more openings and greater structural diversity.

Decreasing habitat block size particularly threatens area-sensitive species (i.e., those whose breeding density is positively related to the size of the forest habitat block available to them). Remaining blocks of relatively contiguous forest habitat have been mapped, and their potential for restoration to achieve minimum sizes of 10,000, 20,000, and 100,000 acres has been assessed (Twedt et al., 1999). These threshold sizes were chosen to reflect the breeding requirements of three priority area-sensitive landbird species chosen by Twedt et al. (1999) as surrogates for breeding landbirds in the LMAV. Swainson's warblers require forested blocks of approximately 10,000 acres to support a source population, cerulean warblers require blocks of 20,000 acres, and swallow-tailed kites require blocks of 100,000 acres to support a population of 80 pairs, which would function as a subset of a regionally secure source population.

Cat Island NWR is the core of a 20,000-acre block mapped by Twedt et al. (1999), and another 20,000-acre block lies adjacent to it to the west directly across the Mississippi River. Existing forest habitat in these two blocks supports many priority bird species. Although swallow-tailed kites have not been recorded breeding on the refuge, they have been sighted there numerous times in recent years. Future sightings of this species on the refuge should be recorded. Management and restoration of the remaining forest blocks in the LMAV will, over time, mitigate the threats of forest fragmentation and unsustainable silvicultural practices.

The second issue affecting habitat quality of bottomland hardwoods in the MAV is stand structure and composition. This aspect of habitat is particularly important for Cat Island NWR, which is primarily composed of forested habitat. Forests on the refuge are mostly second- and third-growth, and thus relatively young. Stand structure, because of the young age classes on the refuge, has not developed the diversity typical of older stands. Many forest-breeding birds are dependent on structural habitat diversity which develops naturally over time but which can also be induced in younger stands through silvicultural practices (Heltzel & Leberg, 2006; LMVJV Forest Resource Conservation Working Group, 2007; Twedt & Somershoe, 2009).

Bird population data for forest-dwelling birds are limited for many refuges in the LMAV. These data are critical for establishing baseline populations that can be used to assess management actions and compare future habitat conditions. Some cursory point count data has been gathered from Cat Island NWR during the summers of 2007, 2012, and 2013, at randomly located points. Forest breeding birds

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should be surveyed with point counts using standard protocol (Hamel et al., 1996) as described by the LMVJV working group (LMVJV Forest Resource Conservation Working Group, 2007). Point counts should be conducted within management units (stands, compartments) distributed throughout the refuge. Five or six point counts should be conducted within a management unit, and counts should be conducted both following a silvicultural treatment and in control areas that have not been treated. Point counts should be rotated among treated areas, revisiting units every three to five years.

*Strategies:*

- Develop and implement a Habitat Management Plan to enhance habitats for forest breeding birds.
- Implement forest management treatments to provide benefits to various priority forest birds.
- Encourage development of emergent trees that rise above the predominant forest canopy.
- Retain snags.
- Retain large diameter cavity trees and potential cavity trees >36" dbh.
- Increase vertical structural diversity of the forest stand.
- Increase herbaceous and woody understory and midstory vegetation.
- As part of a comprehensive Inventory and Monitoring plan, inventory forest breeding bird populations via point counts, and monitor their responses to forest treatments.
- Record all swallow-tailed kite sightings, and document any nesting attempts.

**Objective A.4: American Woodcock**

Enhance American woodcock population by developing and implementing a habitat management plan that provides moist midstory and understory vegetation (thickets) for daytime cover on actively managed forested portions of the refuge and foraging habitat and open nocturnal foraging habitat in grassland areas.

*Discussion:* American woodcock are migratory game birds that occur throughout the forested portions of the eastern United States. Cat Island NWR is within the Central Region used for administrative management of woodcock. Long-term breeding population trends since 1968 have been negative for this species, but more recent trends are non-significant, indicating that the declines of past decades may have slowed or halted in recent years (Cooper & Rau, 2012).

In 1990, the *American Woodcock Management Plan* was completed (U.S. Fish and Wildlife Service, 1990), setting an objective to protect and enhance wintering and migrating habitat on public lands to increase woodcock carrying capacity. The plan also set objectives to inventory and monitor woodcock habitat and develop management demonstration areas. In 2008, the Wildlife Management Institute published the *American Woodcock Conservation Plan* (Kelley et al., 2008). This plan calls for increasing the acreage of early successional habitat in forested regions of the eastern United States, including the LMAV.

Woodcock are closely tied to earthworms, which are their major food resource, and to other special habitat conditions (Krementz & Jackson, 1999). Wintering habitat includes moist bottomland hardwood forests with brush and understory, especially when found in close association with agricultural fields and old fields. These sites are typically wet thickets with a high density of plant stems but relatively open ground cover below. Typical cover includes privet, cane, and briars that result from openings in the overstory canopy. The scrub/shrub and dense bottomland hardwood habitats created to benefit priority forest interior nesting birds (LMVJV Forest Resource Conservation Working Group, 2007) will also provide good daytime cover for woodcock.

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At dusk, most woodcock move to open or brushy fields, if they are available, to forage and conduct courtship activities throughout the night. These habitats include agricultural fields that were not fall disked and sparse grasslands that may have received a cool fall burn to create patchy openings of exposed soil interspersed between grass clumps. Openings such as these are very limited on Cat Island NWR, and should be maintained if staff and funding are available, and increased should additional lands with openings be purchased. Open areas also benefit other species such as floodplain-dependent fish species and waterfowl.

*Strategies:*

- Develop and implement a habitat management plan that provides preferred woodcock habitat by implementing the recommendations in the publication *Restoration, Management and Monitoring of Forest Resources in the Mississippi Alluvial Valley: Recommendations for Enhancing Wildlife Habitat* (LMVJV Forest Resource Conservation Working Group, 2007).
- Consider maintaining openings should additional lands with existing openings be purchased.

**Objective A-5: Resident Game Species**

Each year of the planning period covered by the CCP, Cat Island NWR will support resident game species health and diversity and quality hunting opportunities by providing high-quality habitat for game species.

*Discussion:* Cat Island NWR supports populations of resident game animals including white-tailed deer, wild turkey, and small game. Sustainable management of these resources is integral to the purposes for which the refuge was created, and they will benefit from management focused on refuge resources of concern.

White-tailed deer

White-tailed deer are an important game species in the eastern United States. Deer use a wide range of habitats, and actions focused on managing for refuge priority species will directly benefit white-tailed deer by increasing cover and available food resources. In particular, early successional forest patches created to open up the forest canopy and allow sunlight to the forest floor will increase productivity of browse and soft mast-producing plants which are utilized by deer.

Because of the flood regime on Cat Island NWR, deer and other terrestrial wildlife can only occupy the refuge during low water periods. They opportunistically use the refuge during those times and retreat to the adjacent loessial hills during floods. This migratory pattern poses challenges for managing the hunting program on the refuge. Using hunting to manage the deer population is more difficult when the population is transient and occupies off-refuge lands for much of the year. The refuge currently has 3 days of primitive firearm hunting by lottery, 3 days of modern firearm hunting by lottery, and a full open state season for archery hunting.

Floodwaters also affect the types and productivity of plants which produce browse and mast utilized by deer. Data collected on Cat Island NWR at deer check stations indicate that deer taken on the refuge typically have lower weights than those from non-flood prone landscapes with higher crop production, but may be comparable to other floodplain sites such as St. Catherine Creek NWR. The biological review team recommended that deer browse surveys be conducted periodically in the spring during low-water periods to provide information on deer herd densities relative to habitat conditions and carrying capacity. In addition, a herd health check should be considered, with assistance possible from LDWF personnel.

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### Wild Turkey

The primary resident game bird in the LMAV is the wild turkey. The major factor inhibiting turkey populations on Cat Island NWR is the limited acreage of forested lands above the 1- or 2-year floodplain. Although turkeys will readily roost over water, they require dry land for feeding on acorns and other hard mast during the winter and early spring, when flooding is most common. Turkeys are ground nesters; thus, flooding during the nesting season (late spring) adversely impacts recruitment by flooding nests and by directly affecting survival of young poults. During dry years and through dry cycles, turkey abundance may increase. Due to annual spring flooding throughout the refuge and the lack of adequate population data to support a spring season, turkey hunting is currently not allowed. Forest management can benefit turkeys by increasing the diversity and availability of foods in the form of hard and soft mast, as well as grasses, sedges and forbs. Nesting habitat is improved by selective thinning of trees, which provides more ground cover for nest concealment.

### Small Game

Gray and fox squirrels are generally abundant on the refuge. Their high potential recruitment rates, controlled largely by levels of available hard mast, allow for relatively liberal hunting regulations. Active forest management aimed at increasing the availability of mast-producing tree species should increase habitat quality for squirrels.

Cottontail rabbit and swamp rabbit populations are thought to be limited on Cat island NWR by long-duration flooding inundating much of the refuge from late winter through spring most years. Their numbers are largely controlled by seasonal flooding as well as the limitation of available habitat in the form of ground and understory cover.

Raccoon is the most abundant furbearer on the refuge, as they are well adapted to all existing refuge habitats. This species is occasionally harvested incidental to squirrel hunting.

### *Strategies:*

- Develop and implement a Habitat Management Plan which incorporates the bottomland hardwood forest management recommendations from the LMVJV Forest Resources Conservation Working Group (2007).
- Continue to collect biological harvest data at self-check stations during all hunts in order to collect an adequate data set to make inferences about the deer population.
- Establish deer browse surveys to be conducted during appropriate low-water periods.
- Coordinate with LDWF to conduct a deer herd health check, and repeat approximately every 5 years.
- Conduct turkey poult surveys, when possible, in years when little or no flooding occurs during the late-spring nesting season.
- Continue to allow the hunting of small game.

### **Objective A.6: Bats**

Each year of the planning period covered by this CCP, Cat Island NWR will provide high-quality habitat in support of a healthy, diverse, and viable resident bat population.

*Discussion:* Many different species of bats utilize bottomland systems along the Mississippi River. Rafinesque's big-eared bats, northern long-eared bat, and southeastern myotis utilize bottomland and upland forests as foraging and roosting habitat. However, these species have experienced declines, potentially due to habitat loss within the LMAV, and are federally designated as Species of Concern. The northern long-eared bat was proposed for listing as endangered by the Fish and Wildlife Service on October 2, 2013. Specifically within bottomland hardwood forests, Rafinesque's big-eared bats and

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southeastern myotis prefer large diameter, hollow water tupelo as roosting habitat. Northern long-eared bats roost under tree bark, in tree cavities, or (where available) in caves or abandoned mines. Roosting trees are important to bats for protection, resting sites, and structure to raise young. Management of foraging and roosting habitat is critical for the conservation of these and other bat species.

Management and monitoring efforts on Cat Island NWR have been minimal. Three Anabat (acoustical) surveys were conducted in June and July 2012 as part of a region-wide effort to monitor bat species occurrence and the spread of white-nose syndrome.

*Strategies:*

- Develop and implement a Habitat Management Plan which takes into account habitat requirements of bats by incorporating the following elements of *Restoration, Management, and Monitoring of Forest Resources in the Mississippi Alluvial Valley: Recommendations for Enhancing Wildlife Habitat* (LMVJV Forest Resource Conservation Working Group, 2007):
  - Through natural disturbances and/or silvicultural manipulation, provide openings and diverse canopy structure for bat foraging
  - Retain large trees with large cavities, including a strong component of baldcypress and water tupelo.
  - Promote regeneration of baldcypress and water tupelo.
- Continue to monitor bat species occurrence using AnaBat™<sup>1</sup> acoustical devices or other monitoring devices/efforts that will contribute to regional monitoring efforts, as appropriate, and this activity is a priority for available refuge staffing and funding. Document species occurrence and coordinate reporting with Louisiana Natural Heritage program.
- Conduct a base-line roost tree inventory within cypress/tupelo habitat to determine use vs. availability and tree cavity characteristics.

**Objective A.7: Threatened and Endangered Species**

Each year of the planning period covered by this CCP, Cat Island NWR will provide appropriate habitat which supports the recovery and conservation of all species which occur on the refuge and are protected under the Endangered Species Act (ESA), the Migratory Bird Treaty Act (MBTA), or the Bald and Golden Eagle Protection Act. Use of these habitats by protected species will be documented when practical.

*Discussion:* Several species protected under federal laws and regulations including the ESA, MBTA, and the Bald and Golden Eagle Protection Act use habitats either on the refuge or adjacent to it. Louisiana black bear (listed as threatened under the ESA) is known to occur in West Feliciana Parish and probably ranges through the refuge, at least as a transient. Cat Island NWR and Tunica Hills WMA provide protected bottomland and upland resources for black bear. Bears use large cavity trees, particularly baldcypress, for denning during late winter/early spring. Following recommendations in *Restoration, Management and Monitoring of Forest Resources in the Mississippi Alluvial Valley: Recommendations for Enhancing Wildlife Habitat* (LMVJV Forest Resource Conservation Working Group, 2007) is the best way to promote high-quality foraging and denning habitat for these animals.

Other federally protected species which may use the refuge include bald eagles, which are known to nest on the refuge; fat pocketbook mussels, listed as endangered under the ESA, which may persist in refuge waters; interior populations of the least tern, listed as endangered under the ESA, which may use sandbar habitat along the Mississippi River on Cat Island NWR; and the pallid sturgeon,

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<sup>1</sup> Mention of a trade name does not imply endorsement by the U.S. Fish and Wildlife Service.

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listed as endangered under the ESA, which may occur in waters of the Mississippi River adjacent to the refuge. In addition, the refuge may be used by paddlefish and other state-protected fish species. Habitat requirements of these species can best be identified and met through working with partners and gathering information from available sources including recovery plans, known species ranges, and Heritage data. Where appropriate, actions on the refuge in support of these species should be taken, including protection, restoration, and management of habitat and inventorying and monitoring of populations.

*Strategies:*

- Continue to monitor black bear use of the refuge.
- Develop and implement a Habitat Management Plan which incorporates the following elements of *Restoration, Management, and Monitoring of Forest Resources in the Mississippi Alluvial Valley: Recommendations for Enhancing Wildlife Habitat* (LMVJV Forest Resource Conservation Working Group, 2007):
  - promote increased hard mast and understory production;
  - retain potential den trees as important components of quality black bear habitat.
- Continue to monitor bald eagle use of the refuge and, when nests are found, monitor nesting success.
- Cooperate with partners to conduct surveys for the presence of fat pocketbook mussels and pallid sturgeon.
- Support endangered species and protected species recovery through habitat protection, conservation, restoration and management, and through surveys and research.

**Objective A.8: Aquatic Species**

Each year of the planning period covered by this CCP, Cat Island NWR will support healthy, diverse populations of native aquatic species, with particular emphasis on species identified by state and/or federal agencies as species of special concern.

*Discussion:* Cat Island NWR is part of the Gulf Coastal Plains and Ozarks Landscape Conservation Cooperative (GCPO LCC) geography. Landscape scale assessments are being conducted in the Lower Mississippi River to identify conservation opportunities in the floodplain. The refuge complex currently contributes to a collaborative conservation planning effort with Baton Rouge Fish and Wildlife Conservation Office, Private John Allen National Fish Hatchery, Southeastern Aquatic Resource Partnership (SARP), and the GCPO LCC. The effort is centered around evaluation of the aquatic habitat on St. Catherine Creek NWR. The primary objective of the collaborative assessment is to describe the character, relative availability, and spatial distribution of aquatic habitat on St. Catherine Creek NWR as a backdrop on which to evaluate the needs of aquatic biota in the LMAV.

The Nature Conservancy and state and federal partners are conducting pilot studies of a similar nature in other rivers to evaluate the physicochemical and biological response of reconnecting floodplain habitats in previously isolated river segments. These relationships are integral to the development of forecast models that can quantify the landscape in a manner that is useful in determining whether the Service and its partners can offer conservation opportunities that are feasible, sustainable, and measurable in a manner that merits a commitment of limited conservation resources. One of the keys to success in planning landscape scale conservation is having the opportunity to deliver conservation in an adaptive framework, and access to areas like Cat Island NWR will be critical over the next decade. Although it is not known whether the hydro-geomorphic features of the refuge will fit future conservation needs, it is important to identify this potential contribution to conservation and to plan for flexibility in management over that time frame.

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*Strategies:*

- Assess the hydro-geomorphic features of Cat Island NWR and determine if targeted conservation measures are feasible for the refuge's aquatic system. Such areas as access roads/water crossings, abandoned log roads, straight line ditches, the main canal, and low-grade levees should be evaluated.
- Incorporate monitoring of aquatic species, particularly species of concern, in the step-down Inventory and Monitoring Plan to be prepared for the refuge.

**GOAL B: HABITAT MANAGEMENT**

**Habitats for migratory and native resident wildlife on Cat Island NWR will contribute to the purposes for which the refuge was established as well as fulfill the mission of the National Wildlife Refuge System.**

*Discussion:* Habitat conservation is the most effective and comprehensive tool that wildlife managers have to manage animal populations. The Service has adopted strategic habitat conservation (SHC) (National Ecological Assessment Team, 2006) to serve as a framework for its conservation actions. The conservation delivery component of SHC encompasses not only protection but manipulation of habitats. In the highly modified, intensively managed landscape of the LMAV, it is particularly important to optimize the quality of remaining natural habitats. By manipulating habitats, managers can improve their quality and ensure that all necessary resources are available to wildlife during critical periods of their life cycles.

**Objective B.1: Bottomland Hardwood Forests**

By the end of the planning period covered by this CCP, up to 70 percent of the refuge will be in, or growing toward, conditions described by the Lower Mississippi Valley Joint Venture (LMVJV Forest Resource Conservation Working Group, 2007), subject to limitations of site and pre-existing stand conditions, and with consideration of subsequent refinements which may be published during the planning period.

*Discussion:* Forested habitats predominate on Cat Island NWR. Bottomland hardwood types including elm-ash-sugarberry and overcup oak-bitter pecan (Eyre, 1980) are found on better-drained areas of the refuge, while sloughs and ponds support baldcypress or baldcypress-tupelogum types. The current forest condition not only reflects site potential, but also management history and hydrologic modifications, which have been extensive. Prior to its acquisition by the Service, Cat Island was owned and managed for commercial timber production. Much of the refuge is in relatively young age classes, while other portions support high-graded second-growth stands. A few areas still contain relict components of the old-growth forest, including very large, old baldcypress individuals which were apparently left as culls when the area was logged in the early 20<sup>th</sup> Century. Although Cat Island is not levee-protected, its hydrology has been modified, both by local structures and as a result of the confinement of the annual Mississippi River floods to a small fraction of the former floodplain. Over time, these modifications, which have had the effect of reducing depth and duration of spring floods (Schramm et al., 2009; Schramm, 2004), have likely affected forest regeneration, structure, and productivity, although specific changes are difficult to identify because of lack of good data on the pre-settlement forest.

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Desired forest habitat conditions described by the LMVJV (LMVJV Forest Resource Conservation Working Group, 2007) consist of the following:

- Overstory canopy cover: 60-70%
- Midstory cover: 25-40%
- Basal area: 60-70 ft.<sup>2</sup>/acre
- Tree stocking: 60-70%
- >2 emergent canopy trees/acre
- Understory cover: 25-40%
- At least 400 advance regeneration stems/ac. of shade-intolerant tree species over 30-40% of area
- $\geq 200$  ft.<sup>3</sup>/acre of coarse (>10-inch diameter) woody debris
- >4 visible small cavities/acre, or > 4 “snag” stems  $\geq 4$  inch dbh, or  $\geq 2$  stems > 20 inch dbh
- 1 visible large cavity/den tree/10 acre, or  $\geq 2$  stems  $\geq 26$  inch dbh, ( $\geq 8$  ft<sup>2</sup> BA  $\geq 26$  inch dbh)
- > 6 snag or stressed tree stems/acre  $\geq 10$  inch dbh, or  $\geq 2$  stems  $\geq 20$  inch dbh, (> 4 ft.<sup>2</sup> BA  $\geq 10$  inch dbh)

LMVJV Forest Resource Conservation Working Group (2007) describes strategies by which these conditions can be achieved over time by judicious and adaptive application of silvicultural treatments to bottomland hardwood forest. Young, even-aged stands can be treated to mimic certain aspects of old growth forest such as greater structural diversity and understory development, while other areas, including those already supporting large old trees, can be passively managed and retained for their habitat value as well as to serve as reference points for future management actions. The majority of the cypress/tupelo-dominated stands should be passively managed as a natural area. No more than 10-20 percent of this forest type should be actively managed for some experimental treatments to evaluate various silvicultural techniques targeting cypress/tupelo regeneration.

*Strategies:*

- Develop and implement a Habitat Management Plan which includes a stand entry schedule and provides for the preparation of stand-level silvicultural prescriptions to achieve desired forest conditions described in Objective B.1.
- Beginning after approval of the refuge Habitat Management Plan, periodically assess, and treat if necessary, selected management compartments to accelerate the development of desired forest conditions described in Objective B.1, subject to limitations of pre-existing stand conditions, site, and management capability/resources.
- Conduct post-treatment evaluations in conjunction with forest breeding bird point counts to assess forest habitat response relative to stated objectives.

**Objective B.2: Aquatic Habitats**

Aquatic habitats on Cat Island NWR will be of sufficient quality and diversity to support the full range of native aquatic species for the LMAV, including species which support recreational angling and those which are identified by state or federal agencies as species of special concern, subject to limitations of topography and hydrologic modifications.

*Discussion:* Cat Island NWR supports a range of aquatic habitats typical of the Mississippi River floodplain landscape. Most of the refuge consists of forested wetlands that are periodically inundated by floodwater and provide seasonal aquatic habitat for fish, waterfowl, and other aquatic organisms. Few intermittent streams and sloughs connect the river to the interior of the refuge, and the period of inundation for these streams is very similar to the rest of the floodplain. The ecological contribution or productivity of aquatic organisms attributable to these streams is likely not significant, since they are few and likely remain dry except during high-water periods. However, in aggregate, periodically

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inundated forested wetlands throughout the entrained floodplain provide an important contribution to the productivity of the river's biota.

Aquatic habitats on the refuge provide little opportunity for traditional management of aquatic species for either recreational fishing or targeted conservation. Other than a few small ponds, permanent water bodies do not exist on the refuge. cursory surveys indicate that the substrate type and depth could make it difficult to effectively manage these ponds for fisheries. In addition, the river frequently inundates these ponds, making any structured management a very short-term endeavor. However, the river stocks harvestable-size sport fish into the ponds with each flood event. If access could be provided, these areas may represent angling opportunities for refuge visitors with minimal management effort.

A potential exists to improve access to the Mississippi River where bank anglers could take advantage of the productive fishery that the river provides. Access would only be seasonal, typically during summer months when water levels are lowest. Frequent users of this fishery are few and are typically not deterred by primitive access conditions. Relatively inexpensive access could be provided via unimproved cleared paths with minimal signage.

*Strategies:*

- Inventory and map aquatic habitats on Cat Island NWR.
- Conduct forest habitat management activities so as to minimize negative impacts on aquatic habitats on and adjacent to the refuge.
- Silvicultural activities on Cat Island NWR will incorporate Best Management Practices for silviculture. Tops will not be left in ponds or sloughs, and rutting will be minimized by the use of low ground-pressure equipment.
- Explore the feasibility of improving access to the Mississippi River bank by maintaining trails and improving signage.

**Objective B.3: Invasive Exotic and Nuisance Species**

During the 15-year life span of this CCP, and provided that sufficient resources are available for refuge management, exotic invasive plants such as Chinese tallow, Chinaberry, and Japanese climbing fern will not be allowed to significantly impact native bottomland hardwood habitat. Exotic invasive animals, particularly feral swine, will not have a significant impact on refuge habitats or on native wildlife populations. Nuisance animals, particularly beaver, will not be allowed to significantly impair road condition or damage forest health.

*Discussion:* Exotic plants known to occur on Cat Island NWR include Chinaberry, Chinese tallow, and Japanese climbing fern. Annual deep water flooding may inhibit the rapid spread of these species. However, continuous monitoring, early detection, and removal are critical. All three plant species can be found within the understory but are typically found within open, disturbed sites. Climbing fern is typically found along roadways and ditches. Removal of exotic plants should be conducted by staff to coincide with point counts, road/trail maintenance, and forest inventories.

The two common animal pests that occur on the refuge are exotic feral hogs and beavers. Feral hogs are present on the refuge, but damage caused by hogs is minimal to this point. Continual harvesting by hunters should be encouraged. If damage from hogs increases a trapping program may need to be established. Beavers are present on the refuge, and although they are a native species, populations of beavers can occur at nuisance levels. All beaver dams along road ditches should be removed by staff where possible to reduce road damage and/or damage to forest health. Nutria

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(*Myocastor coypus*) have not yet become a management problem on Cat Island NWR, but could in the future. Trapping and shooting are options for removing this exotic pest as well.

Asian carp are also known to inhabit waters on Cat Island NWR. Strategies for removal are limited because they are restocked each year when the refuge is inundated by the Mississippi River.

*Strategies:*

- In conjunction with the forest stand entry schedule and forest habitat assessments, document the presence of invasive exotic plants and animals, and take feasible actions to control them commensurate to the threat they pose to refuge resources and purposes.
- Continue to encourage the taking of feral hogs by hunters.
- Continue to control beaver populations through shooting, trapping, and dam removal by refuge staff as feasible.
- Document occurrences of exotic invasive plants and the results of any removal efforts.
- Investigate the possibility of removing restrictions on take of Asian carp on the refuge.
- Participate in statewide and regional efforts to control Asian carp.

**GOAL C: RESOURCE PROTECTION**

**Protect the natural and cultural resources of the refuge in accordance with relevant state and federal law and regulations for the benefit of the public, Native American tribes, and other interested parties.**

*Discussion:* The resource protection goal acknowledges that the refuge's natural (land, forests, water, wildlife, etc.) and cultural (old home sites, Native American artifacts, graveyards, etc.) resources face a variety of risks and threats over time. Refuge management must be vigilant to protect these resources from damage, theft, or degradation. The integrity of cultural resources may be impacted by vandalism, theft, or simple neglect. Land acquisition and recording of known sites is one method by which the Service attempts to protect natural and cultural resources. Education, interpretation, and enforcement of laws and regulations each play an additional role.

**Objective C.1: Cultural and Historical Resource Management**

Over the life of this CCP, cultural resources on Cat Island NWR will be identified, their importance will be understood, and they will be appropriately designated and protected under the provisions of the Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act, and the National Historic Preservation Act, as well as applicable state laws. The refuge will comply with all current legal requirements, regulations, and professional standards with respect to the identification, protection, and curation of cultural and historical resources.

*Discussion:* Over more than a century of federal cultural resource legislation, the nation has affirmed its commitment to the value and irreplaceability of cultural resources by codifying a set of principles and requirements governing their management on federal lands. These include: (1) federal land managing agencies are to systematically and scientifically inventory and assess the significance of historical and cultural sites, including an assessment of their eligibility for inclusion in the National Register of Historic Places; (2) impacts to cultural and historic resources by management activities should be avoided or mitigated; (3) cultural and historical resources must be protected from looting and vandalism by law enforcement, public education, and proper management; and (4) federal land managers must consult with interested groups including Native American tribes, African American communities, and others when management activities may impact cultural resources of interest to

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those groups. Cat Island NWR will comply with all legal requirements for management of cultural resources, but will also adhere to the spirit of the law embodied in these principles.

*Strategies:*

- Seek funding for a comprehensive archaeological survey of the refuge by 2018.
- Conduct a refuge-wide cultural resource survey to identify cultural resources by 2020.
- Protect any cultural resources which are discovered during the survey.
- Create, maintain, and update a geographic database which contains location and other information relevant to protection and significance of known cultural and historical resources on the refuge.
- Comply with applicable laws concerning protection of cultural and historical resources.
- Ensure that cultural and historical resource management and protection are integrated into step-down plans which are tiered to this CCP.
- Continue to partner with Louisiana Department of Wildlife and Fisheries and West Feliciana Parish Sheriff's Office to provide law enforcement for visitor safety, protection of resources, and to ensure public compliance with refuge regulations.
- Ensure that federal law enforcement capacity is maintained.
- Avoid management actions in places where they may disturb or adversely impact cultural or historical resources.
- Conduct public education and outreach focused on respecting, preserving, and protecting cultural resources on Cat Island NWR.

**Objective C.2: Land Acquisition**

Identify willing sellers and acquire private land in-holdings within the existing approved acquisition boundary that would enhance the conservation values of the refuge.

*Discussion:* Land acquisition from willing sellers within the approved acquisition boundary will be prioritized based on its value for achievement of refuge purposes and the fulfillment of the mission of the Refuge System. Factors to consider will be: contiguity with existing refuge lands, presence of significant natural resource or visitor-use values, and potential for providing access to refuge lands from public roadways.

*Strategies:*

- Maintain relations with adjacent landowners, and periodically inquire about interest in selling land to the refuge.
- Seek funding for land acquisition through grants under the North American Wetlands Conservation Act, Land and Water Conservation Fund, and Migratory Bird Act Conservation Funds.
- Work with non-governmental organizations to acquire property from willing sellers.

**Objective C.3: Fire and Wildland Urban Interface**

Over the planning period covered by this CCP, maintain the refuge's wildfire response program to protect refuge resources, private lands resources on adjacent parcels, and any infrastructure on the wildland-urban interface.

*Discussion:* Wildland fire is a rare occurrence on Cat Island NWR. Wildfire response is coordinated with the Forest Protection Division, Louisiana Department of Agriculture and Forestry. Prescribed fire is not currently used on the refuge. The refuge has a very small wildland-urban interface. Most of the lands adjacent to the refuge, like the refuge itself, flood every spring and are unsuitable for permanent structures. A small settlement exists within ½-mile of refuge lands to the northeast of the refuge along Metz Road, on high ground.

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*Strategies:*

- Respond appropriately to all wildfires on the refuge; coordinate with state and local resources as necessary.
- Maintain a current Fire Management Plan for the refuge.

**Objective C.4: Law Enforcement**

Over the planning period covered by this CCP, provide sufficient, quality law enforcement to protect public safety, refuge resources and infrastructure, and enforce applicable laws and regulations.

*Discussion:* Law enforcement is the key to providing for the safety of visitors and staff and protecting refuge natural and cultural resources. Currently, Cat Island NWR relies upon partnerships with LDWF and the West Feliciana Parish Sheriff's Office for law enforcement; the complex has no federal officers assigned to the refuge. Having an employee whose primary focus is Cat Island NWR and who has law enforcement as a collateral duty would provide additional focus on enforcement of refuge regulations and federal wildlife laws. Opportunities for partnering and cooperation with local and state agencies would also be enhanced.

*Strategies:*

- Seek funding for additional law enforcement capacity for Cat Island NWR.
- Continue partnering with LDWF and the West Feliciana Parish Sheriff's Office.

**GOAL D: VISITOR SERVICES**

**Provide opportunities for compatible wildlife-dependent public uses that promote an understanding and appreciation of fish, wildlife, habitat conservation, and the mission of the National Wildlife Refuge System.**

*Discussion:* The Improvement Act stipulates that hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation are appropriate recreational activities that the Service can provide on national wildlife refuges as long as they are appropriate and compatible with wildlife conservation and the purposes for which a refuge was established. The Improvement Act also stipulates that other activities may be analyzed for appropriateness and compatibility must be determined before they are permitted on a refuge. Cat Island NWR will focus on providing opportunities for hunting, fishing, wildlife observation, wildlife photography, and environmental and interpretation.

The quality of recreation programs is addressed in Service policy (605 FW 1.6). Criteria for evaluating the quality of recreational activities provided on a refuge are:

- Promotes safety of participants, other visitors, and facilities;
- Promotes compliance with applicable laws and regulations and responsible behavior;
- Minimizes or eliminates conflict with fish and wildlife population or habitat goals or objectives in an approved plan;
- 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 our role in managing and conserving these resources;
- Provides reliable/reasonable opportunities to experience wildlife;
- Uses facilities that are accessible to people and blend into the natural setting; and
- Uses visitor satisfaction to help define and evaluate programs.

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References to the quality of recreational experiences and opportunities in Objectives D.1-D.5 and elsewhere in this document use this set of criteria, and the success of selected strategies should be evaluated in their light.

### **Objective D.1: Hunting**

Each year of the planning period covered by this CCP, Cat Island NWR will provide safe, compatible public hunting opportunities.

*Discussion:* Hunting is a traditional land use on Cat Island that predates the establishment of the refuge. Community support for this activity is strong, and the refuge attracts a diverse group of hunters from the local area as well as from farther afield. Currently, the refuge is open for deer, squirrel, rabbit, waterfowl, and woodcock hunting. The incidental taking of beaver, nutria, coyote, raccoon, and feral swine is also allowed with legal firearms or archery equipment during any open hunting season. Due to spring floods, no turkey hunting is allowed on the refuge. An annual public use fee is required of hunters; revenue from sales of these permits helps fund refuge maintenance and road work. Permits are available at the tourism office in St. Francisville.

#### *Strategies:*

- Maintain a current, accurate refuge Hunt Plan.
- Promote hunting on the refuge by ensuring that information about hunting season dates and regulations is prominently featured in written and verbal communications from the tourism office, on the refuge website, and at refuge entry points and kiosks.
- Maintain and improve access via refuge roads and trails.
- Maintain data collection to evaluate wildlife health, harvest rates, and visitor use.

### **Objective D.2: Fishing**

Each year of the planning period covered by this CCP, Cat Island NWR will provide quality, safe, compatible fishing opportunities and encourage public utilization of the resource.

*Discussion:* Cat Island NWR is open for fishing year-round except during quota deer hunts. Although there are few opportunities to manage a fishery on the refuge due to the annual flooding and lack of large permanent water bodies other than the Mississippi River, fishing opportunities do exist, and management actions can ensure that they are available to refuge visitors. Natural sloughs and borrow pits on the refuge retain water after floods recede. The river "restocks" these ponds each spring, and they are a popular resource for anglers. During low-water periods in the summer and fall, the Mississippi River is also a popular fishing destination for bank anglers. The refuge requires that anglers purchase an annual public use permit and adhere to all state requirements.

#### *Strategies:*

- Maintain a current, accurate refuge Fishing Plan.
- Maintain current access and investigate improved access, as feasible, to refuge ponds that may offer fishing opportunities.
- Provide access to the Mississippi River for bank fishing during low water periods.
- Maintain data collection to evaluate wildlife health, harvest rates, and visitor use.

### **Objective D.3: Wildlife Observation and Photography**

Each year of the planning period covered by this CCP, Cat Island NWR will provide opportunities for, and encourage wildlife observation and photography while ensuring safe, compatible, and quality experiences.

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*Discussion:* Wildlife viewing and photography are among the refuge recreational activities presumed appropriate for refuges by the Improvement Act. By providing quality opportunities for these activities, the refuge promotes public understanding of conservation, knowledge of local ecology, and support for the mission of the Fish and Wildlife Service. Hiking trails are available on Cat Island NWR for use by bird watchers, photographers, and other visitors. When the refuge is flooded it may be accessed by canoe, kayak, or other hand-launched boat.

*Strategies:*

- Work with the Louisiana Hiking Club to ensure that accurate, up-to-date information about the hiking opportunities on Cat Island NWR is available on its website.
- Encourage use of ebird.org by refuge visitors.
- Partner with the Louisiana Hiking Club to maintain the trail markers on Black Fork Trail.
- Remove the Big Cypress boardwalk and replace it with a more durable viewing platform.
- Obtain trail count data for Big Cypress Trail by use of an electronic counter.
- Protect the Big Cypress tree and habitats near the Big Cypress Trail from excessive foot traffic by using signage and public education.

**Objective D.4 Interpretation**

During the 15-year planning period covered by this CCP, visitors will feel welcome at the refuge and be provided with clear, audience-appropriate information that promotes and raises public awareness of the refuge, wildlife conservation, and the Fish and Wildlife Service.

*Discussion:* Effective interpretation furthers the mission of the Refuge System by communicating with the public the importance of conservation and management of natural resources. By increasing awareness of environmental issues, the Service gains the support of the public for its mission.

*Strategies:*

- Partner with the West Feliciana Tourist Commission to provide targeted interpretation programs for school children, families, and other groups.
- Use volunteers to provide interpretation for refuge visitors either at the West Feliciana Parish Tourist Commission office or at the refuge on high-use days.
- Explore the possibility of hosting an annual special event at the refuge.

**Objective D.5 Environmental Education and Outreach**

Environmental outreach will be expanded and enhanced, and education opportunities will be initiated, through the refuge's partnership with the West Feliciana Parish Tourist Commission and through other refuge resources.

*Discussion:* Currently Cat Island NWR has no active environmental education program. Educational groups occasionally use the refuge for field trips. Opportunities to expand environmental education programs are limited without additional resources; however, the possibility exist that new or existing partnerships, either internal or external to the Service, could fill this gap.

*Strategies:*

- Explore the possibility of partnering with local schools or scout groups to initiate an environmental education program at the refuge.
- Explore the possibility of partnering with the Service's Baton Rouge Fish and Wildlife Conservation Office to expand environmental education opportunities and outreach on Cat Island NWR.

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## GOAL E: REFUGE ADMINISTRATION

**Provide sufficient leadership, staffing, information, and infrastructure to manage and protect migratory and native wildlife populations and their habitats, protect and preserve cultural resources, support compatible public uses that contribute to the purposes for which the refuge was established, and further the mission of the National Wildlife Refuge System.**

*Discussion:* Cat Island NWR is currently without resources and has no staff assigned to it. Revenue from permit sales is used to fund minimal road and parking lot maintenance, hiking trail maintenance, and signage. A significant contribution of labor for maintenance of hiking trails has been made by volunteers through the partnership with the Louisiana Hiking Club. The refuge is administered as part of the Lower Mississippi River Refuge Complex, which is headquartered at St. Catherine Creek NWR in Natchez, MS.

### **Objective E.1: Operations and Maintenance**

Refuge facilities and infrastructure will be maintained by a highly skilled professional staff supported by adequate resources to achieve the purposes for which the refuge was created. Full-time equivalents (FTEs) assigned to the refuge will include some or all of the following categories: refuge manager, volunteer coordinator, equipment operator (term), law enforcement officer, biologist, and forester.

*Discussion:* For Cat Island NWR to fulfill the purposes for which it was established and successfully achieve the objectives listed in this chapter, resources would need to be allocated to its management. Realistically, these resources would likely be shared among the refuges within the complex, and individuals may need to be multi-disciplined (e.g., a refuge manager with law enforcement authority, able to conduct biological surveys, and work with volunteers at least until specialists can be added to the refuge complex staff). Rather than a biologist or forester, the refuge complex would likely add a biological technician to assist the complex biologist and forester with complex-wide duties, including work at Cat Island NWR. This plan does not contemplate a full, stand-alone staff for the refuge. Staff roles in terms of achievement of objectives in this chapter are:

- Refuge Manager (collateral duty Law Enforcement): Coordinate all refuge actions (all objectives)
- Park Ranger (Volunteer Coordinator and Interpretive Specialist): Objectives D.1, D.2, D.3, D.4, D.5, E.3
- Equipment Operator (Term Appointment): Objectives C.1, C.4, D.1, D.2, D.3, D.4, D.5, E.2, E.5
- Biologist/Forester (or Biological Technician): Objectives A.1, A.2, A.3, A.4, A.5, A.6, A.7, A.8, B.1, B.2, B.3, C.1, C.3, D.1, D.2, E.4

#### *Strategy:*

- Seek resources to support personnel necessary for operation of Cat Island NWR.

### **Objective E.2: Roads and Rights-of-way**

Throughout the 15-year planning period covered by this CCP, all roads, trails, and rights-of-way on Cat Island NWR will be safe, functional, and well-maintained and will have minimal or no negative effects on wildlife resources.

*Discussion:* Cat Island NWR has one main access road open to the public and a number of secondary roads that are gated. Maintenance of these assets consists of adding gravel and grading roads, mowing rights-of-way, clearing flood debris, maintaining culverts, etc.

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*Strategies:*

- Remove debris left by floodwaters from roads, trails, and food plots/open areas every year after spring floods recede.
- Grade roads 2-3 times per year.
- Mow roadsides each summer beginning in August after the songbird breeding season is over.
- Maintain parking lots by mowing and spraying.
- Maintain spillways and culverts.
- Maintain ATV/UTV trails by mowing and filling low areas.
- Maintain hiking and walking trails by cleaning debris following floods, mowing, and filling low areas.
- Work to create access to the northeast section of the refuge.

**Objective E.3: Volunteers and Partnerships**

Foster, expand, and facilitate partnerships and volunteer activities on the refuge

*Discussion:* Ongoing partnerships with Louisiana Department of Wildlife and Fisheries, the Louisiana Hiking Club, West Feliciana Parish Tourist Commission, West Feliciana Parish Sheriff's Office, U.S. Geological Survey, Louisiana State University, and others, are vital to the refuge's achieving its purposes and contributing to the goals of the Refuge System. Likewise, volunteers will play an essential role in refuge management, helping with maintenance of trails, roadsides, signage, the kiosk, interpretation, visitor services, research, and removal of debris and nuisance animals.

*Strategies:*

- Nurture and maintain existing partnerships through personal contact and recognition.
- Develop new partnerships, including reestablishment/rejuvenation of the Friends of Cat Island NWR, by recruitment, nurturing, development of projects and programs, and recognition of achievements.

**Objective E.4: Inventory and Monitoring**

Throughout the 15-year period covered by this CCP, gather and maintain scientifically sound data on the status of refuge lands, waters, and biota sufficient to support management decision-making, the purposes for which the refuge was established, and the goals of the Refuge System.

*Discussion:* Inventorying and monitoring are integral to Strategic Habitat Conservation. Properly designed and targeted monitoring provides actionable data for decision-making about conservation actions and measures progress toward resource objectives at multiple scales.

*Strategies:*

- Prepare and implement a step-down Inventory and Monitoring Plan which describes the purpose, scope, and methodology for each monitoring action to be carried out on Cat Island NWR.
- Consider conducting baseline inventories included in various strategies listed in this document and in accordance with the Biological Review, including the following existing or proposed monitoring actions, during the Inventory and Monitoring planning process:
  - Bat acoustical surveys
  - Intensive plant inventory
  - Anuran call surveys
  - Songbird point counts
  - Deer harvest data collection
  - Wading bird colony monitoring
  - Aquatic surveys
  - Timber cruises

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- Conduct an Inventory and Monitoring Blitz (intensive, week-long effort, coordinated with staff, volunteers, interns, universities, etc.) to collect good baseline species occurrence data.
  - Incorporate the principles of Strategic Habitat Conservation in all programs and projects conducted on the refuge.
  - Interact with the Service's Inventory and Monitoring Team to conduct biological work in a manner consistent with regional protocols.

**Objective E.5: Refuge Boundaries**

By the end of the 15-year period covered by this CCP, boundaries on Cat Island NWR would be surveyed and clearly marked.

*Discussion:* Clearly defined boundaries are essential to land management, visitor services, and law enforcement operations on a refuge. Unambiguously marked boundaries provide for public safety and help prevent accidental trespass by refuge visitors and users of adjacent private lands.

*Strategy:*

- Seek funding for boundary surveys and boundary marking; implement if funded.



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## Chapter 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 plan for Cat Island 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, 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. Projects that are taken from the refuge's Refuge Operating Needs System (RONS) database are designated with the corresponding RONS number. RONS has been discontinued; therefore, more recent projects do not have corresponding designations.

#### *FISH AND WILDLIFE POPULATION MANAGEMENT*

##### **Enhance wildlife management program**

*Description:* Enhance wildlife management program at Cat Island NWR. Habitat management requires continual monitoring and analysis and is affected by natural and man-made influences. This refuge is flooded by the Mississippi River each year, which can alter habitat quality and distribution of wildlife. This project would allow refuge personnel to assess changes and implement the needed action to be certain the requirements of wildlife are available. Additionally, the refuge is fast-growing and public use would increase rapidly. It is important to monitor the effect of the public on wildlife.

FIRST YEAR COST: \$80,000

RECURRING COST: \$15,000

#### *HABITAT MANAGEMENT*

##### **Conduct wildlife and habitat surveys for planning and implementing habitat management (RONS 4440)**

*Description:* Systematic surveys based on standard protocols need to be conducted to determine the presence and distribution of vertebrate, invertebrate, and plant communities on the refuge. No wildlife surveys have been conducted to date. A biological technician needs to be added to the refuge staff so that these surveys can be conducted. With the onset of climate change, this position is critical to document the wildlife and habitat changes that are taking place on the refuge. These surveys would become pertinent to baseline data for managers to plan and

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implement habitat management practices for the future of this refuge. This would be a shared biological technician position within the complex.

FTE: 0.5 (GS 05 step 10)

FIRST YEAR COST: \$27,575

RECURRING COST: \$27,575

#### *RESOURCE PROTECTION*

##### **Provide Visitor, Resource, and Facility Protection (Law Enforcement) (RONS 4432)**

*Description:* Protecting refuge resources and the safety of visitors is a fundamental responsibility of refuge management. A full-time park ranger/law enforcement position is needed to ensure the safety of the visiting public and to increase protection of the refuge's natural resources and facilities. A refuge officer's presence, surveillance, and visitor contacts are important to visitor safety and are critical in reducing crime on the refuge. Game is commonly taken out of season and night poaching is a continual enforcement problem. With the continually increase of visitors on the refuge, a refuge officer dedicated to this refuge is required to meet the goals of the Service and refuge, as well as ensure the safety of the visiting public. This is 1 FTE to be shared in the complex.

FTE: 0.5 (GS 09 step 10)

FIRST YEAR COST: \$55,000

RECURRING COST: \$55,000

##### **Seek funding for Archaeological Survey**

*Description:* The refuge is in need of more information regarding possible archaeological and historical resources within its boundaries. An archaeological survey would provide information which would facilitate a greater degree of protection for archaeological and historical resources on the refuge.

FIRST YEAR COST: \$20,000

#### *VISITOR SERVICES*

##### **Provide volunteer coordination; enhance visitor use**

*Description:* This plan includes multiple strategies for enhancing visitor use of the refuge. A staff position assigned at least half-time to Cat Island NWR would leverage volunteer capacity and partnerships to broaden public use of the refuge.

FTE: 0.5 (GS 07 step 10)

FIRST-YEAR COST: \$34,177

RECURRING COST: \$34,177

#### *REFUGE ADMINISTRATION*

##### **Provide Management, Improve Refuge Operations, and Enhance Partnerships (RONS 4430)**

*Description:* To access and actively manage the wildlife needs and engage the practices of Strategic Habitat Conservation on Cat Island NWR, the Service needs to hire a refuge operations specialist to take the lead with ongoing and upcoming projects. Cat Island NWR is currently an unstaffed refuge which receives significant public use. No active habitat planning or management occurs on the refuge at this time. A refuge operations specialist is needed to conduct biological surveys and inventories to establish baseline data for the CCP, organize hunt programs, determine habitat management needs, supervise public use programs, update data systems such as RMIS, and implement refuge management plans. All aspects of refuge management would be improved by this project. Habitat management decisions for thousands of wintering waterfowl, other migratory birds, and the

threatened Louisiana Black Bear will be addressed by this project. This would be 1 FTE, which could be dedicated or shared within the complex.

FTE: 0.5-1.0 (GS 5/7/9 step 10 Refuge Operations Specialist)

FIRST-YEAR COST: \$81,489

RECURRING COST: \$81,489

**Survey Refuge Boundaries (RONS 4444)**

*Description:* Determine and properly identify the refuge boundaries. A survey of the refuge boundaries would assist the refuge officer in securing strong court cases. Currently, the refuge is posted, but without proper demarcation, all boundary line violations and disputes are speculative and suspect. Boundary disputes with adjacent private landowners have resulted in Regional Office and congressional contacts. Upon completion of an accurate survey, staff can mark the boundaries appropriately which would assist adjacent landowners and visitors in the delineation of public (refuge) lands versus private lands.

FIRST-YEAR COST: \$251,500

RECURRING COST: \$1,500

Projects are summarized in Table 3.

**Table 3. Summary of projects proposed for Cat Island NWR**

| PROJECT TITLE   | FIRST YEAR COST | RECURRING ANNUAL COST | STAFF (FTEs) | GOAL/OBJECTIVE LINKAGE            |
|---|-----------------|-----------------------|--------------|-----------------------------------|
| Enhance wildlife management program   | \$80,000        | \$15,000              |              | A.1-8, E.4                        |
| Conduct wildlife and habitat surveys for planning and implementing habitat management | \$27,575        | \$27,575              | 0.5          | E.4                               |
| Provide Visitor, Resource, and Facility Protection (Law Enforcement)                  | \$34,177        | \$34,177              | 0.5          | C.2, C.5, D.1, D.2,               |
| Seek Funding for Archaeological Survey  | \$20,000        |                       | 0            | C.1                               |
| Provide Volunteer Coordination; Enhance Visitor Use                                   | \$34,177        | \$34,177              | 0.5          | D.1-D.5                           |
| Title: Provide Management, Improve Refuge Operations and Enhance Partnerships         | \$81,489        | \$81,489              | 0.5-1        | A.1-8, B.1-3, C.1-4, D.1-5, E.1-5 |
| Survey refuge boundaries  | \$251,500       | \$1,500               | 0            | E.5                               |

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## **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 or enhance partnerships with West Feliciana Parish Tourist Commission, Louisiana Hiking club, Baton Rouge Audubon, Louisiana State University, West Feliciana Parish Schools, and West Feliciana Parish Sheriff's Office, and to reestablish an active Friends of Cat Island NWR. At regional and state levels, partnerships may be established or enhanced with organizations such as Lower Mississippi Valley Joint Venture, Gulf Coastal Plains and Ozarks Landscape Conservation Cooperative, Louisiana Department of Wildlife and Fisheries, and U.S. Geological Survey.

## **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 4) 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.

**Table 4. National wildlife refuge step-down management plans related to the goals and objectives of the comprehensive conservation plan**

| <b>Step-down Plan</b>                                     | <b>Completion Date</b> |
|---|------------------------|
| Habitat Management Plan                                   | 2016                   |
| Inventory and Monitoring Plan                             | 2016                   |
| Visitor Services Plan                                     | 2016                   |
| Hunting and Fishing Plan (update plans completed in 2001) | 2017                   |
| Fire Management Plan                                      | Completed              |

## **STRATEGIC HABITAT CONSERVATION**

The Service has adopted Strategic Habitat Conservation (SHC) as the framework for all of its conservation work. An implementation of adaptive management, SHC is conceptualized as a cycle beginning with biological planning grounded in assumption-based research and leading to conservation designs at scale. On the landscape, the Service and its partners then affect conservation delivery, the outcome of which is monitored, feeding back into another round of planning. Actions proposed in this Draft CCP/EA are consistent with SHC and support the Service's vision of working with partners through Landscape Conservation Cooperatives to "conserve landscapes capable of supporting self-sustaining populations of fish and wildlife, while also providing for the needs of people" (U.S. Fish and Wildlife Service, n.d.).

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## **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 final CCP and the step-down management plans would be subject to public review and NEPA compliance.



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## SECTION B. ENVIRONMENTAL ASSESSMENT

### *Chapter I. Background*

#### INTRODUCTION

The Fish and Wildlife Service prepared this Environmental Assessment (EA) for Cat Island NWR in compliance with the National Environmental Policy Act (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 the Draft CCP/EA, a final decision would be made by the Fish and Wildlife Service that will guide Cat Island 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 EEP/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 Draft CCP/EA provides general management direction, subsequent step-down plans would provide more detailed management direction and actions.

The EA determines and evaluates a range of reasonable management alternatives. The intent of which 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 Fish and Wildlife Service in determining if the alternatives would have no significant impacts, thus requiring the preparation of a Finding of No Significant Impact, or if the alternatives would have significant impacts, thus requiring more detailed analysis through an Environmental Impact Statement and a Record of Decision. Following public review and comment, the Fish and Wildlife Service would select an alternative to be fully developed for this refuge.

This Draft CCP/EA 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 comprehensive conservation plan for all national wildlife refuges.

#### PURPOSE AND NEED FOR ACTION

##### *PURPOSE*

The purpose of developing a CCP for Cat Island NWR is to ensure that the refuge can achieve the purposes for which it was created as articulated through a refuge vision and a set of goals, support the mission of the Refuge System, comply with the Improvement Act, meet other legal mandates, and support special designations on the refuge.

##### **Refuge Purposes**

Cat Island NWR was created by Congress through Public Law 106-369, which states: “The purposes for which the Refuge is established and shall be managed are— (1) to conserve, restore, and manage habitats as necessary to contribute to the migratory bird population goals and habitat objective [sic] as established through the Lower Mississippi Valley Joint Venture; (2) to conserve,

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restore, and manage the significant aquatic resource values associated with the area's forested wetlands and to achieve the habitat objectives of the "Mississippi River Aquatic Resources Management Plan"; (3) to conserve, enhance, and restore the historic native bottomland community characteristics of the lower Mississippi alluvial valley and its associated fish, wildlife, and plant species; (4) to conserve, enhance, and restore habitat to maintain and assist in the recovery of endangered, and threatened plants and animals; and (5) to encourage the use of volunteers and facilitate partnerships among the United States Fish and Wildlife Service, local communities, conservation organizations, and other non-Federal entities to promote public awareness of the resources of the Refuge and the National Wildlife Refuge System and public participation in the conservation of those resources." Cat Island National Wildlife Refuge Establishment Act, 114 STAT. 1418, Oct. 27, 2000.

### **Refuge Vision**

A vision for Cat Island NWR has been set forth:

Located within the natural floodplain of the Lower Mississippi River Alluvial Valley, Cat Island National Wildlife Refuge conserves some of the region's last remaining bottomland hardwood forest habitat. The Mississippi River carved the unique landscape consisting of ridges and swales, cypress-tupelo swamps, meandering drains and backwater sloughs. These landscape features, coupled with annual flooding, provide highly productive habitat for an array of fish and wildlife resources including backwater fisheries, migratory songbirds, wintering waterfowl, Louisiana black bear, and other resident wildlife. The Service will facilitate the use of volunteers and partners to promote public awareness and conduct effective management of refuge resources. Management of the refuge will focus on conserving the natural diversity of plants and animals, preserving cultural resources, and providing opportunities for research, environmental education, and quality outdoor recreation for the American public.

### **Refuge Goals**

The following goals were established for the refuge:

- A. Manage and protect migratory and native resident wildlife populations on Cat Island NWR to contribute to the purposes for which the refuge was established as well as to fulfill the mission of the National Wildlife Refuge System.
- B. Habitats for migratory and native wildlife on Cat Island NWR will contribute to the purposes for which the refuge was established as well as fulfill the mission of the National Wildlife Refuge System.
- C. Protect the natural and cultural resources of the refuge in accordance with relevant state and federal law and regulations for the benefit of the public, Native American tribes, and other interested parties.
- D. Provide opportunities for compatible wildlife-dependent public uses that promote an understanding and appreciation of fish, wildlife, habitat conservation, and the mission of the National Wildlife Refuge System.
- E. Provide sufficient leadership, staffing, information, and infrastructure to manage and protect migratory and native wildlife populations and their habitats, cultural resources, and compatible public uses that contribute to the purposes for which the refuge was established and support the mission of the National Wildlife Refuge System.

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### **National Wildlife Refuge System Mission**

The mission of the National Wildlife 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.”

### **National Wildlife Refuge System Improvement Act**

The National Wildlife Refuge System Improvement Act of 1997 directed the Fish and Wildlife Service to prepare a comprehensive conservation plan for every national wildlife refuge. 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.

### **Other Mandates**

Administration of national wildlife refuges is also guided by legislation, presidential executive orders, and international treaties. Policies regulating management options for 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. Treaties, laws, administrative guidelines, and policies 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. Select legal summaries of treaties and laws relevant to administration of the Refuge System and management of the Cat Island NWR are provided in Appendix C of this document.

### **Special Designations**

Cat Island has been designated by the Partners in Flight program as part of a Bird Conservation Area capable of being restored to a 20,000-acre block of relatively unfragmented habitat for migratory birds (Twedt et al., 1999).

### *NEED*

The action is needed because no long-term, comprehensive planning has been done for the refuge. The CCP will provide guidance for refuge management over the next 15 years, ensure that the refuge fulfills the requirements of the Improvement Act, evaluate the compatibility of public uses of the refuge, and protect the biological integrity, diversity, and ecological health of the refuge and its resources.

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## **DECISION FRAMEWORK**

Based on the assessment described in this EA, the Service will select an alternative that best serves the purposes for which Cat Island NWR was created and supports the mission of the Refuge System, and determine if the selected alternative is a major federal action which significantly negatively affects the quality of the environment, thus requiring the preparation of an Environmental Impact Statement. The Service identified issues, concerns, and needs through discussions with the public; organizations; agency managers; conservation partners; tribal governments; local, state, and federal government agencies; and others. The planning team identified priority issues, developed a range of alternatives, evaluated the possible consequences of implementing each of the alternatives, and selected Alternative B as the proposed action. The Draft CCP/EA was developed for implementation based on this recommendation.

## **PLANNING STUDY AREA**

Cat Island NWR is located in West Feliciana Parish, Louisiana, just to the west of the town of St. Francisville and 25 miles north of Baton Rouge. The 10,473-acre refuge is located near the southern end of the Lower Mississippi Alluvial Valley (LMAV), on the east bank of the Mississippi River, inside a meander loop of the river and adjacent to loess hills to the east. Cat Island NWR is within the approximately 10 percent of the historic floodplain of the Mississippi not protected by levees. The refuge's congressionally approved acquisition boundary encompasses 36,500 acres.

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 Improvement Act 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 this EA, with a description of the alternatives considered and an analysis of the environmental consequences of the alternatives (Chapters III and IV in this section). When fully implemented, the CCP is intended to achieve the vision and purposes of Cat Island 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 National Wildlife Refuge System Administration Act of 1966, as amended by 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

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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, public involvement has been a crucial factor throughout the development of the Draft CCP/EA for Cat Island 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 Cat Island 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 appreciates the passion and commitment of so many individuals for the lands and waters administered by the refuge.

Primary responsibility for preparation of this Draft CCP/EA was delegated to a planning team which consisted of refuge complex staff, a representative of the Service's Baton Rouge Fish and Wildlife Conservation Office, a Service field planner, a representative of the Service's Region 4 Division of Migratory Birds, and a representative of LDWF. These individuals met regularly to coordinate preplanning and planning tasks, gather and share information, and solicit comments and assistance. Members of the planning team are listed in Appendix L.

The planning team met on September 18, 2013, and identified a number of issues, concerns, and opportunities related to fish and wildlife protection, management of invasive exotic species, habitat restoration, recreation and management of threatened and endangered species. Additionally, the planning team considered federal and state mandates, as well as applicable local ordinances, regulations, and plans. At the request of the Choctaw Nation of Oklahoma, the team and the Service's Regional Historic Preservation Officer met with representatives of the government of the Choctaw Nation on November 12, 2013, to consult on issues of interest to the tribe. The team also solicited public input during a public scoping period (October 22-December 21, 2013), which incorporated one public scoping meeting held at the St. Francisville Town Hall on November 18, 2013. Approximately 23 members of the public attended the meeting. Comments were received in written and verbal form at the meeting and via email and U.S. postal mail. All public, intergovernmental, and advisory team comments were considered; however, some issues important to the public fall outside the scope of the decisions to be made within this planning process. The team considered all issues that were raised throughout the planning process and developed a plan that attempts to balance competing ideas and interests regarding important issues. The team identified those issues that, in their best professional judgment, are most significant to the refuge.

A complete summary of the issues and concerns is provided in Section C, Appendix D, Public Involvement - Summary of Public Scoping Comments.



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## *Chapter II. Affected Environment*

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



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## Chapter 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 Gulf Coastal Plains and Ozarks Landscape Conservation Cooperative, the goals of the Refuge System, and the mission of the Fish and Wildlife Service. Alternatives are formulated to address the significant issues, concerns, and problems identified by the Service and the public during public scoping.

The three 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. Refuge staff 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 incorporates 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.

### 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 three 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 three alternatives are summarized below. A comparison of the three alternatives follows the summaries.

#### *ALTERNATIVE A - (CURRENT MANAGEMENT - NO ACTION)*

This is the status-quo alternative; under Alternative A, no new actions would be taken to manage Cat Island NWR, improve or otherwise change the refuge's habitats, wildlife, or public use. Programs that have been ongoing in the past would continue. Certain monitoring activities would continue, including periodic migratory bird surveys. Maintenance of roads and public use facilities would continue as presently conducted. Habitats would continue to be mostly passively managed, with actions taken only to provide for public safety or to avoid or mitigate damage to refuge resources. Current partnerships with the West Feliciana Parish Tourist Commission, Louisiana Hiking Club, Louisiana Department of Wildlife and Fisheries, and others would continue as before. Refuge hunting, fishing, and non-consumptive uses would continue as presently constituted. Legal requirements for protection of natural and cultural resources would continue to be met.

Acquisition of lands within the approved acquisition boundary would continue as before, contingent upon the availability of funding and appropriate lands offered by willing sellers. Law enforcement would continue to be a shared responsibility between the Service, the State of Louisiana, and the West Feliciana Parish Sheriff's Office. The refuge would continue to be unstaffed, and funding for its operation would be restricted to funds generated by the sale of recreational use permits and occasional special project funding.

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## *ALTERNATIVE B - ACTIVE RESOURCE MANAGEMENT (PROPOSED ALTERNATIVE)*

Alternative B is the proposed action. Under this alternative, the refuge's natural resources would be managed to enhance habitats for priority species including waterfowl and other migratory birds, threatened and endangered species, species of concern, and resident fish and wildlife. Additionally, consistent wildlife surveys would be conducted using established protocols to establish baseline habitat conditions, estimate wildlife population indices, determine responses to management actions, and contribute to larger-scale biological assessments. Invasive exotic and nuisance species would be actively managed to minimize their impacts on refuge resources. Refuge forests would be actively managed to enhance wildlife habitat. Aquatic habitats on the refuge would be inventoried and assessed, and where feasible, access to them would be improved for recreational anglers.

Refuge cultural resources would continue to be protected as they have been in the past. In addition, the refuge would seek funding to survey and catalog cultural resources on the refuge. Protection of cultural resources would be integrated into refuge planning at all levels, and management actions would be reviewed in order to avoid or mitigate impacts to cultural resources.

Under the proposed alternative, public use would be more actively managed by refuge staff. Hunting and fishing would continue to be managed and made available with the active partnership of LDWF. More law enforcement personnel hours would be allocated by the Service for Cat Island NWR. New partnerships with organizations interested in promoting non-consumptive refuge use would be sought, and existing ones strengthened. In particular, environmental education opportunities would be enhanced by active participation of Service personnel with local schools and nonprofit organizations.

Refuge infrastructure would be maintained as in the past. The refuge would seek to improve access via the main refuge road and various trails. Efforts would be made to provide access to the northeast section of the refuge, and access via Cat Island Road would be pursued. The refuge would hire or assign staff to the refuge. Staff may include one or more of the following: refuge manager, volunteer coordinator, equipment operator, law enforcement officer, forester, and biologist. Any or all of these may be shared positions among refuges in the Lower Mississippi River Refuge Complex. Full staffing under this alternative is anticipated to be 1.5-2 FTE.

## *ALTERNATIVE C - FULL RESOURCE MANAGEMENT WITH ENHANCED PUBLIC USE*

Under this alternative, as with Alternative B, the refuge's natural resources would be actively managed to enhance priority species habitats. A full Inventory and monitoring program, including vegetation mapping and plant and wildlife surveys, would be instituted under a new Inventory and Monitoring Plan. Monitoring activities would be conducted by refuge staff with the assistance of volunteers and partners. An aggressive approach would be taken to control invasive plants and animals, particularly feral hogs. Trapping and shooting by refuge staff and/or contractors would be systematically implemented with the goal of keeping populations at levels which do not pose a significant risk to refuge resources. Forests on the refuge would be assessed according to a stand-entry table, and appropriate silvicultural treatments would be applied to achieve the habitat conditions described by the LMVJV (LMVJV Forest Resource Conservation Working Group, 2007). Abandoned food plots along the main road would be evaluated for restoration to support nocturnal woodcock habitat. Refuge hydrology and aquatic habitats on the refuge would be fully assessed and feasible management actions to restore and enhance their ability to support a native recreational fishery and species of concern would be taken.

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Refuge cultural resources would be protected as required by law and described under Alternative B; increased public outreach and law enforcement presence would be expected to reduce risks of illegal disturbance of cultural artifacts. Funding for cultural resource surveys and catalog efforts would be sought, and cultural resources would be integrated into all refuge management activities including forest management and public use programs. Historical information about the refuge lands would be compiled and displayed.

Public use under Alternative C would be more strongly emphasized. While the refuge would continue to forge and develop partnerships, it would also develop independent capacity to manage public use. This capacity would include significant personnel resources focused on environmental education and interpretation, hunting and fishing, and promoting wildlife observation and photography. Dedicated law enforcement resources would be allocated to the refuge to focus on enhancing public safety and enforcing applicable laws and regulations. The refuge would, if feasible, maintain bank fishing areas adjacent to culverts along the main road and/or at the small pond. Connections to educational institutions in the nearby Baton Rouge metropolitan area would be strengthened, and public outreach would emphasize the role of conservation in supporting urban quality of life. The refuge would investigate the possibility of hosting an annual public event.

Refuge infrastructure would be enhanced. Roads would be improved to reduce overall maintenance costs, particularly those which result from annual flooding. The refuge would evaluate the feasibility of building roadside boat launches for use during flooded conditions. The refuge would work with the State of Louisiana and West Feliciana Parish to improve access road to refuge. New bridges would be constructed on roads and ATV/UTV trails where needed. ATV/UTV trails would be hardened where necessary and maintained annually. The Service would evaluate the feasibility of upgrading the River Road ATV trail to support automobile traffic. The trail and boardwalk at the Big Cypress would be improved. Maintenance and infrastructure on the hiking trails would be improved. Abandoned camps along the Mississippi River would be removed, along with associated debris. The refuge would establish a presence in St. Francisville to house staff and serve as a focus for public outreach. The refuge would hire a core staff team to include a refuge manager, park ranger/volunteer coordinator, law enforcement officer, forester or biologist, and equipment operator. One or more of these positions would be primarily assigned to Cat Island NWR, while others may be shared with other refuges in the complex. Full staffing level dedicated to the refuge is anticipated to be approximately 3-4 FTE under this alternative.

## **FEATURES COMMON TO ALL THREE ALTERNATIVES**

Common features of the three alternatives are listed below to reduce the length and redundancy of the individual alternative descriptions. It should be emphasized that under alternative A (no-action alternative), the refuge is unfunded and unstaffed. Cat Island NWR does not receive any annual recurring funding. Management oversight for Cat Island NWR is provided by staff members whose primary responsibilities are on other refuges in the complex.

### *WILDLIFE AND HABITAT MANAGEMENT*

Under all alternatives, legally mandated management actions, including those required by the Endangered Species Act, Migratory Bird Treaty Act, and Improvement Act, will be carried out to the extent that funding is available for their execution. The Service will strive to fulfill its obligations under partnerships such as the Gulf Coastal Plains and Ozarks Land Conservation Cooperative and the LMVJV to the extent that funding is available. Priority species for management will be those for which the Service has legal responsibility, including waterfowl, migratory birds, threatened and endangered species, and species of concern.

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## *RESOURCE PROTECTION*

Management and protection of natural and cultural resources on Cat Island NWR will comply with all existing legal requirements including Archaeological Resources Protection Act, Native American Graves Protection and Repatriation Act, and National Historic Preservation Act, as well as applicable state laws. The refuge will comply with all current legal requirements, regulations, and professional standards with respect to the identification, protection, and curation of cultural and historical resources.

Land acquisition within the approved acquisition boundary will continue under all three alternatives. The refuge will respond appropriately to wildfires and protect public health and safety and refuge resources during wildfires and other incidents.

## *PUBLIC USE*

Regardless of which alternative is selected, public use of Cat Island NWR will continue. Hunting and fishing will continue to be coordinated with LDWF. Environmental education and interpretation will be allowed and possibly conducted on the refuge, and the refuge will remain open for wildlife observation and photography. The refuge will ensure public safety and enforce applicable laws and regulations.

## *ADMINISTRATION*

Regardless of which alternative is selected, the refuge will continue to be administered as a unit of the Refuge System. Wildlife management will continue to be the highest priority for the refuge. Strategic Habitat Conservation will continue to be the framework for refuge operations. Partnerships and volunteers will continue to play a vital role in refuge management.

A comparison of the three alternatives is provided in Table 5.

## **ENVIRONMENTAL JUSTICE**

Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" was signed by President Bill 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' access to public information and participation in matters relating to human health or the environment. This EA has not identified any adverse or beneficial effects for any alternative unique to minority or low-income populations in the affected area. None of the alternatives will disproportionately place any adverse environmental, economic, social, or health impacts on minority or low-income populations.

## COMPARISON OF THE ALTERNATIVES BY ISSUE

**Table 5. Comparison of alternatives by management issues for Cat Island NWR**

| Issues   | Alternative A<br>(Current Management - No<br>Action Alternative)   | Alternative B<br>(Active Resource Management -<br>Proposed Alternative)   | Alternative C<br>(Full Resource Management<br>with Enhanced Public Use) |
|--|--|---|---|
| <b>Goal A. Manage and protect migratory and native wildlife populations on Cat Island NWR to contribute to the purposes for which the refuge was established as well as to fulfill the mission of the National Wildlife Refuge System.</b> |  |   |   |
| Waterfowl  | The refuge would continue to provide 10,473 acres of passively managed bottomland hardwood forest and associated wetlands for migrating and wintering waterfowl and resident wood ducks.     | The refuge would provide 10,473 acres of bottomland hardwood forest and associated wetlands which would be enhanced by active silvicultural management over up to 70 percent of the area. Forest openings would provide early successional habitat, while overstory species composition would be managed towards increasing hard mast production. | Same as Alternative B.  |
| Colonial Waterbirds  | The refuge would continue to provide foraging and rookery habitat. No surveys would be conducted.  | The refuge would continue to provide foraging and rookery habitat. Surveys would be initiated to monitor rookeries.   | Same as Alternative B.  |
| Forest-breeding Birds  | The refuge would continue to provide 10,473 acres of passively managed forest habitat. Surveys would continue to be conducted on an irregular basis as funding and staff time are available. | The refuge would actively manipulate up to 70 percent of the forested habitat to increase structural diversity and productivity of soft mast to optimize habitat for breeding Neotropical migratory birds. Point counts would be conducted to estimate forest breeding bird populations. Data on use by swallow-tailed kites would be collected.  | Same as Alternative B.  |

| Issues                | Alternative A<br>(Current Management - No<br>Action Alternative)   | Alternative B<br>(Active Resource Management -<br>Proposed Alternative)  | Alternative C<br>(Full Resource Management<br>with Enhanced Public Use)  |
|-----------------------|--|--|--|
| American Woodcock     | The refuge would continue to provide passively managed forest habitat for this species. Open, brushy areas on the refuge including rights-of-way, roads, and trails would be available for nocturnal habitat, but no special management of those areas would be conducted. | Active silvicultural management would increase low cover and provide openings in forest habitat which would enhance habitat quality for American woodcock. Open areas would be monitored and managed as needed and as time allowed to enhance their value to woodcock.   | Same as Alternative B, with the addition that abandoned food plots would be evaluated for conversion to nocturnal woodcock habitat.  |
| Resident Game Species | The refuge would continue to provide 10,473 acres of passively managed forest habitat supporting resident game species.  | Active silvicultural management would provide patches of early successional forest utilized by deer, rabbits, and other game animals. Soft mast production in these patches would increase, benefitting resident game animals. Over longer term, forests would be managed towards a higher density of hard mast-producing trees (oaks), which would benefit deer, turkey, and squirrels. | Same as Alternative B. In addition, refuge staff would take a more active role in check station operation to obtain data on resident game species and identify long-term trends in population size and health. |
| Bats                  | The refuge would continue to provide 10,473 acres of passively managed forest habitat supporting several species of migratory and resident bats. Roost trees would continue to be protected. Acoustical monitoring of bats would continue as staff time and funding allow. | The refuge would manage forest habitats to increase structural diversity and improve insect production while protecting potential roost trees. In addition to acoustical monitoring, a baseline survey of bat use of roost trees on the refuge would be conducted as staff time and money allow.   | Same as Alternative B.   |

| Issues   | Alternative A<br>(Current Management - No<br>Action Alternative)   | Alternative B<br>(Active Resource Management -<br>Proposed Alternative)   | Alternative C<br>(Full Resource Management<br>with Enhanced Public Use)  |
|--|--|---|--|
| Threatened, endangered, and protected species and species of concern | The refuge would continue to provide 10,473 acres of passively managed forest habitat supporting resident and migratory listed and protected species. Legal requirements for the protection of these species would be met. | The refuge would provide 10,473 acres of forest habitat, including some actively managed habitat in which early successional patches would be created. Soft mast production in these patches would increase, providing food resources for Louisiana black bears. Over longer term, forests would be managed towards a higher density of hard mast-producing trees (oaks and pecan), which would also benefit bears. Legal requirements for the protection of listed and protected species would be met. | Same as Alternative B. In addition, refuge hydrology and aquatic habitats would be evaluated for their suitability for species of concern, and appropriate restoration/conservation measures taken.  |
| Aquatic species  | Aquatic species would continue to be passively managed.  | Aquatic species would continue to be passively managed, except that enhanced monitoring actions may be conducted. Invasive aquatic species (Asian carp) would be evaluated and controlled if feasible.  | Native aquatic species would be passively managed. Enhanced monitoring of aquatic species would be conducted. Refuge would investigate ways to control Asian carp and implement if feasible. Refuge staff would enhance public awareness of, and access to, sport angling opportunities on the refuge. |

| Issues   | Alternative A<br>(Current Management - No<br>Action Alternative)  | Alternative B<br>(Active Resource Management -<br>Proposed Alternative)   | Alternative C<br>(Full Resource Management<br>with Enhanced Public Use)   |
|--|---|---|---|
| <b>Goal B. Habitats for migratory and native resident wildlife on Cat Island NWR will contribute to the purposes for which the refuge was established as well as fulfill the mission of the National Wildlife Refuge System.</b> |   |   |   |
| Bottomland<br>Hardwood Forest  | Existing bottomland hardwood forest on the refuge would continue to be managed passively. Changes in habitat quality or condition would result only from natural processes. | Portions of the bottomland hardwood forest on the refuge would be actively managed as described by the Lower Mississippi Valley Joint Venture to increase habitat quality for migratory birds, waterfowl, and resident wildlife (LMVJV Forest Resource Conservation Working Group, 2007). Management actions would be aimed at increasing soft and hard mast production and structural diversity. | Same as Alternative B.  |
| Aquatic Habitats   | The refuge would continue to provide passively managed aquatic habitats in the form of ponds and sloughs.   | The refuge would continue to provide passively managed aquatic habitats. Aquatic features on the refuge would be assessed, and the feasibility of targeted conservation measures for hydrogeographic restoration would be determined. Protection for aquatic habitats would be incorporated into forest management practices.   | Same as Alternative B, with the addition that more funding and staff time would be available for aquatic habitat restoration. |

| Issues  | Alternative A<br>(Current Management - No Action Alternative)  | Alternative B<br>(Active Resource Management - Proposed Alternative)  | Alternative C<br>(Full Resource Management with Enhanced Public Use)  |
|---|--|---|---|
| Invasive exotic and nuisance species  | Invasive exotic species would be controlled in localized situations as they threaten refuge resources. Control of nuisance species (beavers) and invasive exotic animals (hogs, Asian carp) would be by staff or through incidental take by hunters.             | Invasive exotic species would be inventoried and proportionate measures would be taken to manage populations which threaten refuge resources. Removal of hogs, beavers, and Asian carp by staff and incidental take by hunters and anglers would continue to be encouraged, and other measures would be considered if any of these animals threaten refuge resources.   | A more aggressive approach would be taken to removal of feral hogs and control of exotic plants, particularly Chinese tallow. Refuge staff and contractors would be used for exotic species control, with less dependence on hunters and anglers. Additional staff resources would be focused on maintaining beavers at an ecologically appropriate population level. |
| <b>Goal C. Protect the natural and cultural resources of the refuge in accordance with relevant state and federal law and regulations for the benefit of the public, relevant tribes, and other interested parties.</b> |  |   |   |
| Cultural Resource Management and Protection   | Cultural resources would continue to be protected as required by federal and state law; law enforcement efforts would be coordinated through partnership with LDWF and the West Feliciana Parish Sheriff's Office. No surveys or inventories would be conducted. | Protection of refuge cultural resources would be enhanced. Law enforcement would continue to be coordinated through partnership with LDWF and local law enforcement authorities; however, refuge law enforcement would also be tasked and trained to enforce cultural resource protection laws. The refuge would initiate public education efforts targeted at reducing damage and looting of cultural resources, should they be identified. The refuge would seek funding to survey the refuge for cultural resources and archaeological sites. A comprehensive database of cultural and historic resources would be created and maintained. | Same as Alternative B, with the addition that more staff resources would be available for outreach and law enforcement. Outreach would be facilitated by the presence of a local office for the refuge. Historical information would be compiled and displayed.   |

| Issues                                  | Alternative A<br>(Current Management - No<br>Action Alternative)   | Alternative B<br>(Active Resource Management -<br>Proposed Alternative)   | Alternative C<br>(Full Resource Management<br>with Enhanced Public Use)   |
|---|--|---|---|
| Land Acquisition                        | The refuge would identify high priority tracts available from willing sellers inside the approved acquisition boundary and seek funding to purchase them.                        | Same as Alternative A.  | Same as Alternative A.  |
| Fire and<br>Wildland-Urban<br>Interface | The refuge would continue to protect public health and safety and refuge resources by responding appropriately to wildfires. A current fire management plan would be maintained. | Same as Alternative A.  | Same as Alternative A.  |
| Law Enforcement                         | The refuge would continue to partner with LDWF and the West Feliciana Parish Sheriff's Office for law enforcement.   | The refuge would continue to partner with LDWF and the West Feliciana Parish Sheriff's Office for law enforcement. The complex would seek funding for a federal law enforcement officer assigned to Cat Island NWR. | The refuge would provide significant personnel resources toward law enforcement on the refuge. Partnerships with state and local law enforcement agencies would continue and be enhanced by the consistent presence of federal law enforcement personnel. |

| Issues   | Alternative A<br>(Current Management - No<br>Action Alternative)   | Alternative B<br>(Active Resource Management -<br>Proposed Alternative)   | Alternative C<br>(Full Resource Management<br>with Enhanced Public Use)   |
|--|--|---|---|
| <b>Goal D. Provide opportunities for compatible wildlife-dependent public uses that promote an understanding and appreciation of fish, wildlife, habitat conservation, and the mission of the National Wildlife Refuge System.</b> |  |   |   |
| Hunting  | Hunting would continue as in the past; refuge would partner with West Feliciana Parish Tourism Commission to promote the refuge and sell permits and with LDWF to assist with law enforcement. The refuge would continue to provide for public safety.   | Same as Alternative A. In addition, the refuge would allocate additional law enforcement and management resources to hunting. The refuge would work toward developing access to the northeastern part of the refuge and access from Cat Island Road.      | The refuge would upgrade roads and trails to improve public safety and access. The refuge would provide dedicated law enforcement personnel and increased monitoring of hunter take through check stations. Permits and refuge brochures would be available at the local refuge office. |
| Fishing  | Fishing would continue as in the past. The refuge would maintain current access to water bodies for anglers. Permits would be available at the West Feliciana Parish Tourism Commission, and the Service would continue to partner with LDWF to assist with law enforcement. The refuge would continue to provide for public safety. | Same as Alternative A. In addition, the refuge would allocate additional law enforcement and management resources to fishing. The refuge would investigate the possibility of improving access to refuge waters and to the Mississippi River for anglers. | The refuge would upgrade roads and trails to improve public safety and access. The refuge would provide dedicated law enforcement personnel. Permits and refuge brochures would be available at the local refuge office.  |

| Issues                               | Alternative A<br>(Current Management - No Action Alternative)  | Alternative B<br>(Active Resource Management - Proposed Alternative)   | Alternative C<br>(Full Resource Management with Enhanced Public Use)   |
|--------------------------------------|--|--|--|
| Wildlife Observation and Photography | The refuge would remain open for wildlife observation and photography. No new initiatives would be undertaken. The current partnership with the Louisiana Hiking Club to maintain Black Fork Trail would continue. The refuge would continue to provide for public safety. | The refuge would remain open for wildlife observation and photography. Current partnerships would be maintained, and the refuge's online presence would be enhanced. Every effort would be made to strengthen the partnership with the Louisiana Hiking Club to maintain Black Fork Trail and Big Cypress Trail. The Big Cypress Trail observation deck would be kept in a safe and usable condition through more frequent maintenance. Trail count and/or other use data would be obtained. The refuge would continue to provide for public safety. | Same as Alternative B. In addition, the refuge would actively promote wildlife observation and photography through outreach efforts facilitated by a local refuge office and dedicated staff time. Outreach may be enhanced by an annual event on the refuge. More resources would be available to replace and maintain the Big Cypress Trail observation deck and other visitor facilities. |
| Interpretation                       | The refuge would continue to be available for environmental interpretation. Interpretive literature and information would continue to be available at the West Feliciana Parish Tourism Commission. No new programs would be initiated.                                    | The refuge would continue to be open for environmental interpretation and continue to work with the West Feliciana Parish Tourism Commission to disseminate interpretive information. In addition, volunteers would be used to provide interpretation to refuge visitors either on-site or at the Tourism Commission office. The refuge would explore the possibility of hosting an annual event at the refuge.  | The refuge would dedicate staff resources to promoting interpretation through a local refuge office. More staff time and resources would be available to host an annual event and provide interpretive experiences to refuge visitors.   |

| Issues  | Alternative A<br>(Current Management - No Action Alternative)  | Alternative B<br>(Active Resource Management - Proposed Alternative)   | Alternative C<br>(Full Resource Management with Enhanced Public Use)   |
|---|--|--|--|
| Environmental Education   | The refuge would continue to be available for education groups to use. No new programs would be initiated.                                   | The refuge would explore the possibility of partnering with local schools and/or nonprofits to start up an environmental education program.  | The refuge would take the lead in partnering with schools in the Baton Rouge metropolitan area and provide significant staff resources to conduct environmental education programs focused on enhancing appreciation of the role of natural habitats and wildlife and the importance of conservation.  |
| <b>Goal E. Provide sufficient leadership, staffing, information, and infrastructure to manage and protect migratory and native wildlife populations and their habitats, protect and preserve cultural resources, support compatible public uses that contribute to the purposes for which the refuge was established, and further the mission of the National Wildlife Refuge System.</b> |  |  |  |
| Operations and Maintenance (Staffing and resources)   | The refuge would continue to be unstaffed; funding would be primarily limited to that provided through permit sales for hunting and fishing. | The refuge would hire or assign staff to the refuge. Staff may include one or more of the following: refuge manager or refuge operations specialist, volunteer coordinator, equipment operator, law enforcement officer, biological technician, forester, and biologist. Any or all of these may be shared positions among refuges in the Lower Mississippi River Refuge Complex. Full staffing under this alternative is anticipated to be 1.5-2 FTE. | The refuge would hire a core staff team to include refuge manager, park ranger/volunteer coordinator, law enforcement officer, forester or biologist, and equipment operator. One or more of these positions would be primarily assigned to Cat Island NWR, while others may be shared with other refuges in the complex. Full staffing level dedicated to the refuge is anticipated to be approximately 3-4 FTE under this alternative. |

| Issues                           | Alternative A<br>(Current Management - No Action Alternative)  | Alternative B<br>(Active Resource Management - Proposed Alternative)   | Alternative C<br>(Full Resource Management with Enhanced Public Use)   |
|----------------------------------|--|--|--|
| Roads, trails, and rights-of-way | Maintenance of refuge infrastructure would continue as before, with emphasis on maintaining public safety and protecting refuge resources. No new programs would be initiated. | Maintenance of refuge infrastructure would continue, and public safety and refuge resources would be protected. The refuge would work to increase the frequency of maintenance of all roads and trails.  | Same as Alternative B. In addition, roads and trails would be improved where improvements would enhance public safety or reduce maintenance costs.   |
| Inventory and Monitoring         | Current monitoring (forest breeding bird point counts, deer check station data) would continue. No new Inventory and monitoring projects would be initiated.                   | The refuge would prepare and implement an Inventory and Monitoring Plan which would outline a targeted program of monitoring and refuge inventory designed to provide useful data for decision-making and measure progress toward management objectives.   | Same as Alternative B. In addition, more staff resources would be available for monitoring and data management.  |
| Volunteers and Partnerships      | Current partnerships would be maintained; no new partnerships would be initiated.  | Refuge would initiate partnerships and enlist volunteers to enhance programs such as: <ul style="list-style-type: none"> <li>• Road, trail, and facilities maintenance;</li> <li>• Biological surveys;</li> <li>• Maintaining and improving visitor service programs;</li> <li>• Education and interpretive programs.</li> </ul> | Refuge would continue to forge and enhance partnerships and enlist volunteers as in Alternative B. More staff time would be available for volunteer coordination and partnering. More staff time would also be available for direct contributions to road, trail, and facilities maintenance, biological surveys, maintaining and improving visitor service programs, and education and interpretive programs. |
| Refuge Boundaries                | Refuge boundary work would be done as funding becomes available.   | Refuge would seek funding to survey and mark boundaries, and implement if funded.  | Same as Alternative B.   |

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## Chapter IV. Environmental Consequences

### OVERVIEW

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

### SUMMARY OF EFFECTS BY ALTERNATIVE

The following section describes the environmental consequences of adopting each refuge management alternative. We then summarize and address, for specific issues, the likely outcomes of the three alternatives in tabular form, organized by broad issue categories.

#### *ALTERNATIVE A - NO ACTION (CURRENT MANAGEMENT)*

Under Alternative A, Cat Island NWR would be managed as it has been in recent years. Current programs relevant to the refuge including land protection, land management, visitor services, monitoring, and law enforcement would not be expected to change absent wider changes to these efforts within the Service. This alternative is included here for comparison purposes. It should be considered a baseline, and is not expected to be the best way to achieve refuge purposes or fulfill the mission of the Refuge System.

Under the no-action alternative, wildlife populations on Cat Island NWR would continue to be managed as they are now. Wildlife populations would fluctuate due to natural and/or external factors, but baseline management would not change, and no large changes in wildlife populations would be anticipated. Monitoring would continue for forest-breeding birds and bats as funding allows. Check station data would continue to be collected for deer during the 6 days of open firearm hunting each year. Legal requirements for management of threatened and endangered species, species protected under the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and other federal statutes would continue to be met. Fire protection would continue through a partnership with the Louisiana Department of Agriculture and Forestry, Forest Protection Division.

Habitat management would continue as it has in the recent past; forests would be passively managed, and their condition would change only in response to natural processes and events and to anthropogenic changes outside the control of refuge managers, such as those related to hydrologic regime, climate, disease, and exotic species. Forested habitat would probably slowly develop towards an "old-growth" character; age class structure would gradually shift towards uneven-aged as natural disturbances created openings. This change might be imperceptible over the 15-year lifespan of this CCP; however, stochastic events (storms, disease, or insect outbreaks) may create widespread disturbance at unpredictable intervals. Aquatic habitats on the refuge would continue to be passively managed, and public access to them would be maintained at current status.

Public use would not change appreciably except in line with regulatory changes or larger policy-driven shifts. Hunting access and seasons would not be expected to change absent legal or regulatory changes by the State of Louisiana or the Federal Government. Likewise, fishing regulations and access would not be expected to change. Wildlife observation, wildlife photography, and interpretation would continue to be permitted and promoted through partnership with the West

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Feliciania Parish Tourist Commission. Environmental education by partner schools and other organizations would continue on the refuge, but no Service staff would be assigned to its promotion. Under Alternative A, all legal requirements for the protection of cultural resources would be met. However, it is not likely that any more information would be available to managers about the existence, extent, and condition of cultural resources on the refuge, since funding for surveys would not be actively sought.

Cat Island NWR would continue to be unstaffed and funded only or primarily by sales of recreational use permits. This funding stream would continue to be expended on road and facility maintenance. Overall condition of roads, trails, and other refuge infrastructure would, therefore, not be expected to change over the next 15 years. The refuge would continue to rely on partnerships with LDWF, West Feliciana Parish Sheriff's Office, and Louisiana State Police for law enforcement on the refuge.

### *ALTERNATIVE B - ACTIVE RESOURCE MANAGEMENT (PROPOSED ALTERNATIVE)*

The Service believes that refuge purposes would best be achieved under Alternative B. Active management of habitats, visitor services, cultural resources, and other programs would be focused on the goals and objectives described in the Draft CCP.

Under Alternative B, population size and reproductive success of priority species including waterfowl, other migratory birds, threatened and endangered species, and species of concern, as well as resident fish and wildlife, would be expected to improve as a result of more active habitat management. Monitoring would continue for forest-breeding birds and bats and be implemented for other priority species. Data from monitoring would be available to aid in management decisions. Check station data would continue to be collected for deer during the 6 days of open firearm hunting each year. Legal requirements for management of threatened and endangered species, species protected under the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and other federal statutes would continue to be met. Habitat quality for threatened and endangered species would not be expected to change for listed aquatic species nor for interior least tern. Habitat for Louisiana black bear would be expected to improve as a result of silvicultural manipulation of the forest habitat. Fire protection would continue through partnership with the Louisiana Department of Agriculture and Forestry, Forest Protection Division.

Forest habitat on the refuge would become more favorable to priority species over time as the effects of active management accumulate. Forest canopy structure would become more complex, the forest would slowly move towards an uneven-aged condition (though not achieving it within the 15-year life of this CCP), understory and midstory layers would become more developed, overstory species composition would begin to shift in response to silvicultural treatments, and hard and soft mast production would increase. Snags and cavity trees would be intentionally retained, but their numbers would not necessarily be greater than would be the case under Alternative A. The forest would, as under Alternative A, be subject to stochastic disturbance events such as storms and disease outbreaks. Nevertheless, progress towards desired future conditions described by the LMVJV (LMVJV Forest Resource Conservation Working Group, 2007) would be more predictable under Alternative B. Aquatic habitats on the refuge would continue to be passively managed; however, public access to them would be assessed and improved when consistent with protection of refuge resources and achievement of refuge purposes.

Under Alternative B, public use would be enhanced by more direct involvement by refuge staff. Permitted uses would not change except in line with regulatory changes or larger policy-driven shifts. Hunting access and seasons would not be expected to change, absent legal or regulatory changes by the State of Louisiana or the Federal Government. However, refuge staff would take a more active

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role in promoting and protecting public safety through law enforcement. Fishing regulations would not be expected to change unless state or federal regulations are modified; however, access to fishing sites would be enhanced whenever possible. Wildlife observation, wildlife photography, and interpretation would continue to be encouraged and promoted through partnership with the West Feliciana Parish Tourist Commission. In addition, staff time would be devoted to managing these non-consumptive public uses. Environmental education by partner schools and other organizations would continue on the refuge, and Service staff would be assigned to actively partner with local schools and other organizations to increase this use.

All legal requirements for the protection of cultural resources would be met under Alternative B. In addition, more information may be available to managers about the existence, extent, and condition of cultural resources on the refuge as a result of cultural resource surveys, for which funding would be sought.

Under Alternative B, the Service would seek funding for staff, operations, and maintenance for Cat Island NWR. If such funding were provided, the overall condition of roads, trails, and other refuge infrastructure would be expected to improve over the next 15 years. While the refuge would continue to rely on partnerships with LDWF, West Feliciana Parish Sheriff's Office, and Louisiana State Police for law enforcement assistance on the refuge, it would also be able to dedicate additional refuge staff time to law enforcement.

#### *ALTERNATIVE C - FULL RESOURCE MANAGEMENT WITH ENHANCED PUBLIC USE*

Although refuge goals and purposes would be achieved under Alternative C, the Service believes that the most efficient use of public resources would result from Alternative B.

Under Alternative C, population size and reproductive success of priority species including waterfowl, other migratory birds, threatened and endangered species, and species of concern, as well as resident fish and wildlife, would be expected to improve as a result of more active habitat management. Monitoring would continue for forest-breeding birds and bats and be implemented for other priority species. Data from monitoring would be available to aid management decisions. Check station data would continue to be collected for deer during the 6 days of open firearm hunting each year. Legal requirements for management of threatened and endangered species, species protected under the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and other federal statutes would continue to be met. Habitat quality for threatened and endangered species would not be expected to change for listed aquatic species nor for interior least tern. Habitat for Louisiana black bear would be expected to improve as a result of silvicultural manipulation of the forest habitat. Fire protection would continue through partnership with the Louisiana Department of Agriculture and Forestry, Forest Protection Division.

Forest habitat on the refuge would become more favorable to priority species over time as the effects of active management accumulate. Forest canopy structure would become more complex, the forest would slowly move towards an uneven-aged condition (though not achieving it within the 15-year life of this CCP), understory and midstory layers would become more developed, overstory species composition would begin to shift in response to silvicultural treatments, and hard and soft mast production would increase. Snags and cavity trees would be intentionally retained, but their numbers would not necessarily be greater than would be the case under Alternative A. The forest would, as under Alternatives A and B, be subject to stochastic disturbance events such as storms and disease outbreaks. Nevertheless, progress towards desired future conditions described by the LMVJV (LMVJV Forest Resource Conservation Working Group, 2007) would be more predictable under Alternative C. Aquatic habitats on the refuge would be assessed, and if feasible, be improved. Public

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access to them would be assessed and improved when consistent with protection of refuge resources and achievement of refuge purposes.

Under Alternative C, public use would be increased and enhanced due to increased staff resources assigned to the refuge. Permitted uses would not change except in line with regulatory changes or larger policy-driven shifts. Hunting and seasons would not be expected to change, absent legal or regulatory changes by the State of Louisiana or the Federal Government. However, refuge staff would take a more active role in promoting and protecting public safety and in law enforcement. Access to hunting areas would be expected to improve due to improvements to roads and trails and greater ability to provide timely maintenance. Fishing regulations would not be expected to change unless state or federal regulations are modified; however, access to fishing sites would be enhanced by improvements to roads, trails, and bank-fishing areas. Wildlife observation, wildlife photography, and interpretation would be encouraged and promoted by local refuge staff at the refuge office, as well as through partnership with the West Feliciana Parish Tourist Commission. In addition, staff time would be devoted to managing these non-consumptive public uses. Environmental education by partner schools and other organizations would increase on the refuge as a result of Service staff taking the lead in developing an environmental education program in partnership with schools in the Baton Rouge metropolitan area.

All legal requirements for the protection of cultural resources would be met under Alternative C. In addition, more information may be available to managers about the existence, extent, and condition of cultural resources on the refuge as a result of cultural resource surveys, for which funding would be sought.

Under Alternative C, the Service would seek funding for staff, operations, capital improvements, and maintenance for Cat Island NWR. If such funding were provided, the overall condition of roads, trails, and other refuge infrastructure would be expected to improve over the next 15 years. Improvements to roads, rights-of-way, and associated infrastructure would result in reduced annual maintenance costs. While the Service would continue to cultivate partnerships with LDWF, West Feliciana Parish Sheriff's Office, and Louisiana State Police for law enforcement assistance on the refuge, it would have the resources to take the lead on law enforcement.

#### *COMPARISON OF EFFECTS BY ISSUE FOR THE THREE ALTERNATIVES*

Table 6 contains a summary of effects for issues arising from refuge goals and objectives.

**Table 6. Summary of environmental effects by alternative, Cat Island NWR**

| Issues   | Alternative A<br>(Current Management -<br>No Action Alternative)   | Alternative B<br>(Active Resource<br>Management - Proposed<br>Alternative)   | Alternative C (Full Resource<br>Management with Enhanced<br>Public Use)                                      |
|--|--|--|--|
| <b>Goal A. Fish and Wildlife Population Management</b> |  |  |  |
| <b>Waterfowl</b>                                       | No change—passive management of habitat would continue. Use of habitats would continue as in the past. No effect on wintering or migrating waterfowl would be anticipated.                                 | Manage hardwood forests to favor hard mast; may be long-term increase in hard mast production, but probably beyond 15-year planning horizon for this CCP; some increase in early successional habitat would improve habitat for wintering ducks. Incremental improvements for waterfowl would be expected. | Same as Alternative B.   |
| <b>Colonial Waterbirds</b>                             | No change—waterbirds would continue to be protected by law, and habitat would not change appreciably.  | Waterbirds would continue to be protected by law; rookeries would receive better protection from disturbance; habitat probably would not change appreciably.   | Same as Alternative B.   |
| <b>Forest Breeding Birds</b>                           | Forest breeding birds would continue to use habitats on Cat Island NWR, but habitat would not be actively managed, so development of more favorable habitat conditions would be slow and/or unpredictable. | Forest breeding bird populations would benefit from management actions designed to improve habitat quality.  | Same as Alternative B. In addition, more staff resources would be available for inventorying and monitoring. |

| Issues                       | Alternative A<br>(Current Management -<br>No Action Alternative)  | Alternative B<br>(Active Resource<br>Management - Proposed<br>Alternative)   | Alternative C (Full Resource<br>Management with Enhanced<br>Public Use)  |
|------------------------------|---|--|--|
| <b>American Woodcock</b>     | Current conditions would continue; no special consideration would be given to providing low cover or open nocturnal foraging areas. No effect on woodcock would be expected.  | Habitats would be manipulated to improve wintering habitat. Overall, small positive effect on the species.   | Same as Alternative B.   |
| <b>Resident Game Species</b> | Resident game species would continue to use habitats as in the past. Populations would not be expected to change as a result of this alternative.   | Habitat quality would improve for some resident game species in response to silvicultural manipulation of forest. Squirrels would benefit long term from gradual increase in hard mast production. Deer may benefit from creation of early successional patches in the forest habitat. | Same as Alternative B. In addition, more staff resources would be available to monitor populations of resident game species. |
| <b>Bats</b>                  | Bats would continue to use habitats on Cat Island NWR. Information on their abundance would be collected and maintained by the refuge when funding was available. No effect of this alternative would be expected for bats. | Bats would benefit from increasing structural complexity of forest habitats resulting from active forest management. Monitoring data would be collected and maintained by the refuge when funding was available.   | Same as Alternative B.   |

| Issues                                   | Alternative A<br>(Current Management -<br>No Action Alternative)   | Alternative B<br>(Active Resource<br>Management - Proposed<br>Alternative)   | Alternative C (Full Resource<br>Management with Enhanced<br>Public Use)   |
|--|--|--|---|
| <b>Threatened and Endangered Species</b> | Threatened and endangered species would continue to use habitats on Cat Island NWR as they have in the past. Legal protections would remain the same. If interior least terns are found to be using sandbar habitat along the Mississippi River on the refuge, those areas would be closed to public access during the breeding season for that species. | Surveys would be conducted for threatened and endangered species to determine presence and potential protection and habitat improvement measures. Habitat quality for Louisiana black bear would be improved through silvicultural treatments. Other federally protected species would benefit from generally more active management, including law enforcement, on the refuge, but habitat quality would not change appreciably. If interior least terns are found to be using sandbar habitat along the Mississippi River on the refuge, those areas would be closed to public access during the breeding season for that species. | Same as Alternative B. Additional law enforcement resources beyond those planned in Alternative B would be available in the event that certain habitats or sites needed protection. |
| <b>Aquatic Species</b>                   | Aquatic habitats on the refuge would be passively managed as they are now; no change in populations of aquatic species would be anticipated as a result of selecting this alternative.   | Feasibility of improving aquatic habitats would be assessed; if improvements were implemented, aquatic species populations may benefit.  | Same as Alternative B. More resources would be available for improving habitats if improvements were determined to be feasible and beneficial.                                      |

| Issues                                       | Alternative A<br>(Current Management -<br>No Action Alternative)  | Alternative B<br>(Active Resource<br>Management - Proposed<br>Alternative)   | Alternative C (Full Resource<br>Management with Enhanced<br>Public Use)  |
|--|---|--|--|
| <b>Goal B. Habitat Management</b>            |   |  |  |
| <b>Bottomland Hardwood Forest Management</b> | Bottomland hardwood forests on the refuge would slowly develop, under the influence of stochastic disturbance events, along a natural trajectory towards a more complex, diverse condition. No silvicultural treatments would be implemented to direct or control this process. | Silvicultural treatments would create, or hasten the development of, overstory structural complexity, understory, species diversity, and age class diversity. Stochastic disturbance events would also contribute to the development of these features. Potential impacts from silvicultural manipulation include sedimentation, soil compaction, habitat fragmentation, and proliferation of exotic invasive plants (chiefly Chinese tallow). | Same as Alternative B. In addition, more staff resources would be available in the event that exotic invasive plants threatened refuge resources after silvicultural treatments. |
| <b>Aquatic Habitat Management</b>            | Aquatic habitats on the refuge would be passively managed as they are now. No effects would be expected.  | Aquatic habitats would be assessed and improved if feasible.   | Same as Alternative B.   |

| Issues                                      | Alternative A<br>(Current Management -<br>No Action Alternative)   | Alternative B<br>(Active Resource<br>Management - Proposed<br>Alternative)  | Alternative C (Full Resource<br>Management with Enhanced<br>Public Use)   |
|---|--|---|---|
| <b>Invasive Exotic and Nuisance Species</b> | Management of invasive exotic species and nuisance animal species would continue at minimal levels. Invasive species may have impacts on refuge natural resources due to lack of funding for control measures. | Invasive exotic animals (feral hogs, Asian carp) and plants (Chinaberry, Chinese tallow, Japanese climbing fern), and nuisance animals (beaver) would be assessed regularly and managed as appropriate to minimize impacts to refuge resources.   | Same as Alternative B. Additional staff and/or contractor resources would be available for managing exotic and nuisance animals, reducing dependence upon recreational hunters. Exotic plant infestations would be identified and eliminated earlier and more effectively with additional staff resources available for reconnaissance. |
| <b>Goal C. Resource Protection</b>          |  |   |   |
| <b>Cultural and Historical Resources</b>    | Legal requirements for the protection of cultural and historical resources would be met; no new information would likely be obtained.  | Legal requirements for the protection of cultural and historical resources would be met; funding would be sought for surveys of the refuge. Active management would be accompanied by cultural resource surveys as appropriate. Better information about cultural resources on the refuge may result in better protections. | Same as Alternative B.  |
| <b>Land Acquisition</b>                     | Land acquisition within the approved acquisition boundary would continue as funding is available.  | Same as Alternative A.  | Same as Alternative A.  |

| Issues                                   | Alternative A<br>(Current Management -<br>No Action Alternative)   | Alternative B<br>(Active Resource<br>Management - Proposed<br>Alternative)  | Alternative C (Full Resource<br>Management with Enhanced<br>Public Use)  |
|--|--|---|--|
| <b>Fire and Wildland/Urban Interface</b> | No impact; currently minimal effects on human environment.   | Same as Alternative A.  | Same as Alternative A.   |
| <b>Law Enforcement</b>                   | Refuge will continue to provide for public safety; less focus on refuge-specific regulations or federal laws.  | Refuge will continue to provide for public safety; federal law enforcement personnel would provide additional focus on refuge-specific regulations and federal laws.                                      | Federal law enforcement personnel would take the lead on law enforcement; partnerships with state and local law enforcement agencies would be maintained and enhanced.   |
| <b>Goal D. Visitor Services</b>          |  |   |  |
| <b>Hunting</b>                           | Recreational hunting program would continue as it is currently conducted. Quality of hunting experiences would not change as a result of selecting this alternative. | Recreational hunting program would continue as currently conducted; refuge infrastructure, law enforcement, and habitat management would be enhanced, contributing to higher quality hunting experiences. | Same as Alternative B. In addition, improvements to roads and trails would increase levels of public safety and access. Greater focus of law enforcement resources on the refuge would increase public safety and the quality of hunting experiences. Local refuge office would serve as main source of information and permits. |

| Issues                                      | Alternative A<br>(Current Management -<br>No Action Alternative)                                  | Alternative B<br>(Active Resource<br>Management - Proposed<br>Alternative)   | Alternative C (Full Resource<br>Management with Enhanced<br>Public Use)   |
|---|---|--|---|
| <b>Fishing</b>                              | Recreational fishing program would continue as it is currently conducted.                         | Recreational fishing program would continue as currently conducted; refuge infrastructure, including access to fishing areas, and law enforcement would be enhanced, contributing to higher quality fishing experiences.                       | Same as Alternative B. In addition, capital improvements to roads and trails would further improve access and safety. Improvement of aquatic habitats may increase the quality of fishing experiences. Local refuge office would serve as main source of information and permits. |
| <b>Wildlife Observation and Photography</b> | Wildlife observation and photography would continue to be permitted and encouraged on the refuge. | Wildlife observation and photography would continue to be permitted and encouraged on the refuge. As habitats improve and refuge infrastructure is upgraded, wildlife observation and photography opportunities and experiences would improve. | Same as Alternative B. In addition, new and improved infrastructure would improve the quality of experiences and reduce visitor impact on highly trafficked areas (Big Cypress Trail). Local refuge office would be instrumental in promoting these uses.                         |
| <b>Interpretation</b>                       | Interpretation would continue to be permitted and encouraged on the refuge.                       | Interpretation would continue to be permitted and encouraged on the refuge. Experiences would improve as refuge habitats and wildlife populations become more complex and diverse.   | Same as Alternative B. In addition, interpretation would be actively promoted by staff and through volunteers. Local refuge office would be instrumental in promoting this use.   |

| Issues                                       | Alternative A<br>(Current Management -<br>No Action Alternative)  | Alternative B<br>(Active Resource<br>Management - Proposed<br>Alternative)  | Alternative C (Full Resource<br>Management with Enhanced<br>Public Use)   |
|--|---|---|---|
| <b>Environmental Education</b>               | Environmental education would continue to be permitted and encouraged on the refuge. This alternative would have no effect on current environmental education programs.   | Environmental education would continue to be permitted and encouraged on the refuge. Opportunities and experiences would improve as refuge habitats and wildlife populations become more complex and diverse, and active habitat management actions are taken. New partnerships may increase opportunities for environmental education on the refuge. | Same as Alternative B. In addition, refuge staff would take the lead and actively promote environmental education through new partnerships with schools in the Baton Rouge metropolitan area. Awareness of the value of conservation and local conservation issues would increase as large numbers of students are reached. |
| <b>Goal E. Refuge Administration</b>         |   |   |   |
| <b>Operations and Maintenance, Personnel</b> | The refuge would continue to be unstaffed and funded primarily by recreational use permits. Refuge infrastructure would be maintained at constant quality at best, and may degrade over time, especially in response to storms or other events. | The refuge would seek funding for staff and operations. If funding were provided, the refuge would benefit from more active management. Infrastructure would be upgraded as funding allowed, and recovery from storms and other events would be quicker and more comprehensive.   | The refuge would be essentially fully staffed and most able to achieve its purposes. Wildlife populations, habitats, refuge resources, and refuge visitors would all benefit from a full range of services provided by local staff.   |

| Issues                             | Alternative A<br>(Current Management -<br>No Action Alternative)   | Alternative B<br>(Active Resource<br>Management - Proposed<br>Alternative)   | Alternative C (Full Resource<br>Management with Enhanced<br>Public Use)  |
|------------------------------------|--|--|--|
| <b>Roads and Rights-of-Way</b>     | Maintenance of roads and rights-of-way would continue as in the past. Limited funds would be focused on debris removal, grading, gravel, and maintenance of culverts and spillways. Public safety would be the highest priority. Quality and condition of roads and culverts could degrade over time due to lack of funding for major repairs. | Maintenance of roads and rights-of-way would be improved with increased levels of funding and staff time. Besides debris removal, grading, gravel, and maintenance of culverts and spillways, resources could be focused on trail maintenance, mowing, and access to northeastern portion of refuge. As in Alternative A, public safety would be the highest priority. | Same as Alternative B. In addition, capital improvements to roads, rights-of-way, and trails would reduce ongoing maintenance costs and improve recovery time after floodwaters recede each summer.      |
| <b>Volunteers and Partnerships</b> | Current refuge partnerships and use of volunteers would continue; no new partnerships would be sought, nor would any new outreach to volunteers be initiated. No effect on public use would be anticipated under this alternative.   | The refuge would continue current partnerships and uses of volunteers and expand them if feasible. The refuge would seek to reestablish a Friends of Cat Island Refuge group through which volunteer work could be coordinated. New partnerships would enhance the refuge's ability to provide quality public use experiences.   | Same as Alternative B. In addition, dedicated refuge staff resources would be available for volunteer coordination and for forging and maintaining partnerships. Volunteer participation would increase. |

| Issues                          | Alternative A<br>(Current Management -<br>No Action Alternative)   | Alternative B<br>(Active Resource<br>Management - Proposed<br>Alternative)   | Alternative C (Full Resource<br>Management with Enhanced<br>Public Use)         |
|---------------------------------|--|--|---|
| <b>Inventory and Monitoring</b> | The refuge would continue current inventoryng and monitoring efforts; however, new initiatives would not be anticipated with current levels of funding and staff time.                       | The refuge would prepare an Inventory and Monitoring Plan. During the preparation of this plan, current and planned monitoring activities would be considered and prioritized for relevance to refuge purposes and goals and to the mission of the Refuge System.  | Same as Alternative B.  |
| <b>Refuge Boundaries</b>        | No change in boundary marking is anticipated; surveys would not be done due to lack of funds.  | Refuge would conduct surveys to locate boundaries; boundary markers would be placed along property lines and maintained.   | Same as Alternative B. More staff resources would be available for this action. |
| <b>External Threats</b>         |  |  |   |
| <b>Climate Change</b>           | Under Alternative A, no special measures would be taken to address the effects of climate change on the refuge. Resilience of habitats and wildlife to climate change would not be enhanced. | Under the more active and adaptive management described in Alternative B, management actions would be evaluated for their effects on the resilience of habitats and wildlife to anticipated changes in climate. These effects would likely be small during the 15-year planning period covered by this CCP, but may be important in the long term. | Same as Alternative B.  |

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## **GOAL A. FISH AND WILDLIFE POPULATION MANAGEMENT**

### *EFFECTS COMMON TO ALL ALTERNATIVES*

All three alternatives are expected to have neutral or slightly positive effects on waterfowl, colonial waterbirds, forest-breeding birds, American woodcock, resident game, bats, threatened and endangered species, and aquatic species. Hunting and fishing regulations would remain the same under all alternatives, and would thus affect fish and wildlife populations similarly.

### *EFFECTS OF ALTERNATIVE A*

No effects on fish or wildlife populations unique to Alternative A have been identified.

### *EFFECTS OF ALTERNATIVE B*

Alternative B would have slight to moderate positive effects on populations of waterfowl, colonial waterbirds, forest-breeding birds, American woodcock, certain resident game species, bats, and Louisiana black bear. It is possible also under Alternative B that improvements would be made to aquatic habitats that would benefit aquatic species. Wintering waterfowl would benefit from an increase in early successional patches of forest habitat. Further, silvicultural treatments which increase the amount of hard mast production in forest stands would, at least in the long term, improve habitat for wintering waterfowl by providing additional food resources. Allowing beaver ponds to develop in certain areas of the refuge would increase breeding and brood habitat for wood ducks and hooded mergansers. Silvicultural treatments described in the proposed alternative would also benefit Louisiana black bear, American woodcock, bats, deer, squirrels, and forest-breeding birds by increasing soft and hard mast production, structural complexity of forest habitat, midstory shrub and understory development, and vegetation diversity.

### *EFFECTS OF ALTERNATIVE C*

Alternative C would have similar effects on wildlife populations to those of Alternative B. Additional information about wildlife populations would be available due to increased resources dedicated to inventorying and monitoring.

## **GOAL B. HABITAT MANAGEMENT**

### *EFFECTS COMMON TO ALL ALTERNATIVES*

Under all alternatives, the majority of the habitats on Cat Island NWR would probably be managed passively for most if not all of the 15-year planning period covered by this CCP. A maximum of 70 percent of the forest area would be assessed for possible silvicultural treatments, and it is likely that not all of that would warrant active management during the planning period. Therefore, external and natural processes would drive habitat changes on much of the refuge. Effects of this type of “passive” management are expected to be neutral to slightly positive for most wildlife, soils, water quality, and the human environment. Forest stands would slowly develop over time, undergoing changes as events such as windstorms, lightning, disease, and insect outbreaks occurred. In the event of a catastrophic event, such as a hurricane that caused extensive blow-down or breakage of timber, forests under all three alternatives would be similarly affected.

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### *EFFECTS OF ALTERNATIVE A*

Under Alternative A, all forest management on Cat Island NWR would be passive, and limited funds would be available for control of invasive exotic and nuisance plants and animals. Natural and external forces would drive changes in habitats. Exotic invasive plants and animals could have negative effects on refuge natural resources if funding were insufficient for their control. Aquatic habitats would also be passively managed. No assessment of feasibility of hydrologic improvements would be made.

### *EFFECTS OF ALTERNATIVE B*

The proposed alternative includes silvicultural manipulation, including timber harvests, which are designed to improve wildlife habitat, specifically for Neotropical migratory birds and threatened and endangered species. Active forest management carries with it the risk of direct and indirect impacts to refuge resources. Timber harvest can directly cause erosion, sedimentation, soil compaction, rutting and puddling, damage to residual stands, habitat loss, fragmentation, or degradation. Indirect effects of timber harvest can include invasion by exotic plant species, undesirable changes in populations of native animals and plants, and loss of aesthetic value. To mitigate these risks, the refuge would adhere to all Best Management Practices promulgated by the State of Louisiana for logging, road construction and maintenance, and wetland protection, as well as all federal laws, regulations, and policies pertaining to forest management, road construction, pesticide use, and cultural resource protection. Timber harvest would be limited to small group selection or “patch” cuts which produce openings of from approximately ½-acre to 3 acres in size. These proposed activities are anticipated to have positive effects on wildlife and the human environment by mimicking natural disturbance patterns observed in passively managed forests of greater age (LMVJV Forest Resource Conservation Working Group, 2007).

Improper use of herbicides and other pesticides could impact water quality, wildlife populations, and ecological health. To mitigate this risk, the refuge will follow the Integrated Pest Management policy outlined in 569 FW 1 (Service Manual). This includes the preparation of Pesticide Use Proposals for approval before pesticides are applied, and using “cost-effective pest management practices that pose the least risk to humans, natural and cultural resources, facilities, and the environment” (569 FW 1).

Ongoing and proposed exotic species control programs and habitat management actions would position refuge resources to be more resilient in the face of new and recurring threats. Maintaining healthy, diverse, natural environments will increase the likelihood that refuge habitats and wildlife will successfully adapt to changing climate. However, some non-significant impacts of the proposed exotic and nuisance animal and plant control programs may occur. Disturbance to native wildlife by personnel carrying out control operations may occur, but would have a negligible effect on wildlife or the human environment. The risk of damage to non-target plants from herbicide application exists, but proper implementation of the pesticide use proposal process and adherence to label restrictions, policies, and regulations will mitigate any such effects. In particular, targeted sprays, injection, or other non-broadcast methods of application would be used to control Chinese tallow and other invasive plants.

### *EFFECTS OF ALTERNATIVE C*

Effects of Alternative C would be similar to those of Alternative B. Better and more timely control of invasive exotic animals and plants would be expected under Alternative C due to the availability of more staff resources.

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## **GOAL C. RESOURCE PROTECTION**

### *EFFECTS COMMON TO ALL ALTERNATIVES*

#### **Land Ownership and Site Development**

Land acquisition efforts by the Service could lead to changes in land use and recreational use patterns. Most of the non-Service-owned lands within the refuge's approved acquisition boundary are currently in forest or under row crop cultivation. If these lands were acquired as additions to the refuge, they would either be maintained in, or restored to, a natural state to benefit native wildlife populations or kept open and managed for waterfowl. The decision as to whether new lands would be opened to wildlife-dependent public uses would be made in accordance with Service policy and the Improvement Act. Lands would only be opened where those uses were compatible with the purposes of the refuge.

#### **Cultural Resources**

All three alternatives contain minimal levels of land disturbance (other than forestry operations), thereby producing little potential for negative effects on the refuge's cultural and historical resources. Potentially negative effects on cultural resources could result from logging, construction of new trails, or development of an observation platform at the Big Cypress trail. These actions would require review by the Service's Regional Archaeologist in consultation with the State of Louisiana Historic Preservation Office, as mandated by Section 106 of the National Historic Preservation Act. Any proposed action would be evaluated for potential to damage archaeological or historical resources during the planning phase for the relevant 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, historical, 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 historical 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.

Under all three alternatives, the refuge would maintain fire protection through partnership with the Louisiana Department of Agriculture and Forestry, Fire Protection Division. Risk of fire on the refuge under most circumstances would remain small, and wildland-urban interface issues would remain negligible.

### *EFFECTS OF ALTERNATIVE A*

Under Alternative A, no funding for archaeological surveys would be anticipated. No damage or loss of archaeological or historical resources would be anticipated under this alternative; however, the refuge would not gain information about heretofore undiscovered sites. The refuge would comply with all legal requirements regarding the protection of historical and cultural resources.

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## *EFFECTS OF ALTERNATIVE B*

Expanded presence of law enforcement and management personnel would discourage vandalism, littering, and other visitor-related impacts. Dedicated staff time would allow faster recovery from periodic impacts of storms and other disturbances. Cultural resource protection would be enhanced by increased presence of law enforcement and other refuge personnel. Additional information about cultural resources and archaeological sites on Cat Island NWR would become available to the Service through surveys, funding for which would be sought under Alternative B.

## *EFFECTS OF ALTERNATIVE C*

Effects of Alternative C are expected to be similar to those of Alternative B. Higher levels of staffing would provide proportionally greater beneficial effects and mitigation of any adverse effects.

## **GOAL D. VISITOR SERVICES**

### *EFFECTS COMMON TO ALL ALTERNATIVES*

Benefits of a robust visitor services program for a refuge almost always vastly outweigh negative effects. The value of wildlife-dependent recreation has been quantified in terms of dollars (\$2.4 billion in 2011) (Carver & Caudill, 2013); however, this number pales in comparison to the intangible rewards that the American public receives every year from their national wildlife refuges. Nevertheless, impacts are real and must be considered carefully during refuge planning. Because few qualitative changes to the visitor services program on Cat Island NWR are contemplated in the proposed alternative, most of the foreseeable effects of this program on the human environment are common to Alternatives A and B. Incremental increases in some effects may be seen if Alternative B is selected; those effects are discussed below in the section “Effects of Alternative B.” Alternative C includes some significant positive changes in the visitor services program which would be made possible by increased funding and staff time. As for Alternative B, the potential exists for some non-significant adverse effects to occur as a result of increased public use; however, Alternative C also includes increased resources which could be used to address any effects on refuge resources or the human environment.

### **General Environmental Effects**

Although most refuge visitors are law-abiding and make an effort to reduce their impacts on the refuge, in general, impacts of a visitor services program on the refuge resource must be managed if they are to be minimized. Even the most careful and conscientious visitors contribute to traffic and noise on the refuge, compact the soil simply by walking on it, and disturb wildlife by their presence. Other, less punctilious visitors may leave litter, damage vegetation, vandalize refuge property, or commit other legal infractions. These impacts are expected to be non-significant under all three alternatives; however, as discussed below, they may become more important and warrant additional management attention under Alternatives B and C.

### **Effects on Adjacent Landowners**

Public use under any of the alternatives may result in trespass onto adjacent private lands by recreational users. To minimize this potential impact, the refuge will clearly mark refuge boundaries and enforce regulations prohibiting access to the refuge through adjacent private land.

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### **Effects on Wildlife**

Actions related to visitor services taken under all three alternatives will have effects on game and non-game wildlife and fish and other aquatic species, as well as on the human environment. These effects are expected to be minor and insignificant.

Disturbance to wildlife is an unavoidable consequence of any public use program, regardless of the activity involved. Anticipated effects of disturbance from visitor use on any species of wildlife under any of the alternatives are not considered to be significant at Cat Island NWR. Nevertheless, the refuge will 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 will also be managed with restrictions that ensure minimal impact on other resources. General wildlife observation may result in minimal disturbance to wildlife. If the refuge determines that impacts from visitor use are significantly impacting refuge resources, impairing the achievement of refuge purposes, or having a significant impact on the human environment, those uses will be discontinued, restricted, or rerouted to other less-sensitive areas. In certain cases, anticipated conflicts with refuge resources would be preemptively managed by restricting public use. For example, if it is determined that the sandbar habitat along the Mississippi River bank is being used by interior least terns as breeding habitat, those areas would be closed to public access during the breeding season for that species, typically beginning after the sandbars are exposed in the summer and lasting up to 5 months (U.S. Fish and Wildlife Service, 1990; Thompson et al., 1997).

Hunting is an established, traditional, and well-understood activity on Cat Island NWR, in the State of Louisiana, and in the United States, and an appropriate form of wildlife-dependent recreation on national wildlife refuges. Properly managed wildlife populations can sustain hunting pressure without significant impact. In many cases, hunting by humans has partially replaced predation by other predatory animals which have been extirpated or are much less abundant than in the past (Ripple & Beschta, 2005; Giles & Findlay, 2004). However, it is possible that hunting could impact game animal populations directly, or populations of game or nongame animals directly or indirectly, if not properly managed. To mitigate any such effects, the Service monitors and regulates take of game animals and, in partnership with states, conducts surveys of trust species' populations both on refuges and, for migratory species, across the continent. The Service, in partnership with the State of Louisiana, regulates seasons, hunting methods, and numbers of hunters on the refuge to maintain harvest at sustainable levels. State and federal regulations for hunting both resident and migratory game are based on survey and habitat condition data collected each year.

### **Effects on vegetation**

Disturbance of vegetation is a stated objective of certain forest management activities, including some of those outlined in this document. However, vegetation disturbance can also be an unintended consequence of other activities, particularly public use. Intentional disturbance of vegetation by unauthorized persons is prohibited by refuge regulations. Unintentional disturbance of vegetation by foot, ATV, or vehicle traffic will be mitigated by enforcing trail use restrictions and prohibition of off-road use of vehicles. Other damage to vegetation, including damage to trees, will be mitigated by regulations prohibiting climbing spikes, permanent tree stands, metal spikes in trees, and cutting of vegetation.

### **Effects on Soils and Water Quality**

Foot and ATV traffic on trails is expected to have a negligible impact on soil erosion and sedimentation. To minimize impacts from public use, the refuge will include informational signs that request hikers to remain on the trails and enforce restrictions prohibiting off-trail use of ATVs and off-road travel with road-use vehicles.

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## **User Group Conflicts**

Inherent in accommodating multiple groups of refuge users is the possibility that those uses will sometimes conflict. Further, conflict can arise within a user group when the number of users exceeds the capacity of the resource to accommodate them. On Cat Island NWR, actual and potential user group conflicts are managed by separating those uses by either space or time, or by modifying the uses themselves through regulation to reduce conflict. Issues of resource scarcity are managed by restrictions on season and access. The following regulations are currently used on Cat Island NWR to reduce the likelihood of user group conflicts:

1. Two “no-hunting zones” are enforced on the refuge; one surrounding each of the two hiking trails, Black Fork Trail and Big Cypress Trail.
2. Hunting is prohibited within 150 feet of any road, trail, or public facility, including kiosks.
3. Firearm deer hunts are restricted to two, three-day periods (one for modern weapons, one for “primitive” weapons). These hunts are further restricted by lottery selection to limit total number of hunters on the refuge at any time.
4. The refuge is closed to fishing, small game hunting, migratory bird hunting, and archery deer hunting during each of the two, three-day quota firearm deer hunts.

### *EFFECTS OF ALTERNATIVE A*

Unique effects of the Cat Island NWR visitor services program under Alternative A arise mostly because of limited resources available to address ongoing issues. Access to parts of the refuge at certain times of year, particularly in the summer after floodwaters recede, may be limited because equipment and operators may not be available to be assigned to remove debris, repair roads, and maintain water control structures. Under Alternative A, it is likely that no facility upgrade would be done at the Big Cypress trail, although removal of the present decaying boardwalk structure would probably be necessary to protect public safety. Not replacing the boardwalk observation deck would detract from the quality of the visitor experience and fail to protect the big cypress tree from potential damage from excessive foot traffic on its root system. No organized environmental education program would be conducted on the refuge, so opportunities to reach out to students would be lost.

### *EFFECTS OF ALTERNATIVE B*

Effects of the visitor services program proposed under Alternative B would not differ qualitatively from those described above under “Effects Common to All Alternatives.” However, certain actions taken under Alternative B would be expected to increase visitor use, so incremental increases in effects may occur. In particular, facility improvement, public outreach, and improved access are proposed in Alternative B. These actions would most likely lead directly to increased public use and indirectly to effects such as increased littering, noise, and vehicular traffic. Therefore, additional mitigation would be implemented to ensure that those effects did not significantly impact refuge resources or the human environment. Mitigation would probably take the form of additional regulation, upgrading of facilities, or more resources devoted to law enforcement and visitor services management.

### *EFFECTS OF ALTERNATIVE C*

Effects of the visitor services program described under Alternative C would be similar to those under Alternative B. Additional resources and efforts at outreach, law enforcement, and environmental education would have generally positive effects on the refuge resource as well as the human environment.

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## **GOAL E. REFUGE ADMINISTRATION**

### *EFFECTS COMMON TO ALL ALTERNATIVES*

#### **Operations and Maintenance**

Under all three alternatives, Cat Island NWR would continue to be maintained by skilled, professional staff and operated as a unit of the Refuge System. Public safety and achievement of refuge purposes would be the highest priorities for operations.

#### **Roads and Rights-of-way**

Under all alternatives, roads and rights-of-way would be maintained to minimum standards to provide for public safety.

#### **Volunteers and Partnerships**

Volunteers and partnerships are fundamental to the purposes for which the refuge was created in 2000. Under all three alternatives, the refuge would continue to rely on volunteers for trail maintenance and some facility upkeep, and on partnerships at least to some extent for sale of recreational use permits, publicity, fire protection, and law enforcement. Effects common to all three alternatives are positive; involving volunteers in the operation of the refuge creates good will in the community and a sense of ownership and pride in public lands. Partnerships with local organizations help build community involvement and strengthen the local economy.

#### **Inventory and Monitoring**

Under all alternatives, inventorying and monitoring of wildlife populations would be conducted. The refuge would have some information regarding the status of species of concern.

#### **Refuge Revenue-Sharing**

Annual refuge revenue-sharing payments to West Feliciana Parish would continue at similar rates under all three alternatives. If lands are acquired and added to the refuge, the payments would be calculated taking the new acreage into account.

### *EFFECTS OF ALTERNATIVE A*

Some impacts would occur or be exacerbated because of limited resources available for refuge management and resource protection. Mitigation efforts would also be hampered by a lack of resources to respond to impacts as they occur. Examples include damage and degradation of roads, trails, signs and kiosks, and other refuge infrastructure from annual flooding, damage due to vandalism, invasion of exotic species such as feral hogs, Chinese tallow, Japanese climbing fern, and others, and the effects of storms and other disturbance events. Without significant funding and staff time dedicated to the refuge, the Service is more dependent upon volunteers and partners for support with mitigating these effects. Some funding is available from recreational use permits for annual road rehabilitation; however, major road work is precluded by lack of resources. Inventorying and monitoring would continue to be sporadic as funding allows, which would result in incomplete information regarding species the refuge is attempting to manage for, including waterfowl, migratory birds, and threatened and endangered species such as Louisiana black bear.

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## *EFFECTS OF ALTERNATIVE B*

Alternative B would result in improvements in operations and maintenance on Cat Island NWR because of the availability of assigned staff and funding for operations. Road, trail, culvert, and facility conditions would be maintained or improved. Boundaries would be identified and clearly marked. All aspects of refuge operations and management would be improved.

Under Alternative B, the refuge would be better situated to remove flood debris and repair and maintain roads, rights-of-way and culverts in a timely fashion. Durability of roads could be improved to reduce annual maintenance time and expense. Indirect effects that may result from implementing the proposed alternative include minor impacts from siltation due to the disturbance of soils, while improving and maintaining roads and maintaining foot trails. However, these increases would be offset by long-term decreases in erosion and sedimentation due to the improvements.

## *EFFECTS OF ALTERNATIVE C*

Alternative C would have similar effects to those of Alternative B. Capital improvements to roads and trails may reduce long-term sediment production and maintenance costs. Fully staffing the refuge as is contemplated under Alternative C would ensure that adequate personnel and resources were available for maintenance of infrastructure. Volunteer coordination and the maintenance of partnerships would be facilitated by the presence of a local refuge office in West Feliciana Parish.

## **CLIMATE CHANGE**

In 2010, the Service published *Rising to the Urgent Challenge: Strategic Plan for Responding to Accelerating Climate Change* (U.S. Fish and Wildlife Service, 2010). This document lays out the Service's response to anthropogenic climate change. Three kinds of responses are described in this plan: adaptation, mitigation, and engagement. Adaptation involves managing resources so that they become more resilient to climate change and are able to adapt without catastrophic loss of ecosystem function. Mitigation is conceived as taking actions which reduce atmospheric carbon, the main driver of anthropogenic climate change. Engagement means collaborating with partners to address challenges from climate change.

## *EFFECTS COMMON TO ALL ALTERNATIVES*

Refuge management intersects mostly with the first two of these three major strategies. Because natural habitats store chemically reduced carbon in biomass and the soil carbon fraction, they can function to mitigate the effects of industrial CO<sub>2</sub> pollution. Carbon sequestration is thus recognized as a factor in the global carbon balance, and conservation of natural habitats is an important tool for managing atmospheric carbon levels. However, the actions proposed in this Draft CCP/EA would probably have little or no net effect on carbon sequestration, because the refuge is currently forested and would remain so under all alternatives. It is possible that a small net gain in total sequestered carbon would occur as the forest ages, although this is by no means certain, given the possibility of natural disturbance events. The only exception would be if new, open lands were acquired (under any alternative) and then reforested; in that case, some sequestration of carbon would occur.

Under all three alternatives, the refuge would take actions which would promote adaptation of natural habitats and wildlife to climate change. These actions, listed in *Rising to the Urgent Challenge* are:

- “Promote habitat connectivity and integrity”—the refuge would promote habitat connectivity and integrity by protecting existing forested habitat and by acquiring land and restoring habitat within the approved acquisition boundary.

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- “Reduce non-climate change ecosystem stressors”—Cat Island NWR would act to reduce the effects of stressors, particularly invasive species and land-use changes.

#### *EFFECTS OF ALTERNATIVE A*

Under Alternative A, all habitats on Cat Island NWR would be passively managed. Any changes in habitat and/or wildlife resilience in the face of climate change would occur naturally. No management actions would be targeted towards this end.

#### *EFFECTS OF ALTERNATIVE B*

Under Alternative B, habitats on Cat Island NWR would be actively managed, and the effects of management actions on climate adaptability would be assessed and taken into account. Active management of forest habitat would have the effect of increasing structural and species diversity, age classes, and overall resilience to stressors including climate change.

#### *EFFECTS OF ALTERNATIVE C*

Effects of Alternative C would be similar to those of Alternative B.

### **CUMULATIVE IMPACTS**

A cumulative impact is “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” (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 time, caused by past, present, and future actions. 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. Sometimes the overall effect is greater than the sum of the individual effects, such as when a dwindling population crosses a threshold of reproductive sustainability and faces extinction.

A thorough analysis of impacts always considers their cumulative aspects, because actions do not take place in a vacuum. In most cases, other actions have affected the resource in the past, are affecting it in the present, or will affect it in the reasonably foreseeable future. Any assessment of a specific action’s effects must take into account the effects of other actions.

The implementation of the alternatives includes actions relating to facility development, wildlife habitat and population management, resource protection, public use, and administrative programs. These actions would have both direct and indirect effects (e.g., public access improvement results in increased public use, which may increase littering, noise, and vehicular traffic); however, the cumulative negative effects of these actions over the 15-year planning period for Cat Island NWR would not be significant and are far outweighed by the anticipated positive impacts. 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, or those of any other agency or person, as outlined in the proposed alternative.

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Some activities in one or more of the alternatives are anticipated to have negligible or minimal cumulative effects. Actions which have the potential to produce significant effects when combined with the effects of other actions would be conducted in ways to mitigate those effects and render the resulting effects non-significant. Actions which have the potential for significant cumulative effects include: (1) hunting and fishing, (2) general public use, (3) road and trail maintenance, (4) forest management, and (5) exotic and nuisance animal and plant control. Each of these will be discussed below.

### *HUNTING AND FISHING*

Hunting and fishing are identified in the Improvement Act as appropriate public uses. They may be permitted on refuges provided they are determined to be compatible with the purposes for which the refuge was established. Hunting and fishing are common to all alternatives, and potential impacts from these activities are not expected to differ significantly between the three alternatives. Hunting and fishing have the potential to cause cumulative effects on populations of game animals over time. In addition, these activities have the potential to negatively affect habitat and the environment, as well as other user groups.

The refuge will conduct these activities in accordance with state and federal regulations. All Cat Island NWR hunts are circumscribed by season dates and bag limits set by the State of Louisiana. Big game (deer) firearm hunts are further currently restricted to six days to limit the take to sustainable levels. Deer check data are collected annually to ensure that the harvest is sustainable. Small game species on Cat Island NWR (squirrel, rabbit) are able to sustain harvests because of their short reproductive cycles and fecundity. Migratory bird hunts (waterfowl, woodcock) are regulated by federal and state biologists based on a nationwide framework after reviewing habitat and population data. Cat Island NWR has been sustainably hunted for many years, and none of the alternatives anticipate major changes to hunting regulations from those currently in place. To mitigate possible effects on other user groups, hunting is prohibited within 150 feet of any road, trail, or visitor facility, as well as within the no-hunting zones surrounding the two hiking trails on the refuge. Fishing and other hunting activities are prohibited during the two, three-day firearm deer hunts.

No significant changes in fishing regulations are anticipated under any of the alternatives. Some increase in fishing use may occur under Alternatives B and C, if access to remote water bodies were improved. Effects of this change would be expected to be small and positive, and no cumulative effects are expected.

### *GENERAL PUBLIC USE*

Consumptive and non-consumptive use by the public has the potential to cause non-significant cumulative effects on roads, trails, vegetation, and wildlife. Trampling, soil compaction, vandalism, damage to vegetation, and littering are all potential negative impacts due to public use. Inasmuch as Alternatives B and C include additional public use (enhanced environmental education opportunities, improved roads leading possibly to greater visitor traffic, improved access for hunters and anglers possibly leading to greater use), they also propose greater management and resource protection oversight, including law enforcement, staff and volunteer presence, and public education efforts to mitigate any possible cumulative impacts from these activities.

Additional public use could also exacerbate conflicts between or within user groups. The Service anticipates that increases in public use resulting from implementing Alternative B or C would be manageable with current mitigation measures. However, should conflicts arise the refuge would need to address these with additional regulations, spatial or temporal restrictions, or facility development.

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## *ROAD AND TRAIL MAINTENANCE*

Maintenance of roads and trails is an ongoing activity at Cat Island NWR. Alternatives B and C anticipate increased funding for these activities so that they can be conducted in a timely and environmentally sustainable manner. Properly maintained roads, culverts, and trails would produce less sediment and have less impact on aquatic habitat connectivity than rutted, eroding roads or plugged culverts. Cumulative effects could occur under any of the alternatives. Under Alternative A, limited funds would be available to mitigate impacts; however, all activities under any alternative would be conducted according to Best Management Practices and in accordance with all federal and state regulations. Thus, cumulative effects from these activities are expected to be non-significant.

## *FOREST MANAGEMENT*

Forest management, especially timber harvest, has the potential to produce long-term cumulative effects on the environment. Alternatives B and C include silvicultural manipulation, including timber harvest, which is designed to improve wildlife habitat, specifically for Neotropical migratory birds and threatened and endangered species. Timber harvest would be limited to thinning, single-tree selection, group selection, or “patch” cuts, which produce openings of ½ to 3 acres in size. These proposed activities are anticipated to have positive effects on wildlife and the human environment by mimicking natural disturbance patterns observed in passively managed forests of greater age. Forest management activities on national wildlife refuges conform to all laws and policies governing commercial and land-disturbing activities on federal lands. All silvicultural activities would be conducted according to State of Louisiana Best Management Practices for silviculture and road construction. Adaptive management principles would be used for all management activities. Thus, any unanticipated cumulative effects that appear would be addressed by changes in management actions.

## **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 Draft CCP/EA would 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 residents of the surrounding communities.



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## Chapter 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 the Draft CCP/EA.

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

The planning team, which consisted of refuge complex staff, a representative of the Service's Baton Rouge Fish and Wildlife Conservation Office, a Service field planner, a representative of the Service's Region 4 Division of Migratory Birds, and a representative of LDWF (Appendix L), met on September 18, 2013, and identified a number of issues, concerns, and opportunities related to fish and wildlife protection, management of invasive exotic species, habitat restoration, recreation, and management of threatened and endangered species. Additionally, the planning team considered federal and state mandates, as well as applicable local ordinances, regulations, and plans. At the request of the Choctaw Nation of Oklahoma, the team and the Service's Regional Historic Preservation Officer met with representatives of the government of the Choctaw Nation on November 12, 2013, to consult on issues of interest to the tribal nation. The team also solicited public input during a 61-day public scoping period (October 22-December 21, 2013), as advertised in the *Federal Register* 78 FR 62648. The notice was corrected (to extend the scoping period) in a separate entry in the *Federal Register*, 78 FR 70318. The scoping period incorporated one public scoping meeting held at the St. Francisville Town Hall on November 18, 2013. Approximately 23 members of the public attended the meeting. Comments were received in written and verbal form at the meeting and via e-mail and U.S. Postal Service mail. A summary of the results of those meetings is presented in Section A, Chapter III, Plan Development. More detail is presented in Appendix D.



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## SECTION C. APPENDICES

### *Appendix A. Glossary*

- Adaptive Management:** The rigorous application of management, research, and monitoring to gain information and experience necessary to assess and modify management activities. A process that uses feedback from refuge research and monitoring and evaluation of management actions to support or modify objectives and strategies at all planning levels (602 FW 1.6A).
- Alluvial:** Of or related to sediment transported and deposited in a river valley, delta or river bed 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:** Relating to migratory fishes that spend most of their lives in the sea and migrate to freshwater 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).
- 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

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| <b>Cover Type:</b>                  | The present vegetation of an area. Several published classification systems for vegetation exist; however, Service policy, 602 FW 3.4C (1) (f), stipulates that the Service will use the National Vegetation Classification System ( <a href="http://usnvc.org">http://usnvc.org</a> ) to classify vegetation in comprehensive conservation plans. See also: Vegetation Type.   |
| <b>Cultural Resource Inventory:</b> | 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).   |
| <b>Cultural Resource Overview:</b>  | 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).   |
| <b>Cultural Resources:</b>          | Cultural Resources include:<br>(1) Archaeological Resource. Any material remains of past human life or activity greater than 100 years old which are of archaeological interest as defined by Section 4(a) of the Archaeological Resources Protection Act and 43 CFR Part 7.3.<br>(2) Historic Property. Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places. This includes artifacts, records, and remains that are related to and located within such properties. As a general guideline, a cultural resource should be at least 50 years old to be considered as a historic property.<br>(3) Object of Antiquity. Any object of historic or archaeological interest protected by the Antiquities Act of 1906 and 43 CFR Part 3. (614 FW 1.7C) |
| <b>Designated Wilderness Area:</b>  | 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).   |
| <b>Disturbance:</b>                 | Significant alteration of habitat structure or composition. May be natural (e.g., fire) or human-caused events (e.g., cultivation, timber harvest).   |
| <b>Ecosystem:</b>                   | A dynamic and interrelating complex of plant and animal communities and their associated non-living environment.  |
| <b>Ecosystem Management:</b>        | 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.   |

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| <b>Endangered Species (Federal):</b>             | 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.  |
| <b>Endangered Species (State):</b>               | 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.   |
| <b>Endemic Species:</b>                          | A species which is native or indigenous to only one geographic area. Cf. Indigenous Species.   |
| <b>Environmental Assessment (EA):</b>            | 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).  |
| <b>Environmental Impact Statement (EIS):</b>     | 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).   |
| <b>Estuary:</b>                                  | <ol style="list-style-type: none"> <li>1. The term “estuary” means a part of a river or stream or other body of water that has an unimpaired connection with the open sea and where the sea water is measurably diluted with fresh water derived from land drainage. The term also includes near coastal waters and wetlands of the Great Lakes that are similar in form and function to estuaries, including the area located in the Great Lakes biogeographic region and designated as a National Estuarine Research Reserve under the Coastal Zone Management Act of 1972 (16 U.S.C. 1451 et seq.) as of November 7, 2000 (33 U.S.C. 2902).</li> <li>2. The wide lower course of a river into which the tides flow. The area where the tide meets a river current.</li> </ol> |
| <b>Exotic Species:</b>                           | See: Introduced Species  |
| <b>Finding of No Significant Impact (FONSI):</b> | 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).   |
| <b>Forest Cover Type:</b>                        | “. . .a descriptive classification of forestland based on present occupancy of an area by tree species” (Eyre, 1980).  |
| <b>Goal:</b>                                     | 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).  |
| <b>Habitat:</b>                                  | Suite of existing environmental conditions required by an organism for survival and reproduction. The place where an organism typically lives.   |

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| <b>Habitat Restoration:</b>   | Management emphasis designed to move ecosystems to desired conditions and processes, and/or to healthy ecosystems.  |
| <b>Habitat Type:</b>  | See Vegetation Type.  |
| <b>Improvement Act, Refuge Improvement Act:</b>                                     | The National Wildlife Refuge System Improvement Act of 1997.  |
| <b>Indigenous Species</b>   | A species which exists in a geographical area as a result of having evolved there or having arrived independent of human activity; a native species. Indigenous species can be indigenous to more than one geographic area. Cf. Endemic Species.  |
| <b>Introduced Species</b>   | A species which has become established in a geographical area as a result of human actions; an exotic species.  |
| <b>Issue:</b>   | 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)].   |
| <b>Management Alternative:</b>  | See Alternative   |
| <b>Management Concern:</b>  | See Issue   |
| <b>Management Opportunity:</b>  | See Issue   |
| <b>Migration:</b>   | The seasonal movement of animals from one area to another.  |
| <b>Mission Statement:</b>   | Succinct statement of the unit's purpose and reason for being.  |
| <b>Monitoring:</b>  | The process of collecting information to track changes of selected parameters over time.  |
| <b>National Environmental Policy Act of 1969 (NEPA):</b>                            | 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). |
| <b>National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57):</b> | Under the Improvement Act, the Fish and Wildlife Service is required to develop 15-year comprehensive conservation plans for all national wildlife refuges outside Alaska. The Improvement 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).      |
| <b>National Wildlife Refuge System Mission:</b>                                     | 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.   |

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| <b>National Wildlife Refuge System:</b> | 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.   |
| <b>National Wildlife Refuge:</b>        | A designated area of land, water, or an interest in land or water within the Refuge System.  |
| <b>Native Species:</b>                  | See: Indigenous Species.   |
| <b>Noxious Weed:</b>                    | 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. |
| <b>Objective:</b>                       | 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. Make objectives attainable, time-specific, and measurable (Service Manual 602 FW 1.6N).  |
| <b>Plant Association:</b>               | A classification of plant communities based on the similarity in dominants of all layers of vascular species in a climax community.  |
| <b>Plant Community:</b>                 | 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.   |
| <b>Preferred Alternative:</b>           | 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.   |
| <b>Prescribed Fire:</b>                 | Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements (where applicable) must be met, prior to ignition (National Wildfire Coordinating Group, 2014)  |
| <b>Priority Species:</b>                | 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.   |

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| <b>Public Involvement Plan:</b>   | Broad long-term guidance for involving the public in the comprehensive conservation planning process.   |
| <b>Public Involvement:</b>        | 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.  |
| <b>Public:</b>                    | 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.  |
| <b>Purposes of the Refuge:</b>    | “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).  |
| <b>Recommended Wilderness:</b>    | 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).  |
| <b>Record of Decision (ROD):</b>  | 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). |
| <b>Refuge Goal:</b>               | See Goal  |
| <b>Refuge Purposes:</b>           | See Purposes of the Refuge  |
| <b>Songbird:</b>                  | A bird of the order Passeriformes; a passerine. Songbirds are medium to small, perching landbirds. Most are territorial singers and migratory.  |
| <b>Step-down Management Plan:</b> | 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).   |
| <b>Strategy:</b>                  | A specific action, tool, technique, or combination of actions, tools, and techniques used to meet unit objectives (Service Manual 602 FW 1.6 U).  |

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| <b>Study Area:</b>                             | 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.  |
| <b>Threatened Species (Federal):</b>           | 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.  |
| <b>Threatened Species (State):</b>             | 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.  |
| <b>Tiering:</b>                                | 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).  |
| <b>U.S. Fish and Wildlife Service Mission:</b> | 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.  |
| <b>Unit Objective:</b>                         | See Objective   |
| <b>Vegetation Type:</b>                        | A general term referring to a division of a vegetation classification system; a habitat type.   |
| <b>Vision Statement:</b>                       | 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).  |
| <b>Wilderness Study Areas:</b>                 | <p>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:</p> <ul style="list-style-type: none"> <li>▪ Generally appears to have been affected primarily by the forces of nature, with the imprint of man’s work substantially unnoticeable;</li> <li>▪ Has outstanding opportunities for solitude or a primitive and unconfined type of recreation; and</li> <li>▪ 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).</li> </ul> |
| <b>Wilderness:</b>                             | See Designated Wilderness Area.   |
| <b>Wildfire:</b>                               | An unplanned, unwanted wildland fire including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fires where the objective is to put the fire out (National Wildfire Coordinating Group, 2014).   |
| <b>Wildland Fire:</b>                          | Any non-structure fire that occurs in the wildland. Three distinct types of wildland fire have been defined and include wildfire, wildland fire use, and prescribed fire (National Wildfire Coordinating Group, 2014).  |

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**Wildland Fire Use**

The application of the appropriate management response to naturally ignited wildland fires to accomplish specific resource management objectives in pre-defined designated areas outlined in Fire Management Plans. Operational management is described in the Wildland Fire Implementation Plan (WFIP) (National Wildfire Coordinating Group, 2014).

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## ACRONYMS AND ABBREVIATIONS

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| ARPA  | Archaeological Resources Protection Act of 1979 |
| ATV   | All-terrain Vehicle                             |
| BBCC  | Black Bear Conservation Coalition               |
| CCP   | Comprehensive Conservation Plan                 |
| CFR   | Code of Federal Regulations                     |
| CWCS  | Comprehensive Wildlife Conservation Strategy    |
| cfs   | cubic feet per second                           |
| DOI   | Department of the Interior                      |
| DU    | Ducks Unlimited                                 |
| EA    | Environmental Assessment                        |
| EIS   | Environmental Impact Statement                  |
| EPA   | U.S. Environmental Protection Agency            |
| ESA   | Endangered Species Act                          |
| FR    | Federal Register                                |
| FTE   | full-time equivalent                            |
| GIS   | Global Information System                       |
| HPO   | Historic Preservation Officer                   |
| IPCC  | Intergovernmental Panel on Climate Change       |
| LDWF  | Louisiana Department of Wildlife and Fisheries  |
| LMAV  | Lower Mississippi Alluvial Valley               |
| LMVJV | Lower Mississippi Valley Joint Venture          |
| MAV   | Mississippi Alluvial Valley                     |
| MRAP  | Mississippi River Alluvial Plain                |
| MSA   | Metropolitan Statistical Area                   |
| NEPA  | National Environmental Policy Act               |
| NGO   | Non-governmental Organization                   |
| NRCS  | Natural Resources Conservation Service          |
| NRHP  | National Register of Historic Places            |
| NVCS  | National Vegetation Classification System       |
| NWR   | National Wildlife Refuge                        |
| NWRS  | National Wildlife Refuge System                 |
| PIF   | Partners in Flight                              |
| RMIS  | Refuge Management Information System            |
| ROD   | Record of Decision                              |
| RONS  | Refuge Operating Needs System                   |
| FWS   | U.S. Fish and Wildlife Service (also Service)   |
| TNC   | The Nature Conservancy                          |
| USC   | United States Code                              |
| UTV   | Utility Task Vehicle                            |
| WFPTC | West Feliciana Parish Tourist Commission        |
| WSA   | Wilderness Study Area                           |



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## Appendix C. Relevant Legal Mandates and Executive Orders

| STATUTE   | DESCRIPTION   |
|---|---|
| <i>Administrative Procedures Act (1946)</i>                         | 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.  |
| <i>American Antiquities Act of 1906</i>                             | 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.   |
| <i>American Indian Religious Freedom Act of 1978</i>                | 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.  |
| <i>Americans With Disabilities Act of 1990</i>                      | 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.   |
| <i>Anadromous Fish Conservation Act of 1965, as amended</i>         | 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. |
| <i>Archaeological Resources Protection Act of 1979, as amended.</i> | 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.   |
| <i>Architectural Barriers Act of 1968</i>                           | 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.  |
| <i>Bald and Golden Eagle Protection Act of 1940, as amended</i>     | 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.   |

| STATUTE  | DESCRIPTION   |
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| <i>Bankhead-Jones Farm Tenant Act of 1937</i>                        | 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.  |
| <i>Cave Resources Protection Act of 1988</i>                         | 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.  |
| <i>Clean Air Act of 1970</i>   | 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.  |
| <i>Clean Water Act of 1974, as amended</i>                           | 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. |
| <i>Coastal Barrier Resources Act of 1982 (CBRA)</i>                  | 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.   |
| <i>Coastal Barrier Improvement Act of 1990</i>                       | 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.   |
| <i>Coastal Wetlands Planning, Protection, and Restoration (1990)</i> | 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.  |

| STATUTE  | DESCRIPTION   |
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| <i>Coastal Zone Management Act of 1972, as amended</i> | 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. |
| <i>Emergency Wetlands Resources Act of 1986</i>        | 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.   |
| <i>Endangered Species Act of 1973, as amended</i>      | 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.  |
| <i>Environmental Education Act of 1990</i>             | 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.  |
| <i>Estuary Protection Act of 1968</i>                  | 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.   |

| STATUTE   | DESCRIPTION  |
|---|--|
| <i>Estuaries and Clean Waters Act of 2000</i>             | 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.   |
| <i>Food Security Act of 1985, as amended (Farm Bill)</i>  | 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.   |
| <i>Farmland Protection Policy Act of 1981, as amended</i> | 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.  |
| <i>Federal Advisory Committee Act (1972), as amended</i>  | 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.  |
| <i>Federal Coal Leasing Amendment Act of 1976</i>         | Provided that nothing in the Mining Act, the Mineral Leasing Act, or the Mineral Leasing Act for Acquired Lands authorized mining coal on refuges.   |
| <i>Federal-Aid Highways Act of 1968</i>                   | 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.  |
| <i>Federal Noxious Weed Act of 1990, as amended</i>       | 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. |

| STATUTE   | DESCRIPTION   |
|---|---|
| <i>Fish and Wildlife Act of 1956</i>                              | 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. |
| <i>Fish and Wildlife Conservation Act of 1980, as amended</i>     | 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.  |
| <i>Fish and Wildlife Coordination Act of 1958</i>                 | 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.  |
| <i>Improvement Act of 1978</i>                                    | 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.  |
| <i>Fishery (Magnuson) Conservation and Management Act of 1976</i> | 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.   |
| <i>Freedom of Information Act, 1966</i>                           | 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.   |
| <i>Geothermal Steam Act of 1970, as amended</i>                   | 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.  |

| STATUTE  | DESCRIPTION  |
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| <i>Lacey Act of 1900, as amended</i>                             | 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.   |
| <i>Land and Water Conservation Fund Act of 1948</i>              | 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.   |
| <i>Marine Mammal Protection Act of 1972, as amended</i>          | 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. |
| <i>Migratory Bird Conservation Act of 1929</i>                   | 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.   |
| <i>Migratory Bird Hunting and Conservation Stamp Act of 1934</i> | 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.  |
| <i>Migratory Bird Treaty Act of 1918, as amended</i>             | 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.  |
| <i>Mineral Leasing Act for Acquired Lands (1947), as amended</i> | Authorizes and governs mineral leasing on acquired public lands.   |

| STATUTE   | DESCRIPTION   |
|---|---|
| <i>Minerals Leasing Act of 1920, as amended</i>                   | Authorizes and governs leasing of public lands for development of deposits of coal, oil, gas, and other hydrocarbons; sulfur; phosphate; potassium; and sodium. Section 185 of this title contains provisions relating to granting rights-of-way over federal lands for pipelines.  |
| <i>Mining Act of 1872, as amended</i>                             | Authorizes and governs prospecting and mining for the so-called “hard rock” minerals (i.e., gold and silver) on public lands.   |
| <i>National and Community Service Act of 1990</i>                 | 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.   |
| <i>National Environmental Policy Act of 1969</i>                  | 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.   |
| <i>National Historic Preservation Act of 1966, as amended</i>     | 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.  |
| <i>National Trails System Act (1968), as amended</i>              | 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. |
| <i>National Wildlife Refuge System Administration Act of 1966</i> | 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.  |

| STATUTE   | DESCRIPTION  |
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| <i>National Wildlife Refuge System Improvement Act of 1997</i>        | 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.   |
| <i>Native American Graves Protection and Repatriation Act of 1990</i> | 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.   |
| <i>Neotropical Migratory Bird Conservation Act of 2000</i>            | 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.   |
| <i>North American Wetlands Conservation Act of 1989</i>               | 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). |
| <i>Refuge Recreation Act of 1962, as amended</i>                      | 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.  |
| <i>Partnerships for Wildlife Act of 1992</i>                          | 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.   |

| STATUTE  | DESCRIPTION   |
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| <i>Refuge Revenue Sharing Act of 1935, as amended</i>  | 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.  |
| <i>Rehabilitation Act of 1973</i>  | 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.   |
| <i>Rivers and Harbors Appropriations Act of 1899, as amended</i>                                       | 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.   |
| <i>Sikes Act (1960), as amended</i>  | 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. |
| <i>Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948</i>                | 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.  |
| <i>Transportation Equity Act for the 21st Century (1998)</i>   | 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.  |
| <i>Uniform Relocation and Assistance and Real Property Acquisition Policies Act (1970), as amended</i> | 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.  |

| STATUTE   | DESCRIPTION  |
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| <i>Water Resources Planning Act of 1965</i>           | 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.   |
| <i>Wild and Scenic Rivers Act of 1968, as amended</i> | 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.   |
| <i>Wilderness Act of 1964, as amended</i>             | 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. |
| <i>Youth Conservation Corps Act of 1970</i>           | 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  |
|--|---|
| <i>EO 11593, Protection and Enhancement of the Cultural Environment (1971)</i> | 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.   |
| <i>EO 11644, Use of Off-road Vehicles on Public Land (1972)</i>                | 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.  |
| <i>EO 11988, Floodplain Management (1977)</i>                                  | 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.” |
| <i>EO 11989 (1977), Amends Section 2 of EO 11644</i>                           | Directs agencies to close areas negatively impacted by off-road vehicles.   |
| <i>EO 11990, Protection of Wetlands (1977)</i>                                 | 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.  |
| <i>EO 12372, Intergovernmental Review of Federal Programs (1982)</i>           | 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.   |
| <i>EO 12898, Environmental Justice (1994)</i>                                  | 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   |
|--|--|
| <p><i>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.</i></p> | <p>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.</p> |
| <p><i>EO 12962, Recreational Fisheries (1995)</i></p>  | <p>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.</p>   |
| <p><i>EO 13007, Native American Religious Practices (1996)</i></p>   | <p>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.</p>   |
| <p><i>EO 13061, Federal Support of Community Efforts Along American Heritage Rivers (1997)</i></p>   | <p>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.</p>  |
| <p><i>EO 13084, Consultation and Coordination With Indian Tribal Governments (2000)</i></p>  | <p>Provides a mechanism for establishing regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications.</p>   |
| <p><i>EO 13112, Invasive Species (1999)</i></p>  | <p>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).</p>   |

| EXECUTIVE ORDERS  | DESCRIPTIONS  |
|---|---|
| <p><i>EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds. (2001)</i></p> | <p>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.</p> |



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## *Appendix D. Public Involvement*

### **SUMMARY OF PUBLIC SCOPING COMMENTS**

Summary of comments from meeting November 18, 2013 St. Francisville, LA, Town Hall 1700-1900 and subsequent comments received up through December 21, 2013

#### **Hunting/Fishing Access**

Off-trail ATV access for disabled hunters  
Year-round access on Riverside trail  
Don't close refuge to duck hunting during high water  
Reduce/eliminate gun hunts  
Provide more access for older and disabled hunters  
Allow hog hunts 1 or 2 weekends  
Provide access to remote areas in NE of refuge.  
Buy more land in the acquisition boundary to protect it and provide more public access.

#### **Facilities**

Put a check station on the river front [NW side of refuge]  
Check station on Cat Island Road for access to western portion of refuge  
Keep up boundary markers

#### **Safety/Hunting Regulations**

Move the No hunting Zone every 5 or so years  
For safety, require bow hunters in tree stands to flag trees that they are in at eye level  
Use only firearms that are loaded from the muzzle for primitive firearm season

#### **Management**

Do not turn refuge into a trophy deer hunt area  
Consider some select cutting of timber such as elm, cottonwood, etc.  
Always keep small game hunters in mind.  
Cut back on either-sex opportunities when deer numbers are low  
Raise yearly permit fees to help with funding etc.  
Use scout groups, conservation organizations, or similar groups to maintain trails on the non-hunting portion of refuge.  
Keep it as a preserve.

#### **Enforcement**

Enforce ATV restrictions (off-trail use)  
Let ATVs go anywhere, not just on trails

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## SUMMARY OF DISCUSSION WITH THE CHOCTAW NATION OF OKLAHOMA

### Cat Island Intergovernmental Scoping Issues

Choctaw Nation of Oklahoma  
November 12, 2013

#### Participants

Ian Thompson, Tribal HPO  
Johnnie Jacobs, Tribal Section 106 Coordinator  
Bob Strader, Project Leader  
Kent Ozment, Refuge Specialist  
Rick Kanaski, Region 4 Archaeologist and Regional HPO  
Tom Greene, Natural Resource Planner

#### Summary

- Archaeological Issues
  - Will there be a refuge-wide archaeological survey?
  - Will the CCP contain specific objective(s) pertaining to archaeological surveys and other cultural resources actions, with due dates? [yes—as in St. Vincent example]
- ARPA Permits
  - Are there any existing permits? [no]
  - Any collections or surveys done on refuge? [no—would proceed under sec. 106 or ARPA]
  - Permitting process [2-part process—ARPA permit from RA office, and SUP from refuge]
  - Notification of Choctaw Nation if/when permits are issued
- Cultural Resource Enforcement Issues
  - Knowledge of looting on refuge?
  - How long are records maintained of citations, convictions for looting? [indefinite]
  - Disposition of evidence and artifacts?
  - Signage for CR regulations and ARPA compliance?
- Primitive Weapon definition in Louisiana
- Partnership with St. Francisville Historical Society [distr. of brochures, permits]
- Language referring to Native American consultation should reflect intergovernmental nature
- No known sacred sites on or near refuge
- Resources of interest to Choctaw Nation:
  - freshwater mussel shells from dead mussels
  - river cane [*Arundinaria gigantea*]
    - Restoration of cane on refuge?
  - bloodroot [*Sanguinaria canadensis*]

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## *Appendix E. Appropriate Use Determinations*

### **Cat Island 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

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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.

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*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: Cat Island NWR

Use: Airboat or personal watercraft operation

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?  | ✓   |    |
| (b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?  | ✓   |    |
| (c) Is the use consistent with applicable executive orders and Department and Service policies?  | ✓   |    |
| (d) Is the use consistent with public safety?  |     | ✓  |
| (e) Is the use consistent with goals and objectives in an approved management plan or other document?  |     | ✓  |
| (f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?   | ✓   |    |
| (g) Is the use manageable within available budget and staff?   |     | ✓  |
| (h) Will this be manageable in the future within existing resources?   |     | ✓  |
| (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?  |     | ✓  |
| (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? |     | ✓  |

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**

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**

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: Cat Island NWR

Use: Houseboat operation or mooring

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?  | ✓   |    |
| (b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?  | ✓   |    |
| (c) Is the use consistent with applicable executive orders and Department and Service policies?  | ✓   |    |
| (d) Is the use consistent with public safety?  | ✓   |    |
| (e) Is the use consistent with goals and objectives in an approved management plan or other document?  |     | ✓  |
| (f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?   | ✓   |    |
| (g) Is the use manageable within available budget and staff?   |     | ✓  |
| (h) Will this be manageable in the future within existing resources?   |     | ✓  |
| (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?  |     | ✓  |
| (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? |     | ✓  |

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**

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**

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: Cat Island NWR

Use: All-terrain vehicle/Utility Task Vehicle use

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?  | ✓   |    |
| (b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?  | ✓   |    |
| (c) Is the use consistent with applicable executive orders and Department and Service policies?  | ✓   |    |
| (d) Is the use consistent with public safety?  | ✓   |    |
| (e) Is the use consistent with goals and objectives in an approved management plan or other document?  | ✓   |    |
| (f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?   | ✓   |    |
| (g) Is the use manageable within available budget and staff?   | ✓   |    |
| (h) Will this be manageable in the future within existing resources?   | ✓   |    |
| (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?  | ✓   |    |
| (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? | ✓   |    |

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**

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**  \_\_\_\_\_

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: Cat Island NWR

Use: hiking, walking, jogging

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?  | ✓   |    |
| (b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?  | ✓   |    |
| (c) Is the use consistent with applicable executive orders and Department and Service policies?  | ✓   |    |
| (d) Is the use consistent with public safety?  | ✓   |    |
| (e) Is the use consistent with goals and objectives in an approved management plan or other document?  | ✓   |    |
| (f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?   | ✓   |    |
| (g) Is the use manageable within available budget and staff?   | ✓   |    |
| (h) Will this be manageable in the future within existing resources?   | ✓   |    |
| (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?  | ✓   |    |
| (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? | ✓   |    |

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**

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**  \_\_\_\_\_

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: Cat Island 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?  | ✓   |    |
| (b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?  | ✓   |    |
| (c) Is the use consistent with applicable executive orders and Department and Service policies?  | ✓   |    |
| (d) Is the use consistent with public safety?  | ✓   |    |
| (e) Is the use consistent with goals and objectives in an approved management plan or other document?  | ✓   |    |
| (f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?   | ✓   |    |
| (g) Is the use manageable within available budget and staff?   | ✓   |    |
| (h) Will this be manageable in the future within existing resources?   | ✓   |    |
| (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?  | ✓   |    |
| (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? | ✓   |    |

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**

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**

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: Cat Island NWR

Use: Bicycling

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?  | ✓   |    |
| (b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?  | ✓   |    |
| (c) Is the use consistent with applicable executive orders and Department and Service policies?  | ✓   |    |
| (d) Is the use consistent with public safety?  | ✓   |    |
| (e) Is the use consistent with goals and objectives in an approved management plan or other document?  | ✓   |    |
| (f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?   | ✓   |    |
| (g) Is the use manageable within available budget and staff?   | ✓   |    |
| (h) Will this be manageable in the future within existing resources?   | ✓   |    |
| (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?  | ✓   |    |
| (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? | ✓   |    |

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**

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**  \_\_\_\_\_

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: Cat Island 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?  | ✓   |    |
| (b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?  | ✓   |    |
| (c) Is the use consistent with applicable executive orders and Department and Service policies?  | ✓   |    |
| (d) Is the use consistent with public safety?  | ✓   |    |
| (e) Is the use consistent with goals and objectives in an approved management plan or other document?  | ✓   |    |
| (f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?   | ✓   |    |
| (g) Is the use manageable within available budget and staff?   | ✓   |    |
| (h) Will this be manageable in the future within existing resources?   | ✓   |    |
| (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?  | ✓   |    |
| (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? | ✓   |    |

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**

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**

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: Cat Island NWR

Use: Human-powered boat operation

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?  | ✓   |    |
| (b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?  | ✓   |    |
| (c) Is the use consistent with applicable executive orders and Department and Service policies?  | ✓   |    |
| (d) Is the use consistent with public safety?  | ✓   |    |
| (e) Is the use consistent with goals and objectives in an approved management plan or other document?  | ✓   |    |
| (f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?   | ✓   |    |
| (g) Is the use manageable within available budget and staff?   | ✓   |    |
| (h) Will this be manageable in the future within existing resources?   | ✓   |    |
| (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?  | ✓   |    |
| (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? | ✓   |    |

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**

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**  \_\_\_\_\_

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: Cat Island NWR

Use: Plant collection, non-commercial

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?  | ✓   |    |
| (b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?  | ✓   |    |
| (c) Is the use consistent with applicable executive orders and Department and Service policies?  | ✓   |    |
| (d) Is the use consistent with public safety?  | ✓   |    |
| (e) Is the use consistent with goals and objectives in an approved management plan or other document?  | ✓   |    |
| (f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?   | ✓   |    |
| (g) Is the use manageable within available budget and staff?   | ✓   |    |
| (h) Will this be manageable in the future within existing resources?   | ✓   |    |
| (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?  | ✓   |    |
| (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? | ✓   |    |

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**

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**

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: Cat Island NWR

Use: Beaver trapping

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?  | ✓   |    |
| (b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?  | ✓   |    |
| (c) Is the use consistent with applicable executive orders and Department and Service policies?  | ✓   |    |
| (d) Is the use consistent with public safety?  | ✓   |    |
| (e) Is the use consistent with goals and objectives in an approved management plan or other document?  | ✓   |    |
| (f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?   | ✓   |    |
| (g) Is the use manageable within available budget and staff?   | ✓   |    |
| (h) Will this be manageable in the future within existing resources?   | ✓   |    |
| (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?  | ✓   |    |
| (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? | ✓   |    |

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**

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**  \_\_\_\_\_

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: Cat Island NWR

Use: Motorized boat operation, not to include airboats or personal watercraft

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?  | ✓   |    |
| (b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?  | ✓   |    |
| (c) Is the use consistent with applicable executive orders and Department and Service policies?  | ✓   |    |
| (d) Is the use consistent with public safety?  | ✓   |    |
| (e) Is the use consistent with goals and objectives in an approved management plan or other document?  | ✓   |    |
| (f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?   | ✓   |    |
| (g) Is the use manageable within available budget and staff?   | ✓   |    |
| (h) Will this be manageable in the future within existing resources?   | ✓   |    |
| (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?  | ✓   |    |
| (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? | ✓   |    |

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**

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**  \_\_\_\_\_

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.**

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## Appendix F. Compatibility Determinations

**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. Recreational fishing
3. Wildlife observation and photography
4. Environmental education and interpretation
5. Boat operation
6. Use of all-terrain/utility task vehicles (ATV/UTV)
7. Hiking, walking, jogging, bicycling
8. Research
9. Non-commercial plant collection
10. Forest management
11. Nuisance and exotic invasive animal control

**Refuge Name:** Cat Island National Wildlife Refuge.

**Date Established:** October 27, 2000.

**Establishing and Acquisition Authority(ies):** Cat Island National Wildlife Refuge Establishment Act, (114 STAT. 1418), Migratory Bird Conservation Act, North American Wetlands Conservation Act

**Refuge Purpose:** “The purposes for which the Refuge is established and shall be managed are— (1) to conserve, restore, and manage habitats as necessary to contribute to the migratory bird population goals and habitat objective [sic] as established through the Lower Mississippi Valley Joint Venture; (2) to conserve, restore, and manage the significant aquatic resource values associated with the area’s forested wetlands and to achieve the habitat objectives of the “Mississippi River Aquatic Resources Management Plan”; (3) to conserve, enhance, and restore the historic native bottomland community characteristics of the lower Mississippi alluvial valley and its associated fish, wildlife, and plant species; (4) to conserve, enhance, and restore habitat to maintain and assist in the recovery of endangered, and threatened plants and animals; and (5) to encourage the use of volunteers and facilitate partnerships among the United States Fish and Wildlife Service, local communities, conservation organizations, and other non-Federal entities to promote public awareness of the resources of the Refuge and the National Wildlife Refuge System and public participation in the conservation of those resources.” (114 STAT. 1418)

### **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)

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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.

### **(1) Description of Use: Hunting**

Hunting has been identified as a priority wildlife-dependent activity under the National Wildlife Refuge System Improvement Act and is a traditional use at Cat Island National Wildlife Refuge, predating the establishment of the refuge. Hunting is permitted on most areas of the refuge with the exception of no-hunting zones around the two hiking trails, roads, ATV trails, and public facilities. Current hunting regulations provide for legal take of white-tailed deer during a three-day modern weapon lottery hunt, a three-day primitive firearm lottery hunt and, with archery equipment, during the state archery season, rabbit and squirrel hunting during state seasons, woodcock hunting during state season, and waterfowl hunting during state season only before noon on Tuesdays, Thursdays, Saturdays, and Sundays. Incidental take of beaver, nutria, coyote, raccoon, and feral hogs is allowed with any legal firearm or archery equipment during any open hunting season subject to state bag limits. During the two, three-day deer gun hunts, all other hunting is prohibited. A refuge annual public use permit is required for hunting on Cat Island NWR. Further regulations apply to hunting; refer to current “Cat Island National Wildlife Refuge Hunting and Fishing Regulations” brochure and to current Cat Island National Wildlife Refuge map brochure.

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**Availability of Resources:**

Refuge financial resources are generally limited to funds obtained through permit sales. Lower Mississippi River Refuge Complex personnel provide necessary maintenance, management, and monitoring to support the hunting program. The Service partners with the State of Louisiana and the West Feliciana Parish Sheriff's Office to provide for law enforcement and public safety on the refuge. Strategies described in the Draft CCP/EA would increase the level of resources available to support the refuge hunting program.

**Anticipated Impacts of the Use:**

Anticipated impacts of hunting on Cat Island NWR are based on professional judgment and reference to scientific literature. Effects of human disturbance, including hunting, on wildlife have been extensively studied in the United States and elsewhere. A comprehensive review of the literature on waterbirds, including waterfowl (DeLong, 2002), concluded that waterfowl hunting affects behavior of the waterfowl in the hunted populations, but that those effects can be successfully mitigated to provide sustainable harvest of waterfowl. Behavioral adaptations to hunting include spatial and temporal habitat use changes. Waterfowl have a strong preference for protected habitats over hunted areas, and where hunting is allowed on certain days of the week, most of the birds will avoid the hunted areas at all times, although a small percentage may use hunted areas on days when hunting is closed. On lands where hunting is open every day, waterfowl can shift to nocturnal feeding. Mitigation measures suggested by DeLong (2002) include providing sanctuary areas where no hunting is allowed, allowing hunting on some but not all days of the week, and using vegetation as a screen for reducing the impact of human disturbance on waterfowl. The first two of these measures are used at Cat Island NWR, and the third, because the refuge is forested, is also an important factor in reducing disturbance.

DeLong (2002) also reviewed literature on effects of waterfowl hunting on non-hunted waterbird species. In general, effects of hunting on these species are less pronounced, although airboats can cause significant disturbance (DeLong, 2002; Mabie et al., 1989).

Effects of deer and small game hunting have also been studied. Like waterfowl, white-tailed deer will alter their behavior in response to hunting. Intensive hunting pressure can cause deer to change their home ranges and favor areas which are not hunted (Root et al., 1988). Effects of deer hunting on deer populations are fairly well understood, and managers have long used recreational hunting as a population management tool (Giles & Findlay, 2004). With appropriate monitoring and adaptive management, hunted white-tailed deer populations can be maintained at healthy levels. On Cat Island NWR, gun hunts are restricted to 6 days per year, and numbers of gun deer hunters are regulated by a lottery, limiting both disturbance and take to sustainable levels.

Effects of hunting on small game populations have been studied for many decades. Squirrels, the most popular small game animals on Cat Island NWR, are able to sustain fairly intensive hunting pressure without significant effects on overall mortality rate or recruitment (Mosby, 1969). Proper management of habitat and regulation of take are the keys to sustainable harvest of this resource (Baker, 1944). Small game hunting regulations on Cat Island NWR follow those established by the State of Louisiana and have proven to provide for long term sustainability of game species populations.

**Determination (check one below):**

- Use is Not Compatible  
 Use is Compatible with Following Stipulations

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**Stipulations Necessary to Ensure Compatibility:**

- Waterfowl hunting is prohibited on certain days of the week, and allowed only before noon on open days, to provide temporal respite.
- Firearm deer hunting is restricted to short periods within the legal deer firearm season, and the number of firearm hunters is restricted by lottery.
- All hunting on Cat Island NWR is circumscribed by State of Louisiana seasons and bag limits.
- No-hunting zones are maintained on the refuge.

**Justification:**

Hunting is a priority wildlife-dependent recreational activity under the National Wildlife Refuge Improvement Act. Hunting on Cat Island NWR was determined to be compatible with the purposes of the refuge and the goals of the National Wildlife Refuge System because hunting pressure and disturbance levels can be and are successfully managed below levels which would interfere with the achievement of those purposes and goals. Providing hunting opportunities allows people in the community to participate in wildlife-dependent recreation and to appreciate the value of conservation through first-hand experience.

**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:****(2) Description of Use: Recreational Fishing**

Recreational fishing has been identified as a priority wildlife-dependent activity under the National Wildlife Refuge System Improvement Act and is a traditional use at Cat Island National Wildlife Refuge, predating the establishment of the refuge. Anglers use the refuge to access the Mississippi River, and additional fishing opportunities exist in sloughs and ponds on the refuge itself. State licensing and limitations on species, number, and size of fish taken apply. A Refuge Annual Public Use Permit is required. Recreational crawfishing is also permitted on the refuge. Tackle and methods of take are regulated by the refuge.

**Availability of Resources:**

Refuge financial resources are generally limited to funds obtained through permit sales. Lower Mississippi River Refuge Complex personnel provide necessary maintenance, management, and monitoring to support sport fishing on the refuge. The Service partners with the State of Louisiana and the West Feliciana Parish Sheriff's Office to provide for law enforcement and public safety on the refuge. Strategies described in the Draft CCP/EA may increase access to waters in support of sport fishing.

**Anticipated Impacts of the Use:**

Recreational fishing on Cat Island NWR is not anticipated to have a major impact on fisheries resources on the refuge or in adjacent waters. Fishing is regulated by the State of Louisiana in state waters, and the refuge follows state regulations on refuge waters. Refuge waters are inundated by the Mississippi River for up to half of each year, rendering local efforts at fish population management of little consequence on the refuge. Impacts of fishing on other refuge resources would not be

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expected to be significant or different from those of other recreational activities. Impacts can occur from travel to and from ponds or the river bank, from disturbance resulting from angler presence along waters where waterbirds or other wildlife breed, brood young, or forage, from direct competition for fish between human anglers and avian predators, from toxic or otherwise dangerous tackle (i.e., lead sinkers, loose fishing line) left on the refuge, and from accidental introduction of exotic species which may be used for bait. Scientific literature concerning these potential effects has been extensively reviewed (DeLong, 2002). DeLong recommends mitigating these impacts by restricting access to certain waters during the breeding seasons of waterfowl, waterbirds, or other species of concern, regulating the types of tackle and bait that are allowed on the refuge, and managing access routes and methods to minimize disturbance. Restrictions on access to waters on the refuge have not been necessary in the past, but should disturbance of breeding birds (e.g., interior least terns) become an issue, such a step may be required.

**Determination (check one below):**

- Use is Not Compatible  
 Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

- State limitations on species, number, and size of fish taken apply.
- Anglers must be licensed by the State of Louisiana and possess a public use permit.
- No commercial fishing or other commercial take of aquatic animals is allowed.
- Take of frogs and turtles is prohibited.
- Recreational take of crawfish is permitted only during spring and early summer; equipment restrictions apply.
- Fishing is permitted only by hook and line or cast net (for bait).

**Justification:**

Fishing is a priority wildlife-dependent recreational activity under the National Wildlife Refuge Improvement Act. Fishing on Cat Island NWR was determined to be compatible with the purposes of the refuge and the goals of the National Wildlife Refuge System because fishing intensity and disturbance levels can be and are successfully managed below levels which would interfere with the achievement of those purposes and goals. Permitting fishing on the refuge allows anglers to participate in wildlife-dependent recreation and to appreciate the value of conservation through first-hand experience.

**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:**

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### **(3) Description of Use: Wildlife Observation and Photography**

Wildlife observation and photography have been identified as priority wildlife-dependent activities under the National Wildlife Refuge System Improvement Act. They are popular and traditional uses of the refuge. Opportunities for wildlife observation and photography are provided by the two hiking trails open to the public as well as along the public road which traverses the refuge. In addition, the entire refuge is open year-round for access by foot or boat.

#### **Availability of Resources:**

Refuge financial resources are generally limited to funds obtained through permit sales. Lower Mississippi River Refuge Complex personnel provide necessary maintenance, management, and monitoring to support general public access, including wildlife viewing and photography, on the refuge. The Service partners with the State of Louisiana and the West Feliciana Parish Sheriff's Office to provide for law enforcement and public safety on the refuge. Strategies described in the Draft CCP/EA may enhance facilities in support of wildlife viewing and photography.

#### **Anticipated Impacts of the Use:**

Wildlife observation and photography have not caused any discernible impact to the refuge in the past, and no such impacts are anticipated. Any disturbance of wildlife, vegetation, or other potential impact would be minimal and within the tolerance limits of the resource. Use levels are not expected to be so high as to require limits on access. If significant impacts began to be seen, or if malicious disturbance of wildlife or damage to other refuge resources occurred, refuge managers would consider restrictions on access.

#### **Determination (check one below):**

- Use is Not Compatible  
 Use is Compatible with Following Stipulations

#### **Stipulations Necessary to Ensure Compatibility:**

- Access for wildlife observation and photography is limited to times when the refuge is open.
- All refuge visitors must fill out and display a Daily Visitor Use Reporting Card and deposit it at the kiosk station upon departure.
- All visitors are subject to refuge regulations intended to protect public safety and refuge resources.
- Commercial photographers must have a special use permit which specifies measures to mitigate any wildlife disturbance which may occur from the activity. The special use permit should also stipulate that imagery produced would be made available to the refuge for use in outreach, internal use, and other reasonable purposes.

#### **Justification:**

Wildlife observation and photography are designated as priority wildlife-dependent activities under the National Wildlife Refuge System Improvement Act. These activities help foster a conservation ethic and support for wildlife conservation among the public. The purposes for which Cat Island NWR was created include “. . . to promote public awareness of the resources of the Refuge and the National Wildlife Refuge System and public participation in the conservation of those resources.”

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**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:**

**(4) Description of Use: Environmental education and interpretation**

Environmental education and interpretation have been identified as priority wildlife-dependent activities under the National Wildlife Refuge System Improvement Act. The refuge is currently used by school groups, although refuge staff resources are limited. The entire refuge is open year-round for access by foot or boat, and maps and interpretive literature are provided at the kiosk and at the West Feliciana Parish Tourist Commission office in St. Francisville.

**Availability of Resources:**

Refuge financial resources are generally limited to funds obtained through permit sales. Lower Mississippi River Refuge Complex personnel provide necessary maintenance, management, and monitoring to support general public access, including environmental education and interpretation, on the refuge. The Service partners with the State of Louisiana and the West Feliciana Parish Sheriff's Office to provide for law enforcement and public safety on the refuge. Strategies described in the Draft CCP/EA would support enhanced partnerships with schools and other institutions to promote educational and interpretive uses of the refuge.

**Anticipated Impacts of the Use:**

Environmental education and interpretation uses have not caused any discernible impact to the refuge in the past, and no such impacts are anticipated. Any disturbance of wildlife, vegetation, or other potential impact would be minimal and within the tolerance limits of the resource. Use levels are not expected to be so high as to require limits on access, even if the refuge is able to forge new partnerships which promote school visits and other programs, or institute a new annual event on the refuge, both of which are strategies proposed in this Draft CCP/EA.

**Determination (check one below):**

- Use is Not Compatible  
 Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

- Access for environmental education and interpretation is limited to times when the refuge is open, unless a special use permit is obtained.
- All refuge visitors must fill out and display a Daily Visitor Use Reporting Card and deposit it at the kiosk station upon departure.
- All visitors are subject to refuge regulations intended to protect public safety and refuge resources.

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**Justification:**

Environmental education and interpretation are designated as priority wildlife-dependent activities under the National Wildlife Refuge System Improvement Act. These activities help foster a conservation ethic and support for wildlife conservation among the public. The purposes for which Cat Island NWR was created include “. . . to promote public awareness of the resources of the Refuge and the National Wildlife Refuge System and public participation in the conservation of those 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:****(5) Description of Use: Boat Operation**

Boats may be operated on Cat Island NWR for the purposes of hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation. Boats may also be operated on the refuge for the purpose of crossing the refuge from state waters or private property, provided a special use permit is obtained. Boating on Cat Island NWR is subject to regulations designed to promote public safety and protect refuge resources. Boats must be hand-launched on the refuge, and boaters may not enter the refuge from private property or public waterways without a special use permit. All U.S. Coast Guard and State of Louisiana boating regulations apply on the refuge.

**Availability of Resources:**

Refuge financial resources are generally limited to funds obtained through permit sales. Lower Mississippi River Refuge Complex personnel provide necessary maintenance, management, and monitoring to support general public access, on the refuge. The Service partners with the State of Louisiana and the West Feliciana Parish Sheriff's Office to provide for law enforcement and public safety on the refuge.

**Anticipated Impacts of the Use:**

Boating has the potential to cause wildlife disturbance and other resource damage. DeLong (2002) exhaustively reviewed the scientific literature on boating disturbance of waterfowl. She discussed effects of motorboats, airboats, and slow-moving human-powered craft, concluding that all can have deleterious effects on waterbirds. Airboats and other relatively fast-moving, noisy boats have the most severe effects on waterbirds, but even canoes and rowboats can cause disturbance under some circumstances. However, restrictions in place on Cat Island NWR mitigate this potential. All boats must be hand-launched on the refuge; trailer launching is prohibited. This restriction limits boats to smaller sizes. Airboats and personal watercraft are prohibited from the refuge. Further, the fact that the refuge is forested means that boats must be operated slower than in open water and that visual range for disturbance is much shorter than in open water. Together, these factors have served to prevent significant disturbance of wildlife in the past, and are anticipated to do so in the future. Should problems arise from unforeseen changes such as new boating technologies or substantial increases in the number of users, new regulations may need to be evaluated.

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**Determination (check one below):**

- Use is Not Compatible  
 Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

- All boats are hand-launched on the refuge.
- Entering the refuge from public (state) waters is prohibited without a special use permit.
- All U.S. Coast Guard and State of Louisiana regulations apply to boating on the refuge.
- Use of airboats and personal watercraft is prohibited.

**Justification:**

Boating is not a priority wildlife-dependent activity under the National Wildlife Refuge System Improvement Act. However, use of boats facilitates all of the activities on Cat Island NWR that do fall under that category, including hunting, fishing, wildlife observation and photography, and environmental education and interpretation. The refuge is typically flooded for long periods in winter and spring, and boats provide the only access at those times.

**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:**

**(6) Description of Use: Use of all-terrain/utility task vehicles (ATV/UTV)**

Use of ATVs and UTVs is not a priority wildlife-dependent activity under the National Wildlife Refuge Improvement Act. However, their use facilitates hunting and fishing on the refuge, both of which are priority activities. ATVs and UTVs are permitted for use on Cat Island NWR by hunters and anglers during the fall and winter and in restricted areas for fishing access year-round. ATVs and UTVs must be operated only on trails; off-trail use is prohibited. Age restrictions and speed limits apply. All state regulations apply. Users must possess an annual use permit to operate ATVs and UTVs, and operation of ATVs and UTVs is only allowed for hunting and fishing.

**Availability of Resources:**

Refuge financial resources are generally limited to funds obtained through permit sales. Lower Mississippi River Refuge Complex personnel provide necessary maintenance, management, and monitoring to support ATV/UTV use on the refuge, including trail maintenance. The Service partners with the State of Louisiana and the West Feliciana Parish Sheriff's Office to provide for law enforcement and public safety on the refuge.

**Anticipated Impacts of the Use:**

ATVs and UTVs have the potential to impact public safety, wildlife, vegetation, and soils on the refuge. The refuge mitigates these potential impacts by imposing reasonable restrictions on their use. Speed limits and age restrictions contribute to public safety and mitigate wildlife disturbance issues. Restriction of ATV/UTV use to trails mitigates impacts on plants and soils. Seasonal and spatial restrictions mitigate wildlife disturbance, particularly for breeding birds. With these restrictions in

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place, the refuge does not anticipate significant impacts to refuge resources, goals and objectives nor to the achievement of the mission of the National Wildlife Refuge System.

**Determination (check one below):**

- Use is Not Compatible  
 Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

- ATV/UTV use is restricted to trails.
- ATV/UTV use is restricted to hunting season, except for limited areas open year-round for fishing access.
- ATVs and UTVs may only be used during the course of hunting and fishing on the refuge.
- Speed limits, age restrictions, state regulations, and refuge permitting regulations, all apply.

**Justification:**

Use of ATVs and UTVs is not a priority wildlife dependent activity under the National Wildlife Refuge Improvement Act. However, use of these vehicles provides access to the refuge for hunters and anglers, including disabled persons and people with limited mobility. Their use can be managed with minimal disturbance to wildlife or damage to refuge resources, and in a manner consistent with public safety.

**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:**

**(7) Description of Use: Hiking, walking, jogging, bicycling**

Hiking, walking, jogging, and bicycling are not priority wildlife-dependent activities under the National Wildlife Refuge Improvement Act. However, they can facilitate activities that are priority uses. The refuge is open for these uses when not flooded. Trails and roads are available for these activities. The refuge currently provides two hiking trails, the Black Fork Trail and the Big Cypress Trail. Pedestrians and cyclists may also use roads and ATV/UTV trails on the refuge.

**Availability of Resources:**

Refuge financial resources are generally limited to funds obtained through permit sales. Lower Mississippi River Refuge Complex personnel provide necessary maintenance, management, and monitoring to support public use on the refuge, including road and trail maintenance. The Service partners with the State of Louisiana and the West Feliciana Parish Sheriff's Office to provide for law enforcement and public safety on the refuge. A partnership with the Louisiana Hiking Club helps provide for hiking trail maintenance.

**Anticipated Impacts of the Use:**

Pedestrian and bicycle use of the refuge is not anticipated to cause significant impacts to refuge resources, disturbance to wildlife, or other negative effects.

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**Determination (check one below):**

- Use is Not Compatible  
 Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

- Hiking, walking, jogging, and bicycling are restricted to trails and only permitted during times when the refuge is open.

**Justification:**

Although hiking, walking, jogging, and bicycling are not themselves priority wildlife-dependent activities under the National Wildlife Refuge Improvement Act, they facilitate other activities which are, including hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation. These activities help achieve the purposes of Cat Island NWR and further the mission of the National Wildlife Refuge System.

**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:**

**(8) Description of Use: Research**

Research is the systematic testing of scientific hypotheses through replicated experiments. National wildlife refuges are natural laboratories for conservation and wildlife management, and many important principles have been established and elucidated through research conducted on them. Research is currently conducted on Cat Island NWR under special use permits, which are issued for studies which further the goals and objectives of the refuge and further the mission of the National Wildlife Refuge System.

**Availability of Resources:**

Refuge financial resources are generally limited to funds obtained through permit sales. Lower Mississippi River Refuge Complex personnel provide necessary maintenance, management, and monitoring to support use of the refuge, including research. The Service partners with the State of Louisiana and the West Feliciana Parish Sheriff's Office to provide for law enforcement and public safety on the refuge. Resources necessary for research on the refuge are limited to those which are expended for other uses (road maintenance, law enforcement) and to administrative time to process SUPs and oversee research activities.

**Anticipated Impacts of the Use:**

Impacts of research on natural resources and on other public uses of the refuge can be significant. To mitigate this possibility, the refuge controls the types of activities and objectives associated with research. Only research which furthers the purposes of the refuge and the mission of the National Wildlife Refuge System and complies with all applicable laws and regulations will be permitted. With these controls, no significant impacts are anticipated.

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**Determination (check one below):**

Use is Not Compatible

Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

- All research will be performed under a special use permit.
- Research objectives and activities will conform to refuge goals and objectives and further the mission of the Refuge System.
- Research activities should not detract from, degrade or harm wildlife and/or the habitat within the refuge.

**Justification:**

Research is an indispensable part of Strategic Habitat Conservation, the implementation of adaptive management that the Service has selected as its framework for conservation in the 21<sup>st</sup> Century. Allowing research on refuges is one of the best ways of ensuring that research gets done that is relevant and useful to the mission of the National Wildlife Refuge System. Properly conducted, research activities do not pose a threat to refuge resources; rather, the data thus obtained represent expanded knowledge and expertise for refuge land managers.

**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:**

**(9) Description of Use: Non-commercial Plant Collection**

Non-commercial plant collection on Cat Island NWR is conducted under special use permits for scientific or educational purposes. Thus, although it is not itself a priority wildlife-dependent activity under the National Wildlife Refuge System Improvement Act, it supports environmental education, one of six priority public uses of refuges. It also may support research, which is conducted on the refuge under special use permits and which furthers the mission of the Refuge System and the goals and objectives of the refuge.

**Availability of Resources:**

Refuge financial resources are generally limited to funds obtained through permit sales. Lower Mississippi River Refuge Complex personnel provide necessary maintenance, management, and monitoring to support use of the refuge. The Service partners with the State of Louisiana and the West Feliciana Parish Sheriff's Office to provide for law enforcement and public safety on the refuge. Resources necessary for non-commercial plant collection on the refuge are limited to administrative time to process special use permits and oversee permittee activities.

**Anticipated Impacts of the Use:**

No significant impacts to refuge resources or wildlife are anticipated from non-commercial plant collection as described in this compatibility determination. Special use permits are only issued to plant collectors for scientific or educational purposes, and for limited quantities. Plant collecting for these purposes furthers the mission of the Refuge System and the goals and objectives of the refuge.

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**Determination (check one below):**

- Use is Not Compatible  
 Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

- All plant collecting will be under a special use permit which specifies the purpose, quantity, and time frame for collections to take place.
- Plant collection will be for non-commercial educational or scientific purposes.
- Collectors will conform to all laws and regulations governing actions on the refuge.

**Justification:**

Properly conducted, non-commercial plant collection is not expected to create significant impacts on refuge resources. As part of research and educational activities on the refuge, non-commercial plant collection supports the refuge purposes and the mission of the Refuge System.

**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:**

**(10) Description of Use: Forest Management**

Forest management on refuges is conducted for the purpose of establishing, maintaining, and improving wildlife habitat to support refuge resources of concern. Forest management activities on refuges can include inventorying, monitoring, timber harvest, artificial and natural regeneration, control of exotic invasive plant species, and prescribed fire. On Cat Island NWR, forest management actions proposed in this Draft CCP/EA are consistent with those prescribed by the Lower Mississippi Valley Joint Venture (LMVJV) for managing bottomland hardwoods for priority species (forest-breeding birds, Louisiana black bears) (LMVJV Forest Resource Conservation Working Group, 2007). All active forest management (timber harvesting) will be conducted in accordance with an approved Habitat Management Plan. Actions could include inventorying, monitoring, selective harvest (thinning, single tree selection, group selection), removal of invasive exotic plants, and natural or artificial regeneration. Commercial timber harvest constitutes a “refuge management economic activity,” (i.e., it results in generation of a commodity which is or can be sold for income or revenue or traded for goods or services.) Therefore, a compatibility determination is required under Service policy (603 FW 2).

**Availability of Resources:**

Refuge financial resources are generally limited to funds obtained through permit sales. Lower Mississippi River Refuge Complex personnel provide necessary maintenance, management, and monitoring for the refuge. Forest management has been passive since the refuge was established in 2000; planning, oversight, and execution of active forest management requires a greater degree of administrative time than has been allocated for Cat Island NWR in the past. This Draft CCP/EA proposes the use of commercial timber harvesting as a management practice, which would require greater funding and staff time, including forest inventory, preparation of applicable permits, contractor oversight, and monitoring.

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**Anticipated Impacts of the Use:**

Forest management activities can have negative impacts on wildlife habitat and natural resources. The Service does not anticipate significant negative impacts from its proposed forest management activities on Cat Island NWR. The activities proposed conform to those recommended by the LMVJV, would be carefully overseen by refuge personnel, and would be conducted according to published Best Management Practices for Silviculture.

**Determination (check one below):**

- Use is Not Compatible  
 Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

- All forest management activities conform to Service policy and practice and are conducted for the purpose of improving habitat for priority wildlife.
- Recommended Forestry Best Management Practices for Louisiana (Louisiana Department of Agriculture and Forestry, 1997) would be followed.
- All forest management activities conducted by contractors would be under a special use permit issued by the refuge.
- A Habitat Management Plan which provides additional detail would be prepared.

**Justification:**

The forest management practices proposed in this Draft CCP/EA conform to Service guidelines for protecting and enhancing wildlife habitat and are in support of refuge purposes and the mission of the Refuge System.

**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:**

**(11) Description of Use: Nuisance and Exotic Invasive Animal Control**

Refuge management requires control of exotic invasive species and certain native species whose populations reach nuisance levels. Species which are or may become a management concern on Cat Island NWR are: beaver (*Castor canadensis*), feral hog (*Sus scrofa*), and nutria (*Myocastor coypus*). In the case where removal of these animals from the refuge constitutes a "refuge management economic activity" (i.e., it results in generation of a commodity which is or can be sold for income or revenue or traded for goods or services), a compatibility determination is required under Service policy (603 FW 2).

Beavers are a native rodent species which ranges across most of North America north of Mexico. Control of this species becomes desirable when their dams and feeding behavior interfere with management objectives for timber, particularly in bottomland hardwoods on flat terrain where extensive flooding can result in large areas of dead trees. They can also interfere with water control structures such as culverts and weirs, plugging them, flooding large acreages, and endangering the

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levees or roadbeds they are intended to drain. Habitat objectives for Cat Island NWR call for up to 5 percent of the refuge to be in beaver ponds; limiting beaver ponds to this percentage and preventing damage to refuge infrastructure necessitates controlling beaver populations. Current refuge regulations permit the incidental take of beavers with legal arms during any hunting season by licensed hunters. Control measures proposed for Cat Island NWR in this Draft CCP/EA include shooting, trapping, and dam removal by refuge staff. All beaver control measures would be taken under an approved nuisance animal control plan.

Feral hogs and nutria are exotic pests which can cause significant resource damage when unchecked (Barrios-Garcia & Ballari, 2012; Jojola et al., 2005). Controlling these animals is accomplished by shooting or trapping, either by refuge personnel, hunters, or trappers operating under a special use permit. Currently on Cat Island NWR, hogs and nutria are not causing serious resource damage, and control is accomplished by encouraging hunters to take them as incidental species during legal hunts for other species. If significant resource impacts begin to occur, trapping and/or shooting by permittees operating under special use permits or by refuge personnel may become necessary. Any efforts of this type would be made under an approved nuisance animal control plan.

**Availability of Resources:**

Refuge financial resources are generally limited to funds obtained through permit sales. Lower Mississippi River Refuge Complex personnel provide necessary maintenance, management, and monitoring. The Service partners with the State of Louisiana and the West Feliciana Parish Sheriff's Office to provide for law enforcement and public safety on the refuge. Resources necessary for permitting shooting or trapping and removal of beaver, nutria, or hogs under a special use permit on the refuge are limited to those which are expended for other uses (road maintenance, law enforcement) and to administrative time to process the permits and oversee permittee activities.

**Anticipated Impacts of the Use:**

Properly administered and conducted, removal of nuisance and exotic invasive animals should have little or no negative impacts on the refuge nor detract from its purposes or from the mission of the Refuge System. Removing these species is intended and expected to provide a benefit to refuge resources of concern and other trust species.

**Determination (check one below):**

- Use is Not Compatible  
 Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

- All removal of nuisance and exotic invasive animals would be conducted under an approved nuisance animal control plan.
- A special use permit would be required for all trappers and for shooters other than licensed hunters who incidentally take hogs, nutria, or beaver during the course of legal hunts for other game.
- All removal activities would be conducted in a manner consistent with public safety and applicable laws and regulations.

**Justification:**

Removal of nuisance and exotic invasive animals is often necessary to accomplish the purposes, goals, and objectives of the refuge and to further the mission of the Refuge System. Beaver, hogs, and nutria have the potential to interfere with the management of Cat Island NWR, degrade habitats,

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and damage refuge resources and infrastructure. One cost-effective means of controlling these animals is to permit their removal as a special use.

**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:**

**LITERATURE CITED**

See Appendix B

**Approval of Compatibility Determinations**

The signature of approval is for all compatibility determinations considered within the Comprehensive Conservation Plan for Cat Island National Wildlife Refuge. 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)

Chief, National  
Wildlife Refuge System,  
Southeast Region: \_\_\_\_\_  
(Signature/Date)

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# Appendix G. Intra-Service Section 7 Biological Evaluation

## INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

**Originating Person:** Bradley Bordelon  
**Telephone Number:** 318-253-4238  
**E-Mail:** bradley\_bordelon@fws.gov  
**Date:** 29APR2014

### PROJECT NAME:

#### 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:

#### III. Station Name:

#### IV. Description of Proposed Action

Implement the Comprehensive Conservation Plan for Cat Island National Wildlife Refuge by adopting the Proposed Alternative. This plan directs the management of the refuge for 15 years.

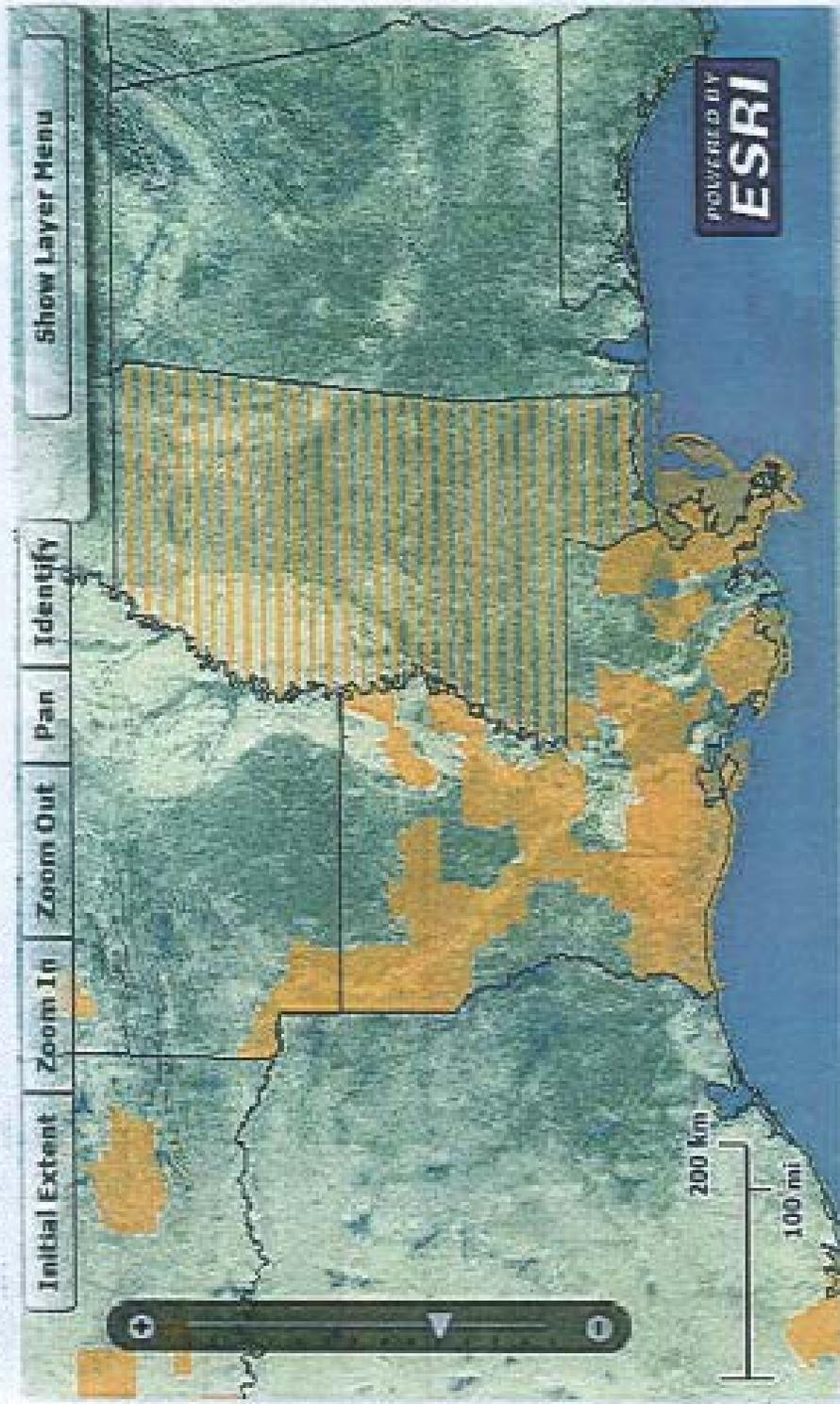
#### V. Pertinent Species and Habitat:

- Sprague's pipit (*Anthus spragueii*), Candidate;
- pallid sturgeon (*Scaphirhynchus albus*), Endangered;
- Louisiana black bear (*Ursus americanus luteolus*), Threatened.
- Least Tern (*Sternula antillarum*), interior population, Endangered
- Fat pocketbook mussel (*Potamilus capax*), Endangered

#### A. Species/habitat occurrence maps:

Sprague's pipit species occurrence map for Louisiana and Mississippi, from <http://ecos.fws.gov/ipac>

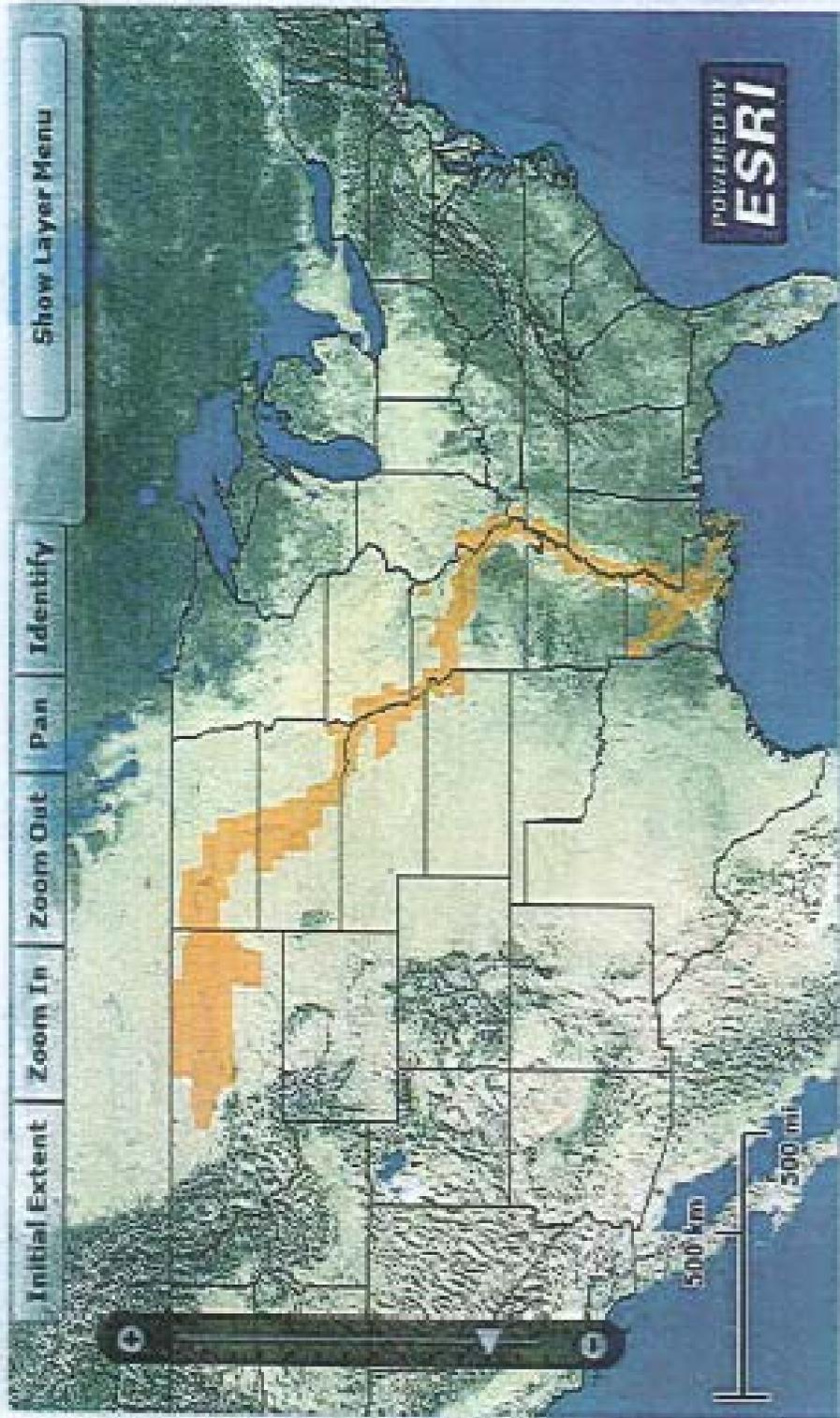
### Map of Species occurrence



This map represents our best available information about where a species is currently known to or is believed to occur; however, it should NOT be used as an official species list for Section 7 Consultation purposes. To obtain an official species list for this purpose, please visit the Information, Planning, and Conservation (IPaC) System (click here: <http://ecos.fws.gov/ipac>)

Pallid sturgeon species occurrence map from <http://ecos.fws.gov/ipac>.

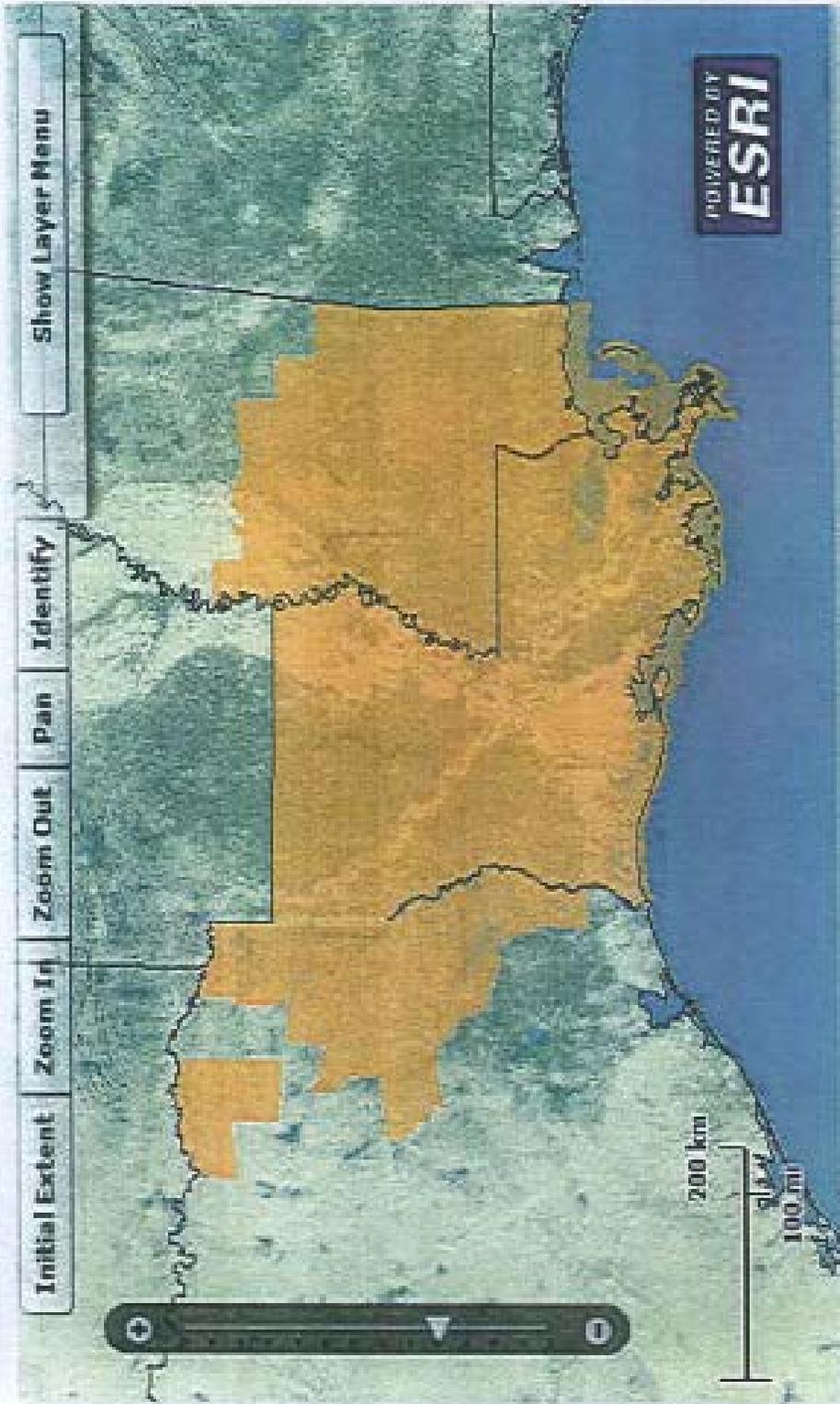
### Map of Species occurrence



This map represents our best available information about where a species is currently known to or is believed to occur; however, it should NOT be used as an official species list for Section 7 Consultation purposes. To obtain an official species list for this purpose, please visit the Information, Planning, and Conservation (IPaC) System (click here: <http://ecos.fws.gov/ipac>)

Louisiana black bear species occurrence map from <http://ecos.fws.gov/ipac>.

### Map of Species occurrence



This map represents our best available information about where a species is currently known to or is believed to occur; however, it should NOT be used as an official species list for Section 7 Consultation purposes. To obtain an official species list for this purpose, please visit the Information, Planning, and Conservation (IPaC) System (click here: <http://ecos.fws.gov/ipac>)

Range of Least Tern, (interior population) from the 1990 Recovery Plan for the population

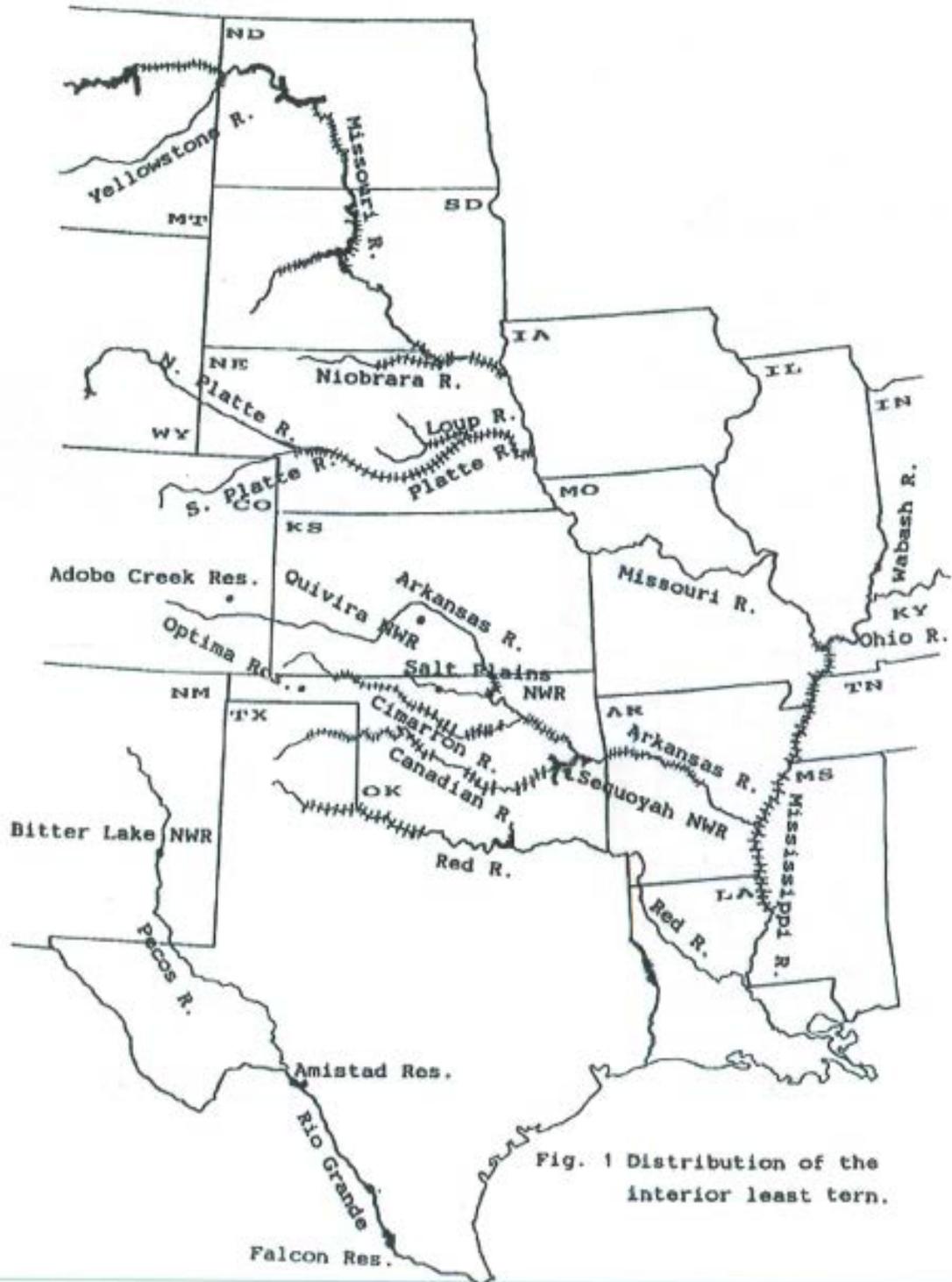


Fig. 1 Distribution of the interior least tern.

Range of *Potamilus capax* from the 1985 Recovery Plan for the species.

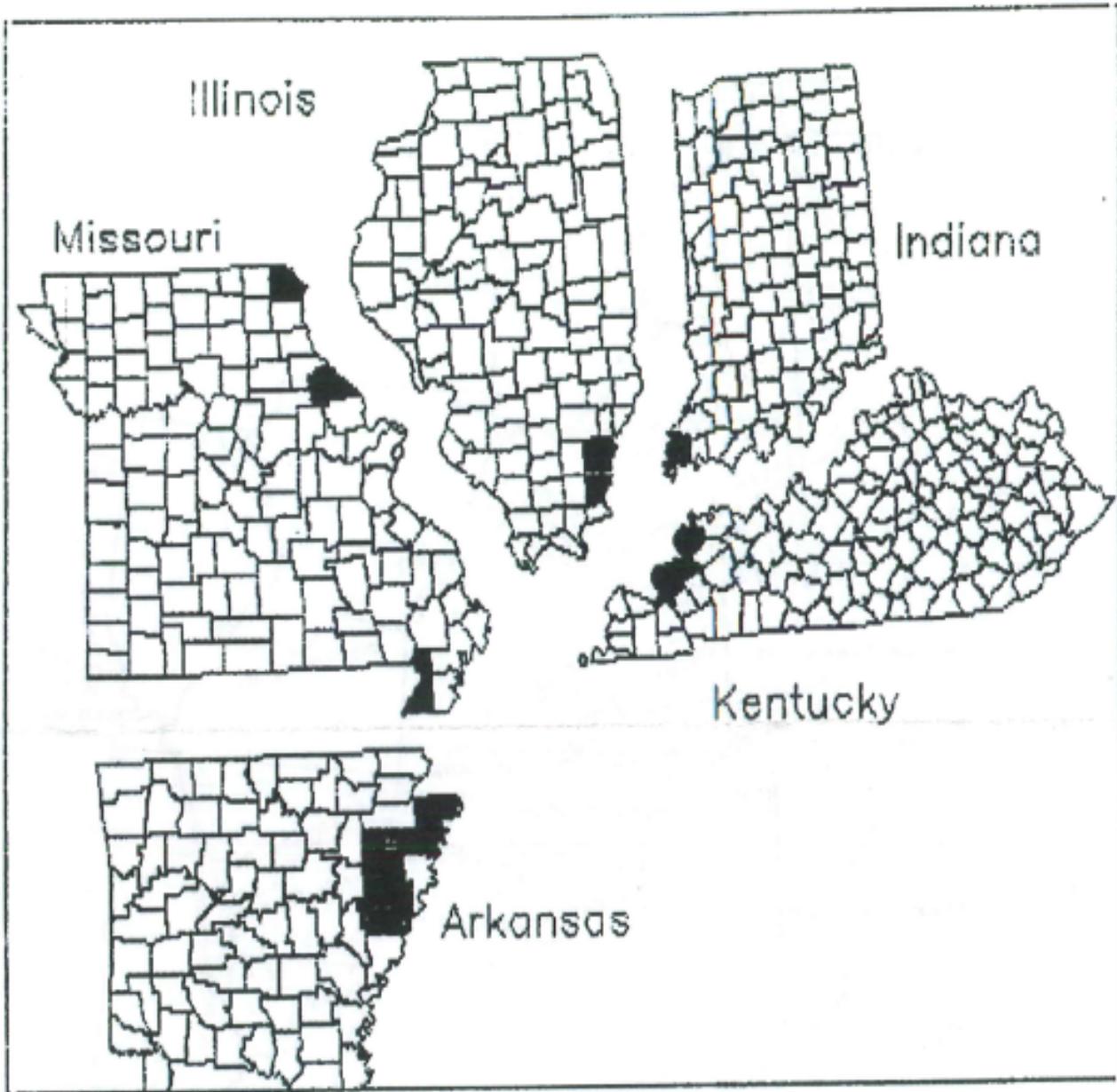


Figure 1. Present range of Potamilus capax



**B. Complete the following table:**

| SPECIES/CRITICAL HABITAT                                  | STATUS <sup>1</sup> |
|---|---------------------|
| Sprague's Pipit ( <i>Anthus spragueii</i> )               | C                   |
| Pallid sturgeon ( <i>Scaphirhynchus albus</i> )           | E                   |
| Louisiana black bear ( <i>Ursus americanus luteolus</i> ) | T                   |
| Least Tern ( <i>Sternula antillarum</i> )                 | E                   |
| Fat pocketbook mussel ( <i>Potamilus capax</i> )          | E                   |
|   |                     |
|   |                     |
|   |                     |

<sup>1</sup>STATUS: E=endangered, T=threatened, PE=proposed endangered, PT=proposed threatened, CH=critical habitat, PCH=proposed critical habitat, C=candidate species, S/A=Similar Appearance

**VI. Location (attach map):**



- A. **Ecoregion Number and Name:** 27: Lower Mississippi River
- B. **County and State:** West Feliciana Parish, Louisiana
- C. **Section, township, and range (or latitude and longitude):** 30.791978° -91.491176°
- D. **Distance (miles) and direction to nearest town:** 7 miles E to Saint Francisville, LA
- E. **Species/habitat occurrence:**

**Sprague's Pipit:** Although Cat Island NWR is within the winter range of Sprague's pipit, this species is not recorded from the refuge. Open habitats are small and rare on Cat Island; suitable habitats for Sprague's pipit are grasslands and fields.

**Pallid sturgeon:** This species may use refuge habitats during floods.

**Louisiana black bear:** Louisiana black bears have been recorded on Cat Island NWR, although there is not a resident population on the refuge. All of the refuge is suitable habitat for this species when not flooded.

**Least Tern:** This species is not known to breed on Cat Island NWR. Nevertheless, potentially suitable breeding habitat does occur on the refuge. Should the species be found using refuge habitats, appropriate actions to protect those habitats would be taken, specifically closure of sandbar habitat to public access during the breeding season. This measure is included in the Draft CCP/EA.

**Fat pocketbook mussel:** This species is not known from Cat Island NWR. However, the species has been discovered nearby. Should fat pocketbook mussels be found on Cat Island NWR, the refuge believes that actions described in the Draft CCP/EA, including protection of water bodies from sedimentation and disturbance, would provide adequate protection for this species.

**VII. Determination of Effects:**

**A. Explanation of effects of the action on species and critical habitats in item V. B:**

| SPECIES/<br>CRITICAL HABITAT     | IMPACTS TO SPECIES/CRITICAL HABITAT  |
|----------------------------------|--|
| Sprague's Pipit                  | No Impact  |
| Pallid sturgeon                  | No Impact  |
| Louisiana black bear             | Proposed actions are intended to improve habitat quality for this species. |
| Least Tern (interior population) | No Impact  |
| Fat pocketbook mussel            | No Impact  |
|                                  |  |

**B. Explanation of actions to be implemented to reduce adverse effects:**

| SPECIES/<br>CRITICAL HABITAT     | ACTIONS TO MITIGATE/MINIMIZE IMPACTS |
|----------------------------------|--------------------------------------|
| Sprague's Pipit                  | N/A                                  |
| Pallid sturgeon                  | N/A                                  |
| Louisiana black bear             | N/A                                  |
| Least Tern (interior population) | N/A                                  |
| Fat pocketbook mussel            | N/A                                  |
|                                  |                                      |

**VIII. Effect Determination and Response Requested:**

| SPECIES/CRITICAL HABITAT         | DETERMINATION <sup>1</sup> |    |    | REQUESTED   |
|----------------------------------|----------------------------|----|----|-------------|
|                                  | NE                         | NA | AA |             |
| Sprague's Pipit                  | X                          |    |    | Concurrence |
| Pallid sturgeon                  | X                          |    |    | Concurrence |
| Louisiana black bear             |                            | X  |    | Concurrence |
| Least Tern (interior population) | X                          |    |    | Concurrence |
| Fat pocketbook mussel            | X                          |    |    | Concurrence |
|                                  |                            |    |    |             |

<sup>1</sup>DETERMINATION/ 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 and candidate species is "Conference".

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Bradley Borden

Signature (originating station)

4/30/2014

Date

Acting Project Leader

Title

**IX. Reviewing Ecological Services Office Evaluation:**

A. Concurrence \_\_\_\_\_ Nonconcurrency \_\_\_\_\_

B. Formal consultation required \_\_\_\_\_

C. Conference required \_\_\_\_\_

D. Informal conference required \_\_\_\_\_

E. Remarks (attach additional pages as needed):

\_\_\_\_\_  
Signature

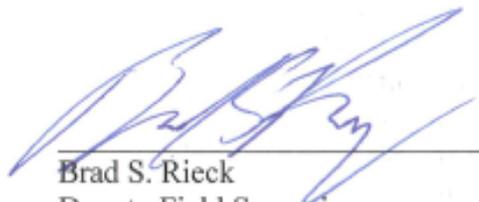
\_\_\_\_\_  
Date

\_\_\_\_\_  
Title

\_\_\_\_\_  
Office

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Cat Island National Wildlife Refuge (NWR) proposes to implement their Comprehensive Conservation Plan that will provide direction for the Refuge and guide management actions throughout the 15-year planning period. Fish and wildlife conservation will receive top priority in refuge management; other activities (such as wildlife-dependent recreation) would only be permissible provided that they are compatible with that primary mission. Federally listed species that could be potentially impacted by implementation of the CCP for Cat Island NWR include Sprague's pipit, pallid sturgeon, interior least tern, fat pocketbook mussel, and Louisiana black bear. The Cat Island NWR provides very little, if any, suitable habitat for the Sprague's pipit, and only seasonal habitat for the pallid sturgeon. Most of the federally listed species described in the CCP are not known to occur on Cat Island NWR. Transient Louisiana black bears may occasionally use the Cat Island NWR, but there is no known breeding subpopulation of bears on that refuge. For these reasons, and because implementation the CCP for the Cat Island NWR would improve habitat conditions for the Louisiana black bear (and could also provide habitat benefits for the other listed species), the Louisiana Ecological Services Office concurs with Cat Island NWR's "NA" determination for the Louisiana black bear, and "NE" determinations for the Sprague's pipit, pallid sturgeon, interior least tern, and fat pocketbook mussel for the proposed implementation of their CCP as described in their April 29, 2014, Intra-Service Section 7 Biological Evaluation Form.

  
\_\_\_\_\_  
Brad S. Rieck  
Deputy Field Supervisor  
Louisiana Ecological Services Office

5/13/14  
\_\_\_\_\_  
Date

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## *Appendix H. Wilderness Review*

### **INTRODUCTION**

A Wilderness, as defined by the Wilderness Act, contrasts with “those areas where man and his works dominate the landscape.” A Wilderness is defined by the Wilderness Act as “an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.” An area of wilderness is further defined to mean “an area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.”

The purpose of a wilderness review is to identify and recommend for congressional designation National Wildlife Refuge System (Refuge System) lands and waters that merit inclusion in the National Wilderness Preservation System. Wilderness reviews are a required element of comprehensive conservation plans and conducted in accordance with the refuge planning process outlined in 602 FW 1 and 3, including public involvement and the National Environmental Policy Act compliance (NEPA). There are three phases to the wilderness review process: (1) inventory, (2) study, and (3) recommendation. Lands and waters that meet the minimum criteria for wilderness are identified in the inventory phase. These areas are called wilderness study areas (WSAs). In the study phase, a range of management alternatives are evaluated to determine if a WSA is suitable for wilderness designation or management under an alternate set of goals and objectives that do not involve wilderness designation. The recommendation phase consists of reporting the suitable recommendations from the Director of the Fish and Wildlife Service through the Secretary and the President of the United States to Congress in the form of a wilderness study report. If new lands are proposed for wilderness designation, the wilderness study report is prepared after the record of decision for the final comprehensive conservation plan (CCP) has been signed. In compliance with 610 FW 1, refuge lands recommended for designation are managed to maintain wilderness character in accordance with management goals, objectives, and strategies outlined in the wilderness study report until Congress makes a decision or the CCP is amended to modify or remove the wilderness proposal. If the final determination in a CCP is that a WSA is not suitable, the decision and the withdrawal of the land are documented in the CCP. Areas found unsuitable for wilderness designation are managed following the management direction outlined in the CCP.

The core CCP team including: Michelle Paduani, Bob Strader, Mike Perot, Deisha Norwood, Nick Wirwa, Kent Ozment, John Simpson, Kayla Kimmel, and Tom Edwards met on August 19, 2013, to gather information and conduct an inventory of the refuge's lands and waters. This process required reviewing all land acquisitions, site knowledge with existing land status maps, photographs, available land use information and road inventory data to determine if any refuge lands and waters met the minimum criteria for wilderness. Aerial and non-aerial photographs were used to document the imprint of man's work, road locations, and other surface disturbances.

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## WILDERNESS INVENTORY

The wilderness inventory is a broad look at the planning area to identify WSAs. A WSA is an area of undeveloped federal land that retains its primeval character and influence, without permanent improvements or human habitation and further meets the minimum criteria for wilderness as identified in Section 2(c) of the Wilderness Act. A WSA must be a roadless area or island, meet the size criteria, appear natural, and provide for solitude or primitive recreation.

### 1. Roadless

Roadless refers to the absence of improved roads suitable and maintained for public travel by means of motorized vehicles primarily intended for highway use. A route maintained solely by the passage of vehicles does not constitute a road. Only federal lands and waters are eligible to be considered for Wilderness designation and inclusion into the National Wilderness Preservation System.

### 2. Size

Roadless areas or roadless islands meet the size criteria if any one of the following standards apply:

- An area with over 5,000 contiguous acres. State and private lands are not included in making this acreage determination.
- A roadless island of any size. A roadless island is defined as an area surrounded by permanent waters or that is markedly distinguished from the surrounding lands by topographical or ecological features.
- An area of less than 5,000 contiguous federal acres that is of sufficient size as to make practicable its preservation and use in an unimpaired condition, and of a size suitable for wilderness management.
- An area of less than 5,000 contiguous acres that is contiguous with a designated wilderness, recommended wilderness, or area under wilderness review by another federal wilderness managing agency such as the Forest Service, National Park Service, or Bureau of Land Management.

### 3. Naturalness

A WSA must meet the naturalness criteria. The Wilderness Act, Section 2(c), defines wilderness as an area that "... generally appears to have been affected primarily by the forces of nature with the imprint of man's work substantially unnoticeable." The area must appear natural to the average visitor rather than "pristine." The presence of historic landscape conditions is not required. An area may include some human impacts provided they are substantially unnoticeable in the unit as a whole. Significant human-caused hazards, such as the presence of unexploded ordnance from military activity, and the physical impacts of refuge management facilities and activities are also considered in evaluation of the naturalness criteria. An area may not be considered unnatural in appearance solely on the basis of the "sights and sounds" of human impacts and activities outside the boundary of the unit. The cumulative effects of these factors in conjunction with land base size and physiographic and vegetative characteristics were considered in the evaluation of naturalness.

### 4. Solitude or Primitive and Unconfined Recreation

In addition to meeting the roadless size and naturalness criteria, a WSA must provide outstanding opportunities for solitude or primitive and unconfined recreation. The area does not have to possess outstanding opportunities for both solitude and primitive and unconfined recreation, and does not need to have outstanding opportunities on every acre. Further, an area does not have to be open to public use and access to qualify under this criteria; Congress has designated a number of wilderness areas in the Refuge System that are closed to public access to protect resource values. Opportunities for solitude refer to the ability of a visitor to be alone and secluded from other visitors in the area.

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Primitive and unconfined recreation means non-motorized, dispersed outdoor recreation activities that are compatible and do not require developed facilities or mechanical transport. These primitive recreation activities may provide opportunities to experience challenge and risk, self-reliance, and adventure. These two “elements” are not well defined by the Wilderness Act, but, in most cases, can be expected to occur together. However, an outstanding opportunity for solitude may be present in an area offering only limited primitive recreation potential. Conversely, an area may be so attractive for recreation use that experiencing solitude is not an option.

##### 5. Supplemental Values

The Wilderness Act states that an area of wilderness may contain ecological, geological, or other features of scientific, educational, scenic or historical value. Supplemental values of the area are optional, but the degree to which their presence enhances the area’s suitability for wilderness designation should be considered. The evaluation should be based on an assessment of the estimated abundance or importance of each of the features.

##### *Cat Island NWR Wilderness Inventory, Methodology and Review Conclusion*

Land classification can be thought of as a continuous spectrum of land types ranging from urbanized land on one end to wilderness on the other. In our society, all portions of the spectrum are important, and many land classifications for public lands can complement wilderness. Many of these classifications better fit the recreation desires of diverse users and are excellent alternatives to visiting wilderness.

The Cat Island NWR Wilderness Inventory started with the inventory of all federal lands within the refuge. These fee-title lands were initially assessed based on the size criteria and were then assessed for the other inventory considerations.

There were questions about the northeast area that was estimated to be about 1,000 acres and the southwest roadless area estimated at about 1,300 acres and whether or not these areas should be considered wilderness. These areas were less than 5,000 acres, had been trammled by man, and were surrounded by extensively managed private lands. The northeast portion of the refuge was a good area of land with supplemental value and could possibly have an opportunity for solitude or primitive and unconfined recreation. However, the area considered is small and almost completely surrounded by private lands, which would make primitive and unconfined recreation and the management as wilderness difficult. The area also had past timber management while under previous ownership. In addition, the roadless unit to the southwest was determined to possess even less of the desirable attributes and was quickly dismissed for further consideration.

For these reasons, the Service finds that none of the federal lands within the Cat Island NWR meet the minimum criteria as defined by the Wilderness Act and will not be considered further in this CCP for Wilderness designation. The Service also finds that although the lands in the northeast portion of the refuge will not be proposed Wilderness, this area should be considered to have a layer of protection through minimal management implemented by the goals and objectives within the Habitat Management Plan as stepped down through the CCP to preserve the natural diversity within this unit, and to allow the public and management to have an area in which to research, explore, and conserve this unique habitat. It was also noted that the northeast area could be reconsidered as Wilderness at a later date with the possibility of acquiring more lands within the approved acquisition boundary.



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# Appendix I. Cultural Resource Review

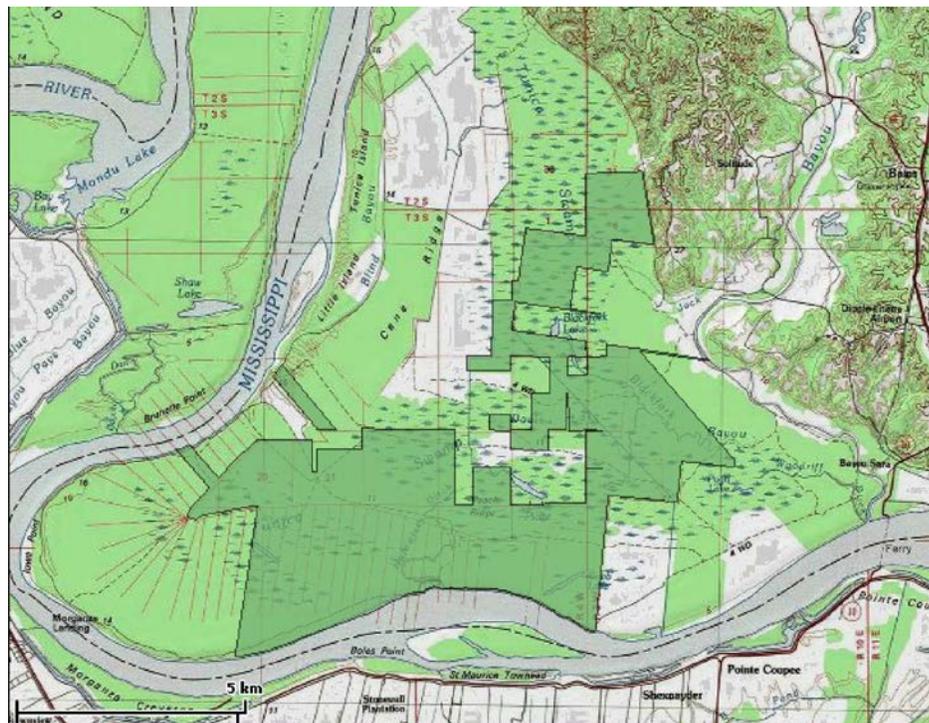
## Cat Island National Wildlife Refuge, West Feliciana Parish, Louisiana Comprehensive Conservation Plan Cultural Resource Background

Richard S. Kanaski, *Regional Archaeologist &  
Regional Historic Preservation Officer*  
U.S. Fish and Wildlife Service

November 8, 2013

Cat Island National Wildlife Refuge was established in 2000 primarily to conserve, restore, and manage the historic bottomland communities for migratory waterfowl, aquatic species, and other threatened and endangered biota. The 10,473-acre refuge, which is situated on the southernmost unleveed section of the Mississippi River, is inundated annually (Fig. I-1). The refuge's dominant landscape feature is the Tunica Swamp. Scattered across the swamp are a number of small lakes, bayous, brakes, and sloughs. The largest of the lakes include Pugh Lake, Black Fork Lake, and Lake Platt.

**Figure I-1. Cat Island NWR, fee-title holdings.**



A review of the Southeast Region Master Site Files did not reveal any recorded historic properties on the refuge, though there are a number of archaeological sites located along Bayou Sara and Blind Bayou (Fig. I-2). Table I-1 provides a brief description of the Bayou Sara sites. The lack of recorded sites on the refuge is not surprising due to the nature of the landform. To ascertain the refuge's archaeological potential, one must examine the geomorphology, soils, and the wetlands .

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**Figure I-2. Location of archaeological sites near Cat Island National Wildlife Refuge. THIS FIGURE HAS BEEN REDACTED**

This map has been redacted from the plan available for public review as it depicted the locations of archaeological sites within and/or near the Refuge. Section 470w-3.a of the National Historic Preservation Act and Section 9 of the Archaeological Resources Protection explicitly state that archaeological site locations can be kept confidential by the Federal agency if disclosure risks harm to historic resources, impedes the use of a traditional religious site by practitioners, or causes a significant invasion of privacy. Furthermore, any information about the location or ownership of a historic resource identified in this text is not subject to Freedom of Information Act requests.

However, any individual or organization can submit a request in writing for such information to the Regional Archaeologist. The mailing address is:

Office of the Regional Archaeologist  
Savannah Coastal Refuges  
694 Beech Hill Lane  
Hardeeville, South Carolina 29927.

The request shall identify the site(s) in question (if possible) and the purpose for which the information is sought.

**Table I-1. Archaeological Sites recorded on the lower portion of Bayou Sara. THIS TABLE HAS BEEN REDACTED.**

This table has been redacted from the plan available for public review as it described the locations of archaeological sites within and/or near the Refuge. Section 470w-3.a of the National Historic Preservation Act and Section 9 of the Archaeological Resources Protection explicitly state that archaeological site locations can be kept confidential by the Federal agency if disclosure risks harm to historic resources, impedes the use of a traditional religious site by practitioners, or causes a significant invasion of privacy. Furthermore, any information about the location or ownership of a historic resource identified in this text is not subject to Freedom of Information Act requests.

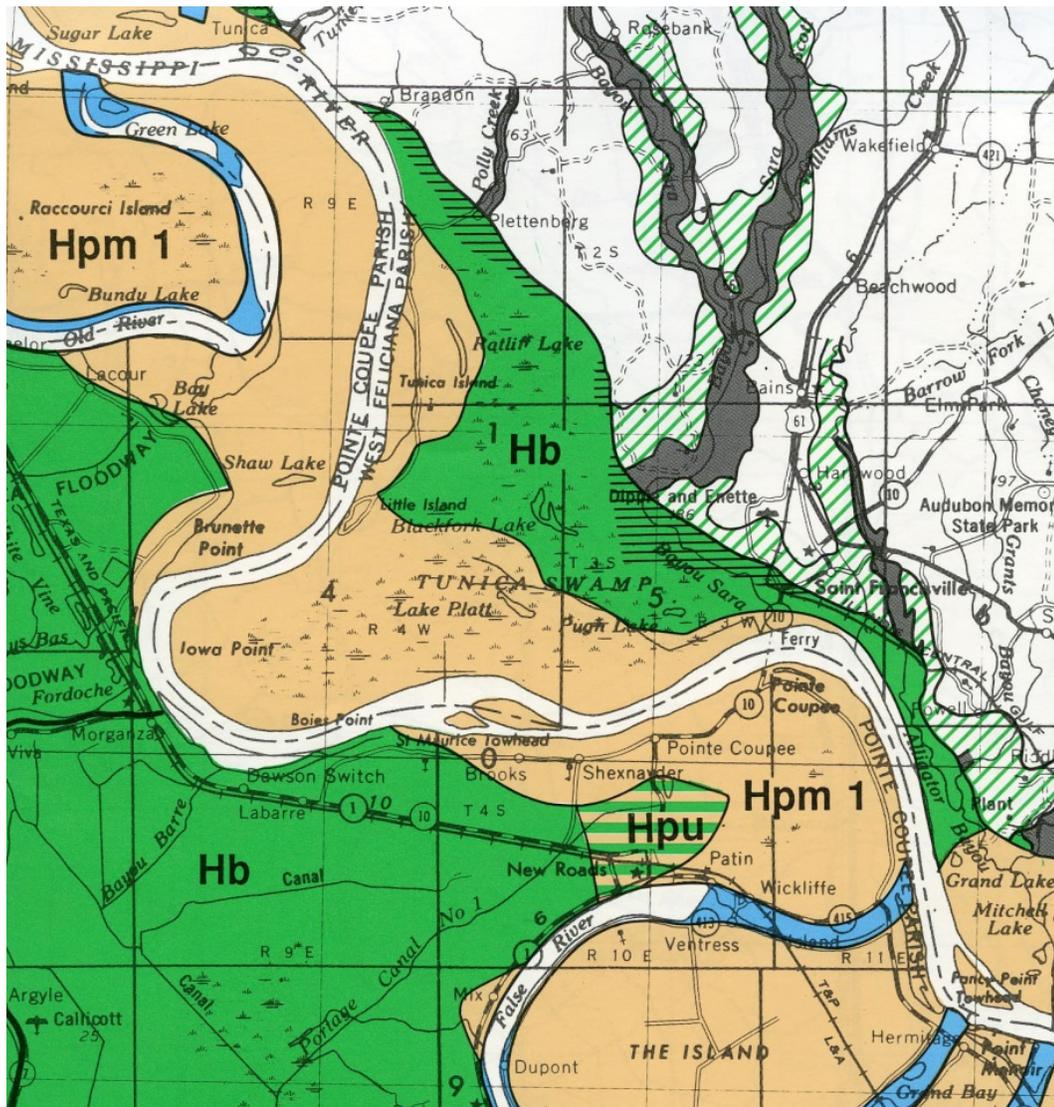
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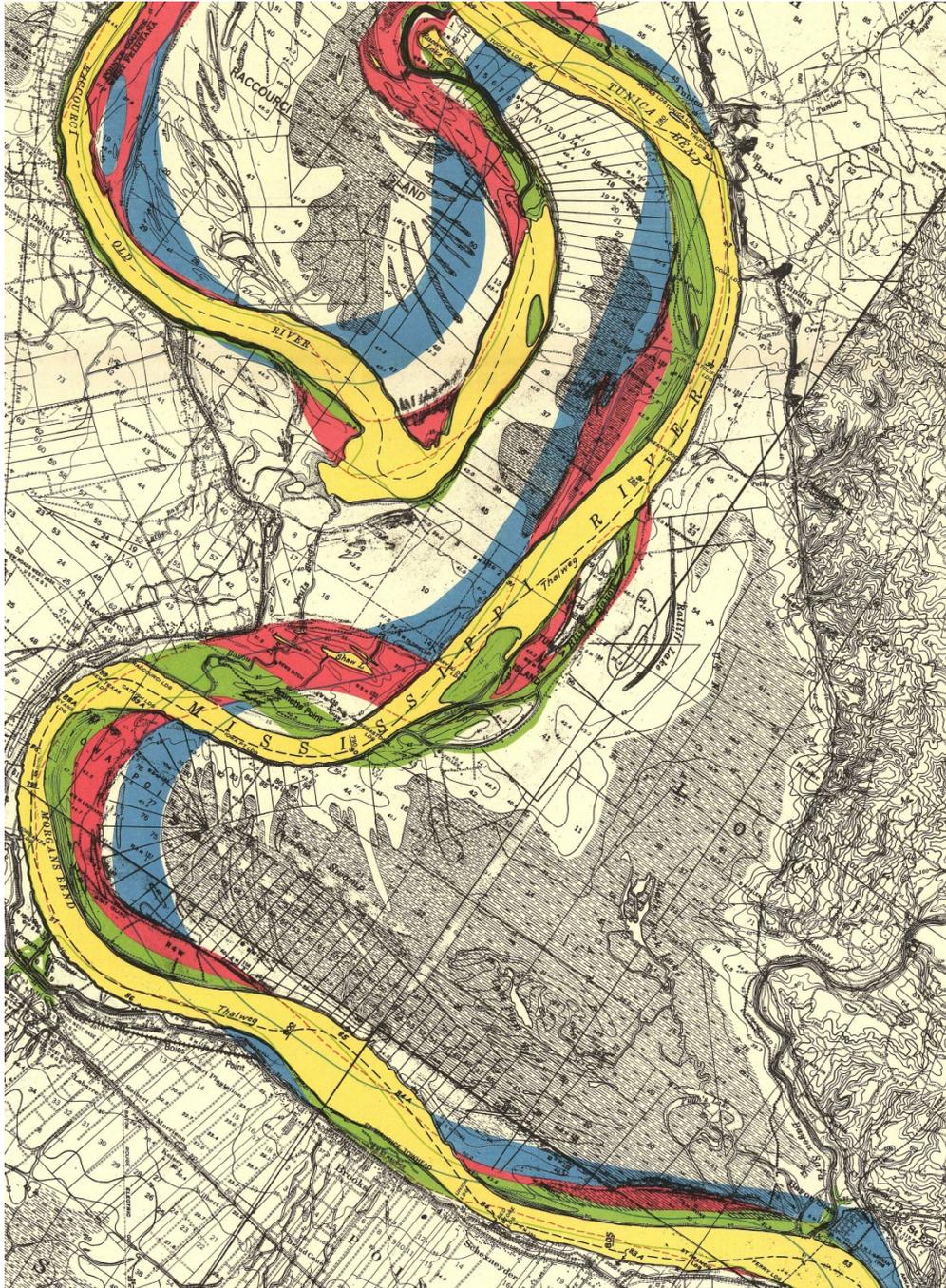
The geomorphic processes of the refuge and surrounding environs were shaped by the Mississippi River. Saucier mapped this area as point bar or meander scroll deposits of the Mississippi River Meander Belt 1 (Hpm1) and backswamps (Hb) (Fig. I-3). This meander belt dates to 3000 years ago and corresponds to the river's modern belt. Bayou Sara is mapped primarily as undifferentiated alluvium (Hal). Near its confluence with the river, Saucier mapped it as an alluvial fan and/or apron that overlaid backswamp deposits (Haf). The high loess bluff that overlooks the refuge, the lower portion of Bayou Sara, and Tunica Swamp is mapped as undifferentiated fluvial deposits of the Prairie complex and are mostly natural levees and backswamp deposits of the Mississippi River (Ppu).

Figure I-3. Geological features of Cat Island and surrounding area.



Fisk (1940: Sheet 11) shows four channel configurations between 1765 and 1932 (Fig. I-4). Much of the southwestern portion of the refuge and Iowa Point were substantially modified by the river's migration between 1765 and 1932. The potential for early archaeological sites in this area will be quite low. Historic period occupations and/or structures would post-date the channel's abandonment. Fisk's base map, which is dated 1939, does not show any structures in Tunica Swamp. Several roads enter the swamp along its western periphery, such as the one from Keller. An abandoned railroad runs along the swamp's eastern margin and west of Bayou Sara.

Figure I-4. Mississippi River channel configurations from 1765-1932.



Soils, their drainage capability, and periodicity of flooding are critical factors in determining archaeological potential as well as vegetative communities. The refuge is mapped primarily as poorly drained Tunica and Sharkey soils, frequently flooded (Tu), poorly drained Sharkey soils, frequently flooded [SH], and very poorly drained Fausse soils (FA) (Fig. 15). Fausse soils are typically situated in backswamps; Tunica and Sharkey soils are on natural levees. None of these soils are considered to be prime agricultural lands. The archaeological potential is considered as quite low on these soil types, particularly as better drained soils on higher elevations are present nearby. Table I-2 provides a brief description of the area's soil types.

**Figure I-5. Soils of Cat Island National Wildlife Refuge.**



**Table I-2. Soil mapping units on Cat Island National Wildlife Refuge.**

| Symbol | Soil Type   | Description  |
|--------|---|--|
| CM     | Commerce soils, gently undulating, occasionally flooded | This somewhat poorly drained soil is situated on natural levees. Slope range from 0-3%. Depth to the water range ranges from 18 to 48 inches. It is prime agricultural land.                               |
| CN     | Commerce soils, gently undulating, frequently flooded   | Same as above, except is not considered to be prime agricultural land.   |
| CR     | Crevasse loamy sand, frequently flooded                 | This excessively drained soil is found on point bars. Slope ranges from 0-5%. Depth to the water table ranges from 42 to 72 inches. It frequently floods. It is not considered as prime agricultural land. |
| FA     | Fausse soils  | This poorly drained soils is found in backswamps. Slope ranges from 0-1%. The water table is at or near the surface. It frequently floods and ponds. It is not prime agricultural land.                    |
| Fe     | Felician silt loam, 1-3% slopes                         | This well drained soil is found on terraces. Depth to the water table is greater than 80 inches. It does not flood or pond. It is considered to be prime agricultural land.                                |
| Fg     | Felician silt loam, 3-8% slopes                         | Same as above, except it is not considered to be prime agricultural land.  |

| Symbol | Soil Type  | Description   |
|--------|--|---|
| FH     | Feliciana and Natchez silt loams, steep                  | See description for Feliciana silt loam above. Feliciana soils included in this type have slopes that range from 8 to 40%. Natchez soils are well drained and found on hill slopes. Slopes range from 12 to 60%. Depth to the water table is greater than 80 inches. Neither of these soils is considered to be prime agricultural land.  |
| MB     | Morganfield and Bigbee soils, frequently flooded         | Morganfield soils are well drained and found on the floodplains. Slopes range from 0-2%. Depth to the water table ranges from 36 to 48 inches. Bigbee soils are excessively drained and found on terraces. Slopes range from 0-2%. Depth to the water table ranges from 42 to 72 inches. Both soils are subject to frequent flooding. Neither soil is considered to be prime agricultural land. |
| RA     | Riverwash  | Excessively drained sand found on the floodplains. Depth to the water table ranges from 6 to 72 inches. It is frequently flooded. It is not considered to be prime agricultural soil.   |
| RC     | Robinsonville and Convent soils, occasionally flooded    | Robinsonville soils are well drained and found on natural levees. Slopes range from 1-5%. Depth to the water ranges from 48 to 72 inches. Convent soils are somewhat poorly drained and found on natural levees. Slopes range from 0-3%. Depth to the water table ranges from 18 to 48 inches. Both soils are considered to be prime agricultural land.   |
| SH     | Sharkey soils, frequently flooded                        | This poorly drained soil is found on natural levees. Slopes range from 0-1%. Depth to the water table ranges from 0 to 24 inches. It is frequently flooded. It is not considered to be prime agricultural land.   |
| Tu     | Tunica and Sharkey soils, undulating, frequently flooded | Tunica soils are poorly drained and found on natural levees. Slopes range from 1-3%. Depth to the water table ranges from 18 to 36 inches. It frequently floods and is not considered to be prime agricultural land. See description above for Sharkey soils.   |
| UB     | Urban land   | -   |
| We     | Weyanoke silt, 1-3% slopes                               | This well drained soil is found on floodplains. Slopes range from 1-3%. Depth to the water table ranges from 30-48 inches. It rarely floods. It is prime agricultural land.   |

The National Wetlands Inventory mapped the refuge as palustrine broad- and needle leaved deciduous forested wetlands that are temporarily or semi-permanently flooded [PFO1A AND PFO1A/2F] and as persistent palustrine emergent wetlands [PEM1A] (Fig. I-6). The refuge possesses very little acreage that can be classified as uplands, though large expanses of uplands are located adjacent to it.





## Appendix J. Refuge Biota

### BIRDS OF CAT ISLAND NATIONAL WILDLIFE REFUGE

| Common Name                 | Scientific Name                  | Seasonal Occurrence <sup>1</sup> |   |   |   |
|-----------------------------|----------------------------------|----------------------------------|---|---|---|
|                             |                                  | SP                               | S | F | W |
| Pied-billed Grebe           | <i>Podilymbus podiceps</i>       | O                                |   | O | U |
| American White Pelican      | <i>Pelecanus erythrorhynchos</i> | O                                |   | U | U |
| Double-crested Cormorant    | <i>Phalacrocorax auritus</i>     | U                                |   | U | C |
| Anhinga                     | <i>Anhinga anhinga</i>           | U                                | O | R | R |
| Great Blue Heron            | <i>Ardea herodias</i>            | C                                | C | C | C |
| Great Egret                 | <i>Ardea alba</i>                | C                                | C | C | C |
| Snowy Egret                 | <i>Egretta thula</i>             | C                                | C | C | U |
| Little Blue Heron           | <i>Egretta caerulea</i>          | U                                | U | U | U |
| Tricolored Heron            | <i>Egretta tricolor</i>          | R                                | O | R | R |
| Cattle Egret                | <i>Bubulcus ibis</i>             | O                                | O | O | O |
| Green Heron                 | <i>Butorides virescens</i>       | U                                | U | U | U |
| Black-crowned Night-Heron   | <i>Nycticorax nycticorax</i>     | O                                | U | O |   |
| Yellow-crowned Night-Heron  | <i>Nyctanassa violacea</i>       | U                                | U | U |   |
| White Ibis                  | <i>Eudocimus albus</i>           | C                                | C | U |   |
| Roseate Spoonbill           | <i>Platalea ajaja</i>            |                                  | O | R |   |
| Wood Stork                  | <i>Mycteria americana</i>        |                                  | U | O |   |
| Black Vulture               | <i>Coragyps atratus</i>          | C                                | C | C | C |
| Turkey Vulture              | <i>Cathartes aura</i>            | C                                | C | C | C |
| Greater White-fronted Goose | <i>Anser albifrons</i>           |                                  |   | U | U |
| Snow Goose                  | <i>Chen caerulescens</i>         |                                  |   | U | U |
| Ross's Goose                | <i>Chen rossii</i>               |                                  |   | R | R |
| Canada Goose                | <i>Branta canadensis</i>         |                                  |   | R | R |
| Wood Duck                   | <i>Aix sponsa</i>                | C                                | C | C | C |

| Common Name         | Scientific Name                 | Seasonal Occurrence <sup>1</sup> |   |   |   |
|---------------------|---------------------------------|----------------------------------|---|---|---|
|                     |                                 | SP                               | S | F | W |
| Green-winged Teal   | <i>Anas crecca</i>              | U                                |   | U | C |
| Mottled Duck        | <i>Anas fulvigula</i>           | O                                | O | O |   |
| Mallard             | <i>Anas platyrhynchos</i>       | U                                | O | C | C |
| Northern Pintail    | <i>Anas acuta</i>               | R                                |   | R | R |
| Blue-winged Teal    | <i>Anas discors</i>             | C                                |   | C | O |
| Northern Shoveler   | <i>Anas clypeata</i>            | U                                |   | C | C |
| Gadwall             | <i>Anas strepera</i>            | U                                |   | U | C |
| American Wigeon     | <i>Anas americana</i>           | U                                |   | U | C |
| Canvasback          | <i>Aythya valisineria</i>       |                                  |   |   | R |
| Redhead             | <i>Aythya americana</i>         |                                  |   |   | R |
| Lesser Scaup        | <i>Aythya affinis</i>           |                                  |   |   | R |
| Ring-necked Duck    | <i>Aythya collaris</i>          | U                                |   | U | U |
| Greater Scaup       | <i>Aythya marila</i>            |                                  |   |   | R |
| Hooded Merganser    | <i>Lophodytes cucullatus</i>    | U                                | U | U | C |
| Osprey              | <i>Pandion haliaetus</i>        | U                                | U | U | U |
| Swallow-tailed Kite | <i>Elanoides forficatus</i>     | O                                | O |   |   |
| Mississippi Kite    | <i>Ictinia mississippiensis</i> | C                                | C | U |   |
| Bald Eagle          | <i>Haliaeetus leucocephalus</i> |                                  |   |   | R |
| Northern Harrier    | <i>Circus cyaneus</i>           |                                  |   |   | R |
| Sharp-shinned Hawk  | <i>Accipiter striatus</i>       | U                                |   | U | U |
| Cooper's Hawk       | <i>Accipiter cooperi</i>        | U                                | U | C | C |
| Red-shouldered Hawk | <i>Buteo lineatus</i>           | C                                | C | C | C |
| Broad-winged Hawk   | <i>Buteo platypterus</i>        | U                                | U | U |   |
| Red-tailed Hawk     | <i>Buteo jamaicensis</i>        | C                                | U | C | C |
| American Kestrel    | <i>Falco sparverius</i>         | R                                |   | R | U |
| Merlin              | <i>Falco columbarius</i>        | R                                |   | R | R |

| Common Name               | Scientific Name                   | Seasonal Occurrence <sup>1</sup> |   |   |   |
|---------------------------|-----------------------------------|----------------------------------|---|---|---|
|                           |                                   | SP                               | S | F | W |
| Peregrine Falcon          | <i>Falco peregrinus</i>           |                                  |   |   | R |
| Wild Turkey               | <i>Meleagris gallopavo</i>        | U                                | U | U | U |
| American Coot             | <i>Fulica americana</i>           | U                                |   | U | U |
| Killdeer                  | <i>Charadrius vociferus</i>       | U                                | U | U | U |
| Black-necked Stilt        | <i>Himantopus mexicanus</i>       | O                                | U | O | R |
| Greater Yellowlegs        | <i>Tringa melanoleuca</i>         | U                                | R | U | U |
| Lesser Yellowlegs         | <i>Tringa flavipes</i>            | U                                | R | U | R |
| Solitary Sandpiper        | <i>Tringa solitaria</i>           | U                                |   | U |   |
| Spotted Sandpiper         | <i>Actitis macularius</i>         | U                                |   | U |   |
| American Woodcock         | <i>Scolopax minor</i>             | U                                |   | U | U |
| Laughing Gull             | <i>Leucophaeus atricilla</i>      | O                                | O | O | O |
| Ring-billed Gull          | <i>Larus delawarensis</i>         | U                                |   | O | U |
| Forster's Tern            | <i>Sterna forsteri</i>            | O                                | O | O |   |
| Least Tern                | <i>Sternula antillarum</i>        | O                                | O | O |   |
| Mourning Dove             | <i>Zenaida macroura</i>           | C                                | U | U | U |
| Black-billed Cuckoo       | <i>Coccyzus erythrophthalmus</i>  | O                                |   | O |   |
| Yellow-billed Cuckoo      | <i>Coccyzus americanus</i>        | C                                | C | C |   |
| Eastern Screech-Owl       | <i>Megascops asio</i>             | U                                | U | U | U |
| Great Horned Owl          | <i>Bubo virginianus</i>           | U                                | U | U | U |
| Barred Owl                | <i>Strix varia</i>                | C                                | C | C | C |
| Common Nighthawk          | <i>Chordeiles minor</i>           | U                                | O | O |   |
| Chimney Swift             | <i>Chaetura pelagica</i>          | C                                | C | C |   |
| Ruby-throated Hummingbird | <i>Archilochus colubris</i>       | C                                | C | C |   |
| Belted Kingfisher         | <i>Megaceryle alcyon</i>          | U                                | O | U | U |
| Red-headed Woodpecker     | <i>Melanerpes erythrocephalus</i> | C                                | C | C | C |
| Red-bellied Woodpecker    | <i>Melanerpes carolinus</i>       | C                                | C | C | C |

| Common Name                   | Scientific Name                   | Seasonal Occurrence <sup>1</sup> |   |   |   |
|-------------------------------|-----------------------------------|----------------------------------|---|---|---|
|                               |                                   | SP                               | S | F | W |
| Yellow-bellied Sapsucker      | <i>Sphyrapicus varius</i>         | U                                |   | C | C |
| Downy Woodpecker              | <i>Picoides pubescens</i>         | C                                | C | C | C |
| Hairy Woodpecker              | <i>Picoides villosus</i>          | C                                | C | C | C |
| Northern Flicker              | <i>Colaptes auratus</i>           | C                                | U | C | C |
| Pileated Woodpecker           | <i>Dryocopus pileatus</i>         | C                                | C | C | C |
| Olive-sided Flycatcher        | <i>Contopus cooperi</i>           | R                                |   | R |   |
| Eastern Wood-Pewee            | <i>Contopus virens</i>            | C                                | C | U |   |
| Acadian Flycatcher            | <i>Empidonax vireescens</i>       | C                                |   | C | C |
| Eastern Phoebe                | <i>Sayornis phoebe</i>            | U                                | C | C |   |
| Great Crested Flycatcher      | <i>Myiarchus crinitus</i>         | C                                | C | U |   |
| Eastern Kingbird              | <i>Tyrannus tyrannus</i>          | U                                | U | U |   |
| Loggerhead Shrike             | <i>Lanius ludovicianus</i>        |                                  |   | O | O |
| White-eyed Vireo              | <i>Vireo griseus</i>              | C                                | C | C | U |
| Yellow-throated Vireo         | <i>Vireo flavifrons</i>           | C                                | C | C |   |
| Blue-headed Vireo             | <i>Vireo solitarius</i>           | U                                |   | U | U |
| Red-eyed Vireo                | <i>Vireo olivaceus</i>            | C                                | C | C |   |
| Blue Jay                      | <i>Cyanocitta cristata</i>        | C                                | C | C | C |
| American Crow                 | <i>Corvus brachyrhynchos</i>      | C                                | C | C | C |
| Fish Crow                     | <i>Corvus ossifragus</i>          | C                                | C | C | C |
| Purple Martin                 | <i>Progne subis</i>               | C                                | U | U |   |
| Tree Swallow                  | <i>Tachycineta bicolor</i>        | C                                |   | C | O |
| Northern Rough-winged Swallow | <i>Stelgidopteryx serripennis</i> | U                                | C | U |   |
| Barn Swallow                  | <i>Hirundo rustica</i>            | U                                | C | R |   |
| Carolina Chickadee            | <i>Parus carolinensis</i>         | C                                | C | C | C |
| Tufted Titmouse               | <i>Parus bicolor</i>              | C                                | C | C | C |
| Brown Creeper                 | <i>Certhia americana</i>          | R                                |   | U | U |

| Common Name            | Scientific Name                 | Seasonal Occurrence <sup>1</sup> |   |   |   |
|------------------------|---------------------------------|----------------------------------|---|---|---|
|                        |                                 | SP                               | S | F | W |
| Carolina Wren          | <i>Thryothorus ludovicianus</i> | C                                | C | C | C |
| House Wren             | <i>Troglodytes aedon</i>        | U                                |   | U | C |
| Winter Wren            | <i>Troglodytes troglodytes</i>  | U                                |   | U | U |
| Sedge Wren             | <i>Cistothorus platensis</i>    | U                                |   | U | U |
| Golden-crowned Kinglet | <i>Regulus satrapa</i>          | R                                |   | R | U |
| Ruby-crowned Kinglet   | <i>Regulus calendula</i>        | C                                |   | C | C |
| Blue-gray Gnatcatcher  | <i>Polioptila caerulea</i>      | C                                | C | C | C |
| Eastern Bluebird       | <i>Sialia sialis</i>            | O                                | R | O | O |
| Veery                  | <i>Catharus fuscescens</i>      | U                                |   | U |   |
| Gray-cheeked Thrush    | <i>Catharus minimus</i>         | U                                |   | U |   |
| Swainson's Thrush      | <i>Catharus ustulatus</i>       | U                                |   | U |   |
| Hermit Thrush          | <i>Catharus guttatus</i>        | U                                |   | U | C |
| Wood Thrush            | <i>Hylocichla mustelina</i>     | C                                | C | C |   |
| American Robin         | <i>Turdus migratorius</i>       | U                                | R | C | C |
| Gray Catbird           | <i>Dumetella carolinensis</i>   | U                                | O | U | U |
| Brown Thrasher         | <i>Toxostoma rufum</i>          | U                                | U | U | U |
| Cedar Waxwing          | <i>Bombycilla cedrorum</i>      | C                                |   | U | U |
| Blue-winged Warbler    | <i>Vermivora cyanoptera</i>     | U                                |   | U |   |
| Golden-winged Warbler  | <i>Vermivora chrysoptera</i>    | R                                |   | R |   |
| Tennessee Warbler      | <i>Oreothlypis peregrina</i>    | U                                |   | U |   |
| Orange-crowned Warbler | <i>Oreothlypis celata</i>       | U                                |   | C | C |
| Nashville Warbler      | <i>Oreothlypis ruficapilla</i>  | U                                |   | U |   |
| Northern Parula        | <i>Setophaga americana</i>      | C                                |   | C | C |
| Yellow Warbler         | <i>Setophaga petechia</i>       | C                                |   | C |   |
| Chestnut-sided Warbler | <i>Setophaga pensylvanica</i>   | U                                |   | U |   |
| Magnolia Warbler       | <i>Setophaga magnolia</i>       | U                                |   | U |   |

| Common Name                  | Scientific Name                | Seasonal Occurrence <sup>1</sup> |   |   |   |
|------------------------------|--------------------------------|----------------------------------|---|---|---|
|                              |                                | SP                               | S | F | W |
| Yellow-rumped Warbler        | <i>Setophaga coronata</i>      | C                                |   | C | C |
| Black-throated Blue Warbler  | <i>Setophaga caerulescens</i>  | R                                |   |   |   |
| Black-throated Green Warbler | <i>Setophaga virens</i>        | U                                |   | C |   |
| Blackburnian Warbler         | <i>Setophaga fusca</i>         | R                                |   | R |   |
| Yellow-throated Warbler      | <i>Setophaga dominica</i>      | U                                | U | U |   |
| Prairie Warbler              | <i>Setophaga discolor</i>      | R                                |   | R |   |
| Palm Warbler                 | <i>Setophaga palmarum</i>      | U                                |   | U | U |
| Bay-breasted Warbler         | <i>Setophaga castanea</i>      | U                                |   | U |   |
| Blackpoll Warbler            | <i>Setophaga striata</i>       | R                                |   | R |   |
| Cerulean Warbler             | <i>Setophaga cerulea</i>       | R                                |   | R |   |
| Black-and-white Warbler      | <i>Mniotilta varia</i>         | U                                |   | U | R |
| American Redstart            | <i>Setophaga ruticilla</i>     | U                                | U | C |   |
| Prothonotary Warbler         | <i>Protonotaria citrea</i>     | C                                | C | C |   |
| Worm-eating Warbler          | <i>Helmitheros vermivora</i>   | U                                | R | U |   |
| Swainson's Warbler           | <i>Limnothlypis swainsonii</i> | U                                | U | U |   |
| Ovenbird                     | <i>Seiurus aurocapillus</i>    | U                                |   | U |   |
| Northern Waterthrush         | <i>Parkesia noveboracensis</i> | U                                |   | U |   |
| Louisiana Waterthrush        | <i>Parkesia motacilla</i>      | R                                |   | R |   |
| Kentucky Warbler             | <i>Geothlypis formosa</i>      | U                                | U | U |   |
| Common Yellowthroat          | <i>Geothlypis trichas</i>      | C                                | C | C | C |
| Hooded Warbler               | <i>Setophaga citrina</i>       | C                                | C | C |   |
| Wilson's Warbler             | <i>Cardellina pusilla</i>      | U                                |   | U | U |
| Yellow-breasted Chat         | <i>Icteria virens</i>          | C                                | C | C |   |
| Summer Tanager               | <i>Piranga rubra</i>           | C                                | C | C |   |
| Scarlet Tanager              | <i>Piranga olivacea</i>        | O                                |   | O |   |
| Eastern Towhee               | <i>Pipilo erythrophthalmus</i> | C                                | C | C | C |

| Common Name                   | Scientific Name                  | Seasonal Occurrence <sup>1</sup> |   |   |   |
|-------------------------------|----------------------------------|----------------------------------|---|---|---|
|                               |                                  | SP                               | S | F | W |
| <b>Savannah Sparrow</b>       | <i>Passerculus sandwichensis</i> | C                                |   | C | C |
| <b>Song Sparrow</b>           | <i>Melospiza melodia</i>         | U                                |   | U | U |
| <b>Swamp Sparrow</b>          | <i>Melospiza georgiana</i>       | C                                |   | C | C |
| <b>White-throated Sparrow</b> | <i>Zonotrichia albicollis</i>    | C                                |   | C | C |
| <b>Dark-eyed Junco</b>        | <i>Junco hyemalis</i>            | U                                |   | U | U |
| <b>Northern Cardinal</b>      | <i>Cardinalis cardinalis</i>     | C                                | C | C | C |
| <b>Rose-breasted Grosbeak</b> | <i>Pheucticus ludovicianus</i>   | U                                |   | U |   |
| <b>Blue Grosbeak</b>          | <i>Passerina caerulea</i>        | C                                |   | C |   |
| <b>Indigo Bunting</b>         | <i>Passerina cyanea</i>          | C                                | C | C |   |
| <b>Painted Bunting</b>        | <i>Passerina ciris</i>           | C                                | C | C |   |
| <b>Red-winged Blackbird</b>   | <i>Agelaius phoeniceus</i>       | C                                | C | C | C |
| <b>Common Grackle</b>         | <i>Quiscalus quiscula</i>        | C                                | C | C | C |
| <b>Brown-headed Cowbird</b>   | <i>Molothrus ater</i>            | C                                | C | C | C |
| <b>Orchard Oriole</b>         | <i>Icterus spurius</i>           | C                                | C | U |   |
| <b>Baltimore Oriole</b>       | <i>Icterus galbula</i>           | U                                |   | U |   |
| <b>American Goldfinch</b>     | <i>Spinus tristis</i>            | C                                |   | U | C |

<sup>1</sup>C=common; U=uncommon; R=rare; O=occasional.

**COMMON FOREST TREES OF CAT ISLAND NATIONAL WILDLIFE REFUGE**

| <b>Family</b>       | <b>Common Name</b>                 | <b>Scientific Name</b>        |
|---------------------|------------------------------------|-------------------------------|
| <b>Cupressaceae</b> | <b>Baldcypress</b>                 | <i>Taxodium distichum</i>     |
| <b>Salicaceae</b>   | <b>Eastern cottonwood</b>          | <i>Populus deltoides</i>      |
|                     | <b>Black willow</b>                | <i>Salix nigra</i>            |
| <b>Juglandaceae</b> | <b>Pecan</b>                       | <i>Carya illinoensis</i>      |
|                     | <b>Water hickory, bitter pecan</b> | <i>Carya aquatica</i>         |
| <b>Fagaceae</b>     | <b>Overcup oak</b>                 | <i>Quercus lyrata</i>         |
|                     | <b>Nuttall oak</b>                 | <i>Quercus texana</i>         |
| <b>Ulmaceae</b>     | <b>Sugarberry</b>                  | <i>Celtis laevigata</i>       |
|                     | <b>American elm</b>                | <i>Ulmus americana</i>        |
|                     | <b>Planertree (waterelm)</b>       | <i>Planera aquatica</i>       |
| <b>Platanaceae</b>  | <b>American sycamore</b>           | <i>Platanus occidentalis</i>  |
| <b>Fabaceae</b>     | <b>Waterlocust</b>                 | <i>Gleditsia aquatica</i>     |
|                     | <b>Honeylocust</b>                 | <i>Gleditsia triacanthos</i>  |
| <b>Aceraceae</b>    | <b>Boxelder</b>                    | <i>Acer negundo</i>           |
|                     | <b>Red maple</b>                   | <i>Acer rubrum</i>            |
| <b>Nyssaceae</b>    | <b>Water tupelo</b>                | <i>Nyssa aquatica</i>         |
| <b>Ebenaceae</b>    | <b>Common persimmon</b>            | <i>Diospyros virginiana</i>   |
| <b>Oleaceae</b>     | <b>Green ash</b>                   | <i>Fraxinus pennsylvanica</i> |

**FISH WHICH MAY OCCUR ON CAT ISLAND NATIONAL WILDLIFE REFUGE**

| <b>Family</b>                     | <b>Common Name</b>            | <b>Scientific Name</b>              |
|-----------------------------------|-------------------------------|-------------------------------------|
| <b>Lampreys (Petromyzontidae)</b> | <b>Southern brook lamprey</b> | <i>Ichthyomyzon gagei</i>           |
|                                   | <b>Least brook lamprey</b>    | <i>Lampetra aepyptera</i>           |
| <b>Sturgeons (Acipenseridae)</b>  | <b>Pallid sturgeon</b>        | <i>Scaphirhynchus albus</i>         |
|                                   | <b>Shovelnose sturgeon</b>    | <i>Scaphirhynchus platyrhynchus</i> |
| <b>Paddlefish (Polyodontidae)</b> | <b>Paddlefish</b>             | <i>Polyodon spathula</i>            |
| <b>Bowfins (Amiidae)</b>          | <b>Bowfin</b>                 | <i>Amia calva</i>                   |
| <b>Gar (Lepisosteidae)</b>        | <b>Alligator gar</b>          | <i>Atractosteus spatula</i>         |
|                                   | <b>Spotted gar</b>            | <i>Lepisosteus oculatus</i>         |
|                                   | <b>Longnose gar</b>           | <i>Lepisosteus osseus</i>           |
|                                   | <b>Shortnose gar</b>          | <i>Lepisosteus platostomus</i>      |
| <b>Herring (Clupeidae)</b>        | <b>Skipjack shad</b>          | <i>Alosa chrysochloris</i>          |
|                                   | <b>American gizzard shad</b>  | <i>Dorosoma cepedianum</i>          |
|                                   | <b>Threadfin shad</b>         | <i>Dorosoma petenense</i>           |
| <b>Mooneyes (Hiodontidae)</b>     | <b>Goldeye</b>                | <i>Hiodon alosoides</i>             |
|                                   | <b>Mooneye</b>                | <i>Hiodon tergisus</i>              |
| <b>Pikes (Esocidae)</b>           | <b>Grass pickerel</b>         | <i>Esox americanus</i>              |
|                                   | <b>Chain pickerel</b>         | <i>Esox niger</i>                   |
| <b>Suckers (Catostomidae)</b>     | <b>River carpsucker</b>       | <i>Carpionodes carpio</i>           |
|                                   | <b>Highfin carpsucker</b>     | <i>Carpionodes velifer</i>          |
|                                   | <b>Creek chubsucker</b>       | <i>Erimyzon oblongus</i>            |
|                                   | <b>Lake chubsucker</b>        | <i>Erimyzon sucetta</i>             |
|                                   | <b>Northern hogsucker</b>     | <i>Hypentelium nigricans</i>        |
|                                   | <b>Smallmouth buffalo</b>     | <i>Ictiobus bubalus</i>             |

| <b>Family</b>                | <b>Common Name</b>                | <b>Scientific Name</b>         |
|------------------------------|-----------------------------------|--------------------------------|
|                              | <b>Bigmouth buffalo</b>           | <i>Ictiobus cyprinellus</i>    |
|                              | <b>Spotted sucker</b>             | <i>Minytrema melanops</i>      |
|                              | <b>Golden redhorse</b>            | <i>Moxostoma erythrurum</i>    |
|                              | <b>Blacktail Redhorse</b>         | <i>Moxostoma poecilurum</i>    |
| <b>Minnnows (Cyprinidae)</b> | <b>Central stoneroller</b>        | <i>Campostoma anomalum</i>     |
|                              | <b>Southern redbelly dace</b>     | <i>Chrosomus erythrogaster</i> |
|                              | <b>Grass carp</b>                 | <i>Ctenopharyngodon idella</i> |
|                              | <b>Blunface shiner</b>            | <i>Cyprinella camura</i>       |
|                              | <b>Red shiner</b>                 | <i>Cyprinella lutrensis</i>    |
|                              | <b>Blacktail Shiner</b>           | <i>Cyprinella venusta</i>      |
|                              | <b>Steelcolor shiner</b>          | <i>Cyprinella whipplei</i>     |
|                              | <b>Common carp</b>                | <i>Cyprinus carpio</i>         |
|                              | <b>Cypress minnow</b>             | <i>Hybognathus hayi</i>        |
|                              | <b>Mississippi silvery minnow</b> | <i>Hybognathus nuchalis</i>    |
|                              | <b>Striped shiner</b>             | <i>Luxilus chrysocephalus</i>  |
|                              | <b>Ribbon shiner</b>              | <i>Lythrurus fumeus</i>        |
|                              | <b>Cherryfin shiner</b>           | <i>Lythrurus roseipinnis</i>   |
|                              | <b>Redfin shiner</b>              | <i>Lythrurus umbratilis</i>    |
|                              | <b>Speckled Chub</b>              | <i>Macrhybopsis aestivalis</i> |
|                              | <b>Sicklefin chub</b>             | <i>Macrhybopsis meeki</i>      |
|                              | <b>Silver Chub</b>                | <i>Macrhybopsis storeriana</i> |
|                              | <b>Bluehead chub</b>              | <i>Nocomis leptcephalus</i>    |
|                              | <b>Golden shiner</b>              | <i>Notemigonus crysoleucas</i> |
|                              | <b>Golden shiner</b>              | <i>Notemigonus crysoleucas</i> |

| <b>Family</b>                | <b>Common Name</b>       | <b>Scientific Name</b>         |
|------------------------------|--------------------------|--------------------------------|
|                              | <b>Pallid Shiner</b>     | <i>Hybopsis amnis</i>          |
|                              | <b>Emerald Shiner</b>    | <i>Notropis atherinoides</i>   |
|                              | <b>River shiner</b>      | <i>Notropis blennius</i>       |
|                              | <b>Silverjaw Minnow</b>  | <i>Ericymba buccata</i>        |
|                              | <b>Ghost Shiner</b>      | <i>Notropis buchanani</i>      |
|                              | <b>Longnose Shiner</b>   | <i>Notropis longirostris</i>   |
|                              | <b>Taillight Shiner</b>  | <i>Notropis maculatus</i>      |
|                              | <b>Silverband Shiner</b> | <i>Notropis shumardi</i>       |
|                              | <b>Weed Shiner</b>       | <i>Notropis texanus</i>        |
|                              | <b>Mimic shiner</b>      | <i>Notropis volucellus</i>     |
|                              | <b>Channel Shiner</b>    | <i>Notropis wickliffi</i>      |
|                              | <b>Pugnose minnow</b>    | <i>Opsopoeodus emiliae</i>     |
|                              | <b>Bluntnose minnow</b>  | <i>Pimephales notatus</i>      |
|                              | <b>Bullhead minnow</b>   | <i>Pimephales vigilax</i>      |
|                              | <b>Creek chub</b>        | <i>Semotilus atromaculatus</i> |
| <b>Catfish (Ictaluridae)</b> | <b>Black bullhead</b>    | <i>Ameiurus melas</i>          |
|                              | <b>Yellow bullhead</b>   | <i>Ameiurus natalis</i>        |
|                              | <b>Brown bullhead</b>    | <i>Ameiurus nebulosus</i>      |
|                              | <b>Blue catfish</b>      | <i>Ictalurus furcatus</i>      |
|                              | <b>Channel catfish</b>   | <i>Ictalurus punctatus</i>     |
|                              | <b>Tadpole madtom</b>    | <i>Noturus gyrinus</i>         |
|                              | <b>Least madtom</b>      | <i>Noturus hildebrandi</i>     |
|                              | <b>Brindled Madtom</b>   | <i>Noturus miurus</i>          |
|                              | <b>Freckled Madtom</b>   | <i>Noturus nocturnus</i>       |

| <b>Family</b>                        | <b>Common Name</b>            | <b>Scientific Name</b>         |
|--------------------------------------|-------------------------------|--------------------------------|
|                                      | <b>Brown madtom</b>           | <i>Noturus phaeus</i>          |
|                                      | <b>Flathead catfish</b>       | <i>Pylodictis olivaris</i>     |
| <b>Eels (Anguillidae)</b>            | <b>American eel</b>           | <i>Anguilla rostrata</i>       |
| <b>Killifish (Fundulidae)</b>        | <b>Northern studfish</b>      | <i>Fundulus catenatus</i>      |
|                                      | <b>Golden topminnow</b>       | <i>Fundulus chrysotus</i>      |
|                                      | <b>Blackstripe topminnow</b>  | <i>Fundulus notatus</i>        |
|                                      | <b>Blackspotted topminnow</b> | <i>Fundulus olivaceus</i>      |
| <b>Topminnows (Poeciliidae)</b>      | <b>Mosquito fish</b>          | <i>Gambusia affinis</i>        |
| <b>Pirate perch (Aphredoderidae)</b> | <b>Pirate perch</b>           | <i>Aphredoderus sayanus</i>    |
| <b>Silversides (Atherinopsidae)</b>  | <b>Brook silverside</b>       | <i>Labidesthes sicculus</i>    |
|                                      | <b>Inland silverside</b>      | <i>Menidia beryllina</i>       |
| <b>Bass (Moronidae)</b>              | <b>White bass</b>             | <i>Morone chrysops</i>         |
|                                      | <b>White bass</b>             | <i>Morone chrysops</i>         |
|                                      | <b>Yellow Bass</b>            | <i>Morone mississippiensis</i> |
|                                      | <b>Striped bass</b>           | <i>Morone saxatilis</i>        |
| <b>Pygmy sunfish (Elassomatidae)</b> | <b>Banded pygmy sunfish</b>   | <i>Elassoma zonatum</i>        |
| <b>Sunfish (Centrarchidae)</b>       | <b>Shadow bass</b>            | <i>Ambloplites ariommus</i>    |
|                                      | <b>Flier</b>                  | <i>Centrarchus macropterus</i> |
|                                      | <b>Redbreast sunfish</b>      | <i>Lepomis auritus</i>         |
|                                      | <b>Green sunfish</b>          | <i>Lepomis cyanellus</i>       |
|                                      | <b>Warmouth</b>               | <i>Lepomis gulosus</i>         |
|                                      | <b>Orange spotted sunfish</b> | <i>Lepomis humilis</i>         |
|                                      | <b>Bluegill</b>               | <i>Lepomis macrochirus</i>     |
|                                      | <b>Dollar sunfish</b>         | <i>Lepomis marginatus</i>      |

| <b>Family</b>           | <b>Common Name</b>        | <b>Scientific Name</b>         |
|-------------------------|---------------------------|--------------------------------|
|                         | <b>Longear sunfish</b>    | <i>Lepomis megalotis</i>       |
|                         | <b>Redear sunfish</b>     | <i>Lepomis microlophus</i>     |
|                         | <b>Redspotted sunfish</b> | <i>Lepomis miniatus</i>        |
|                         | <b>Bantam sunfish</b>     | <i>Lepomis symmetricus</i>     |
|                         | <b>Spotted bass</b>       | <i>Micropterus punctulatus</i> |
|                         | <b>Largemouth bass</b>    | <i>Micropterus salmoides</i>   |
|                         | <b>White crappie</b>      | <i>Pomoxis annularis</i>       |
|                         | <b>Black crappie</b>      | <i>Pomoxis nigromaculatus</i>  |
| <b>Perch (Percidae)</b> | <b>Naked sand darter</b>  | <i>Ammocrypta beanii</i>       |
|                         | <b>Scaly sand darter</b>  | <i>Ammocrypta vivax</i>        |
|                         | <b>Mud darter</b>         | <i>Etheostoma asprigene</i>    |
|                         | <b>Rainbow darter</b>     | <i>Etheostoma caeruleum</i>    |
|                         | <b>Bluntnose darter</b>   | <i>Etheostoma chlorosomum</i>  |
|                         | <b>Swamp darter</b>       | <i>Etheostoma fusiforme</i>    |
|                         | <b>Slough darter</b>      | <i>Etheostoma gracile</i>      |
|                         | <b>Harlequin darter</b>   | <i>Etheostoma histrio</i>      |
|                         | <b>Goldstripe darter</b>  | <i>Etheostoma parvipinne</i>   |
|                         | <b>Cypress darter</b>     | <i>Etheostoma proeliare</i>    |
|                         | <b>Speckled darter</b>    | <i>Etheostoma stigmaeum</i>    |
|                         | <b>Gulf darter</b>        | <i>Etheostoma swaini</i>       |
|                         | <b>Blackside darter</b>   | <i>Percina maculata</i>        |
|                         | <b>Dusky darter</b>       | <i>Percina sciera</i>          |
|                         | <b>River darter</b>       | <i>Percina shumardi</i>        |
|                         | <b>Saddleback Darter</b>  | <i>Percina vigil</i>           |

| Family                    | Common Name            | Scientific Name              |
|---------------------------|------------------------|------------------------------|
|                           | <b>Redfin darter</b>   | <i>Etheostoma whipplei</i>   |
|                           | <b>Sauger</b>          | <i>Sander canadensis</i>     |
| <b>Drums (Sciaenidae)</b> | <b>Freshwater drum</b> | <i>Aplodinotus grunniens</i> |

**REPTILES AND AMPHIBIANS KNOWN OR EXPECTED ON CAT ISLAND NATIONAL WILDLIFE REFUGE**

| Class      | Order       | Family                               | Common Name                      | Scientific Name                     |
|------------|-------------|--------------------------------------|----------------------------------|-------------------------------------|
| Crocodylia | Alligatoria | Alligatoridae                        | <b>American alligator</b>        | <i>Alligator mississippiensis</i>   |
| Chelonia   | Cryptodeira | Snapping Turtles (Chelydridae)       | <b>Snapping turtle</b>           | <i>Chelydra serpentina</i>          |
|            |             |                                      | <b>Alligator snapping turtle</b> | <i>Macrochelys temminckii</i>       |
|            |             | Musk and Mud Turtles (Kinosternidae) | <b>Eastern mud turtle</b>        | <i>Kinosternon subrubrum</i>        |
|            |             |                                      | <b>Razor-backed musk turtle</b>  | <i>Sternotherus carinatus</i>       |
|            |             |                                      | <b>Eastern musk turtle</b>       | <i>Sternotherus odoratus</i>        |
|            |             | Box and Water Turtles (Emydidae)     | <b>Southern painted turtle</b>   | <i>Chrysemys dorsalis</i>           |
|            |             |                                      | <b>Chicken turtle</b>            | <i>Deirochelys reticularia</i>      |
|            |             |                                      | <b>False map turtle</b>          | <i>Graptemys pseudogeographica</i>  |
|            |             |                                      | <b>River cooter</b>              | <i>Pseudemys concinna</i>           |
|            |             |                                      | <b>Three-toed box turtle</b>     | <i>Terrapene carolina triunguis</i> |
|            |             |                                      | <b>Pond slider</b>               | <i>Trachemys scripta</i>            |

| Class    | Order                            | Family                              | Common Name                    | Scientific Name                |
|----------|----------------------------------|-------------------------------------|--------------------------------|--------------------------------|
|          |                                  | Softshell Turtles<br>(Trionychidae) | <b>Smooth softshell</b>        | <i>Apalone mutica</i>          |
|          |                                  |                                     | <b>Spiny softshell</b>         | <i>Apalone spinifera</i>       |
| Reptilia | Lizards and Snakes<br>(Squamata) | Geckos<br>(Gekkonidae)              | <b>Mediterranean gecko</b>     | <i>Hemidactylus turcicus</i>   |
|          |                                  | Anoles<br>(Polychrotidae)           | <b>Green anole</b>             | <i>Anolis carolinensis</i>     |
|          |                                  | Spiny Lizards<br>(Phrynosomatidae)  | <b>Fence lizard</b>            | <i>Sceloporus undulatus</i>    |
|          |                                  | Whiptails (Teiidae)                 | <b>Six-lined racerunner</b>    | <i>Aspidoscelis sexlineata</i> |
|          |                                  | Skins (Scincidae)                   | <b>Coal skink</b>              | <i>Plestiodon anthracinus</i>  |
|          |                                  |                                     | <b>Common five-lined skink</b> | <i>Plestiodon fasciatus</i>    |
|          |                                  |                                     | <b>Broad-headed skink</b>      | <i>Plestiodon laticeps</i>     |
|          |                                  |                                     | <b>Ground skink</b>            | <i>Scincella lateralis</i>     |
|          |                                  | Glass Lizards<br>(Anguidae)         | <b>Slender glass lizard</b>    | <i>Ophisaurus attenuatus</i>   |
|          |                                  | Colubrids<br>(Colubridae)           | <b>Eastern worm snake</b>      | <i>Carphophis amoenus</i>      |
|          |                                  |                                     | <b>Racer</b>                   | <i>Coluber constrictor</i>     |
|          |                                  |                                     | <b>Ring-necked snake</b>       | <i>Diadophis punctatus</i>     |
|          |                                  |                                     | <b>Mud snake</b>               | <i>Farancia abacura</i>        |
|          |                                  |                                     | <b>Eastern hog-nosed snake</b> | <i>Heterodon platirhinos</i>   |
|          |                                  |                                     | <b>Scarlet kingsnake</b>       | <i>Lampropeltis elapsoides</i> |
|          |                                  |                                     | <b>Speckled kingsnake</b>      | <i>Lampropeltis getula</i>     |
|          |                                  |                                     | <b>Milk snake</b>              | <i>Lampropeltis triangulum</i> |

| Class | Order | Family             | Common Name                   | Scientific Name                  |
|-------|-------|--------------------|-------------------------------|----------------------------------|
|       |       |                    | Mississippi green water snake | <i>Nerodia cyclopion</i>         |
|       |       |                    | Yellow-bellied water snake    | <i>Nerodia erythrogaster</i>     |
|       |       |                    | Banded water snake            | <i>Nerodia fasciata</i>          |
|       |       |                    | Diamond-backed water snake    | <i>Nerodia rhombifer</i>         |
|       |       |                    | Common water snake            | <i>Nerodia sipedon</i>           |
|       |       |                    | Rough green snake             | <i>Opheodrys aestivus</i>        |
|       |       |                    | Red corn snake                | <i>Pantherophis guttata</i>      |
|       |       |                    | Western rat snake             | <i>Pantherophis obsoleta</i>     |
|       |       |                    | Gray rat snake                | <i>Pantherophis spiloides</i>    |
|       |       |                    | Graham's crayfish snake       | <i>Regina grahamii</i>           |
|       |       |                    | Glossy crayfish snake         | <i>Regina rigida</i>             |
|       |       |                    | Brown snake                   | <i>Storeria dekayi</i>           |
|       |       |                    | Red-bellied snake             | <i>Storeria occipitomaculata</i> |
|       |       |                    | Western ribbon snake          | <i>Thamnophis proximus</i>       |
|       |       |                    | Common garter snake           | <i>Thamnophis sirtalis</i>       |
|       |       |                    | Rough earth snake             | <i>Virginia striatula</i>        |
|       |       |                    | Smooth earth snake            | <i>Virginia valeriae</i>         |
|       |       | Vipers (Viperidae) | Copperhead                    | <i>Agkistrodon contortrix</i>    |
|       |       |                    | Cottonmouth                   | <i>Agkistrodon piscivorus</i>    |

| Class    | Order   | Family                                      | Common Name                              | Scientific Name                      |
|----------|---------|---|--|--------------------------------------|
|          |         |   | <b>Timber rattlesnake</b>                | <i>Crotalus horridus</i>             |
|          |         |   | <b>Pygmy rattlesnake</b>                 | <i>Sistrurus miliarius</i>           |
| Amphibia | Caudata | Amphiumas<br>(Amphiumidae)                  | <b>Three-toed<br/>amphiuma</b>           | <i>Amphiuma<br/>tridactylum</i>      |
|          |         | Sirens (Sirenidae)                          | <b>Lesser siren</b>                      | <i>Siren intermedia</i>              |
|          |         | Mudpuppies<br>(Proteidae)                   | <b>Gulf Coast waterdog</b>               | <i>Necturus beyeri</i>               |
|          |         | Mole Salamanders<br>(Ambystomatidae)        | <b>Spotted salamander</b>                | <i>Ambystoma<br/>maculatum</i>       |
|          |         |   | <b>Marbled salamander</b>                | <i>Ambystoma opacum</i>              |
|          |         |   | <b>Mole salamander</b>                   | <i>Ambystoma<br/>talpoideum</i>      |
|          |         |   | <b>Small-mouthed<br/>salamander</b>      | <i>Ambystoma texanum</i>             |
|          |         | Newts<br>(Salamandridae)                    | <b>Eastern newt</b>                      | <i>Notophthalmus<br/>viridescens</i> |
|          |         | Lungless<br>Salamanders<br>(Plethodontidae) | <b>Southern dusky<br/>salamander</b>     | <i>Desmognathus<br/>auriculatus</i>  |
|          |         |   | <b>Spotted dusky<br/>salamander</b>      | <i>Desmognathus<br/>conanti</i>      |
|          |         |   | <b>Southern two-lined<br/>salamander</b> | <i>Eurycea cirrigera</i>             |
|          |         |   | <b>Three-lined<br/>salamander</b>        | <i>Eurycea guttolineata</i>          |
|          |         |   | <b>Dwarf salamander</b>                  | <i>Eurycea<br/>quadridigitata</i>    |
|          |         |   | <b>Mississippi slimy<br/>salamander</b>  | <i>Plethodon mississippi</i>         |
|          |         |   | <b>Webster's<br/>salamander</b>          | <i>Plethodon websteri</i>            |
|          |         |   | <b>Red salamander</b>                    | <i>Pseudotriton ruber</i>            |

| <b>Class</b> | <b>Order</b>            | <b>Family</b>                    | <b>Common Name</b>                 | <b>Scientific Name</b>            |
|--------------|-------------------------|----------------------------------|------------------------------------|-----------------------------------|
|              | Frogs and Toads (Anura) | Spadefoots (Scaphiopodidae)      | <b>Eastern spadefoot</b>           | <i>Scaphiopus holbrookii</i>      |
|              |                         | Toads (Bufonidae)                | <b>American toad</b>               | <i>Anaxyrus americanus</i>        |
|              |                         |                                  | <b>Fowler's toad</b>               | <i>Anaxyrus fowleri</i>           |
|              |                         |                                  | <b>Southern toad</b>               | <i>Anaxyrus terrestris</i>        |
|              |                         |                                  | <b>Gulf Coast toad</b>             | <i>Incilius nebulifer</i>         |
|              |                         | Treefrogs (Hylidae)              | <b>Blanchard's cricket frog</b>    | <i>Acris blanchardi</i>           |
|              |                         |                                  | <b>Southern cricket frog</b>       | <i>Acris gryllus</i>              |
|              |                         |                                  | <b>Bird-voiced treefrog</b>        | <i>Hyla avivoca</i>               |
|              |                         |                                  | <b>Cope's gray treefrog</b>        | <i>Hyla chrysoscelis</i>          |
|              |                         |                                  | <b>Green treefrog</b>              | <i>Hyla cinerea</i>               |
|              |                         |                                  | <b>Barking treefrog</b>            | <i>Hyla gratiosa</i>              |
|              |                         |                                  | <b>Squirrel treefrog</b>           | <i>Hyla squirella</i>             |
|              |                         |                                  | <b>Gray treefrog</b>               | <i>Hyla versicolor</i>            |
|              |                         |                                  | <b>Spring peeper</b>               | <i>Pseudacris crucifer</i>        |
|              |                         |                                  | <b>Cajun chorus frog</b>           | <i>Pseudacris fouquettei</i>      |
|              |                         | Narrowmouth Toads (Microhylidae) | <b>Eastern narrow-mouthed toad</b> | <i>Gastrophryne carolinensis</i>  |
|              |                         | True Frogs (Ranidae)             | <b>Green frog</b>                  | <i>Lithobates clamitans</i>       |
|              |                         |                                  | <b>American bullfrog</b>           | <i>Lithobates catesbeianus</i>    |
|              |                         |                                  | <b>Pickerel frog</b>               | <i>Lithobates palustris</i>       |
|              |                         |                                  | <b>Southern leopard frog</b>       | <i>Lithobates sphenoccephalus</i> |

**MAMMALS PRESENT OR HISTORICALLY KNOWN FROM CAT ISLAND NATIONAL WILDLIFE REFUGE**

| <b>Order</b>    | <b>Family</b>                     | <b>Common Name</b>                | <b>Scientific Name</b>          |                             |
|-----------------|-----------------------------------|-----------------------------------|---------------------------------|-----------------------------|
| Didelphimorphia | Didelphidae                       | <b>Virginia opossum</b>           | <i>Didelphis virginiana</i>     |                             |
| Carnivora       | Weasels<br>(Mustelidae)           | <b>Northern river otter</b>       | <i>Lontra canadensis</i>        |                             |
|                 |                                   | <b>Long-tailed weasel</b>         | <i>Mustela frenata</i>          |                             |
|                 |                                   | <b>Mink</b>                       | <i>Mustela vison</i>            |                             |
|                 | Raccoons<br>(Procyonidae)         | <b>Common raccoon</b>             | <i>Procyon lotor</i>            |                             |
|                 | Skunks (Mephitidae)               | <b>Striped skunk</b>              | <i>Mephitis mephitis</i>        |                             |
|                 |                                   | <b>Spotted skunk</b>              | <i>Spilogale putorius</i>       |                             |
|                 | Bears (Ursidae)                   | <b>American black bear</b>        | <i>Ursus americanus</i>         |                             |
|                 | Dogs (Canidae)                    | <b>Coyote</b>                     | <i>Canis latrans</i>            |                             |
|                 |                                   | <b>Gray fox</b>                   | <i>Urocyon cinereoargenteus</i> |                             |
|                 |                                   | <b>Red fox</b>                    | <i>Vulpes vulpes</i>            |                             |
|                 | Cats (Felidae)                    | <b>Bobcat</b>                     | <i>Lynx rufus</i>               |                             |
|                 |                                   | <b>Mountain lion</b>              | <i>Puma concolor</i>            |                             |
| Artiodactyla    | Deer (Cervidae)                   | <b>White-tailed deer</b>          | <i>Odocoileus virginianus</i>   |                             |
|                 | Pigs (Suidae)                     | <b>Wild pig, feral swine</b>      | <i>Sus scrofa</i>               |                             |
| Chiroptera      | Free-tailed bats<br>(Molossidae)  | <b>Mexican free-tailed bat</b>    | <i>Tadarida brasiliensis</i>    |                             |
|                 | Vesper bats<br>(Vespertilionidae) | <b>Rafinesque's big eared bat</b> | <i>Corynorhinus rafinesquii</i> |                             |
|                 |                                   | <b>Big brown bat</b>              | <i>Eptesicus fuscus</i>         |                             |
|                 |                                   |                                   | <b>Eastern red bat</b>          | <i>Lasiurus borealis</i>    |
|                 |                                   |                                   | <b>Hoary bat</b>                | <i>Lasiurus cinereus</i>    |
|                 |                                   |                                   | <b>Northern yellow bat</b>      | <i>Lasiurus intermedius</i> |
|                 |                                   |                                   | <b>Seminole bat</b>             | <i>Lasiurus seminolis</i>   |
|                 |                                   | <b>Southeastern myotis</b>        | <i>Myotis austroriparius</i>    |                             |
|                 |                                   | <b>Evening bat</b>                | <i>Nycticeius humeralis</i>     |                             |

| Order        | Family                     | Common Name                        | Scientific Name                   |
|--------------|----------------------------|------------------------------------|-----------------------------------|
|              |                            | <b>Tri-colored bat</b>             | <i>Perimyotis subflavus</i>       |
| Soricomorpha | Shrews (Soricidae)         | <b>Southern short-tailed shrew</b> | <i>Blarina carolinensis</i>       |
|              |                            | <b>Least shrew</b>                 | <i>Cryptotis parva</i>            |
|              |                            | <b>Southeastern shrew</b>          | <i>Sorex longirostris</i>         |
|              | Moles (Talpidae)           | <b>Eastern mole</b>                | <i>Scalopus aquaticus</i>         |
| Lagomorpha   | Rabbits (Leporidae)        | <b>Swamp rabbit</b>                | <i>Sylvilagus aquaticus</i>       |
|              |                            | <b>Eastern cottontail</b>          | <i>Sylvilagus floridanus</i>      |
| Rodentia     | Beavers (Castoridae)       | <b>American beaver</b>             | <i>Castor canadensis</i>          |
|              | Mice and rats (Cricetidae) | <b>Woodland vole</b>               | <i>Microtus pinetorum</i>         |
|              |                            | <b>Eastern woodrat</b>             | <i>Neotoma floridana</i>          |
|              |                            | <b>Golden mouse</b>                | <i>Ochrotomys nuttalli</i>        |
|              |                            | <b>Common muskrat</b>              | <i>Ondatra zibethicus</i>         |
|              |                            | <b>Marsh rice rat</b>              | <i>Oryzomys palustris</i>         |
|              |                            | <b>Cotton mouse</b>                | <i>Peromyscus gossypinus</i>      |
|              |                            | <b>White-footed mouse</b>          | <i>Peromyscus leucopus</i>        |
|              |                            | <b>Fulvous harvest mouse</b>       | <i>Reithrodontomys fulvescens</i> |
|              |                            | <b>Eastern harvest mouse</b>       | <i>Reithrodontomys humulis</i>    |
|              |                            | <b>Hispid cotton rat</b>           | <i>Sigmodon hispidus</i>          |
|              | Squirrels (Sciuridae)      | <b>Southern flying squirrel</b>    | <i>Glaucomys volans</i>           |
|              |                            | <b>Eastern gray squirrel</b>       | <i>Sciurus carolinensis</i>       |
|              |                            | <b>Eastern fox squirrel</b>        | <i>Sciurus niger</i>              |
| Cingulata    | Armadillos (Dasypodidae)   | <b>Nine-banded armadillo</b>       | <i>Dasypus novemcinctus</i>       |

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## *Appendix K. List of Preparers*

| <b>NAME</b>             | <b>ORGANIZATION /TITLE</b>  |
|-------------------------|---|
| <b>Bob Strader</b>      | USFWS, Project Leader, Lower Mississippi River Refuge Complex (Retired)               |
| <b>Bradley Bordelon</b> | USFWS, Acting Project Leader, Lower Mississippi River Refuge Complex                  |
| <b>Michelle Paduani</b> | USFWS, Natural Resource Planner, Sam D. Hamilton Noxubee National Wildlife Refuge     |
| <b>Tom Greene</b>       | USFWS, Natural Resource Planner, Southeast Louisiana Refuges                          |
| <b>Deisha Norwood</b>   | USFWS, Refuge Manager, Bayou Cocodrie NWR   |
| <b>John Simpson</b>     | USFWS, Forester, Lower Mississippi Refuge Complex                                     |
| <b>Nick Wirwa</b>       | USFWS, Wildlife Biologist, Lower Mississippi Refuge Complex                           |
| <b>Kent Ozment</b>      | USFWS, Wildlife Refuge Specialist, St Catherine Creek NWR                             |
| <b>Kayla Kimmel</b>     | USFWS, Fish and Wildlife Biologist, Baton Rouge Fish and Wildlife Conservation Office |
| <b>Mike Perot</b>       | Louisiana Department of Wildlife and Fisheries, Technical Services Biologist          |
| <b>Glenn Constant</b>   | USFWS, Project Leader, Baton Rouge Fish and Wildlife Conservation Office              |
| <b>Tom Edwards</b>      | USFWS, Project Leader, Arkansas/Louisiana Migratory Bird Field Office                 |



# Cat Island National Wildlife Refuge

Jimmy Laurent, Project Leader

Lower Mississippi River Refuge Complex  
21 Pintail Lane  
Natchez, MS 39120

601-442-6696

[http://www.fws.gov/refuge/cat\\_island/](http://www.fws.gov/refuge/cat_island/)

U.S. Fish and Wildlife Service  
1-800-344-WILD  
<http://www.fws.gov>

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