

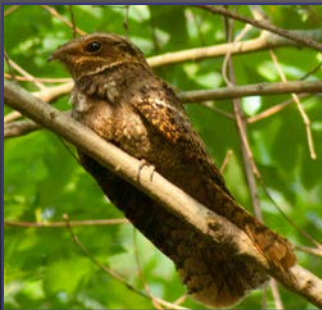


U.S. Fish & Wildlife Service

James River National Wildlife Refuge

Final Comprehensive Conservation Plan

June 2015



Front cover photos:

Background - Sunrise on James River/USFWS

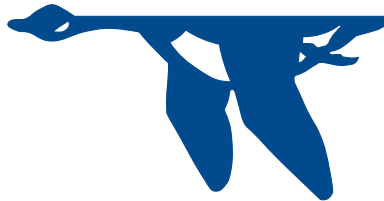
Insets, clockwise from top left -

Bald eagle/Bruce Halman-USFWS

Spotted salamander/Jeromi Hefner-USGS

Wild turkey/Don McCullough

Chuck-will's-widow/Glen Peterson



*This blue goose, designed by
J.N. "Ding" Darling, has become
the symbol of the National Wildlife
Refuge System.*

The U.S. Fish and Wildlife Service (Service) is the principal Federal agency responsible for conserving, protecting, and enhancing fish, wildlife, plants, and their habitats for the continuing benefit of the American people. The Service manages the National Wildlife Refuge System comprised of over 150 million acres including over 560 national wildlife refuges and thousands of waterfowl production areas. The Service also operates 70 national fish hatcheries and over 80 ecological services field stations. The agency enforces Federal wildlife laws, manages migratory bird populations, restores nationally significant fisheries, conserves and restores wildlife habitat such as wetlands, administers the Endangered Species Act, 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 wildlife agencies.

Comprehensive Conservation Plans (CCPs) provide long-term guidance for management decisions on a refuge and set forth goals, objectives, and strategies needed to accomplish refuge purposes. CCPs also identify the Service's best estimate of future needs. These plans detail program levels that are sometimes substantially above current budget allocations and, as such, are primarily for Service strategic planning and program prioritization purposes. CCPs do not constitute a commitment for staffing increases, operational and maintenance increases, or funding for future land acquisition.



U.S. Fish & Wildlife Service

James River National Wildlife Refuge

*Final Comprehensive Conservation Plan
June 2015*

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11 June 2015

Acting



U.S. Fish & Wildlife Service

James River National Wildlife Refuge

Final Comprehensive Conservation Plan *June 2015*

Vision Statement

James River National Wildlife Refuge safeguards nationally significant habitats along the lower James River for bald eagles and vulnerable species of the Chesapeake Bay. Healthy, contiguous forests of pine and mixed hardwoods offer respite to diminishing wildlife populations. As a living laboratory, the refuge supports environmental research conducted by partner organizations and institutions recognized for their scientific excellence.

Visitors to this wild place are welcomed by gobbling wild turkeys, fragrant spring flowers, lush fall leaves, and inconspicuous wildlife awaiting discovery. Tracing the steps of native peoples and early settlers in a serene landscape invigorates the mind, body, and spirit, while nurturing a stewardship ethic. Recreational hunting opportunities at the refuge promote America's conservation heritage.



U.S. Fish & Wildlife Service

James River National Wildlife Refuge

Final Comprehensive Conservation Plan June 2015

Summary

Type of Action:	Administrative—Development of a Comprehensive Conservation Plan
Lead Agency:	U.S. Department of the Interior, Fish and Wildlife Service
Location:	James River National Wildlife Refuge Prince George County, Virginia
Administrative Headquarters:	Eastern Virginia Rivers National Wildlife Refuge Complex Warsaw, Virginia
Responsible Official:	Wendi Weber, Regional Director, Region 5
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Chapter 1



Ron Holmes/USFWS

Bald eagle in flight

The Purpose of, and Need for, Action

- 1.1 Introduction**
- 1.2 The Purpose of, and Need for, Action**
- 1.3 The Service and Refuge System Policies and Mandates Guiding Planning**
- 1.4 Conservation Plans and Initiatives Guiding Our Planning**
- 1.5 Refuge Establishment Authority and Refuge Purpose**

1.1 Introduction

This comprehensive conservation plan (CCP) for James River National Wildlife Refuge (NWR, the refuge) was prepared pursuant to the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd–668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Refuge Improvement Act) (Pub.L. 105-57; 111 Stat. 1253); in conformance with United States Fish and Wildlife Service (USFWS, Service, we, our) policy and legal mandates (see “The Service and Refuge System Policies and Mandates Guiding Planning,” below). The development of a CCP is also subject to the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321 et seq.; 83 Stat. 852) because the adoption and implementation of management actions analyzed in a CCP have the potential to affect the natural and human environment. This CCP will serve as a guide for the refuge’s management over the next 15 years.

This CCP has five chapters.

- Chapter 1, “The Purpose of, and Need for, Action,” explains the purpose of, and need for, preparing a CCP, and sets the stage for four subsequent chapters and the appendices.
- Chapter 2, “The Planning Process,” describes the planning process we followed in the course of developing this plan, as well as the issues of public concern.
- Chapter 3, “Existing Environment,” describes the refuge’s regional and local setting, physical attributes, habitats, species, and other natural resources, and human-created environment of roads, trails, and buildings.
- Chapter 4, “Management Direction and Implementation,” presents the actions, goals, objectives, and strategies that will guide our decision-making and land management for the refuge. It also outlines staffing and funding needed to accomplish this management.
- Chapter 5, “Consultation, Coordination, and Preparation,” summarizes how the Service involved the public and our partners in the planning process. Also, it includes a list of Service and non-Service contributors to the planning effort.
- A bibliography, glossary, list of acronyms and abbreviations, list of species scientific names.

Seven appendices provide additional supporting documentation and references:

- Appendix A: Resources of Concern

- Appendix B: Findings of Appropriateness (FOAs) and Compatibility Determinations (CDs)
- Appendix C: Staffing Chart
- Appendix D: Refuge Operations Needs System (RONS) and Service Asset Maintenance Management System (SAMMS)
- Appendix E: Consultation Documentation
- Appendix F: Summary of Public Comments and Service Responses on the Draft Comprehensive Conservation Plan and Environmental Assessment for James River National Wildlife Refuge
- Appendix G: Finding of No Significant Impact (FONSI)

Project Area

James River NWR is located in Prince George County, Virginia, along the south bank of the Lower James River. The refuge is approximately 6 miles east of Hopewell, Chesterfield County, Virginia, and approximately 30 miles southeast of Richmond, the State capital. The refuge encompasses 4,324 acres of pine-dominated, moist hardwood, and floodplain forests; freshwater marsh and shrub swamp; aquatic habitats; erosional bluffs; and non-forested upland.

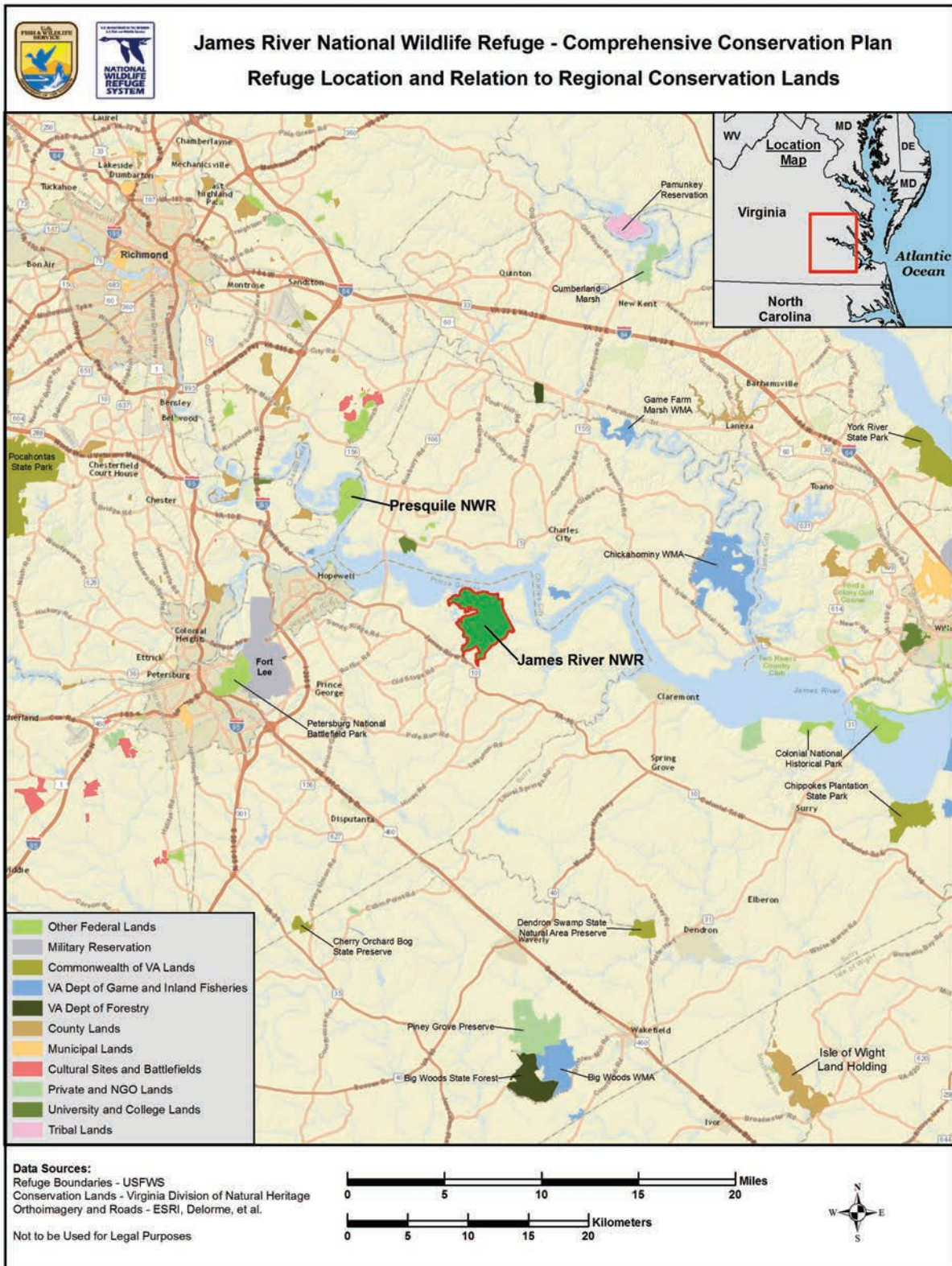
The refuge is bounded to the north by the James River, to the west by Powell Creek, to the southeast by Flowerdew Hundred Creek, and to the south by Route 10. The regional context of the project area is defined by the interactions of the nearby metropolitan area, the James River watershed, and the Chesapeake Bay Estuary (maps 1.1 through 1.3).

In 1991, James River NWR was the fourth refuge established specifically for the protection of bald eagles. At that time, the bald eagle was federally listed as endangered. Throughout its range, successful recovery efforts resulted in delisting of the bald eagle from the Federal list in 2007 and from the Virginia List of Endangered and Threatened Species (4VAC15-20-130) on January 1, 2013. Along the James River in southeastern Virginia, the bald eagle population has increased from zero pairs in the 1970s to more than 200 nesting pairs in 2013 (Center for Conservation Biology [CCB] 2013). The bald eagle remains a species protected under the Federal Bald and Golden Eagle Protection Act (BGEPA) and the Federal Migratory Bird Treaty Act.

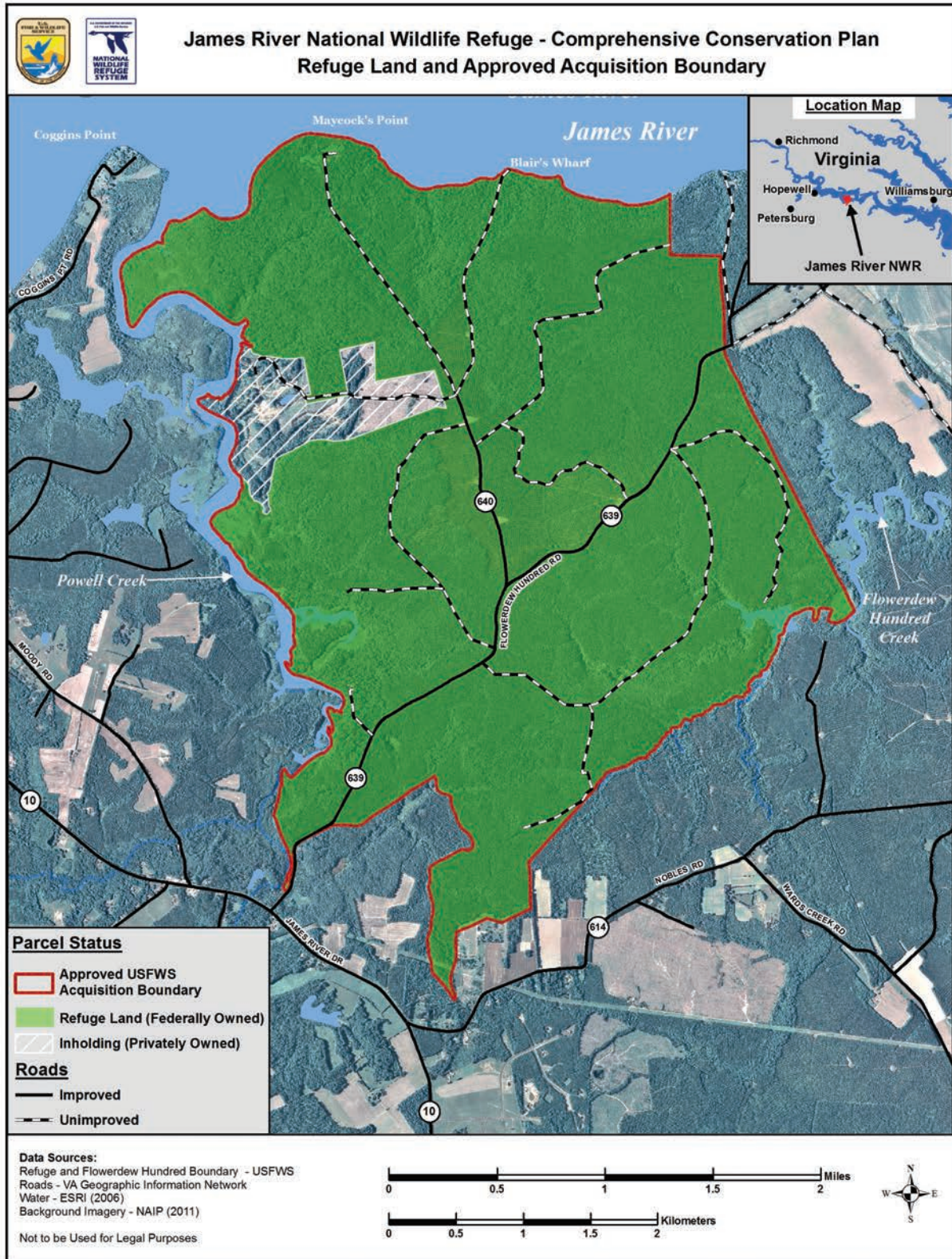
Map 1.1 James River NWR and Regional Context



Map 1.2 Refuge Location and Relation to Regional Conservation Lands



Map 1.3 Refuge Land and Approved Acquisition Boundary



1.2 The Purpose of, and Need for, Action

This CCP has been developed for the refuge that, in the Service's best professional judgment, achieves the purposes and goals of the refuge; contributes to the mission of the National Wildlife Refuge System (Refuge System); adheres to Service policies and other mandates; addresses identified issues of significance; and incorporates sound principles of fish and wildlife science. The CCP provides strategic management direction for the next 15 years. "Strategic" means we will implement approaches that are ecologically sound and sustainable in light of physical and biological change, and are also practical, viable, and economically realistic.

There are three primary reasons why each national wildlife refuge has a CCP. First, the Refuge Improvement Act requires that all refuges have a CCP in place to help fulfill the mission of the Refuge System by October 9, 2012. Although this CCP for James River NWR did not meet this deadline, the Service identified that initiation of public scoping by that date was sufficient and that the refuge should continue toward generation of a CCP.

Second, the refuge's closest equivalent to a CCP is a Station Management Plan, dated September 1991 (USFWS 1991). The region's natural environment, human uses, and management direction have all changed since refuge establishment. This CCP has been developed in the context of a changing and dynamic environment. This CCP is designed to address management and protection of valuable natural resources into the future, a future where continued change is even more likely to occur.

Third, management should be consistent with current policies. This CCP brings the refuge into conformity with all current law and policies. This CCP also helps the Commonwealth of Virginia's natural resource agencies, our conservation partners, local communities, and the public understand our priorities and work with us to achieve common goals.

Approximately every 15 years the Service will review, evaluate, and update this CCP. However, if and when significant new information becomes available, ecological conditions change, major refuge expansion occurs, or when we identify the need to do so, the CCP may be reviewed sooner. All plan revisions will require NEPA review.

1.3 The Service and Refuge System Policies and Mandates Guiding Planning

Several Service policies providing specific guidance on implementing the Refuge Improvement Act have been developed since the refuge was established. A CCP incorporates those policies and provides strategic management direction for the refuge for 15 years, by

- Stating clearly the desired future conditions for refuge habitat, wildlife, visitor services, staffing, and facilities.
- Explaining concisely to state agencies, refuge neighbors, visitors, partners, and other stakeholders the reasons for management actions.
- Ensuring that refuge management conforms to the policies and goals of the Refuge System and legal mandates.
- Ensuring that present and future public uses are appropriate and compatible.
- Providing long-term continuity and consistency in management direction.
- Justifying budget requests for staffing, operating, and maintenance funds.

In addition to the laws already mentioned, this section highlights Service policy, legal mandates, and existing regional, State, and local resource plans that directly influenced development of this CCP.

1.3.1 The U.S. Fish and Wildlife Service Mission and Policies

The USFWS is a bureau within the Department of the Interior. The Service's mission is, "*Working with others, to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.*"

Congress entrusts to the Service the conservation and protection of these national natural resources: migratory birds and fish, federally listed endangered or threatened species, interjurisdictional fish, wetlands, certain marine mammals, and national wildlife refuges. The Service also enforces Federal wildlife laws and international treaties on importing and exporting wildlife, assists states with their fish and wildlife programs, and helps other countries develop conservation programs.

The Service Manual (USFWS 2012a) contains the standing and continuing directives on implementing our authorities, responsibilities, and activities. The Service publishes special directives that affect the rights of citizens or the authorities of other agencies separately in the Code of Federal Regulations (CFR); the Service Manual does not duplicate them (<http://www.fws.gov/policy/direct.html>; accessed March 2013).

1.3.2 The National Wildlife Refuge System Mission

The Service administers the Refuge System, which is the world's largest network of lands and waters set aside specifically for the conservation of wildlife and the protection of ecosystems. More than

560 national wildlife refuges encompass more than 150 million acres of lands and waters in all 50 states and several island territories. Each year, more than 40 million visitors hunt, fish, observe, and photograph wildlife, or participate in environmental education and interpretation on refuges (USFWS 2007a).

In 1997, President Clinton signed into law the Refuge Improvement Act. This act establishes a unifying mission for the Refuge System and a new process for determining the compatibility of public uses on refuges, and requires us to prepare a CCP for each refuge. The act states that the Refuge System must focus on wildlife conservation first. It also states that the mission of the Refuge System, coupled with the purpose(s) for which each refuge was established, will provide the principal management direction on that refuge.

The mission of the Refuge System is *“To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.”* (Refuge System Improvement Act; Pub.L. 105–57).

1.3.3 Policy on the National Wildlife Refuge System Mission, Goals, and Purposes

This policy (601 FW 1) sets forth the Refuge System mission noted above, how it relates to the Service mission, and explains the relationship of the Refuge System mission and goals, and the purpose(s) of each unit in the Refuge System. In addition, it identifies the following Refuge System goals:

- Conserve a diversity of fish, wildlife, and plants;
- Develop and maintain a network of habitats;
- Conserve those ecosystems, plant communities, and wetlands that are unique within the United States (U.S.);
- Provide and enhance opportunities to participate in compatible, wildlife-dependent recreation; and
- Help to foster public understanding and appreciation of the diversity of fish, wildlife, and plants and their habitats.

This policy also establishes management priorities for the Refuge System:

- Conserve fish, wildlife, and plants and their habitats;
- Facilitate compatible wildlife-dependent recreational uses; and
- Consider other appropriate and compatible uses.

1.3.4 Policy on Maintaining Biological Integrity, Diversity, and Environmental Health

This policy (601 FW 3) provides guidance on maintaining or restoring the biological integrity, diversity, and environmental health of the Refuge System, including the protection of a broad spectrum of fish, wildlife, and habitat resources in refuge ecosystems. It provides refuge managers with a process for evaluating the best management direction to prevent the additional degradation of environmental conditions and restore lost or severely degraded components of the environment. It also provides guidelines for dealing with external threats to the biological integrity, diversity, and environmental health of a refuge and its ecosystem.

1.3.5 Policy on Coordination and Cooperative Work with State Fish and Wildlife Agencies

This policy (601 FW 7) establishes procedures for coordinating and working cooperatively with state fish and wildlife agency representatives on management of units of the Refuge System. Effective conservation of fish, wildlife, plants, and their habitats depends on the professional relationship between managers at the state and Federal level. We acknowledge the unique expertise and role of state fish and wildlife agencies in the management of fish and wildlife. It encourages refuge managers to invite, coordinate, cooperate, and collaborate with state fish and wildlife agencies in timely and meaningful opportunities to participate in the development and implementation of programs conducted under this policy. This opportunity will most commonly occur through state fish and wildlife agency representation on the CCP planning team.

1.3.6 Policy on Refuge System Planning

This policy (602 FW 1, 2, 3) establishes the requirements and guidance for Refuge System planning, including CCPs and step-down management plans. It states that the Service will manage all refuges in accordance with an approved CCP that, when implemented, will help:

- Achieve refuge purposes;
- Fulfill the Refuge System mission;
- Maintain and, where appropriate, restore the ecological integrity of each refuge and the Refuge System;
- Achieve the goals of the National Wilderness Preservation System (NWPS) and the National Wild and Scenic Rivers System; and
- Conform to other applicable laws, mandates, and policies.

This planning policy provides step-by-step directions and identifies the minimum requirements for developing all CCPs. Among them, the Service is to review any existing special designation areas such as wilderness and wild and scenic rivers, specifically address the

potential for any new special designations, conduct a wilderness review, and incorporate a summary of that review into each CCP (602 FW 3).

1.3.7 Policy on Appropriateness of Refuge Uses

Federal law and Service policy provide the direction and planning framework for protecting the Refuge System from inappropriate, incompatible, or harmful human activities and ensuring that visitors can enjoy its lands and waters. This policy (603 FW 1) provides a national framework for determining appropriate refuge uses to prevent or eliminate those that should not occur in the Refuge System. It describes the initial decision process the refuge manager follows when first considering whether to allow a proposed use on a refuge. An appropriate use must meet at least one of the following four conditions:

- The use is a wildlife-dependent recreational use as identified in the Refuge Improvement Act.
- 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 Refuge Improvement Act became law.
- The use is within the boundaries set by state regulations for the take of fish and wildlife.
- The use has been found to be appropriate after concluding a specified findings process using 10 criteria.

FOAs, including the list of 10 criteria, for specific public uses at James River NWR can be reviewed in appendix B.

1.3.8 Policy on Compatibility

This policy (603 FW 2) complements the appropriateness policy. Once a refuge manager finds a use appropriate, they conduct a further evaluation through a compatibility determination assessment. CDs completed for those public uses determined to be appropriate are included in appendix B as part of this document.

The direction in this policy provides guidelines for determining compatibility of uses and procedures for documentation and periodic review of existing uses. Highlights of the guidance in that chapter follows:

- The Refuge Improvement Act and its regulations require an affirmative finding by the refuge manager on the compatibility of a public use before the Service allows it on a refuge.
- A compatible use is one *“that will not materially interfere with or*

detract from the fulfillment of the mission of the Refuge System or the purposes of the refuge.”

- The act defines six wildlife-dependent uses that are to receive enhanced consideration on refuges: *“hunting, fishing, wildlife observation and photography, and environmental education and interpretation.”*
- The refuge manager may authorize those priority uses on a refuge when they are compatible and consistent with public safety.
- When the refuge manager publishes a compatibility determination, it will stipulate the required maximum reevaluation dates: 15 years for wildlife-dependent recreational uses or 10 years for other uses.
- However, the refuge manager may reevaluate the compatibility of a use at any time, including sooner than its mandatory date or even before the Service completes the CCP process, if new information reveals unacceptable impacts or incompatibility with refuge purposes (603 FW 2.11, 2.12).
- The refuge manager may allow or deny any use, even one that is compatible, based on other considerations such as public safety, policy, or available funding.

1.3.9 Policy on Wildlife-dependent Public Uses

This policy (605 FW 1) of the Service manual presents specific guidance on implementing management of the priority public uses, including the following criteria for a quality, wildlife-dependent recreation program that:

- 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 and reasonable opportunities to experience wildlife.
- Uses facilities that are accessible to people and blend into the natural setting.
- Uses visitor satisfaction to help to define and evaluate programs.

1.3.10 Refuge System Vision — Conserving the Future (2011)

In July 2011, the Refuge System convened the “Conserving the Future - Wildlife Refuges and the Next Generation” conference to renew and update its 1999 vision document, originally called “Fulfilling the Promise.” After the conference and an extensive public engagement process, the Service finalized a renewed vision document in October 2011 (USFWS 2011). The document has 24 recommendations, covering a variety of topics from habitat and species management, visitor services, refuge planning, land conservation, communications, building partnerships, and urban refuges. Currently, implementation teams are developing strategies to help us accomplish the vision. We will incorporate implementation strategies as appropriate, in our step-down plans and refuge programs.



Encouraging youth involvement

1.3.11 Other Mandates

Federal laws require the Service to identify and preserve its important historic structures, archaeological sites, and artifacts. NEPA mandates our consideration of cultural resources in planning Federal actions. The Refuge Improvement Act requires that the CCP identify the refuge's archaeological and cultural values. In addition, we consult with the State Historic Preservation Officer (SHPO) on the draft and final CCPs. The following four Federal laws also cover historic and archaeological resources on national wildlife refuges:

- The Archaeological Resources Protection Act (ARPA; 16 U.S.C. § 470aa–470ll; Pub.L. 96–95), approved October 31, 1979 (93 Stat. 721). The ARPA establishes detailed requirements for issuance of permits for any excavation for, or removal of, archaeological resources from Federal or Native American lands. It also establishes civil and criminal penalties for the unauthorized excavation, removal, or damage of those resources; for any trafficking of those resources removed from Federal or Native American land in violation of any provision of Federal law; and for interstate and foreign commerce in such resources acquired, transported, or received in violation of any state or local law.
- The Archaeological and Historic Preservation Act (16 U.S.C. § 469–469c; Pub.L. 86–523), approved June 27, 1960 (74 Stat. 220), as amended by Pub.L. 93–291 approved May 24, 1974 (88 Stat. 174). The Archaeological and Historic Preservation Act carries out the policy established by the Historic Sites Act (see below). It directs Federal agencies to notify the Secretary of the Interior whenever they find that a Federal or federally assisted licensed or permitted project may cause the loss or destruction of significant scientific, prehistoric, or archaeological data. The act authorizes the use of appropriated, donated, or transferred funds for the recovery, protection, and preservation of that data.
- The National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. § 470–470b, 470c–470n), Pub.L. 89–665, approved October 15, 1966 (80 Stat. 915), and repeatedly amended. The NHPA establishes the National Register of Historic Places (National Register). It requires Federal agencies like us to consider the effects of their activities on sites listed in or eligible for listing on the National Register. The act and regulations require that the Service inventory its lands for archaeological sites and historic structures. Until sites and structures have been evaluated for National Register eligibility, they are treated as if eligible. This requirement to consider eligible cultural resources in planning activities applies to activities using Federal funds, a Federal permit, or taking place on Federal land. Important regulations of this act (36 CFR 800) define the roles of the SHPOs, the national Advisory Council on Historic Preservation, and Tribal Historic

Preservation Offices. Under this act and regulations, the Service is to consult with federally recognized Tribes and the public about the effects of activities in relation to historic properties. The act created the Historic Preservation Fund, which partially funds state and Tribal Historic Preservation Offices.

- The Native American Grave Protection and Repatriation Act (NAGPRA) directs the Service to consider during project planning whether an activity is likely to expose human remains, funerary objects, sacred objects or objects of cultural patrimony. If so, we are to consult with appropriate Tribes about developing a Plan of Action to manage the impacts. In addition, such remains and objects, when inadvertently discovered, shall be repatriated to descendent Tribes.

Under ARPA and NHPA above, archaeological artifacts and site documentation such as field records must be preserved and made available for study. The Service also owns and cares for historic objects, environmental specimens, art, and historical documents as museum property at non-government repositories such as museums and at refuges. Each refuge maintains an inventory of its museum property. Our Regional museum property coordinator in Hadley, Massachusetts, guides the refuges in caring for that property, and helps us comply with the NAGPRA and Repatriation Act and Federal regulations governing Federal archaeological collections. The Service ensures that those collections will remain available to the public for learning and research.

Other Federal resource laws are also important to highlight as they are integral to developing a CCP.

- The Wilderness Act of 1964 (16 U.S.C. 1131–1136; Pub.L. 88–577) establishes a NWPS that is composed of federally owned areas designated by Congress as “*wilderness areas*.” The act directs each agency administering designated wilderness to preserve the wilderness character of areas within the NWPS, and to administer the NWPS for the use and enjoyment of the American people in a way that will leave those areas unimpaired for future use and enjoyment as wilderness. This act also directs the Secretary of the Interior, within 10 years, to review every roadless area of 5,000 acres or more and every roadless island (regardless of size) within the Refuge System and National Park System for inclusion in the NWPS. Service planning policy requires that the Service evaluate the potential for wilderness on refuge lands, as appropriate, during the CCP development process. Our wilderness review was included as appendix E in the draft CCP and environmental assessment (EA).
- The Wild and Scenic Rivers Act of 1968, as amended, 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. Service planning policy requires that the Service evaluate the potential for wild and scenic rivers designation on refuge lands, as appropriate, during the CCP development process. Because the potentially eligible 62-mile segment of the James River does not occur within the refuge boundary, a wild and scenic river review was not conducted for this refuge.

Our mandates also include orders and initiatives by the President, Secretary of the Interior, or Director of the Service. We highlight six of those below.

- Presidential Executive Order (EO) 13508-Chesapeake Bay Protection and Restoration, was issued on May 12, 2009. This order furthers the purpose of the Clean Water Act of 1972, as amended (33 U.S.C. 1251 et seq.), and other laws “...to protect and restore the health, heritage, natural resources, and social and economic value of the Nation’s largest estuarine ecosystem and the natural sustainability of its watershed.” It recognizes the Chesapeake Bay as “a national treasure constituting the largest estuary in the United States and one of the largest and most biologically productive estuaries in the world.”

It directs the establishment of a Federal Leadership Committee chaired by the Administrator of the U.S. Environmental Protection Agency (EPA), or their designee, with participation by all Federal agencies with jurisdiction in the bay. The Committee’s purpose is to lead the effort to restore the health of the Chesapeake Bay under a renewed commitment to control pollution from all sources as well as protect and restore habitat and living resources, conserve lands, and improve management of natural resources, all of which contribute to improved water quality and ecosystem health.

The strategic plan for implementing this EO was issued in 2010 and emphasized: (1) water quality; (2) sources of pollution from agricultural lands and Federal lands and facilities; (3) protecting the Chesapeake Bay’s resources as the climate changes; (4) expanding opportunities for public access; (5) conserving landscapes and ecosystems; and (6) the monitoring and accountability of activities. Annual work plans and accomplishment reports document progress toward meeting objectives detailed in the strategic plan (<http://executiveorder.chesapeakebay.net/page/Reports-Documents.aspx>; accessed November 2013).

- EO 13653-Preparing the United States for the Impacts of Climate

Change was issued on November 1, 2013. This order builds on prior Presidential directives (e.g., memoranda; EOs 12893, 13514, and 13604) to promote interagency coordination and modernization of Federal infrastructure. EO 13653 establishes an interagency Council on Climate Preparedness and Resilience, whose members include senior officials from various departments of the Federal government. This Council shall work across agencies and offices, and in partnership with state, local, and Tribal governments, academic and research institutions, and the private and nonprofit sectors to: (1) develop, recommend, coordinate interagency efforts on, and track implementation of, priority Federal government actions related to climate preparedness and resilience; (2) support regional, state, local, and Tribal action to assess climate change related vulnerabilities and cost-effectively increase climate preparedness and resilience of communities, critical economic sectors, natural and built infrastructure, and natural resources; (3) facilitate the integration of climate science in policies and planning of government agencies and the private sector, including promoting the development of innovative, actionable, and accessible Federal climate change related information, data, and tools at appropriate scales for decisionmakers and deployment of this information through a Governmentwide web-based portal; and (4) such other functions as may be decided by the Council.

- Secretarial Order 3330-Improving Mitigation Policies and Practices of the Department of the Interior was issued on October 31, 2013. This order establishes a Departmentwide mitigation strategy that will ensure consistency and efficiency in the review and permitting of infrastructure development projects and in conserving our Nation's valuable natural and cultural resources. Central to this strategy will be: (1) the use of a landscape-scale approach to identify and facilitate investment in key conservation priorities in a region; (2) early integration of mitigation considerations in project planning and design; (3) ensuring the durability of mitigation measures over time; (4) ensuring transparency and consistency in mitigation decisions; and (5) a focus on mitigation efforts that improve the resilience of our Nation's resources in the face of climate change.
- The Department of the Interior's Energy and Climate Change Task Force has been directed to: (1) develop a coordinated Departmentwide, science-based strategy to strengthen mitigation practices to effectively offset impacts of large development projects of all types through the use of landscape-level planning, banking, in-lieu fee arrangements, and other possible measures; (2) conduct a comprehensive review of the mitigation aspects of existing land and water management practices and procedures, permitting, and environmental review authorities, regulations, and

guidance; (3) identify any new policies or practices, revisions to existing policies or practices, or regulatory or other changes that could be implemented to incorporate landscape-scale planning into mitigation-related decisions; and (4) draft a strategy for developing additional policies and practices or any regulatory or other changes, including a timeline for implementation with designated agency leads.

- Secretarial Order 3289 – Addressing the Impacts of Climate Change on America’s Water, Land, and Other Natural and Cultural Resources was issued on September 14, 2009, and amended in February 2010. This order establishes a Departmentwide, science-based approach to increasing our understanding of climate change and to coordinate an effective response to its impacts on Tribes and on the land, water, ocean, fish and wildlife, and cultural heritage resources that the Department of the Interior manages.

The order establishes a Climate Change Response Council that will execute a coordinated Departmentwide strategy to increase scientific understanding and the development of adaptive management tools to address the impact of climate change on our natural and cultural resources. The council will help coordinate activities within and among Federal agencies. Land management agencies are directed to pursue appropriate activities to reduce their carbon footprint, adapt water management strategies to address the possibility of a shrinking water supply, and protect and manage land in anticipation of sea level rise, shifting wildlife populations and habitats, increased wildland fire threats, and an increase in invasive and exotic species. As of October 2013, the Department of the Interior has developed climate adaptation policies, plans, and strategies and will continue to further develop important climate adaptation tools.

- The Presidential initiative, America’s Great Outdoors (AGO), was issued on April 16, 2010. President Obama launched the AGO initiative as a conservation and recreation effort that would help increase connections with American citizens and the outdoors. AGO takes as its premise that lasting conservation solutions should come from citizens who share in the responsibility to conserve, restore, and provide better access to our lands and waters.

In February 2011, a report was generated to lay the foundation for implementing this initiative (<http://americasgreatoutdoors.gov>; accessed March 2013). This report identifies 10 major goals and 75 action items to advance this initiative, from expanding youth programs to increasing public awareness about conservation to better managing our public lands. Among these are three major

place-based goals to focus the collective conservation and recreation efforts of the Federal government: create and enhance urban parks and green spaces, renew and restore rivers, and conserve large, rural landscapes.

During the spring and summer of 2011, the Secretary of the Interior sought recommendations for two specific projects in each state that would highlight opportunities to support the three place-based goals of the AGO initiative. In Virginia, the two projects identified are the Fort Monroe National Historical Park, in Hampton, Virginia, and the Captain John Smith Chesapeake National Historic Trail (NHT). The Captain John Smith Chesapeake NHT crosses much of eastern tidal Virginia, including a passage adjacent to James River NWR. Additional details on the trail are provided below in section 1.4. We also discuss more on our efforts to cooperate on this project in chapter 3, section 3.9.1.

- Presidential EO 13443-Facilitation of Hunting Heritage and Wildlife Conservation was issued on August 16, 2007. The purpose of this order is to direct Federal agencies that have programs and activities affecting public land management, outdoor recreation, and wildlife management, including the Department of the Interior and the Department of Agriculture (USDA), to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat. Federal agencies are directed to pursue certain activities listed in the order, consistent with their missions. Those activities include managing wildlife and wildlife habitats on public lands in a manner that expands and enhances hunting opportunities, and working with state and tribal governments to manage wildlife and habitats to foster healthy and productive populations and provide appropriate opportunities for the public to hunt those species.

In Chapter 4, “Environmental Consequences,” of the draft CCP and EA, we evaluated this plan’s compliance with the acts noted above, and with the Clean Water Act of 1977 as amended (33 U.S.C. 1251, et seq.; Pub.L. 107–303), the Clean Air Act of 1970 as amended (42 U.S.C. 7401 et seq.), and the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531–1544), as amended. Our draft CCP and EA was written to fulfill our obligations under NEPA and comply with the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500–1508). Appendix G of the CCP, the FONSI, documents our compliance with these Federal laws and how they were considered in our final decision.

Pursuant to the Federal Coastal Zone Management Act, the National Oceanic and Atmospheric Administration (NOAA) approved the Virginia Coastal Zone Management Program in 1986. In accordance with the Virginia Coastal Zone Management Program requirements, a

Federal Consistency Determination was prepared for the CCP and is included in appendix E of this CCP.

While Service and Refuge System policies and each refuge's purpose(s) provide the foundation for management, national wildlife refuges are administered consistent with a variety of other Federal laws, EOs, treaties, interstate compacts, and regulations on the conservation and protection of natural and cultural resources. The "Digest of Federal Resource Laws of Interest to the U.S. Fish and Wildlife Service" lists them at:

<http://www.fws.gov/laws/Lawsdigest.html> (accessed March 2013).

1.4 Conservation Plans and Initiatives Guiding Our Planning

Important guidance for habitat management and visitor service management at James River NWR has already been provided by a series of plans and their priorities. The following plans and initiatives were available early in the CCP and EA development phase.

1.4.1 National, Regional, and Local Plans and Priorities

Landscape Dynamics: Land Cover and Land Use

North Atlantic Landscape Conservation Cooperative Operations Plan (USFWS 2009a)

The Service is developing a coordinated network of landscape conservation cooperatives across the U.S., in part to address major environmental and human-related factors that limit fish and wildlife populations at the broadest of scales, including developing adaptation strategies in response to climate change. The landscape conservation cooperative is utilizing principles of strategic habitat conservation to develop and communicate landscape-scale scientific information to shape conservation across the northeastern U.S. This initial plan outlines the regional threats to conservation, priority species and habitats, as well as active regional partnerships.

Strategic Habitat Conservation (U.S. Geological Survey [USGS] and USFWS 2006)

Strategic Habitat Conservation (SHC), the conservation approach the Service is using to achieve its mission in the 21st century, is a framework that utilizes adaptive management to redefine broad-scale conservation. It departs from the general pursuit of conserving more habitat and species to a more planned approach based on scientific data, at a landscape level, and in cooperation with partners. Starting with explicit, measurable objectives that are based on testable assumptions that can be evaluated, it is enacted through an iterative process of biological planning, conservation design, conservation delivery, assumption-driven research, and outcome-based monitoring. The goal is to set specific population objectives for selected species of fish, wildlife, and plants, which become our conservation targets. We refer to this select group of species as representative or surrogate

species because they represent other species or aspects of the environment. Such identified species are used for comprehensive conservation planning that supports multiple species and habitats within a defined landscape or geographic area.

Some of the surrogate species that have been identified for the Mid-Atlantic Landscape Conservation Cooperative (LCC), in which the refuge is located, include the bank swallow, black-and-white warbler, brown-headed nuthatch, grasshopper sparrow, marsh wren, ovenbird, prothonotary warbler, red-shouldered hawk, whip-poor-will, wood thrush, eastern box turtle, marbled salamander, alewife, American eel, and American shad. Appendix A includes additional information about these and other species considered as potential resources of concern for the James River NWR CCP.

Through the SHC approach, we coordinate and link actions that various programs within the Service, other Federal agencies, and our state, nonprofit and private conservation partners take at individual sites, so the combined effort of all our work will enable the realization of biological outcomes at the larger landscape, regional, or continental scale. Inherent in the process is a continual evaluation of biological outcomes and approaches, with the intent to adapt the overall conservation strategy to respond to changing circumstances and new information.

The Nature Conservancy's Chesapeake Bay Lowlands Ecoregional Plan (Draft) (TNC 2003)

The Chesapeake Bay Lowlands ecoregion is centered on the Chesapeake Bay and includes most of Delaware, all of the coastal plain in Maryland and the District of Columbia, and coastal Virginia south to the James River. Five major types of conservation targets were identified in the Chesapeake Bay Lowlands ecoregion: (1) matrix forest blocks; (2) aquatic ecosystems; (3) “*significant conservation areas*” in tidal waters (for estuarine, coastal, and marine targets); (4) natural communities; and (5) species. To the extent that some of these conservation targets overlap with the species and habitats found on James River NWR, they have been considered as part of this plan development.

The National Park Service's Captain John Smith Chesapeake National Historic Trail (NPS 2010)

The National Park Service (NPS) administers the Captain John Smith Chesapeake NHT, the first national water trail in the U.S. Established in 2006, the trail consists of a series of water routes extending over 3,000 miles along the Chesapeake Bay and its tributaries in Virginia, Maryland, Delaware, New York, Pennsylvania, and in the District of Columbia, tracing the 1607 to 1609 voyages of Captain John Smith to chart the land and waterways of the Chesapeake Bay. The trail complements the diverse resources of the Chesapeake Bay Gateways

Network—a partnership of existing water trails, parks, museums, wildlife refuges, and other sites that provide interpretation and bay access—to make additional opportunities for education, recreation, and heritage tourism. As the Nation’s first national water trail, the Captain John Smith Chesapeake NHT will be most fully experienced by watercraft and at water access sites. However, visitors will also be able to view the trail setting and learn the stories from land. Numerous existing land sites along the voyage routes will interpret Smith’s explorations, native settlements and cultures, and the environment of the early 17th century.

Wildlife and Habitat

National Bald Eagle Management Guidelines (USFWS 2007b)

Under comprehensive eagle protection and management programs implemented by state and Federal agencies, bald eagle populations have increased dramatically across much of the lower 48 States since they were the first federally listed endangered species in 1967. On August 8, 2007, the bald eagle was removed from the Federal list of threatened and endangered species (72 FR 37346) and on January 1, 2013, it was also removed from the Virginia list of threatened and endangered species (Virginia Department of Game and Inland Fisheries [VDGIF] and CCB 2012). However, the bald eagle continues to be protected by the Bald and Golden Eagle Protection Act (BGEPA, 16 U.S.C. 668-668c; 50 CFR Part 22) and the Migratory Bird Treaty Act (MBTA, 16 U.S.C. 701 et seq.; 50 CFR Parts 10, 20, 21).

The BGEPA prohibits anyone, without a permit issued by the Secretary of the Interior, from “*taking*” bald eagles, including their parts, nests, or eggs. “*Take*” is defined as “*pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb.*” *Disturb* is defined as “*to agitate or bother a bald or golden eagle to a degree that causes . . . (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.*” The MBTA extends these prohibitions to any migratory bird.

Because of these guidelines and in an effort to help people minimize such impacts to bald eagles, particularly where they may constitute disturbance, the Service issued the National Bald Eagle Management Guidelines (USFWS 2007b). These guidelines are intended to: (1) publicize the provisions of the BGEPA that protect bald eagles to reduce the possibility that people will violate the law, (2) advise landowners, land managers, and the general public of the potential for various human activities to disturb bald eagles, and (3) encourage additional nonbinding land management practices that benefit bald eagles.

The guidelines establish five phases of activity of the bald eagle from “courtship and nest building” to “nestlings 8 weeks through fledging” and also rank the eagle’s sensitivity to human activity during these periods. It also provides a chronology of typical reproductive stages of the eagle. Finally, it makes recommendations for avoiding disturbances to foraging and roosting bald eagles and at nest sites based upon the type of disturbance and distance from the birds. The VDGIF adopted these strategies (VDGIF and CCB 2012). It notes that also applicable Virginia laws and VDGIF regulations no longer apply to the bald eagle since it was removed from the State endangered list; it is still offered State protection under its designation as a tier II species of greatest conservation need under Virginia’s Wildlife Action Plan (WAP) (VDGIF 2005). It is also protected by State laws that mimic the MBTA. Therefore, the VDGIF is still authorized by the USFWS to enforce protection of the bald eagle.

Virginia Bald Eagle Nest and Productivity Survey: Year 2011 Report (Watts and Byrd 2011)

In partnership with other government agencies, conservation organizations, and researchers, the VDGIF has led the annual bald eagle surveys since 1997 as part of the Chesapeake Bay Bald Eagle Recovery Team. This team’s objectives are: (1) to monitor the recovery of the bald eagle in Virginia, (2) to document the status, distribution, and productivity of breeding bald eagles in Virginia, (3) to provide information to the government agencies charged with the management and protection of Virginia bald eagle population, (4) to provide information to landholders about the status of bald eagles on their properties, and (5) to increase our understanding of bald eagle natural history in Virginia.

These surveys are performed using aircraft to systematically survey at altitudes of 100 meters to detect eagle nest activity twice during each year. The first flight is performed between late February and mid-March to locate active nests and the second is conducted from late April through mid-May to assess active nests for productivity.

In 2011, a total of 726 occupied bald eagle territories were identified in Virginia. This was a 6.2 percent increase over 2010, with more than 130 new nests mapped in 45 counties and 10 cities. Most of these territories occurred on the Coastal Plain with less than 5 percent of pairs occurring in the piedmont and mountains. The highest number of chicks ever recorded in the history of the survey was 938 chicks. In the 35 years of study, 11,030 bald eagle chicks have been recorded; 8.5 percent of these were produced in 2010 and 73.2 percent have been produced since 2000.

USFWS Birds of Conservation Concern (USFWS 2008a)

This report identifies the migratory and non-migratory bird species

(beyond those already designated as federally threatened or endangered) that represent the Service's highest conservation priorities and draws attention to species in need of conservation action. The geographic scope includes the U.S. in its entirety, including island territories in the Pacific and Caribbean. Bird species considered for inclusion on lists in this report include nongame birds, gamebirds without hunting seasons, subsistence-hunted nongame birds in Alaska; and ESA candidate, proposed endangered or threatened, and recently delisted species. Assessment scores are based on several factors, including population trends, threats, distribution, abundance, and area importance.

USFWS Migratory Bird Program Strategic Plan (USFWS 2004a)
The Migratory Bird Program Strategic Plan provides direction for the Service's migratory bird management over the next decade (2004 to 2014). The plan contains a vision and recommendations for the Refuge System's place in bird conservation. It defines strategies for the Service, including the Refuge System, to actively support bird conservation through monitoring, conservation, consultation, and recreation. Considerations for, to the extent it is practical, standard monitoring protocols, habitat assessment and management, and promoting nature-based recreation and education to forward the vision of the Migratory Bird Program Strategic Plan have been incorporated into this plan.

North American Waterfowl Management Plan (NAWMP 2004) and Joint Venture Plans

Originally written in 1986, the North American Waterfowl Management Plan describes a 15-year strategy for the U.S., Canada, and Mexico to restore and sustain waterfowl populations by protecting, restoring, and enhancing habitat. The plan committee, including representatives from all three countries, has modified the 1986 plan twice to account for biological, sociological, and economic changes that influenced the status of waterfowl and to allow cooperative habitat conservation. The most recent modification in 2004 updates the needs, priorities, and strategies for the next 15 years, and guides partners in strengthening the biological foundation of North American waterfowl conservation and stakeholder confidence in the direction of the plan (NAWMP 2004).

To convey goals, priorities, and strategies more effectively, that 2004 modification comprises two separate documents: Strategic Guidance and Implementation Framework. The former is for agency administrators and policy makers who set the direction and priorities for conservation. The latter includes supporting technical information for use by biologists and land managers.

The plans are implemented at the regional level in 14 habitat joint ventures and 3 species joint ventures (Arctic Goose, Black Duck, and

Sea Duck). James River NWR lies in the Atlantic Coast Joint Venture (ACJV), which includes all the Atlantic Flyway states from Maine to Florida and Puerto Rico. The ACJV Waterfowl Implementation Plan (ACJV 2005) was completed in June 2005. The refuge lies within the plan's Lower James River Focus Area.

The waterfowl goal for the ACJV is to “*Protect and manage priority wetland habitats for migration, wintering, and production of waterfowl, with special consideration to black ducks, and to benefit other wildlife in the joint venture area.*” The Black Duck Joint Venture Final Draft Strategic Plan (USFWS and Canadian Wildlife Service 1993) also relates to our CCP. American black ducks use the refuge during the winter and migration, but are less common during their breeding season as their primary breeding grounds are in Canada. We referred to both joint venture plans in developing the management objectives and strategies under goals 1 and 2.

Bird Conservation Plan for the Mid-Atlantic Coastal Plain (Physiographic Area 44) (PIF 1999)

Partners in Flight (PIF) is a partnership of government agencies, private organizations, academic researchers, and private industry throughout North America focused on coordinating voluntary bird conservation efforts to benefit species at risk and their habitats. Bird conservation regions (BCRs) have been developed to guide management on a regional scale. Version 1.0 of the Mid-Atlantic Coastal Plain BCR was completed in 1999. James River NWR is located within the Coastal Plain Physiographic Province and thus is considering the conservation priorities of this plan along with other conservation plans.

Mid-Atlantic Coast Bird Conservation Region Implementation Plan (BCR 30) (USFWS 2008b)

The implementation plan for the BCR 30 combines continental and regional plans, assessments, and research completed over the past two decades to develop continental-based bird conservation efforts. The BCR 30 planning area is approximately 9,885,700 hectares in size and extends from southern coastal Maine through coastal Virginia, encompassing several major estuaries, including Chesapeake Bay. James River NWR is located within the southern extent of the mid-Atlantic Coastal Plain. Priority species for this region are mostly waterbirds (over 50 percent) and waterfowl because it covers mostly coastal areas. Priorities also focus on many declining species of forested upland birds. Many of the priority species listed for BCR 30 are also species of concern listed within the BCR 27 and Virginia WAP.

South Atlantic Migratory Bird Initiative (BCR 27) (Watson and McWilliams 2005)

The South Atlantic Migratory Bird Initiative is a vision and process of

integrated bird conservation planning and implementation of the Management Board of the ACJV. The planning area is the eastern portion of BCR 27, the Southeastern Coastal Plain, and includes the coastal plain of Virginia, North Carolina, South Carolina, Georgia, and Florida. This plan provides a regional-scale framework for the conservation of waterfowl, shorebirds, waterbirds, landbirds, and upland game birds. This framework seeks to integrate common goals and objectives of these national and regional plans, providing conservationists a strategy for meeting the challenge of sustaining healthy ecosystems and healthy bird populations in the midst of increasing threats along the Atlantic Coast. This plan identifies priority species, priority habitats, priority areas, and strategies to achieve the conservation of “*all birds across all habitats*” in this region. James River NWR is located just north of the northern extent of the Southeastern Coastal Plain. Many of the priority species listed for BCR 27 are also species of concern listed within the BCR 30 and Virginia WAP.

Virginia Wildlife Action Plan (VDGIF 2005)

The Virginia WAP was completed in 2005 (VDGIF 2005). While creating a strategic focus for State fish and wildlife management agencies, this plan attempts to provide a Statewide perspective on conservation, presenting geographic, species, and habitat priorities. James River NWR protects several habitats that support species determined to be of conservation need by the State. As such, species of conservation priority noted in the WAP were considered in development of the refuge’s resources of concern.



Dominic Sherony

Yellow-bellied sapsucker

1.5 Refuge Establishment Authority and Refuge Purpose

The purpose of James River NWR is “...to conserve (A) fish or wildlife which are listed as endangered species or threatened species...or (B) plants” (Endangered Species Act of 1973, 16 U.S.C. § 1534).

1.5.1 Refuge-specific Plans

Existing refuge program-specific plans have been consulted either in their draft or final format to help guide decision making. These plans will also be maintained and updated as necessary to ensure accordance with the recommendations of this CCP.

Following refuge establishment, a Station Management Plan was developed and provided the refuge management team with direction to begin developing long-term programs for: (1) creating wildlife and habitat database, (2) managing eagle and other wildlife habitat, (3) accommodating certain public uses, (4) minimizing losses caused by wildfire, (5) protecting historic and archaeological resources, and (6) developing a concept for protecting additional eagle habitat (USFWS 1991).

Refuge Operational Plans (Step-down Plans)

The chapter Refuge Planning Policy (602 FW 4) identifies more than 25 step-down management plans that may be completed for each refuge, and refuge management determines which of the 25 step-down plans should be completed for their refuge. Those plans provide the details necessary to “step-down” general goals and objectives to specific strategies and implementation schedules. Some require annual revisions; others are revised on a 5- to 10-year schedule. Some require additional NEPA analysis, public involvement, and compatibility determinations before they can be implemented.

The following step-down plans have been completed and will be updated in accordance with the Service’s revision schedule:

- Safety Management Plan (1993)
- Hunt Management Plan (1993, as amended)
- Spill Prevention, Control, and Countermeasures Plan (2001)
- Forest Management Plan (2003)
- Fire Management Plan (2006)
- Chronic Wasting Disease Surveillance and Contingency Plan (2008)
- Hurricane Action Plan (2013)

The following step-down plans are our highest three priority step-

down management plans, to be prepared within 5 years of CCP approval:

- Habitat Management Plan (HMP)
- Inventory and Monitoring Plan (IMP)
- Visitor Services Plan (VSP)

1.5.2 Refuge Vision

The CCP planning team developed the following vision statement to provide a guiding philosophy and sense of purpose for refuge management:

James River National Wildlife Refuge safeguards nationally significant habitats along the lower James River for bald eagles and vulnerable species of the Chesapeake Bay. Healthy, contiguous forests of pine and mixed hardwoods offer respite to diminishing wildlife populations. As a living laboratory, the refuge supports environmental research conducted by partner organizations and institutions recognized for their scientific excellence.

Visitors to this wild place are welcomed by gobbling wild turkeys, fragrant spring flowers, lush fall leaves, and inconspicuous wildlife awaiting discovery. Tracing the steps of native peoples and early settlers in a serene landscape invigorates the mind, body, and spirit, while nurturing a stewardship ethic. Recreational hunting opportunities at the refuge promote America's conservation heritage.

1.5.3 Refuge Goals

The CCP planning team developed refuge goals after considering the vision statement, the purposes for establishing the refuge, the missions of the Service and the Refuge System, and the mandates, plans, and conservation initiatives noted above. These goals are intentionally broad, descriptive statements of purpose. They highlight elements that we will emphasize in its future management.

In developing and adopting a CCP for James River NWR, we want to accomplish the following goals:

Goal 1. Forest Habitat: Protect, enhance, and restore the ecological integrity of inner coastal plain forest ecosystems of the lower James River to support native wildlife and plant communities, including species of conservation concern, and to ensure those ecosystems are resilient in anticipation of climate change.

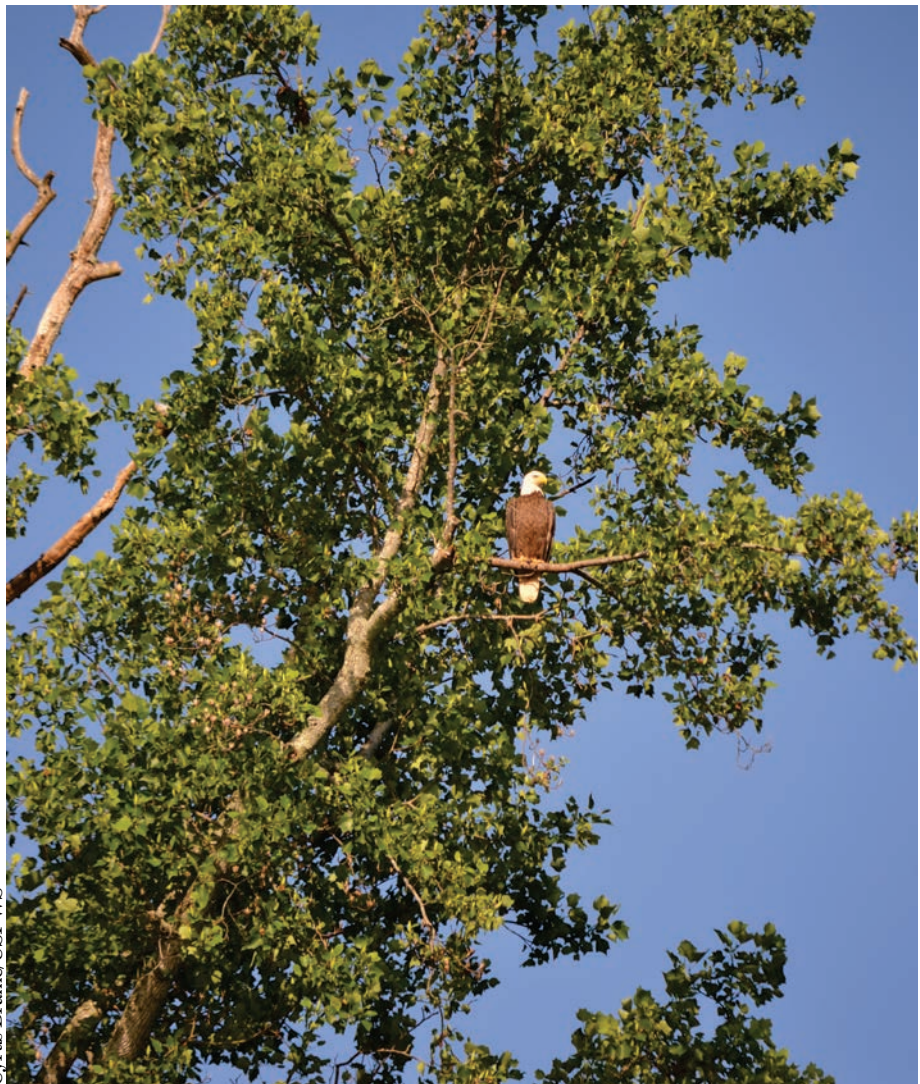
Goal 2. Non-forest Habitat: Protect, enhance, and restore the ecological integrity of non-forest ecosystems of the lower James River to support native wildlife and plant communities,

including species of conservation concern, and to ensure those ecosystems are resilient in anticipation of climate change.

Goal 3. Cultural Resources: Protect and conserve the refuge’s cultural resources and landscape, and seek opportunities to increase knowledge and appreciation of the refuge’s history as part of the lower James River.

Goal 4. Wildlife-dependent Recreation: Provide wildlife-dependent recreational opportunities for visitors to connect with nature and foster enhanced stewardship of the lower James River, Chesapeake Bay estuary, and the Refuge System.

Goal 5. Partnerships: Develop new partnerships and strengthen existing partnerships to promote natural and cultural resource stewardship and the mission of the Refuge System.



Cyrus Brame/USFWS

Bald eagle perched at James River NWR

Chapter 2



Discussions with attendees at draft CCP and EA release public meeting

The Planning Process

2.1 The Comprehensive Conservation Planning Process

2.2 Issues, Concerns, and Opportunities

2.1 The Comprehensive Conservation Planning Process

Service policy (602 FW 3) establishes a planning process that also complies with NEPA (<http://policy.fws.gov/602fw3.html>; accessed March 2013). We followed the process depicted below in developing this CCP. The planning process for this CCP involved three primary steps: (1) initial planning, (2) public scoping, and (3) plan development. These steps are described below in more detail and depicted in figure 2.1. Additional information regarding the preparation of this document is detailed in chapter 5.

Step A: Initial Planning

We began preparing a CCP for James River NWR in April 2009. Initially we focused on collecting information on the refuge's natural and cultural resources and public use program. We identified members of the CCP core team. We received confirmation of the VDGIF participation on May 11, 2009.

Development of a CCP for James River NWR was delayed from 2009 until early 2012. James River NWR staff is shared with three other refuges in the Eastern Virginia Rivers NWR Complex. Refuge staff worked to finalize the Rappahannock River Valley NWR CCP during 2009 and focused on developing a CCP for Presquile NWR from 2010 through 2012. Also during this time, we experienced turn-over in five of the eight refuge staff positions.

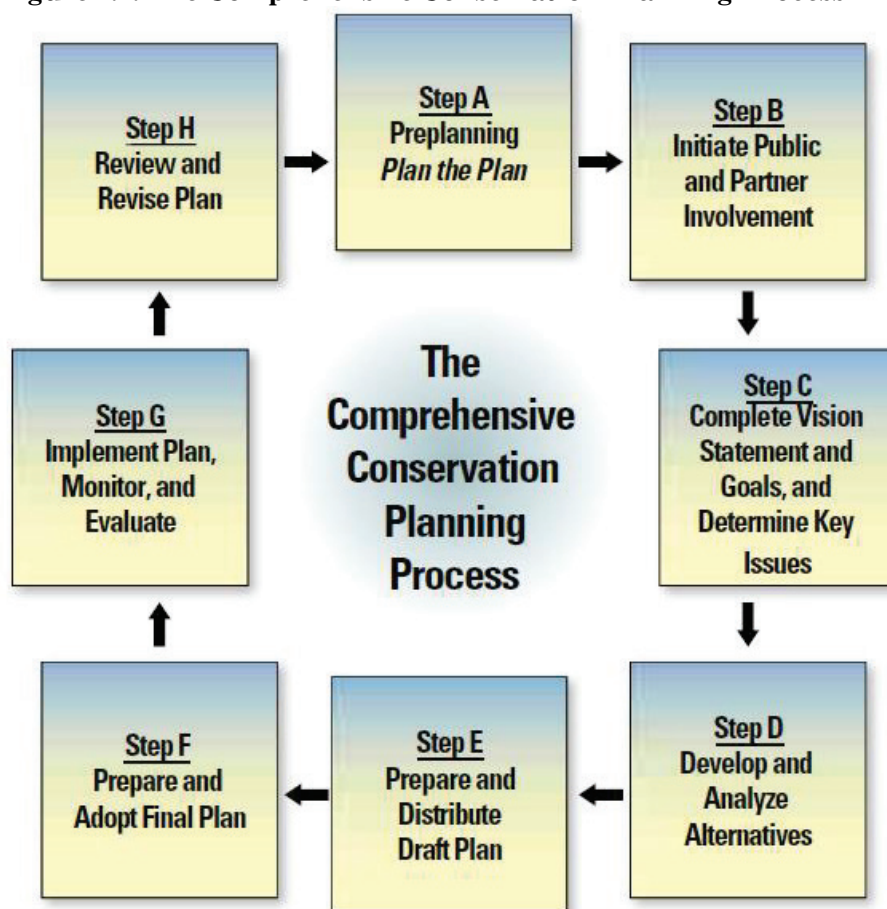
We reconfirmed VDGIF's participation on our CCP core team on January 11, 2012. On March 27 and 28, 2012, the CCP core team of refuge, Regional Office staff, and one representative from VDGIF held an internal scoping meeting to discuss existing information, draft a vision statement and goals, and prepare for the public scoping meeting, and a technical meeting of State and Federal partners.

Step B: Public Scoping

We initiated the public scoping process when the notice of intent to prepare a CCP for James River NWR was published in the *Federal Register* on January 11, 2012 (77 FR 1716). Our first planning newsletter was distributed in late August 2012 to 557 parties on our mailing list (including media outlets) and posted announcements on the refuge website. The planning newsletter included location, date, and time information about upcoming public scoping meetings that would serve to inform the public about current refuge management and elicit input on topics of interest to the public.

We hosted two public scoping meetings in Prince George, Virginia, at the Prince George County Human Services Building on September 12, 2012. These meetings were open houses, held from 2 p.m. to 4 p.m. and from 6 p.m. to 8 p.m. A total of 16 individuals attended these meetings. Planning team staff was also in attendance at both meetings, but not included in the participant attendance noted.

Figure 2.1. The Comprehensive Conservation Planning Process



We received 34 correspondences (i.e., emails, letters, scoping comment forms, faxes, and phone calls) containing comments from interested parties since our announcement to prepare a CCP was published in the *Federal Register* on January 12, 2012. We asked that comments be provided by October 15, 2012. General information inquiries and requests to be added to our mailing list are not included in this total.

Steps C and D: Vision, Goals, and Alternatives Development

We invited 83 representatives of various local, State, and Federal agencies and 6 Virginia Indian Tribes to attend an agency scoping meeting to be held on September 11, 2012, from 10 a.m. to 3 p.m. The workshop was attended by eight representatives from various State and Federal agencies, as well as the Crater Planning District Commission. Refuge and planning team staff were also in attendance at this workshop, but not included in the participant attendance noted. The purpose of the meeting was to identify issues, determine the significant resource values attributed to the refuge, and seek advice from technical experts on what resources of conservation concern in the refuge planning area should be a management priority. We continued to consult with experts throughout 2012, 2013, and 2014. We

met regularly as a core team to develop draft alternatives that incorporate the scoping comments received.

On November 30, 2012, we distributed a planning newsletter update and public comment summary to 594 parties on our mailing list, including media outlets, and posted announcements on our website.

Step E: Draft CCP and NEPA Document

Between December 2012 and October 2014, the core team worked on drafting the CCP and EA. We published a notice of availability in the *Federal Register* announcing our release of this draft on October 22, 2014 for a public review and comment period (79 FR 63161). During the comment period, we held two public meetings to obtain comments directly from individuals. We also received comments by regular mail and e-mail. After the comment period ended, we reviewed and summarized all of the comments received, developed our responses, and revised the CCP as warranted based on the comments. We include a summary of these comments and our responses as appendix F in this document.

Step F: Adopt Final Plan

We submitted the final plan to our Regional Director for review in March 2015. The Regional Director selected alternative B from the draft CCP and EA to implement in the final plan. Our Regional Director also determined that a FONSI was appropriate (see appendix G), and certified this final CCP meets agency compliance requirements, achieves refuge purposes, and helps fulfill the mission of the Refuge System. With an affirmative FONSI and other positive findings, the Regional Director approved the final CCP. We will publish another notice of availability in the *Federal Register* to announce the final decision and availability of the final plan. We will also distribute a newsletter announcing this decision to all contacts on our project list as well as post that newsletter on our website. These actions will complete planning step F to prepare and adopt a final plan.

Step G: Implement, Monitor, and Evaluate Plan and Step H: Review and Revise Plan

We will begin to implement the plan and monitor our success immediately after we publish our final notice of availability in the *Federal Register*. Over the 15-year life of the plan, we will annually review the plan to see if it requires any revisions. We will update and revise the plan at least every 15 years, or sooner if significant new information becomes available, ecological conditions change, a major refuge expansion occurs, or we identify the need to do so during our annual reviews.

2.2 Issues, Concerns, and Opportunities

The Service defines an issue as “*any unsettled matter requiring a management decision*” (USFWS 2012a). Issues can include an “*initiative, opportunity, resource management problem, threat to a resource, conflict in use, or a public concern.*” Issues arise from many sources, including refuge staff, other Service programs, state agencies, other Federal agencies, our partners, neighbors, user groups, or Congress. One of the distinctions among the proposed management alternatives is how each addresses those issues.

From agency and public meetings and planning team discussions, we developed a list of issues, concerns, opportunities, and other items requiring a management decision. We placed them in two categories: key issues and issues outside the scope of this analysis.

2.2.1 Key Issues

Key issues are those the Service has the jurisdiction and authority to resolve. The key issues, together with refuge goals, form the basis for developing and comparing the different management alternatives analyzed in chapter 3 of the draft CCP and EA. The key issues are described in detail below.

Natural Resource Management

James River NWR was originally established for the protection of an endangered species, the bald eagle. Although the bald eagle has recently been removed from the Federal and State lists of endangered species, it remains a species protected under BGEPA and the Federal MBTA. We must comply with all applicable Federal laws, regulations, and policies to ensure continued protection of bald eagles and their habitats at James River NWR.

Given that the specific legal authority used to establish this refuge was the ESA, we must also determine if other federally listed species occur at the refuge today or have the potential to benefit from refuge management actions in the future. We explored how management of this refuge for the benefit of bald eagles could benefit species that are currently listed or are candidates for endangered or threatened status.

We considered a variety of factors to evaluate how the refuge contributes to the ecological integrity of the inner Coastal Plain forested and non-forested ecosystems for the benefit of native plants and animals, especially species of conservation concern. Shoreline erosion, invasive nonnative species management, and climate change are among the factors influencing refuge management decisions.

Our response to these concerns is noted under Goals 1 and 2 in chapter 4.



Meghan Powell/USFWS

Pine-dominated forest after thinning and prescribed burn treatments

Cultural Resource Protection

We have identified that nationally significant cultural resources may occur at James River NWR. The limited archaeological investigations on the refuge and on adjacent properties have yielded evidence and information about Native Indian occupations, early European settlements, and military actions. Seven previously identified archaeological sites are located on the refuge, including one site on the National Register and one site that is eligible for listing on the National Register. In recent years, additional sites and areas of high probability for having archaeological resources have been inventoried but have not yet been recorded by the Virginia Department of Historic Resources (VDHR). National Register eligibility status of these additional sites and areas of high probability has not been evaluated. Until their National Register eligibility has been evaluated, they are treated as if eligible. Archaeological sites at the refuge are threatened by natural processes, refuge management and operations, and illegal activities by refuge visitors.

In addition to archaeological sites, the refuge's cultural resources include museum collections, historic structures, and indigenous

cultural landscapes. To ensure the continued protection of the diversity of cultural resources associated with James River NWR, we must comply with all applicable Federal laws, regulations, and policies. We explored opportunities to maintain the refuge's management and protection of its cultural resources.

Our response to these concerns is noted under Goal 3 in chapter 4.

Public Use

Limited public use opportunities are offered on the refuge currently. We explored opportunities to provide an acceptable level of public use of the refuge that will not impede our ability to fulfill the refuge's primary purpose. During the public scoping period, we received comments requesting consideration of options ranging from closing the refuge to some uses we currently allow to expanding existing opportunities and considering that additional public uses be allowed on the refuge.

We explored how the refuge can offer high quality visitor services programs on- and off-refuge, while promoting stewardship of this refuge for the benefit of wildlife along the lower James River, Chesapeake Bay watershed, and Refuge System.

Our response to these concerns is noted under Goal 4 in chapter 4.

Partnerships

The physical location and role of the refuge in the larger landscape or regional context is strongly considered during the planning process for the refuge. However, there is concern that refuge management activities in several different areas including biological resource management, environmental education, and visitor services will be done independent of the needs and goals of area agencies, businesses, and organizations. Refuge management is driven by several Service policies and mandates (see chapter 1) along with the legislative acts used to create the refuge. Using these guidelines, management of the refuge will build on existing partnerships and explore additional opportunities in support of resource conservation and visitation at James River NWR and the surrounding area.

During the public comment period, we received extensive feedback providing examples of opportunities to collaborate with a broad array of organizations, both governmental entities and non-governmental organizations. Commenters recommended nurturing current partnerships and developing new partnerships to expand and improve biological resource management, visitor service opportunities, and cultural resource protection and interpretation.

Our response to these concerns is noted under Goal 5 in chapter 4.

2.2.2 Outside of Scope

We determined that the following public comments are outside the scope of this CCP:

- Rezone properties adjacent to the refuge—Public comments suggested that the Service work with Prince George County to rezone properties along Route 10 and adjacent to the refuge for commercial development, establishing the refuge vicinity as a tourist destination. The Service does not have the authority to rezone areas within or surrounding the refuge. Prince George County recently updated its comprehensive plan, including zoning information (Prince George County Planning Commission 2012). Future rezoning of County land adjacent to the refuge is outside the scope of the refuge’s CCP.
- Leasing refuge lands to private entities—Public comments noted concern about how leasing Federal lands to private entities is believed to alter the availability of that land to be used by the general public. Since none of the lands or facilities within James River NWR are leased to private entities and we have received no notice of interest from private entities, we determined this topic is outside the scope of the refuge’s CCP.
- Chesapeake Bay water quality—Public comments noted concern about land use and bacteria throughout the Chesapeake Bay. Addressing water quality issues of the Chesapeake Bay in its entirety is beyond the scope of this refuge’s CCP. However, we are aware that the impaired water quality of the refuge’s streams contributes to local water quality concerns in the James River. In this CCP, we describe the existing water quality conditions in the refuge vicinity and identify strategies to improve water quality on and adjacent to the refuge to the maximum extent practicable.
- Allow concealed carry firearms on the refuge—Public comments noted interest in allowing lawfully licensed concealed carry permit holders to carry their firearm on the refuge during their visit for self-defense purposes. Federal legislation allows for a person legally in possession of a firearm under State code to possess it on the refuge (50 CFR 27.42). This has been in effect since February 2010.

Chapter 3



Daniel Lay/USFWS SCA Intern

Refuge road

Existing Environment

- 3.1 Introduction**
- 3.2 Physical Landscape**
- 3.3 The Cultural Landscape Setting and Land Use History**
- 3.4 Climate**
- 3.5 Air Quality**
- 3.6 Water Resources**
- 3.7 Soundscape**
- 3.8 Socioeconomic Landscape**
- 3.9 Special Status Areas**
- 3.10 Refuge Administration**
- 3.11 Natural Resources**
- 3.12 Cultural Resources**
- 3.13 Public Uses**

3.1 Introduction

This chapter describes the current and historic physical, biological, and socioeconomic landscape and resources of James River NWR. We first describe the regional landscape, including its historical and contemporary influences, and then we describe the refuge and its resources.

3.2 The Physical Landscape

3.2.1 Watershed Context

The 4,324-acre refuge is located within the greater Chesapeake Bay watershed, the Nation's largest estuary. The Chesapeake Bay's drainage basin of 64,000 square miles (165,759 square kilometers) encompasses parts of the states of Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, and the District of Columbia.

The James River Basin covers 10,265 square miles (26,586 square kilometers) or approximately 24 percent of Virginia's total area. The largest of Virginia's Chesapeake Bay watersheds, the James River Basin is divided into eight USGS hydrologic units (HUCs): Upper James, Maury, Upper Middle James, Rivanna, Lower Middle James, Lower James, Appomattox, and Elizabeth. The 8 HUCs are further divided into 109 waterbodies and 298 sixth-order subwatersheds. James River NWR is located entirely within the Lower James River HUC (HUC 02080206) and within two subwatersheds, JL 09 and JL 11 (VDEQ 2012).

The James River is one of several major tributaries of the Chesapeake Bay watershed. The James River is formed by the confluence of the Jackson and Cowpasture Rivers and flows 340 miles from its headwaters in the mountains of Bath and Highland Counties, Virginia, to the Chesapeake Bay. The refuge is located in the lower third of the James River watershed, and the river defines the refuge's northern boundary. Powell Creek forms much of the refuge's western boundary, and the Flowerdew Hundred Plantation is its eastern boundary.

In Virginia, riparian ownership ends at the mean low water mark. Accordingly, Federal ownership and refuge management only extends to the mean low water mark of the James River. All activities in the James River and in areas beyond the mean low water mark are under the jurisdiction of the Commonwealth of Virginia (Tittler 2012 personal communication).

3.2.2 Geologic Development

James River NWR lies within the Virginia Coastal Plain Physiographic Province of the Atlantic Coastal Plain, as delineated by USGS. Physiographic provinces are broad-scale subdivisions based on

terrain topography, rock type, and geologic structure and history. The Virginia Coastal Plain Physiographic Province consists of a series of terraces, or scarps, sloping downward toward the coast, with each terrace representing a former shoreline. It is the youngest physiographic province in the State and consists primarily of Holocene (11,700 years ago to present) and Pleistocene (2.6 million to 11,700 years ago) age sedimentary deposits of sand, clay, marl, and shell (USGS 1989). Its principle characteristics are a generally low topographic relief, extensive marshes, and tidally influenced rivers and creeks (USFWS 2007c).

The Virginia Coastal Plain Physiographic Province is separated on its western boundary from the Appalachian Piedmont Physiographic Province by the “Fall Line,” a low, east-facing cliff that parallels the Atlantic coastline from New Jersey to the Carolinas. It separates hard Paleozoic (542 to 251 million years ago) metamorphic rocks of the Piedmont to the west from the softer, gently dipping Mesozoic (251 to 66 million years ago) and Tertiary (65 million to 2.6 million years ago) sedimentary rocks of the coastal plain. This erosional scarp, the site of many waterfalls, hosted flume- and water-wheel-powered industries in colonial times and helped determine the location of major cities such as Philadelphia, Baltimore, Washington, and Richmond. Richmond marks the approximate Fall Line on the James River (USFWS 2007c). The Virginia Department of Conservation and Recreation, Division of Natural Heritage (VDCR Natural Heritage) further subdivides the coastal plain region into northern, southern, inner, and outer Virginia coastal plain to account for the area’s rich variety and distinction of natural community types. The James River NWR lies in the southern inner coastal plain region.

3.3 The Cultural Landscape Setting and Land Use History

Known cultural resources from James River NWR date from the Early Archaic period (8000 B.C. to 6500 B.C.) through the 20th century (Goode et al. 2009). These resources contribute to further understanding Virginia’s history involving American Indian settlements and subsistence, initial exploration of the James River by Europeans beginning in 1607, plantation society, military history, and post-Civil War rural agriculture.

3.3.1 Early American Indian and European Influences

James River NWR has seven archaeological sites that are known to contain American Indian components dating from the Early Archaic through Late Woodland periods (8000 B.C. through European contact in 1607). The Archaic period is identified by archaeologists as the period when more localized seasonal settlement and subsistence patterns replaced the broad seasonal migration patterns of the earlier Paleo-Indian period (9500 B.C. to 8000 B.C.). In Virginia, the

transition from nomadic to permanent, year-round settlement also increased dramatically during the Archaic period, as evidenced through the presence of stone bowls and small subsurface features (Goode et al. 2009). The innovation of ceramic technology and the emergence of cultivated plants generally identify the transition to the Woodland period. In Virginia, the Woodland period is also characterized by the large-scale exploitation of shellfish, often visible archaeologically through the presence of mounds of discarded shells (Goode et al. 2009).

The archaeological evidence at James River NWR indicates a strong American Indian presence spanning thousands of years prior to European contact (pre-contact) and continuing into the contact period. Pre-contact sites at James River NWR have yielded artifacts including sand, shell or stone tempered ceramics and stone tools including projectile points. At least two of the sites were used repeatedly from the Middle Archaic through the Late Woodland periods (Goode et al. 2009).

Extensive American Indian settlements near James River NWR are well documented in the colonial period. The James River NWR is situated in what was Weyanoke Indian territory when the English established the colony of Jamestown in 1607 (Rountree et al. 2007). The Weyanoke inhabited both sides of the James River in that area. Shortly after Jamestown was established, the English began taking the lands of Tribes along the James River by force, including Paspahugh, in whose territory Jamestown was situated, Kecoughtan, Warraskoyack, Quiyoughcohannock, and Arrohatock. In 1611, Sir Thomas Dale's forces seized the Appamattuck town, the seat of the



Engraving of Virginia Indians, based on a watercolor by John White in 1585

Theodore De Bry

female leader Opposunoquonuske, at what became Bermuda Hundred. (<http://www.hmdb.org/Marker.asp?Marker=54254>; accessed June 2014). Colonial records show that the Weyanoke were living only on the south side of the river by 1612; they survived decades of English attacks but eventually moved south and left the area permanently after an assault in 1644 (Rountree 1990).

In 1618, Captain Samuel Maycock patented an approximately 1,700-acre plantation along the southern shore of the James River. Maycock's Point, named for him, was located in the present-day James River NWR (Goode et al. 2009). As early as 1705, a ferry across the James River was established at Maycock's Point (Goode et al. 2009). Neighboring land holdings included Powell-Brooke and Flowerdew Hundred, both located adjacent to but outside James River NWR.

3.3.2 Historic Occupation of James River NWR over the Past 300 Years

By the mid-1700s, Virginia was well settled by Europeans along the James River. Plantations were built to support tobacco and corn production from the coast up to Richmond, Virginia. In the early 1800s, a long wharf and warehouse were built on the James River, located partially within the James River NWR. This wharf was used until around 1915 for shipping agricultural products (Goode et al. 2009). During the mid-19th century, settlement within James River NWR was concentrated in the western part of the property and along the James River (Goode et al. 2009).

During the Civil War, land in and around James River NWR was used only intermittently and on a temporary basis. In 1862, Maycock's Point was used by Confederate General Hill to torment Union boat traffic along the James River, with the remains of a battery reported at this location (Goode et al. 2009). After this time, several Federal stations were established along the James River, including at least one near Maycock's Point. In addition, Federal troops passed through James River NWR towards Petersburg after General Ulysses S. Grant's river crossing on to Flowerdew Hundred Plantation in June 1864.

A mill located on Powell Creek that had been damaged during the war was re-opened after the Civil War. It operated until about 1920, fell into disrepair, and collapsed in the 1930s (Goode et al. 2009).

In the early 1900s, large portions of James River NWR were wooded. Development of the property occurred in the 1910s, mainly on the western part of the property. In the early 20th century, an African-American community was located near the intersection of Powell Creek Road (State Route 640) and Bradby Road. Comprised of a school, church, and a few houses, this community was largely demolished by the mid-20th century. One member of the community was a Chickahominy Tribe member named John Bradby, who owned

property on the present-day refuge where he lived with his daughter (Goode et al. 2009).

Additional information about specific properties, cultural landscapes, and archaeological resources known to occur on the refuge is provided in section 3.12.

3.4 Climate

3.4.1 General Climate Description

The climate of the middle James River system is humid and subtropical as determined by latitude, topography, prevailing westerly winds, and the influence of the Atlantic Ocean. Prevailing winds are westerly with highest wind speeds in the spring (USFWS 2007c). Average annual temperature fluctuations typically range from a high of approximately 71 °Fahrenheit (°F, 22 degrees Celsius [°C]) to a low of approximately 48 °F (9 °C). The average monthly temperature ranges from 37 °F in January to 83 °F in July. Precipitation averages 44 inches (112 centimeters [cm]) annually, with peak rainfall occurring in the summer (see table 3.1). Local annual average relative humidity is 68 percent. Prevailing winds in the spring and summer are from the south-southeast, while those in the fall and winter are from the north-northwest. Local average annual wind speed is 4 miles per hour (6.44 kilometers per hour)

(<http://www.wunderground.com/history/airport/KPTB>; accessed May 2012). Data available for Hopewell, Virginia (Station 444101) indicates the growing season to be approximately 185 days, and the average annual snowfall is 7.9 inches (20 cm) (Southeast Regional Climate Center 2012).

Table 3.1. Monthly Average Temperature and Precipitation for the Refuge Vicinity, 2011

Month	Average Temperature (in °F)	Average Precipitation (in inches)
January	37	1.65
February	48	1.01
March	53	4.47
April	65	1.47
May	70	3.90
June	79	2.61
July	83	7.97
August	80	8.05
September	74	11.13
October	62	2.86
November	55	4.20
December	50	2.30
Annual	40	51.62

(NOAA 2012a)

¹Data are for the weather station in Hopewell, VA.

3.4.2 Global Climate Change and Potential Effects of Climate Change

Global climate change is a significant concern to the Service and to its partners in the conservation community. Climate change is a change in the state of the climate characterized by changes in the mean and/or the variance of its properties, persisting for an extended period, typically decades or longer (Intergovernmental Panel on Climate Change [IPCC] 2007a). There is consensus in the scientific community that climate change is occurring, particularly that the planet is warming and that changes in atmospheric composition are the primary drivers (Bierbaum et al. 2007, U.S. Global Climate Research Program 2009, USEPA 2012). Most scientific papers agree that this warming process has occurred naturally and by means of human activities, primarily economic production activities (Cook et al. 2013, IPCC 2007b).

Increasing greenhouse gases (e.g., water vapor, carbon dioxide, nitrous oxide, methane, ozone) absorb infrared radiation emitted by the Earth's surface, by the atmosphere itself, and by clouds. These gases also trap heat within the surface-troposphere system (IPCC 2007a), heating the Earth's surface and the lower atmosphere. Conservatively, global temperatures are projected to rise between 1.1 °F and 7.2 °F by the year 2100, relative to 1980 to 1999 levels (IPCC 2007a), and 0.27 °F per decade for two centuries after 2100 (Titus and Narayanan 1995).

General Impacts on Species and Ecosystems

Among the numerous ecological, social, economic, and cultural effects of climate change on species and ecosystems, we believe the following potential climate change impacts are the most relevant to be considered in the management planning process for James River NWR. These potential impacts may include species range shifts, species extinctions, behavioral or physical changes in species, and shifts in primary productivity periods.

The density of species may change locally and their ranges may shift in response to the need to find areas within their range of tolerance. Plant communities and species adapted to warmer subtropical latitudes are expected to expand and establish beyond the northern edge of their current range (U.S. Climate Change Science Program 2008). The U.S. Forest Service (USFS) assessed the current and predicted status of 134 tree species following climate change. They combined three global climate or general circulation models to produce high or low averages that can be accessed through an interactive program, the Climate Change Tree Atlas, for displaying the range expansion (or contraction) of suitable habitat for each species by the year 2100 (Prasad et al. 2007-ongoing). Models are provided for common species in the refuge's forests, including loblolly pine, Virginia pine, yellow poplar, American holly, white oak, red oak, flowering dogwood, sweetgum, mockernut hickory, red maple,

blackgum, and willow oak. Abundance and distribution of each of the above species is predicted to be affected differently based on different life cycle needs.

According to an analysis of Christmas Bird Count (CBC) data nationwide from the past 40 years, a significant northward shift of winter abundance is occurring among at least 305 bird species in North America (Niven et al. 2009). Of these bird species, 208 shifted north, with 123 species shifting more than 50 miles. Landbirds shifted more than waterfowl or coastal species, with 75 percent of landbirds shifting north an average of 48 miles. Landbirds were further analyzed according to four habitat guilds: woodland, grassland, shrub, and generalist. Woodland birds shifted the most, followed by shrub species, while grassland birds and generalists shifted the least. This study confirmed northward shift of species already suspected, such as red-bellied woodpecker, tufted titmouse, Carolina wren, and northern cardinal, which are all common species at the refuge throughout the year. It may not be possible to separate climate change influences from forest management influences over the 15-year planning horizon of this document.

Changes in phenology (i.e., the timing of such important life history events as flowering, egg laying, and migration) are anticipated. Changes in body sizes and behaviors may occur. Genetic frequencies may shift. In a study that investigated 61 studies on phenology changes of 694 species over the past 50 years, a statistically significant shift toward earlier timing of spring events was evident. Data collected over the last 21 years through a Virginia Commonwealth University (VCU) study indicate that male prothonotary warblers are arriving to the nearby Presquile NWR earlier in the breeding season (an average of one day per year), and the earlier arrival dates are correlated with a rise in average atmospheric temperature on the breeding grounds. Earlier arrival dates may be associated with occupation of better territories and a higher probability of breeding with multiple females (Blem et al. 2007).

Species with short life cycles, such as insects and annual plants, should have fewer problems adapting to climate change because of their more rapid evolution. Longer-lived species such as trees would experience longer evolution timeframes and thus be less adaptable (Rogers and McCarty 2000). Many animal species time important events in their life cycles, particularly reproduction, so that young arrive when food sources are available. Changes in other phenological events such as flowering or insect hatching could be disastrous for species that fail to adapt in time. The refuge's resilience to climate change can be increased by providing biologically diverse habitats and connected corridors to a diverse species pool that can utilize the refuge habitats.

Species ranges are expected to shift northward or toward higher

elevations as temperatures rise, but responses will likely be highly variable depending on species or taxonomic group. Under these rapidly changing conditions, migration ability, not evolution, will determine which species are able to survive. Species that cannot migrate, such as plants, mussels, and amphibians, are vulnerable to temperature shifts and may be affected in their ability to survive, grow, and reproduce. The Virginia Climate Change Strategy for Species of Greatest Conservation Need predicts that there will be significant challenges for species of greatest conservation need. More than 60 percent of species of greatest conservation need are aquatic and another 15 to 20 percent rely on riparian and wetland habitats. Increased sediment load, turbidity, and inputs of herbicides, fungicides, and insecticides are anticipated in the James River (VDGIF et al. 2009).

Some possible positive effects on vegetation from climate change include increased productivity through longer growing seasons, increased precipitation, and increased carbon dioxide fertilization, which will increase primary production and yield greater biomass and soil inputs. Predicted increase in fire frequency (to a degree) would also be beneficial to native grasses that have deep root systems and suppress hardwood species in the understory. Mature trees should fare better because of developed root systems and higher carbon reserves (Swanston et al. 2011).

Sea Level Rise

In an effort to address the potential effects of sea level rise on national wildlife refuges, the Service ran the Sea Level Affecting Marshes Model (SLAMM) for most Region 5 refuges. Predicted global sea level rise scenarios range from a conservative estimate of 11.8 to 39.4 inches by 2100, to a moderate estimate of 19.7 to 55.1 inches, and to an upper extreme of 72 inches. The SLAMM report for James River NWR indicates that the refuge is vulnerable to the sea level rise scenarios modeled over the next century with some changes to tidal marsh possibly occurring sooner, by 2025 (Clough and Larson 2010). An increase in sea level rise along the higher ends of projections would inundate much of the refuge's tidal-fresh marshes and tidal swamps; the refuge's dry lands, inland-fresh marshes, and non-tidal swamps are expected to be relatively resilient to sea level rise (Clough and Larson 2010).

Increased Wildfire Frequency and Severity

One of the effects of climate change in the region is increased wildfire frequency and severity (Scholze et al. 2006). Wildfire regimes have also changed due to long periods of fire suppression, forestry practices, and other land management trends, but higher temperatures and decreased precipitation are fundamental to wildfire intensification. Intensified fire regimes modify fish and wildlife habitats, benefiting some species while harming others. However, the

risk of catastrophic fire that causes widespread and permanent damage to current ecosystems increases in warmer and drier conditions.

The Northeast Region of the USFWS entered into a cooperative agreement with NPS, USFS, and Commonwealth of Virginia's Department of Forestry (VDOT) for wildland fire management and Stafford Act response to improve efficiency by facilitating the coordination and exchange of personnel, equipment, supplies, services, and funds among the agreement signatories. We also have agreements in place with TNC and the VDCR Natural Heritage Program for fire support (Craig 2012 personal communication).

Other Effects

Observed changes and documented responses in natural and managed systems resulting from climate change are diverse and include the magnitude, timing, distribution, and type of precipitation, with corresponding effects on surface and groundwater resources (IPCC 2007b). Climate change may alter storm frequency and intensity (Henderson-Sellers et al. 1998, Huntington 2006); result in changes in availability, uptake, and toxicity of contaminants and increased sensitivity of fish and wildlife to contaminants (Noyes et al. 2009); alter wildlife disease transmission dynamics and ranges (Acevedo-Whitehouse and Duffus 2009); and result in additional introductions of new invasive species and spread of present invasive species due to climate change (Mooney and Hobbs 2000).

3.5 Air Quality

The USEPA collects emissions data on three common air pollutants that can negatively affect human health and the environment: carbon monoxide, sulfur dioxide, and particulate matter. The USEPA also collects data on three major promoters of criteria air pollutants: volatile organic compounds, nitrogen oxides, and ammonia. These data are summarized in the Air Quality System database, the USEPA's repository of criteria air pollutant monitoring data. This database reports the number of days when air quality was good, moderate, or unhealthy for sensitive groups, by stationed county (counties with air quality monitoring stations).

James River NWR is located in the Richmond-Petersburg Metropolitan Statistical Area (MSA) (<http://www.epa.gov/ozonedesignations/2008standards/rec/region3R.htm>; accessed February 2013). The Virginia Department of Environmental Quality (VDEQ) monitors levels of ozone and particle pollution from several stations in Virginia. Air quality in the Richmond-Petersburg MSA was good for the majority of days during 2012 and met the attainment criteria for various air pollutants

(USEPA 2013). Air quality is measured on the Air Quality Index (AQI). Only one day was rated as unhealthy in 2012 in the Richmond-Petersburg MSA, the result of high ozone levels. The AQI, a measurement of air quality, is calculated from measurements of these pollutants over several hours. A higher rating indicates a higher level of air pollution and consequently, a greater potential for health risk. In the Richmond-Petersburg MSA, there were 11 days of unhealthy for sensitive groups AQI scores, all due to ozone, and 57 moderate days due mostly to ozone, but also to nitrogen oxides and particulate matter (USEPA 2013). Table 3.2 presents the air quality data for the counties near James River NWR. Note that data for Prince George County overall do not exist, but data for the nearby city of Hopewell are available and presented in the table. No data for Surry or Sussex Counties, or for any cities within either county, are presently available. Data for the nearest other two counties are presented in table 3.2.

Table 3.2. Air Quality Data from the EPA's Air Quality System Database for Three Jurisdictions near James River NWR, 2012.

Location	Direction to Refuge	Days Measured	Number (Percent) of Days in 2012 when Air Quality was		
			Good	Moderate	Unhealthy for Sensitive Groups
City of Hopewell	SE	60	60 (100 percent)	0 (0 percent)	0 (0 percent)
Charles City County	N	366	332 (91 percent)	29 (8 percent)	5 (1 percent)
Chesterfield County	NW	260	221 (85 percent)	36 (14 percent)	3 (1 percent)

(<http://www.epa.gov/airdata>; accessed May 2013)

Within a 10-mile radius of the refuge, there are two air quality monitoring stations (USEPA 2011). One station is located approximately 8 miles northwest of James River NWR, at the Shirley Plantation (Site 51-036-0002). The other station is located approximately 9 miles west of James River NWR, at 1000 Winston Churchill Drive in Hopewell (Site 51-670-0010). Sulfur dioxide, nitrogen dioxide, particulate matter 0-2.5 micrometers (μm), and ozone are currently monitored at Shirley Plantation; lead and particulate matter 0 to 10 μm are currently monitored at the Hopewell site.

The Shirley Plantation monitoring station, VDEQ site designator 75-B, is located approximately 8 miles upstream of the refuge on the James River. It continuously monitors ozone, nitrogen oxide, and sulfur dioxide levels and records values hourly. In 2012, Charles City County had 14 days when air quality monitors recorded ozone concentrations greater than 76 parts per billion (ppb), the health-based air quality standard. Of these instances, seven were in June, four in July, two in August, and one in late May. However, no days in 2012 had a daily average concentration above this threshold; the

highest recorded average was 62 ppb.

Located to the west of the refuge, the city of Hopewell is heavily industrialized (<http://www.epa.gov/myenv>; accessed July 2013). During the spring and summer, prevailing winds coming from the west and south-southwest could blow emissions from industrial facilities in Hopewell directly over the refuge. These emissions could pose a threat to plant and wildlife as particulates and other contaminants settle on the refuge (USFWS 2013a). Emissions from industrial sites within 15 miles of the refuge include a broad spectrum of chemicals and metals.

The VDEQ collected data on the long-term cancer and non-cancer risk exposure to the air quality in the Hopewell area using three monitoring stations for 3 years (McMurray and Anthony 2010). All three sites exceeded the benchmark estimated risk probability, which is the chance that a person living near a source would have health risks if exposed to a maximum pollutant concentration for 70 years (EPA 1989). The most important carcinogenic chemicals detected were carbon tetrachloride and formaldehyde. A suite of non-carcinogenic chemicals were also measured to determine the risk that a person living near the area would develop some negative effect to their health due to exposure to these chemical concentrations. All three sites had a risk level that exceeded the probability of a person developing non-carcinogenic health effects; however, when compared to the rest of the State, the Hopewell area is very similar to other urban areas. The non-carcinogenic compound of greatest concern is acrolein.

According to VDEQ's Division of Air Program Coordination, Charles City, Henrico, Hanover, Chesterfield, and Prince George Counties all are within an ozone maintenance and emission control area for oxides of nitrogen and volatile organic compounds.

Real-time air quality information for the sites in the refuge vicinity are available on the VDEQ's website (http://vadeq.ipsmtx.com/cgi-bin/aqi_map.pl?metro01_aqi.png; accessed February 2013).

3.6 Water Resources

The 3-mile segment of the James River bordering the refuge to the north is tidal, as are the lower stretches of Powell Creek and Flowerdew Hundred Creek. Average daily amplitudes are approximately 3 feet (0.9 meters). Rain, wind, or full moon tides can cause the river to fluctuate several feet (1 meter) from normal. In refuge vicinity, the river is slightly brackish with salinities ranging from a high of about 25 parts per million (ppm) in the summer to a low of 10 ppm in the winter (Spencer 2009 personal communication).

3.6.1 Groundwater Quality and Quantity

The Coastal Plain region is the only one in Virginia that is composed mostly of unconsolidated deposits, primarily alternating layers of sand, gravel, shell, rock, silt, and clay. In many places, a shallow unconfined aquifer system lies above relatively impermeable clay beds and is the source of water for hundreds of domestic and other small capacity wells. More groundwater is stored in these very permeable materials than in any other province in the State. The Columbia Aquifer, also known as the water table aquifer, is the uppermost aquifer and is unconfined throughout its extent. It ranges in thickness from 10 to 80 feet and is present only in the central and eastern portions of the region. The top of the aquifer, or the water table, can vary in depth with precipitation and location from just a few feet to 50 feet below the surface. The Columbia Aquifer serves as a reservoir of recharge to the underlying confined aquifers and is an important source of water for rural and domestic users.

As of February 2013, VDEQ is consolidating water well information collected by different State and Federal agencies for a variety of purposes. The number of wells on lands adjacent to the refuge is currently unknown. Any wells that are present can be assumed to be widely used. According to VDEQ (2012c), 3 out of every 10 Virginians use groundwater for their daily water supply. The Coastal Plain physiographic province, where the refuge is located, has abundant, highly used groundwater. However, the potential for groundwater pollution is also high due to geology and population density.

The refuge has one artesian groundwater well, located south of the equipment shed, which supplies water to spigots at the equipment shed and restroom facility in the hunter check station. Since 2009, the Commonwealth of Virginia Department of General Services has conducted tests on the groundwater well; results indicate an absence of the potentially harmful bacterium, *Escherichia coli* (*E. coli*), found in sewage. Additionally, the Service requires that wells be tested quarterly for total bacteria and annually for nitrates, nitrites, lead, and copper (Guil 2011 personal communication); results of these tests indicate levels of these constituents are at acceptable levels. Four punch wells and two shallow dug wells are located on the refuge but are not currently in use.

The refuge's groundwater withdrawal well and septic system outflow system are maintained in good working condition and support refuge operations and limited public use on the refuge.

3.6.2 Surface Water Quality

Currently 53 percent of the James River's streams are categorized as in good or excellent condition. According to the James River Association's (JRA) State of the James River 2013 report, the overall river health score for the James River has increased 2 percent since

2011. Stream condition and tidal water quality have declined, while submerged aquatic vegetation (SAV) and riparian forests have improved or not declined in recent years. Many streams are still under moderate to severe stress. The tidal James River continues to have excessive algae growth and poor water clarity, meeting the State standard only 10 percent of the time (JRA 2013).

Pollution continues to be the greatest threat to the James River and is tied directly to the decrease in stream condition and tidal water quality. Together, sediment, nitrogen, and phosphorous pollution to the James River and its tributaries can lead to low dissolved oxygen levels, lower water clarity, and algal blooms, which degrade aquatic habitats. Additional best management practices for erosion control could help to reduce sediment loadings to the James River, while reductions in point source nutrients could help to reduce phytoplankton concentrations in the James River (VDEQ 2005).

Water quality, when assessed by biological parameters, presented a varied picture for the James River. Measures of the phytoplankton community were poor to fair throughout much of the river. Benthic organisms, invertebrates that live on the bottom on streams and rivers, met water quality goals at most stations in the main stem of the James River except at one station located 45 miles downstream from the refuge and one station 8 miles upstream of the refuge (VDEQ 2005).

Data on dissolved oxygen, pH, and *E. coli* levels were recorded in Powell Creek along the southwest edge of the refuge from May 9, 2006 to October 3, 2007 (Frederickson 2007 personal communication). Dissolved oxygen levels ranged from a low of 4.6 ppm to a high of 12.2 ppm, with an average of 7.5 ppm. Oxygen levels below 4.0 ppm stress aquatic life. Oxygen depletion is also a major source of fish kills. The pH levels ranged from a low of 6.2 to a high of 7.7, with an average of 7.1 (<http://mddnr.chesapeakebay.net/eyesonthebay/whatsitmean.cfm>; accessed January 2014). These levels represent pH values that would not be stressful to aquatic life. Levels of *E. coli* ranged from a low of 11 colony forming units per 100 milliliters (CFU/100 ml) to a high of 280 CFU/100 ml, with an average of 81.9 CFU/100 ml, which is the below the State standard of 235 CFU/100 ml and indicates that these waters are safe for recreation.

SAV is a critically important component of the aquatic environment in the Chesapeake Bay; its presence and healthiness are indicators of good water quality. SAV covered 55 percent of the 3,408-acre goal set for the James River, a 6 percent increase from 2011 (JRA 2013). Although SAV is thriving in many of the tidal tributaries to the James River and above the Fall Line, there are no SAV beds anywhere on the main stem of the James River from Richmond to the James River Bridge in Newport News (JRA 2011).

Current and historical SAV monitoring data indicate that the section of the James River adjacent to the refuge has not supported SAV at any time between 1971, when monitoring began, and 2011. SAV does not occur along this section of the James River due to polluted and turbid conditions of the water (Virginia Institute of Marine Science [VIMS] 2013). In 2005, a small section of Flowerdew Hundred Creek, just outside the refuge's southeast corner, became vegetated with SAV. This patch has increased in size on an annual basis, growing downstream towards the river, but has not moved further inland into the headwaters of the creek. Powell Creek, along the refuge's western border, has also seen yearly increases in SAV since 2006, when it was first observed. In 2011, SAV was observed to cover the headwaters between 70 and 100 percent in fragmented patches just east of Garysville, on the refuge's southwest corner and throughout the majority of Powell Creek all the way to its mouth at the James River. A small section of the stream, approximately 0.6 miles in length around Eelbank Point, had no observed SAV (VIMS 2013).



Meghan Powell/USFWS

Tributary to Flowerdew Hundred Creek

3.6.3 Impaired Waterways

In March 2012, VDEQ updated the 305(b)/303(d) Water Quality Assessment Integrated Reports for 2005 to 2010 (VDEQ 2012). The report combined both the 305(b) Water Quality Assessment and the 303(d) Report on Impaired Waters for each major river basin. It describes segments of streams, lakes, and estuaries that violate water quality standards and details the pollutant responsible for these

violations, as well as the cause and source of the pollutant, if known. If a waterbody contains more pollutants than allowed by the water quality standards, it will not support one or more of its designated uses. Such waters are considered to have impaired water quality. Designated use impairments that were assessed within the watershed include aquatic life, fish consumption, public water supply, recreation, and wildlife, and they are expressed in terms of river miles (VDEQ 2010).

The 3-mile segment of the James River bordering the refuge to the north is listed as an impaired waterway for aquatic life and fish consumption uses, due to inadequate benthic community scores and elevated levels of polychlorinated biphenyl (PCB) in fish tissues (VDEQ 2012). In 2011, VDEQ initiated a study of PCBs in the James River in the stretch from Richmond to the Hampton Roads Bridge Tunnel using high resolution/low detection methods. These data have not been published but will be used to establish 2014 total maximum daily load (TMDL) PCBs in the James River (VDEQ 2012). A TMDL is a reduction plan that defines the limit of a pollutant(s) that a waterbody can receive and still meet water quality standards.

Two segments of stream within the Powell Creek subwatershed and Flowerdew Hundred Creek are 303(d) listed as impaired waterways (VDEQ 2010). A small pond and 1.59 stream miles of a tributary at the headwaters of Powell Creek are listed as impaired due to the presence of *E. coli* from an unspecified nonpoint source. The headwaters to the tidal limit of Powell Creek (7.6 stream miles) are not listed as impaired waterways; however, the estuarine area (0.4 square miles) of Powell Creek following the western border of the refuge is 303(d) listed as impaired due to the presence of noxious aquatic plants, organic enrichment, and oxygen depletion. Among the probable sources contributing to its impairment are agriculture, atmospheric deposition of nitrogen, clean sediments entering the waterway, industrial point source discharges, natural plant and wildlife nutrient cycling, loss of riparian habitat, municipal discharges and/or sewage, and stormwater. Numerous tidal areas in the lower James River watershed, including both Powell Creek and Flowerdew Hundred Creek, are 303(d) listed as impaired due to organic enrichment and oxygen depletion. TMDLs have not yet been established for these waterways.

3.6.4 Chemical Pollution in Waters and Wildlife

The historic and potential for future chemical pollution of the waters to impact refuge wildlife are noteworthy. Of particular concern is potential contamination of food sources for the bald eagle and waters used in support of refuge operations and public use.

DDT

The use of dichlorodiphenyltrichloroethylene (DDT), an organochlorine insecticide, was the primary factor that contributed to

the decline of bald eagle populations throughout North America during the 1960s. Environmental concern about the potential impacts of indiscriminate application of chemicals, especially DDT, grew during the 1960s. DDT was banned for agricultural use worldwide by the 2001 Stockholm Convention on Persistent Organic Pollutants. However, the use of DDT is still permitted in small quantities in countries that need it.

In 1993, a study was conducted to determine if fish in the James River were contaminated by DDT-related pollutants and other pollutants, and if so, if that contamination was posing a possible threat to the James River bald eagle concentration area (Morse et al. 1993). The study analyzed metals, pesticides, polycyclic aromatic hydrocarbons, and PCBs in live and dead gizzard shad and white catfish. Arsenic, cadmium, copper, and lead concentrations in fish tissue were found to be above the national 85th percentile concentrations obtained through the National Contaminants Biomonitoring Program. Dichlorodiphenyldichloroethylene, cis-nonachlor, trans-nonachlor, and PCB concentrations were also above the 85th percentile concentrations. At that time, the concentration levels were high enough to cause concern for the stability of bald eagle populations of the James River. The study recommended that fish contaminants continue to be monitored, and that a sediment monitoring program be started as well as an eaglet blood monitoring program (Morse et al. 1993).

Kepone

From 1966 to 1975, the James River and its tributaries from Richmond to Newport News were polluted with Kepone, a chlorinated hydrocarbon insecticide that was produced by the Allied Chemical Company. Since 1975, VDEQ has continually monitored Kepone levels in the James River, the major areas of concern being Kepone levels in the water column, finfish, and sediment of the James River and its tributaries, and in the groundwater in Hopewell. Water column monitoring was discontinued in 1981 after continuous non-detectable results were collected. Since that time, Kepone levels in finfish, ground water, and sediment have decreased. The Virginia Department of Health has established a level of concern of 0.30 ppm Kepone in fish-filet samples. Since 1996, no fish-filet samples from the lower James River have exceeded this level. (VDEQ 2012).

Pollution Potential

Near-surface sources of contamination have the potential to impact groundwater supplies in the upper 100 feet of the coastal plain's shallow regional aquifer, the aquifer from which drinking water is withdrawn in support of refuge operations and public use (http://pubs.usgs.gov/wri/wri034278/wrir03_4278.pdf; accessed May 2013). The pollution potential in the uppermost unconfined aquifer is high because of the permeability coupled with the high population

density and agricultural activities in the area (USFWS 2013a). Based on a review of literature and Virginia Water Control Board records, and other research, there are seven high priority threats to groundwater in Southeastern Virginia: septic systems, underground storage tanks, spills and improper disposal of hazardous materials, surface waste impoundments, landfills, pesticide and fertilizer applications, and saltwater encroachment (USFWS 2013a).

The USFWS evaluated various contaminant sites for the potential risk to trust resources utilizing James River NWR (USFWS 2013a). More than 1,000 sites identified by EPA's data management systems as potential sources of contaminants were reviewed. However, it was determined that the majority of the 1,000 sites were not of concern to the refuge for various reasons, including distance from the refuge and the improbability of contaminants reaching the refuge, minimally toxic materials are released in small quantities, and operational status. The following sites were retained as part of the contaminant assessment process as contributors to poor water quality in the James River and tributaries: Chesterfield Power, Hercules Hopewell Plant, Honeywell International Inc., Rocktenn, Hopewell Cogeneration Facility and Power Station, Hopewell Wastewater Treatment Plant, Philip Morris, and Proctors Creek Wastewater Treatment Plant (USFWS 2013a). Contaminant concerns in the future will most likely to be related to the potential for a spill event to occur in the James River, potentially contaminated areas identified above for which little or no data exists on the presence of contaminants and potential contaminant threats associated with the site, and proposed development in the vicinity of the refuge.

3.7 Soundscape

Noise has the potential to impact wildlife populations and the human experience on the refuge. The landscape surrounding James River NWR is comprised of large tracts of forested riparian areas and agriculture lands. Limited gunshots can be heard from adjacent properties during hunting seasons and from a range located west of the refuge.

The natural soundscape of James River NWR is an important natural feature that contributes to the visitor's experience at the refuge. The natural sounds of the refuge change seasonally with vegetation changes and migration, but include the rustling and crunching of leaves, the snapping of twigs, the barking of squirrels, and the drumming of woodpeckers. The calls of a wide variety of birds and frogs add a harmony of pitches and melodies, wind whistles through the forests, and waves may lap gently against the shore or crash into the gravel shores with a dull roar. The natural soundscape of James River NWR is serene and calm, explaining to the listening visitor a

great amount of detail about the surrounding ecosystem and wildlife.

The major human activities that contribute to the soundscape of James River NWR include boat traffic (both recreational and barges), infrequent gunshots during the fall hunting seasons in the areas adjacent to the refuge boundaries, and occasional refuge visitors. The James River supports recreational boating and barge traffic carrying materials up and down the river. Large ships and tugs can occasionally be heard on the main stem of the river from the refuge shore. Bass boats can occasionally be heard within Powell Creek and Flowerdew Hundred Creek. Road traffic from Routes 10, 639, and 640 can be heard, more so during winter, because full foliage in the summer months helps to absorb sound.

Species that occupy the interior of the refuge are likely buffered from any human sound sources that would have a negative impact on their lifecycle. The refuge has a limited trail system, which helps to minimize disturbance from visitors on the refuge.

3.8 Socioeconomic Landscape

3.8.1 Regional Socioeconomic Setting

Regional Demographics

According to the U.S. Census Bureau (USCB), James River NWR is located within the Richmond MSA. In addition to the city of Richmond, this region includes Prince George County, where James River NWR is located, and the adjacent counties of Charles City, and Chesterfield, and the cities of Colonial Heights, Hopewell, and Petersburg. The city of Hopewell is located 8 miles northwest of the refuge, and Richmond, the largest city in Virginia, is located 30 miles northwest. Surry County, located southeast of the refuge, is located within the Norfolk/Virginia Beach/Newport News MSA.

With its location within the Richmond MSA and close proximity to the population centers of Richmond, Petersburg, Hopewell, and Colonial Heights, James River NWR is considered an urban refuge. According to the Service's Urban Wildlife Refuge Initiative, existing refuges that are located within a 25-mile radius of urban areas are to provide public use benefits associated with fish and wildlife resources that include, but are not limited to, bird watching, fishing, scientific research, environmental education, open space in an urban setting, and protection of cultural resources (<http://americaswildlife.org/wp-content/uploads/2011/03/Urban-Initiative-Fact-Sheet.pdf>; accessed November 2013).

To understand the constituency that comprises the urban refuge area, table 3.3 provides the regional population demographics, and table 3.4 describes the racial, economic, and linguistic characteristics for the adjacent jurisdictions.

Table 3.3. Regional Population Demographics

Jurisdiction	Population	Population Density (people per square mile)	Median Age	Population Change Between 2000 and 2010 ¹
Virginia	8,001,024	203	37.5	+ 13.0 percent
City of Richmond	204,214	3,415	32.0	+ 3.3 percent
City of Hopewell	22,591	2,198	36.5	+ 1.1 percent
City of Petersburg	32,420	1,414	39.8	-3.9 percent
Colonial Heights	17,411	2,315	41.9	+ 3.0 percent
Prince George County	35,725	135	38.0	+ 8.1 percent
Charles City County	7,256	40	46.6	+ 4.8 percent
Chesterfield County	316,236	747	37.6	+ 21.7 percent
Surry County	7,058	25	45.0	+ 3.4 percent

(USCB 2000, 2010a-c)

¹Population change from 2000 to 2010 is derived by dividing the difference between the population in Census 2010 and the Census 2000 estimates base by the Census 2000 estimates base.

Table 3.4. Regional Racial, Economic, and Linguistic Demographics

Jurisdiction	Majority Ethnic Population/ Percentage	Minority Population ¹	Low-income Population ²	Linguistically Isolated Population ³
Virginia	White/ 72.4 percent	27.6 percent	10.7 ± 0.1 percent	2.7 ± 0.1 percent
City of Richmond	Black or African-American/ 50.6 percent	49.4 percent	23.7 ± 1.2 percent	1.9 ± 0.2 percent
City of Hopewell	White/ 55.4 percent	44.6 percent	20.1 ± 3.2 percent	1.3 ± 1.0 percent
City of Petersburg	Black or African-American/ 79.1 percent	20.9 percent	21.8 ± 2.7 percent	0.8 ± 0.5 percent
Colonial Heights	White/ 82.3 percent	17.7 percent	7.1 ± 2.1 percent	1.1 ± 0.6 percent
Prince George County	White/ 61.1 percent	38.9 percent	6.5 ± 1.7 percent	0.9 ± 0.6 percent
Charles City County	Black or African-American/ 48.4 percent	51.6 percent	8.9 ± 2.2 percent	0.0 ± 1.4 percent
Chesterfield County	White/ 68.3 percent	38.9 percent	6.1 ± 0.6 percent	2.2 ± 0.2 percent
Surry County	White/ 51.3 percent	48.7 percent	8.5 ± 3.3 percent	0.3 ± 0.4 percent

(USCB 2009, 2010d, 2011)

¹Minority population includes persons who identified themselves and members in their households as members of the following groups:

- One Race: American Indian and Alaska Native; Asian; Black or African American; Hispanic; Native Hawaiian and Other Pacific Islander; White; or some other race.
- Two or More Races: Any combination of two or more of these race categories.

²Low-income population includes the percentage (and percent margin of error) of people whose income over the past 12 months is below the poverty level.

³Linguistically isolated population, defined as persons who indicated that they speak English less than very well, is based on the percentage (and percent margin of error) of households.



LaVonda Walton/USFWS

Children birdwatching

Prince George County's population density is less than that for the State and the cities of Richmond and Hopewell, but more than Charles City County, which is on the north side of the James River, opposite the refuge. The county median age is generally the same as that of Virginia and Hopewell, but slightly less than Richmond and nearly 10 years less than Charles City County. A growing area, Prince George County's population increase of approximately 8 percent is greater than that of all the surrounding jurisdictions. The majority of the population identifies as white, which is also the majority demographic for Hopewell. With only 6.5 percent of the population identifying as low income, Prince George County is the most affluent of the jurisdictions around the refuge.

Land Use

James River NWR is located within Prince George County's Rural Conservation Planning Area, which is the county's designated conservation area (Prince George County Planning Commission 2012). The county has adopted regulations and policies to achieve conservation and preservation objectives within Rural Conservation Planning Areas. Land use immediately to the east, south, and west of James River NWR is almost exclusively agriculture (Prince George County Planning Commission 2007). There is a small industrial area on the western border of the refuge, known as the Hitch Sand and Gravel site. Further west, the area is single-family residential.

James River NWR is part of one of the county's five critical environmental areas. These areas have been legislatively defined by the county as "*areas of natural, scenic and historic value, including, but not limited to, wetlands, marshlands, shorelands, and floodplains of rivers, lakes and streams, wilderness and wildlife habitats, historic*

buildings and areas” (Prince George County Planning Commission 2012).

The Prince George County 2012 update to its comprehensive plan includes a future land use map that is generally consistent with the existing land use surrounding the refuge. The town of Garysville, the location of the Flowerdew Hundred Plantation, is designated as a neighborhood commercial area on the future land use map. This land use category designates those areas where small-scale commercial uses, which provide goods and services designed to meet the needs of the surrounding residential community, are encouraged (Prince George County Planning Commission 2012).

Employment

Virginia’s well-developed transportation system and central location along the Atlantic Coast provides access to major markets throughout the U.S. Nearly 50 percent of the Nation’s population and 50 percent of the manufacturing activity are within 500 miles of Richmond, and the Richmond MSA is a leading manufacturing, finance, trade, and corporate headquarters center in Virginia (Virginia Economic Development Partnership 2008).

In 2005, Forbes Magazine ranked the Richmond area as one of the best places for business and careers in the U.S., primarily due to its highly educated labor force and relatively low business codes. Other areas of the economy that have developed recently include pharmaceuticals, insurance, advertising, biotechnology, education, tourism, health services, and semi-conductors. In 2009, travel and tourism was the fifth largest industry by nonfarm employment in Virginia, with travelers spending \$17.7 billion (Virginia Tourism Corporation 2010). Visitor centers that promote local tourism occur in the cities of Richmond, Petersburg, and Hopewell.

Prince George County is a predominantly rural county, with a designated growth area on the western portion influenced by the southeast metropolitan Richmond area. The largest employment category in Prince George County is services, with manufacturing, and retail and wholesale trade, ranking second and third, respectively. The major industrial employers include distribution facilities for Food Lion, Standard Motor Products, Perdue, Ace Hardware, as well as the Crosspointe Rolls-Royce manufacturing facility. Fort Lee is the major public-sector employer. Commercial farming is a secondary economic factor in the county. Chief crops are soybeans, wheat, corn, and forage (hay), and livestock includes cattle, beef cows, and milk cows (<http://www.nass.usda.gov>; accessed January 2013).

Nearly 75 percent of the county is comprised of forested areas, owned primarily by private individuals or private corporations. Of the 98 timber-producing localities in Virginia, Prince George County ranked

21st in total value of timber products in 2007. These products had an average annual harvest value exceeding \$3.6 million in 2006. Direct and indirect forestry-related employment in the Tri-Cities area exceeded 2,000 jobs in 2007 with a total harvest value in excess of \$73 million (<http://www.princegeorgeva.org/Index.aspx?page=601>; accessed January 2013).

3.8.2 Refuge Contributions to the Local Economies

Recreational visitors to the refuge can affect local income and employment. According to the 2007 “Banking on Nature” report compiled by Service economists, the Refuge System is a major economic engine for local communities (Carver and Caudill 2007). Since the refuge establishment in 1991, visitation has fluctuated with onsite staffing. Visitation estimates have ranged from 1,228 in 1994 to 270 in 2006. Average visitation during the last 8 years (2005 to 2012) is generally around 400 visitors annually (Brame 2013 personal communication). In general, approximately 80 percent of visitors to James River NWR live within a 30-mile radius of the refuge. In 2006, total visitor recreation expenditures at James River NWR were \$17,600, of which 60 percent represented non-residents (Carver and Caudill 2007).

James River NWR further contributes to the regional economy through direct expenditures and refuge revenue sharing payments to Prince George County. National wildlife refuges also contribute to local economies through shared revenue payments. Under the provisions of the Refuge Revenue Sharing Act (the Act of June 15, 1935; 16 U.S.C. 715s), the Service pays an annual refuge revenue sharing payment to counties that contain lands the Service administers. The exact amount of the annual payment depends on Congressional appropriations, which in recent years have tended to be less than the amount to fully fund the authorized level of payments. Recent revenue sharing payments for James River NWR to Prince George County between 2005 and 2012 are presented in table 3.5.

The refuge also contributes indirectly to the economy of Prince George County and the Richmond MSA by protecting wildlife habitat in perpetuity.

Table 3.5. Revenue Sharing Payments to Prince George County, Fiscal Years 2005 to 2012

Year	Acres	Full Payment	Actual Payment	Percent of Full Payment
2005	4,199.58	\$44,385	\$20,660	46.5 percent
2006	4,199.58	\$44,385	\$19,121	43.1 percent
2007	4,199.58	\$44,385	\$19,121	43.1 percent
2008	4,199.58	\$44,385	\$18,490	41.7 percent
2009	4,199.58	\$44,385	\$14,345	32.3 percent
2010	4,323.72	\$126,138	\$13,480	30.4 percent
2011	4,323.72	\$126,138	\$26,993	21.4 percent
2012	4,323.72	\$126,138	\$28,925	22.9 percent

3.9 Special Status Areas

3.9.1 Federally Designated Special Status Areas

Federally designated special status areas include wilderness areas, wild and scenic rivers, national parks, national trails, national natural landmarks, research natural areas, experimental research areas, world heritage sites, biosphere reserves, national marine sanctuaries, Class I and Class II clean air areas, and critical habitat for endangered, threatened, and rare species management. Designated areas within a 5-mile radius of the refuge are highlighted below.

Wilderness Area

As part of the planning process, we also evaluated all the federally owned (in fee title) lands on the refuge for their possible inclusion into the NWPS. We completed a wilderness review for this CCP, with the recommendation that we not proceed further with a wilderness study because we determined that refuge lands do not meet the criteria for eligibility. Appendix E in the draft CCP and EA presents the results of our assessment.

The closest designated wilderness area to the refuge is the Three Ridges Wilderness, which is located approximately 100 miles northwest of the refuge in the George Washington National Forest in Nelson County, Virginia.

National Wild and Scenic Rivers

The National Wild and Scenic Rivers Act (16 U.S.C. 1271-1287) established a process for identifying free-flowing rivers deserving of Federal protection to preserve them and their immediate environments for the use and enjoyment of present and future generations. NPS compiles and maintains the Nationwide Rivers Inventory, which is a register of river segments that potentially qualify as national wild, scenic, or recreational river areas.

Service planning policy requires us to conduct a wild and scenic river review during the CCP process if applicable. The nearest river segment that has the potential for national wild and scenic river designation is a portion of the James River that begins upriver from James River NWR, at Hopewell City to Mogarts Beach in Isle of Wight County, Virginia. This 62-mile segment is one of the most significant historic, relatively undeveloped rivers in the entire Northeast Region (NPS 2009). However, we did not conduct a wild and scenic river review for James River NWR because this potentially eligible segment is adjacent to the refuge and not within the refuge boundary.

National Fish Hatchery

The Harrison Lake National Fish Hatchery (NFH) is located in Charles City, along Herring Creek on the north side of the James River and is managed by the Service. The 444-acre NFH plays a key

role in the Service's efforts to protect and restore declining and imperiled populations of migratory fish and other aquatic species of Atlantic Coast watersheds by rearing American shad, river herring, and striped bass. NFH staff are working closely with VDGIF to culture imperiled and declining freshwater mussel species for recovery and restoration efforts. Co-located at the NFH is the USFWS Virginia Fisheries Coordinators Office, whose duties include supporting funding and Atlantic sturgeon research. The NFH grounds offer opportunities for recreational fishing, boating, hiking, wildlife watching, and picnicking.

National Parks

No portions of any National Parks are within a 5-mile radius of James River NWR.

National Historical Trails and Watertrails

The refuge is located on the James River segment of the Captain John Smith Chesapeake NHT, within the Chesapeake Bay Gateways and Watertrails Network (CBGN). In October 2010, the Service and NPS signed a Memorandum of Understanding (MOU) regarding cooperation and collaboration on a variety of efforts within the Chesapeake Bay watershed, including the Captain John Smith Chesapeake NHT and CBGN.

Captain John Smith Chesapeake NHT

In 2011, refuge staff actively participated on the interagency planning team to develop the James River Segment Trail Plan (NPS 2011). Five initial focus areas were identified along the James River segment because they have resources and stories associated with Smith's explorations; American Indian cultures of the time; significant, evocative 17th century landscapes. Additionally, the focus areas have a variety of immersive visitor experiences, including a key anchor site that already provides for public access and key visitor amenities, receives high visitation, and has the potential for significantly contributing to trail themes in concert with existing programming. The availability of key visitor amenities and comparatively low visitation at James River NWR disqualified it from being considered among the first five focus areas. If additional visitor services were to be provided at the refuge, it could become a new focus area site along the James River segment. Passive water access for canoes and kayaks are lacking on the southern banks of the James River.

Chesapeake Bay Gateways and Watertrails Network (CBGN)

Established by Congress in 1998, the CBGN is a partnership of parks, wildlife refuges, historic sites, museums, historic vessels, environmental education centers, information centers, byways, and water trails that provides people with opportunities for meaningful Chesapeake Bay experiences. The primary goal of the CBGN as envisioned by Congress is to foster citizen stewardship of the

Chesapeake Bay. The Chesapeake Bay Office of the NPS administers the CBGN program, officially designating gateways, and providing technical and financial assistance. If additional visitor services were to be provided at the refuge, it could become a new site in the CBGN.

National Historic Landmarks

Westover Plantation

Located adjacent to the refuge on the north bank of the James River is Westover Plantation, one of Virginia's oldest and grandest plantation mansions and a National Historic Landmark. It is considered by some as America's premier example of colonial Georgian architecture and the quintessential James River plantation house (<http://www.nps.gov/history/nr/travel/jamesriver/wes.htm>; accessed January 2013). It is the ancestral seat of the Byrd family in Virginia. Built by William Byrd II (1674-1744), a planter, public official, and author, the 2½-story brick mansion (circa 1730-1734) of early Georgian style is notable for the quality of its construction and for its completeness of design. Byrd is especially noted for his posthumously published letters and diaries

(<http://tps.cr.nps.gov/nhl/detail.cfm?ResourceId=702&ResourceType=Building>; accessed January 2013). The VDHR holds a preservation easement on the property.

Upper Weyanoke Plantation

First inhabited by the Weanoc Indians, the Tribe that gave the Weyanoke peninsula its name, the site of the Upper Weyanoke plantation was settled by English colonists during the 17th century and has been continuously occupied ever since. During the 18th century and early 19th century, the locally prominent Minge family owned the property, as well as others on the Weyanoke peninsula, such as North Bend. The 1½-story, early 19th century brick cottage is thought to have been built by John Minge as a two-room dependency to a now vanished main dwelling. The grounds of Upper Weyanoke also include a Greek Revival-style residence built in 1859 for Robert Douthat. The 2-story brick home has a side-hall plan typically utilized in urban homes, rather than rural plantation houses

(<http://www.nps.gov/nr/travel/jamesriver/upp.htm>; accessed January 2013).

3.9.2 State or Local Government Designated Areas

Virginia Scenic Rivers

The Virginia Scenic Rivers Act of 1970 created a Statewide program to protect and preserve rivers, or sections of rivers, having natural or scenic beauty and cultural and historic interest. The Code of Virginia (§10.1-402) provides that the VDCR may fully review and make recommendation to Federal, State, and local agencies regarding the planning for use and development of water and related land resources so that scenic rivers resources are protected.

Since 1975, more than 650 river miles on 24 rivers have been recognized (VDCR 2012). An additional 13 rivers have been evaluated and found to qualify for scenic river designation. James River NWR is located along a section of the James River (Segment 48: James River-Orleans Street (extended) to Surry County) that has been evaluated and found worthy of designation, but has yet to be designated (VDCR 2007).

Chesapeake Bay Preservation Areas

Under the Chesapeake Bay Preservation Act (Virginia Code §10.1-1200 et seq.), counties, cities, and towns in tidewater Virginia have been required to enact programs designed to improve water quality in the bay through the mitigation of the impacts of development and redevelopment on sensitive environmental features such as streams, wetlands, floodplains, and highly erodible and highly permeable soils.

Resource Protection Areas (RPAs) and Resource Management Areas (RMAs) have been designated in each locality; these areas consist of groupings of sensitive environmental features. RPA features, which include tidal wetlands, certain non-tidal wetlands, tidal shores, and buffer areas, are the most sensitive; in general, only water-dependent uses may be constructed in a resource protection area. RMA features, which include highly erodible soils, highly permeable soils, and certain non-tidal wetlands, are less sensitive than resource protection areas features. Development in a RMA requires that activities meet certain performance criteria designed to mitigate negative environmental impacts.

As defined by the county ordinance (Prince George County Code of Ordinances, Chapter 90, Article XIV A, Chesapeake Bay Protection), RPAs on the refuge are “*lands adjacent to water bodies with perennial flow that have an intrinsic water quality value due to the ecological and biological processes they perform or are sensitive to impacts which may result in significant degradation to the quality of state waters.*” In their natural condition, these lands provide for the removal, reduction, or assimilation of sediments, nutrients and potentially harmful or toxic substances in runoff entering the bay and its tributaries, and minimize the adverse effects of human activities on State waters and aquatic resources (<http://www.princegeorgeva.org/Index.aspx?page=1010>; accessed January 2013).

RPAs include:

- Tidal wetlands.
- Nontidal wetlands connected by surface flow and contiguous to tidal wetlands or water bodies with perennial flow.
- Tidal shores.

- Other lands considered necessary to protect the quality of State waters.
- A buffer area not less than 100 feet in width located adjacent to and landward of the components in the RPA, and along both sides of any water body with perennial flow.

RMAs are lands that are part of the Chesapeake Bay Preservation Area but are not classified as part of the resource protection area. RMAs include land types that, if improperly used or developed, have the potential for causing significant water quality degradation or for diminishing the functional value of the RPA. The RMA is contiguous to the entire inland boundary of the refuge RPA and includes the following categories of land:

- Floodplains.
- Highly erodible soils, including steep slopes.
- Highly permeable soils.
- Nontidal wetlands not included in the RPA.
- Other lands considered necessary to protect the quality of State waters.

Areas within the refuge that do not qualify as RPAs are classified as RMAs, based on the above criteria.

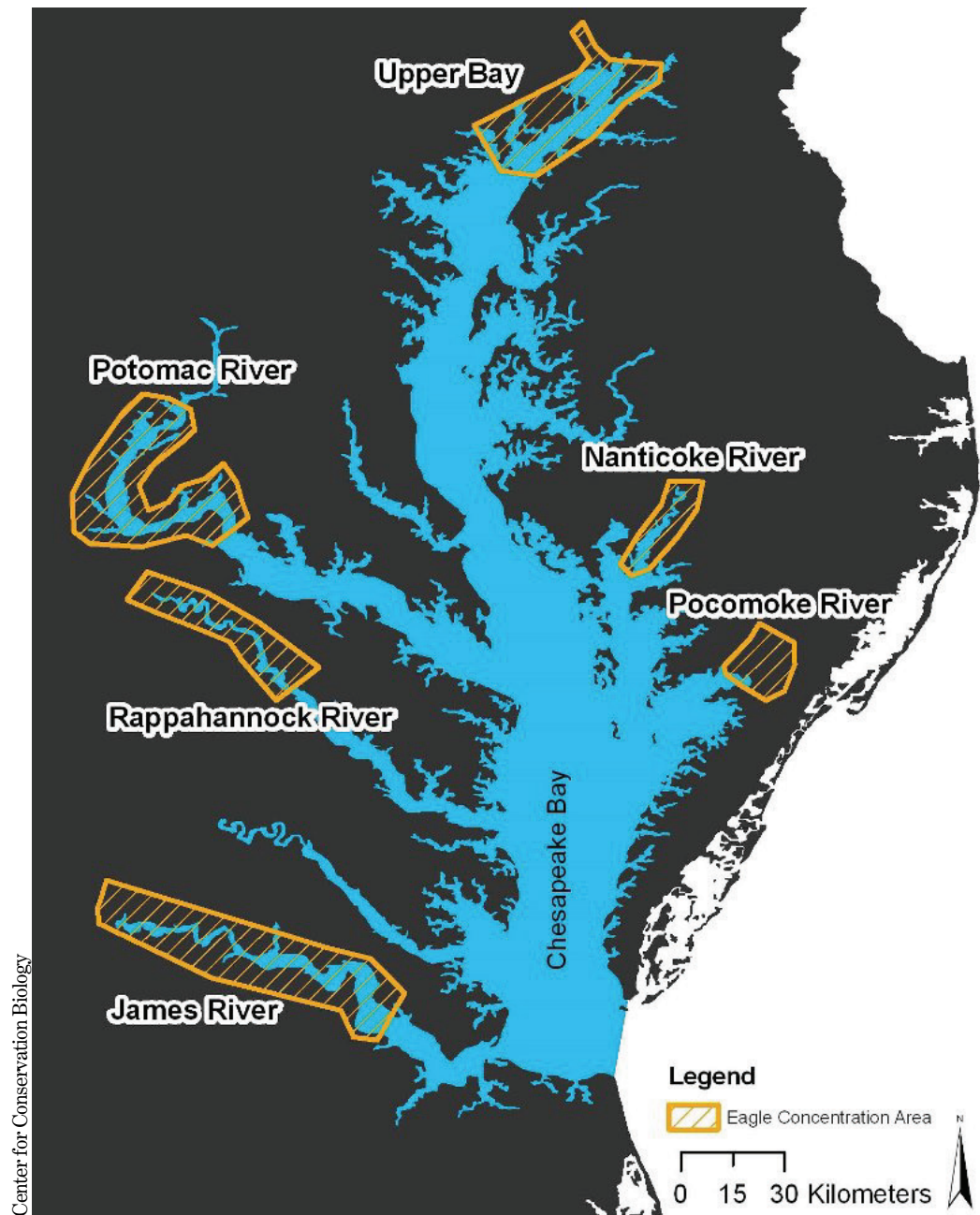
Natural Heritage Conservation Sites

The State defines Natural Heritage Conservation Sites as habitats of rare, threatened, or endangered plant and animal species; unique or exemplary natural communities; or significant geologic formations. Six natural heritage conservation sites occur within a 5-mile radius of the refuge; none of these sites occurs wholly or partly within the refuge (VDCR Natural Heritage Program 2014). Three of the six sites are stream conservation units because they include unique or exemplary natural communities, while the remaining three sites are areas that provide habitat for one or more rare terrestrial plants or animals.

Bald Eagle Concentration Areas

The refuge is within the VDGIF-designated James River Winter and Summer Bald Eagle Concentration Zone. Concentration zones are defined as *“locations along waterways where eagles congregate in numbers much greater than can be accounted for by local breeding pairs and their offspring.”* These areas are used by juveniles, sub-adults, and non-breeding adults, as well as by breeding adults for foraging, perching, and roosting (VGDIF and CCB 2012). A report generated in February 2013 from the VDGIF Bald Eagle Concentration Areas and Roosts database listed 14 Bald Eagle

Concentration Areas and Roosts (BECAR) and 67 bald eagle nests within 3 miles of the refuge (VDGIF 2013a). Historically, as many as 100 birds were counted in a single BECAR (no date in database); however, the most recent BECAR data were recorded in 2009, and the numbers range from 0 to 13. From 2006 to 2007, eagle use in one BECAR was noted as high during the summer and others note winter BECAR use from low to moderate. Since 1993, bald eagles were observed at all of the 67 nests. Of these, 35 have been observed from February to May 2011. Currently, there are five active bald eagle nests on the refuge.



Eagle Concentration Areas in Virginia

Anadromous Fish Use Area

According to VDGIF, three waterways with frontage on the refuge are designated as anadromous fish use areas: James River, Powell Creek, and Flowerdew Hundred Creek. These areas are defined as waterways that are known to provide migratory and spawning habitats for anadromous fish, those species that spend most of their life cycles in saltwater but return to freshwater to spawn. Seven anadromous fish species occur in this portion of the James River: alewife, American shad, striped bass, blueback herring, yellow perch, Atlantic sturgeon, and hickory shad. The primary threat to the conservation of these fish is hydrologic barriers (e.g., a dam preventing them from reaching spawning grounds), of which the refuge has none.

Conservation Easements

A conservation easement is a voluntary agreement that allows a landowner to permanently limit the type and amount of development on their property while retaining private ownership. Within a 5-mile radius of the refuge, there are nine conservation easements on a total of approximately 4,000 acres. Among the easement holders are Virginia Soil and Water Conservation District, Virginia Outdoors Foundation, and TNC (<https://vanhde.org/content/map>; accessed July 2013).

3.9.3 Other Special Status Areas

Lower James River Important Bird Area

In 2007, the National Audubon Society designated 118,218 acres along 20 miles (32.2 kilometers) of the tidal James River and 1.9 miles (3 kilometers) landward on each side as an important bird area (IBA) (Audubon 2007). The Lower James River IBA earned this status largely due to the high concentrations of bald eagles using this area during the winter and summer months. Other species of concern in this IBA include prairie warbler, American woodcock, red-headed woodpecker, American black duck, eastern meadowlark, rusty blackbird, loggerhead shrike, prothonotary warbler, barn owl, grasshopper sparrow, and field sparrow. The largest threats to this IBA include: “(1) contaminants within the fishery used by piscivorous birds, (2) conversion of open land to residential, and (3) expansion of recreational boating access to sensitive portions of the river”

(<http://web4.audubon.org/bird/iba/virginia/Documents/Lower%20James%20River.pdf>, accessed August 2013). James River NWR is the largest contiguous tract of public land within the Lower James River IBA.

3.10 Refuge Administration

3.10.1 Staffing

Established in March 1991, James River NWR is part of the Eastern Virginia Rivers NWR Complex. The term “*refuge complex*” describes a situation where the Service combines two or more individual refuges, typically within the same state or adjoining states, under a single refuge manager’s responsibility. In 2000, the Service redirected staff and other resources, and management responsibility for James River and Presquile NWRs was transferred to the refuge manager stationed at the newly formed Rappahannock River Valley NWR. The Service named the three-refuge grouping the Eastern Virginia Rivers NWR Complex. In 2003, the Service added Plum Tree Island NWR, located in Poquoson, Virginia, to the refuge complex.

Current refuge complex staffing consists of eight positions, seven of which are stationed at the Eastern Virginia Rivers NWR Complex headquarters at Rappahannock River Valley NWR in Warsaw, Virginia: refuge manager, deputy refuge manager, natural resource planner, wildlife biologist, Federal wildlife officer, administrative assistant, and maintenance worker. The remaining staff member, a wildlife refuge specialist, is stationed at the Harrison Lake NFH in Charles City, Virginia. Additional staff members may be hired on a temporary basis to assist with specific projects, biological surveys, and other required work.

All the positions within the refuge complex share in the responsibility for all four refuge units. The refuge complex manager is responsible for determining the priorities for the complex and how to distribute staff time and resources among the four refuges. Since 2003, one full-time employee has been administering activities and providing visitor services at James River NWR, as well as at Presquile NWR and Plum Tree Island NWR, with assistance from other refuge staff as needed.

3.10.2 Budget

Funding for James River NWR comes out of the budget for the entire refuge complex. Approximately 80 percent of the refuge complex budget is allocated to Rappahannock River Valley NWR, because it supports complex operations and is the largest refuge in the complex. Operational funding includes salaries, supplies, utilities, fuel, and all other operational activities (e.g., wildlife and habitat surveys and management) that are not funded by special projects. Base maintenance funds are used to repair vehicles, equipment, and facilities and have been generally stable over the past 5 years. Replacement of vehicles, larger pieces of equipment (e.g., tractor, backhoe), or larger facilities (e.g., buildings) are funded as projects. Annual funding fluctuates according to the number and size of projects funded in a given year (e.g., vehicle or equipment replacement, visitor service enhancements, and facility improvements) (see table 3.6).

Table 3.6. Funding and Staff Allocations for the Eastern Virginia Rivers NWR Complex, 2005 to 2012

Year	Operations	Maintenance	Projects	Cost Share	Total Funding	Staff
2005	\$650,748	\$23,520	\$368,229	\$8,133	\$1,050,630	8.34
2006	\$588,006	\$24,535	\$474,459	\$11,272	\$1,098,272	8.00
2007	\$782,083	\$59,117	\$116,917	\$10,606	\$968,723	8.30
2008	\$734,535	\$22,034	\$41,283	\$2,469	\$800,321	8.35
2009	\$788,886	\$24,000	\$469,021	\$7,999	\$1,289,906	7.40
2010	\$823,579	\$27,016	\$38,771	\$54,172	\$943,538	7.00
2011	\$963,324	\$27,410	\$290,260	\$0	\$1,280,994	7.40
2012	\$891,061	\$93,030	\$85,328	\$0	\$1,069,419	9.50

80 percent of the complex budget is allocated to Rappahannock River Valley NWR. 20 percent is divided among the other three refuges; it is not divided equally.

3.10.3 Lands

Refuge Establishment and Land Acquisition

In 1991, James River NWR was the fourth refuge established specifically for the protection of bald eagles. At that time, the bald eagle was federally listed as endangered. The primary objective for establishing the refuge was to protect essential nesting, feeding, and roosting habitat for bald eagles. Land acquisition significantly complemented recovery efforts for this species, in particular the Chesapeake Bay bald eagle population.

In March 1991, the first tract acquired was 3,516 acres. Previously owned by Hopewell Hardwood Sales and later Continental Can, the property had been harvested extensively for timber, and several areas were clearcut. Historic logging operation at the sites left deep ruts and unburned slash. Some cutover areas naturally regenerated with pine, while other areas were in need of restoration. In subsequent years, an additional 808 acres were acquired fee simple with funds from the Land and Water Conservation Fund (LWCF) under the authority of the ESA (table 3.7). In 2010, the Service acquired the 124-acre Blair's Wharf tract with LWCF funds and funds from the Virginia Aquatic Resources Trust Fund.

Table 3.7. History of Refuge Land Acquisition

Date of Acquisition	Acreage
1991	3,515.80
1992	630.70
1997	48.08
1999	5.00
2010	124.14
TOTAL	4,323.72

Three right-of-way easements associated with the refuge were already in existence at the time of the land transfer and refuge establishment.

There are two easements for electricity transmission and distribution via pole line on the refuge, and there is one telephone easement for buried telephone cable along Route 639, Route 640, and the unimproved road through Blair's Wharf.

Within the refuge's approved acquisition boundary, one 223-acre parcel bordering Powell Creek remains in private ownership (map 1.3). Throughout this CCP, we refer to this property as the Hitch Sand and Gravel parcel. A number of methods are available to acquire property rights, including direct purchase, donation, or bequest from willing property owners.

Expansion of the refuge's acquisition boundary is a necessary future step to meet habitat needs for trust species such as federally listed threatened and endangered species, migratory birds, and migratory fish, as well as to contribute to the network of conservation lands and wildlife resources in the regional landscape. However, with input we received from the public during scoping coupled with reduced land acquisition funding, we are not planning any major refuge boundary expansion as part of this CCP. Approval to explore refuge boundary expansion comes from the Service's Director, and then expansion requires development of a Land Protection Plan (LPP).

We will continue to consider minor acquisitions adjacent to the refuge from willing sellers if the lands are determined to be biologically important or provide connections with other protected lands. Land protection efforts that emerge outside of this planning process will include significant public involvement in decisionmaking, involve partners in the protection effort, and will use a full range of protection methods, including management agreements, conservation easements, and fee acquisition. Any new LPP developed in the future will incorporate these features and contributors.

3.10.4 Refuge Operations and Sustainability Practices

Refuge operations and sustainability practices are undertaken in accordance with the Service's policy (565 FW 1). At James River NWR, we emphasize the following goals in refuge operations and employ sustainability practices. We lead by example and encourage others to adopt environmentally friendly practices by incorporating sustainability into the communications, environmental education, and interpretation programs offered by refuge staff and partner organizations, both on and off the refuge.

Non-hazardous Solid Waste Management and Recycling

Refuge staff created the "James River Excess to Asset" program under which refuge volunteers and partners have worked with refuge staff to collect and recycle thousands of pounds of metal, tires, and



Cyrus Brame/USFWS

Scrap metal to be recycled

other debris from refuge lands at James River NWR and Presquile NWR. Collected materials have been sold to local scrap yards for funding that is returned back into the refuge for promotion of the recycling program. As of 2011, more than 23,226 pounds of metal scrap had been taken for repurposing and more than \$1,300 has been recovered. We have purchased recycling containers using the funds obtained from previous recycling efforts.

Per policy requirements, 32 pieces of government equipment and vehicles have been excessed, including a 1951 Clark forklift, 1961 Cub tractor, and 1968 Dodge. Excess equipment has ranged in size from a small air compressor to a tilt bed trailer. All items were beyond the needs of their intended purpose and ready to be removed from the station's asset inventory. Some vehicles and equipment were replaced with newer, more fuel efficient vehicles/equipment, while other items were released with the only benefits being the return of proceeds to the government and increased space on the refuge. Items that were released would have demanded a prohibitively high expense to maintain or an exponential decline in value if unused. These items were sold through the U.S. General Services Administration (GSA) auction. The program has resulted in cleaner refuge lands, cleaner facilities, and monies returned to the refuge and the Department of the Interior. Several acres of property have been returned to natural habitat, and more than \$30,000 has been generated in GSA sales.

This program has been implemented in accordance with the U.S. Department of the Interior's policy of promoting sound environmental practice by preventing pollution and recovering resources through recycling (515 DM 3) and various EOs (e.g., 12873, 13423, and 13514),

where applicable. For example, we have diverted at least 50 percent of non-hazardous solid waste from landfills through recycling, meeting the goal specified in EO 13514, section 2(e)(ii).

In 2011, our wildlife refuge specialist, Mr. Cyrus Brame, was recognized by the U.S. Department of the Interior as a Sustainability Hero for developing, implementing, managing, and promoting this recycling program.

Known and Potentially Hazardous Materials

In 2005, Prion Compliance & Testing Services removed 1,600 square feet of asbestos from refuge lands. All known asbestos has been removed from the refuge.

Prior to refuge establishment, a 25-acre skeet range was used by five different hunt clubs. Upon refuge establishment, the skeet range was closed (USFWS 2012b). During the summer of 2014, personnel from the Ecological Services Virginia Field Office and refuge staff initiated a site characterization of the former skeet range located at the James River NWR (Brame 2014 personal communication). The purpose of this site characterization is to assess the extent and nature of the contamination associated with the former skeet range, which will focus on soil where shot was deposited within the footprint of the former skeet range. Soil outside the areas directly impacted by shot will also be assessed to determine whether lead or other chemical constituents have migrated as the result of runoff or windblown movement of soil particles. The primary constituent of concern associated with the former skeet range is from the lead shot.



Barry Brady/USFWS

Skeet range in 1991

3.10.5 Facilities

Access Routes and Features

Vehicular access to the refuge is via Route 10 to Flowerdew Hundred Road (State Route 639) (map 3.1). Within the refuge, there are 4 miles of State roadway (Routes 639 and 640). State and Prince George County maintenance staff is responsible for clearing and repairing culverts, mowing roadsides, and graveling and grading State roads. Approximately 13 miles of unimproved logging roads branch off State Routes 639 and 640 into the refuge forests. The unimproved roads serve as fire breaks. To limit unauthorized vehicular access, the refuge has installed 10 cable or swing gates that are lockable. Refuge staff also maintains refuge roads, associated gates, and drainage features. Two large culverts and an earthen levee straddle a feeder tributary to Flowerdew Hundred Creek on Hunter Circle Road.

There is an approximately 0.5-mile long designated nature trail within the refuge (maps 3.1 and 3.2). There are no designated biking trails along the State roads or refuge's unimproved roads.

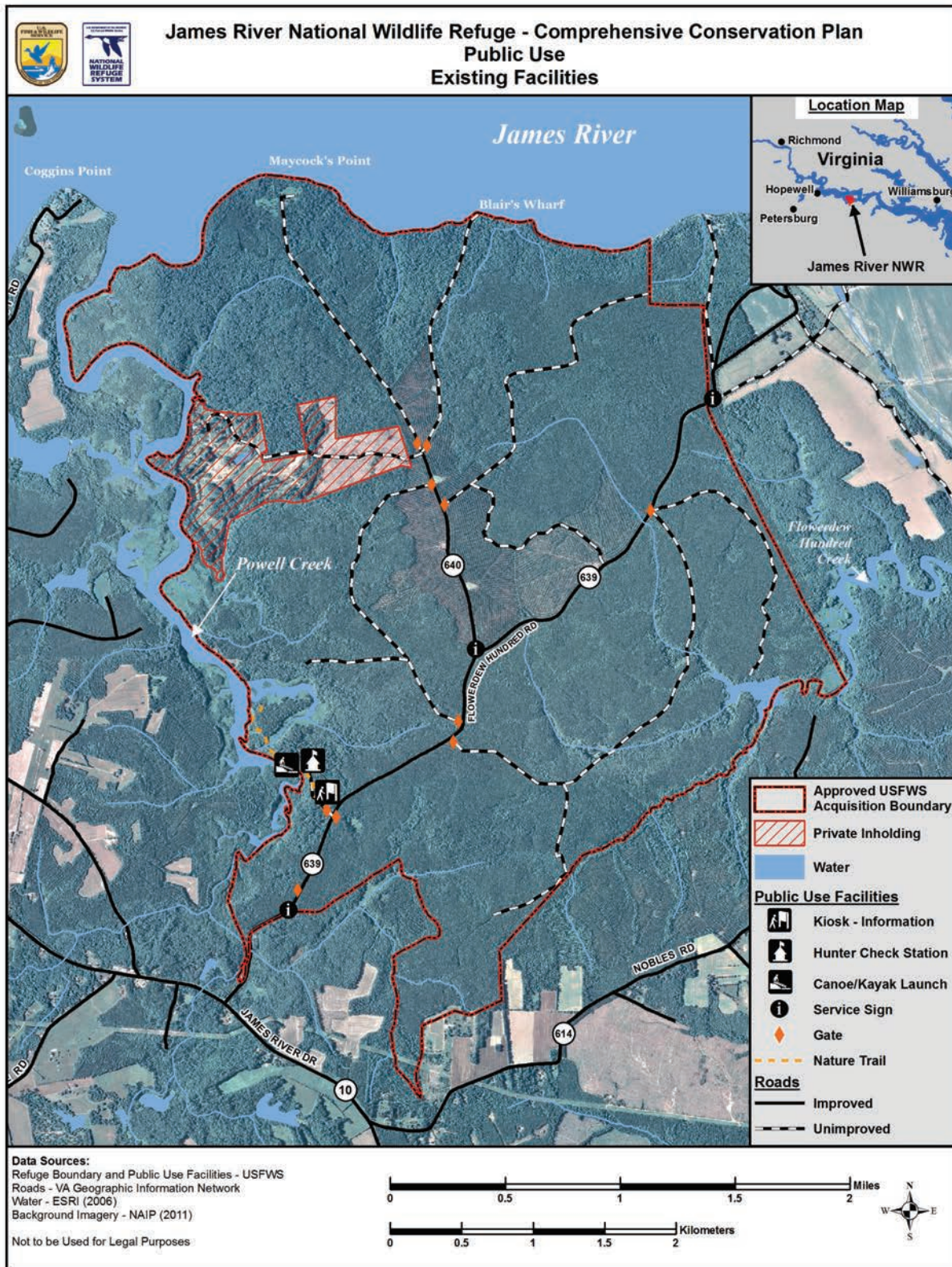
Boat access from the refuge is via an unimproved soft launch for canoes and kayaks along the shallow waters of Powell Creek, downhill from the refuge's maintenance complex. This unimproved soft launch is used by refuge staff and by the public when authorized. Pilings are the only remnants of a 215-foot long pier that once extended from the shoreline at Blair's Wharf perpendicular into the James River.



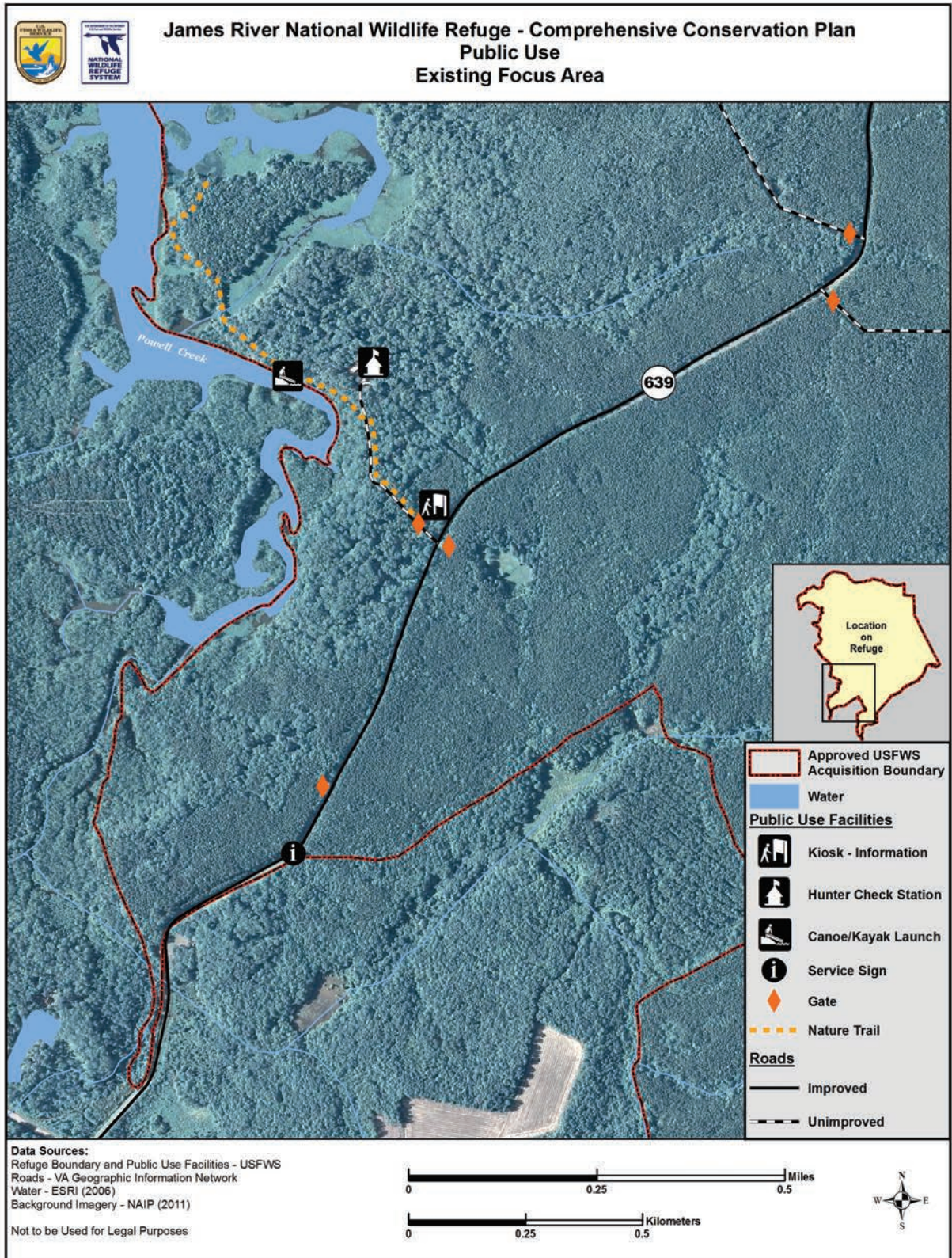
Meghan Powell/USFWS

Fall foliage on the Powell Creek nature trail

Map 3.1 Existing Public Use Facilities at James River NWR



Map 3.2 Existing Public Use Focus Area at James River NWR



Buildings and Support Facilities

The refuge's maintenance complex is located approximately 1 mile from the refuge entrance, to the west of State Route 639, and is accessible via a gated, unimproved road. A 0.88-acre maintenance complex located on the refuge consists of these structures and support facilities:

- An equipment shed (400-square-foot, tin-sided enclosure with 800-square-foot roofed, open-walled shed area).
- A one-story cinderblock building (800 square feet) used as an Americans with Disability Act (ADA)-accessible hunter check station.
- A repeater radio tower (100 feet tall) used to aid with refuge communications.
- Electricity transmission poles.



Cyrus Brame/USFWS

Maintenance complex

A remote automatic weather station (RAWS) used to support prescribed burns on the refuge is located east of State Route 639 and south of the maintenance complex, in a 0.3-acre fenced area. Vegetation surrounding the RAWS is maintained by annual mowing and invasive plant management on an as-needed basis. The RAWS at James River NWR is one of the nearly 2,200 interagency RAWS strategically located throughout the U.S. (<http://raws.fam.nwgc.gov>; accessed April 2013). Weather data collected by these stations provides valuable information used for monitoring air quality, rating fire danger, and research applications. The data are transmitted from the station to a satellite, then to the NOAA.

Additional facilities not currently in use and in disrepair include:

- A wooden house off Bradby Road.
- Two structures previously used as part of a 25-acre skeet range.

- A cinderblock house at Blair's Wharf.
- Remnants of a 213-foot long pier and associated construction debris on the shoreline at Blair's Wharf.

While the refuge owns these facilities, they were acquired with land purchases and are not currently identified as critical to accomplishment of the refuge purposes and Service's mission. The refuge is considering demolition of the structures, but a decision to demolish them has not been finalized. Until sites and structures have been evaluated for National Register eligibility, they are treated as if eligible. Cultural resource professionals will help us determine our course of action through an existing project in the Service's RONS (appendix D).

Signage

Refuge entrance signs are located along Flowerdew Hundred Road (State Route 639) at the southern and eastern termini. A directional sign points refuge visitors from Flowerdew Hundred Road toward the information kiosk. One informational sign and two interpretive signs are located at the kiosk. One additional informational sign is located at the intersection of Routes 639 and 640.

The refuge boundary and gated access roads are also identified with standard-issue NWR boundary signs.

3.10.6 Refuge Access Permit Requirement

Since the establishment of James River NWR, refuge managers have managed public access, use, and recreation activities at the refuge by issuing special regulations, individual permits, or public notices in accordance with Service regulations (50 CFR 25 et seq.) and policies (603 FW 1, 603 FW 2, and 605 FW 1).

Because no portion of the refuge is open to general public access, refuge visitors must participate in a refuge- or partner-sponsored program, acquire an individual general special use permit (SUP), or acquire a hunting permit to be able to access the refuge. Persons interested in visiting the refuge are required to contact refuge staff to learn more about scheduled events open to the public or learn more about acquiring a permit to access the refuge. Visitors are required to contact the refuge at least 3 business days in advance to allow for request processing and permit issuance. Instructions regarding refuge access requirements are provided on the refuge website (http://www.fws.gov/refuge/james_river; accessed November 2013).

Section 3.13 provides additional information regarding public uses at the refuge.

3.11 Natural Resources

3.11.1 Soils

Most of the refuge lies on upland soils, with the seven most dominant soils comprising 82 percent of the refuge (USDA 2010). The moderately well drained Peawick silt loam, on slopes of 0 to 2 percent and 2 to 6 percent, occurs on stream terraces and represents 31 percent of the refuge. The somewhat poorly drained Newflat silt loam also occurs on stream terraces and accounts for another 12.3 percent, while well-drained Emporia soils on slopes of 15 to 45 percent occur on marine terraces and account for 11.8 percent of refuge acreage. A summary of the characteristics of major soil types follows in table 3.8. Additional information can be obtained from the refuge headquarters.

Table 3.8. Summary of the Seven Most Prevalent Soils Types on James River NWR

Soil Type	Local Landform	Hydric Traits	Suitability	Classified as Prime and Other Important Farmland	Acres ¹ (percentage of total refuge)
Chickahominy Silt Loam	Stream Terraces	Poorly drained/hydric	Agriculture: Poor Silviculture: Poor	Not prime farmland	345 (8.1 percent)
Emporia and Slagle Soils, 6 to 15 percent slopes	Marine terraces	Well drained	Agriculture: Good Silviculture: Good	Farmland of Statewide importance	303 (7.1 percent)
Emporia Soils, 15 to 45 percent slopes	Marine terraces	Well drained	Agriculture: Poor (Slopes) Silviculture: Fair	Not prime farmland	483 (11.4 percent)
Newflat Silt Loam	Stream terraces	Somewhat poorly drained	Agriculture: Poor Silviculture: Poor	Farmland of Statewide importance	545 (12.8 percent)
Peawick Silt Loam, 0 to 2 percent slopes	Stream terraces	Moderately well drained	Agriculture: Good Silviculture: Good	Farmland of Statewide importance	743 (17.5 percent)
Peawick Silt Loam, 2 to 6 percent slopes	Stream terraces	Moderately well drained	Agriculture: Good Silviculture: Good	Farmland of Statewide importance	574 (13.5 percent)
Wickham Fine Sandy Loam, 2 to 6 percent slopes	Stream terraces	Well drained	Agriculture: Good Silviculture: Good	Prime farmland	492 (11.6 percent)

¹ Approximate. Source: (USDA 2010).

3.11.2 Vegetation Communities and Associated Special Status Plant Species

Vegetation communities within James River NWR were identified using the NatureServe ecological systems classification system and further defined by the Northeastern Terrestrial Wildlife Habitat Classification Project (Gawler 2008). An ecological system is a “*group of plant community types (associations) that tend to co-occur within landscapes with similar ecological processes, substrates, or*

environmental gradients. A given ecological system will typically manifest itself in a landscape at intermediate geographic scales of tens to thousands of acres and will persist for 50 or more years” (Comer et al. 2003). These units form a cohesive, distinguishable unit on the ground (USFWS 2007e) that are readily mappable and identifiable by conservation and resource managers in the field (Gawler 2008).

Pine-dominated forest occupies approximately 61 percent of the refuge’s total land area (table 3.9 and map 3.3). Within this single largest general habitat category on the refuge, the most dominant ecological community is Southern Piedmont Dry Oak-(Pine) Forest, which dominates the eastern half of the refuge.

To determine the habitat types described this CCP, we grouped similar ecological systems into broader habitat categories to define management objectives and strategies proposed in this CCP. Subsequent planning for the refuge’s habitat management plan may make use of the more detailed mapping of habitat associations. Table 3.9 represents how refuge habitat types were categorized, listing them in the order they are described throughout this CCP.

Table 3.9. Refuge Habitat Types at James River NWR

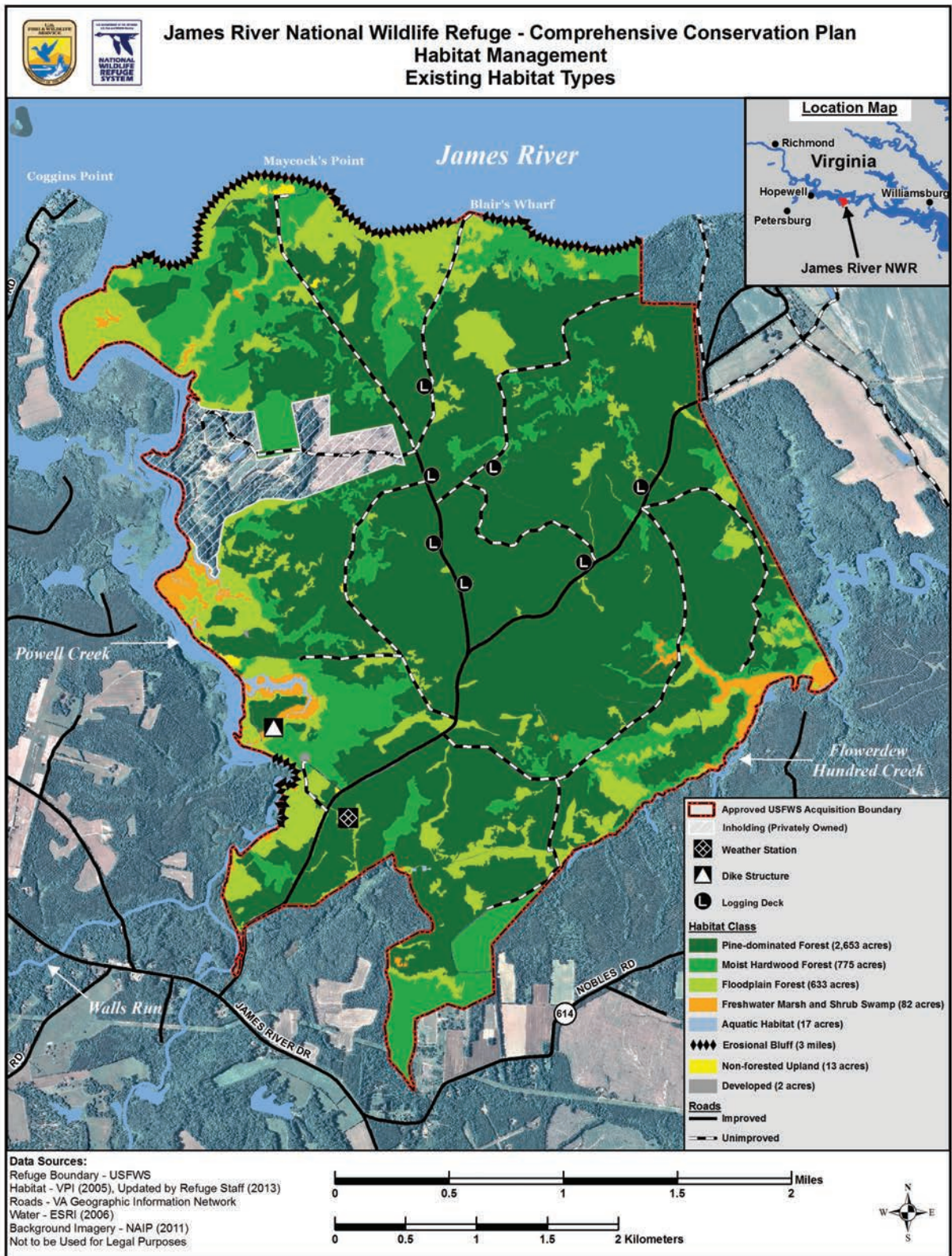
Habitat Type	Management Units¹
Pine-dominated Forest	2,653 acres
Moist Hardwood Forest	775 acres
Floodplain Forest	633 acres
Freshwater Marsh and Shrub Swamp	82 acres
Aquatic Habitats	17 acres
Erosional Bluff	3 shoreline miles
Non-forested Upland	13 acres
Habitat Total	4,173 acres
Refuge Total	4,324 acres

¹ Management units estimated from Geographic Information System and rounded up to nearest whole number. The difference in habitat acres and total refuge acres occurs because boundaries that were used for habitat mapping project are not identical with the data held in our reality files. Total habitat acreages do not include 2 acres of developed lands (e.g., roads, buildings) because they are not considered habitat.

Pine-dominated Forest

Pine-dominated forests are the largest single habitat type on the refuge. They consist primarily of abandoned loblolly pine plantations or early successional loblolly pine forests that became established after agriculture ended. The soil and topography in these areas results in more moist conditions than upland pine stands in sandy conditions. The canopy is dominated by loblolly pine, with varying amounts of white, red, black, and post oaks in both upper and mid-canopy. Sweetgum may be present, but it is not generally present in quantity. The shrub layer has variable closure and is often characterized by

Map 3.3 Existing Habitats at James River NWR



greenbrier, muscadine, and poison ivy) can contribute considerable midstory cover. The herbaceous layer is sparse to non-existent. If it is present, it is often composed of exotic invasive species, such as Japanese stiltgrass.

Prior to refuge establishment in 1991, a commercial timber operation owned and managed the land that is now part of the refuge. Over time, the pine forests have become too thick to benefit migratory birds, with more than 1,000 trees per acre. This thickness presents a wildfire hazard and makes trees susceptible to disease infestation from pine bark beetles.

We work closely with our Regional Office, State partners, non-governmental organization partners, and contractors to conduct pine thinning and prescribed burns on the refuge in accordance with the refuge's Forest Management Plan (USFWS 2003), Fire Management Plan (USFWS 2006) and regularly updated Prescribed Fire Plan (USFWS 2013b). We strive to improve forest stand conditions, protecting it from losses due to catastrophic wildfire, disease, and habitat management activities. Our top priority has been to treat dense stands that have the greatest potential for catastrophic wildfire. Thinning and burning these overstocked stands improves stand health of the remaining trees and increases their value to wildlife.

In accordance with the National Bald Eagle Management Guidelines (USFWS 2007b), thinning operations have not been conducted within 660 feet of active nests and have not been conducted between December 15 and July 15 to protect nesting bald eagles. Since these trees have commercial value as pulp, bio-fuel, and some saw timber, using a commercial contractor to achieve the refuge's habitat management goals is the most efficient and cost-effective approach.



Prescribed burn in progress

Cyrus Brame/USFWS

The contractor is authorized to conduct work on the refuge in accordance with specific conditions detailed in a SUP. Among the permit conditions is a requirement to employ the standard operating procedures previously approved by the Historic Preservation Officers of the USFWS and Commonwealth of Virginia for the protection of historic and archaeological resources.

We work with VDOF to assess the forest before operations, provide recommendations for thinning and burning patterns and regimes, and coordinate assessments after thinning activities are completed.

The Service has established a unique partnership with TNC and VDCR Natural Heritage Program for conducting prescribed burns in southeastern Virginia. This partnership enables annual fire management of the thinned sections of pine-dominated forest. Prescribed burning occurs in the late winter to early spring season nesting birds, the last date that a prescribed burn can occur on the refuge is April 15 (USFWS 2013b).

Moist Hardwood Forest

This habitat is characterized by moist upland forested areas typically located on lower slopes, bluffs along streams and rivers in dissected terrain, mesic flats between drier pine-dominated uplands and floodplains, and local raised areas within bottomland terraces or wet flats. These forest stands are naturally sheltered from frequent fire. Soils vary in both texture and pH. Vegetation is tree-dominated and includes a significant component of mesophytic deciduous hardwood species, such as beech or southern sugar maple. Upland and bottomland oaks found in areas with a mid-range of moisture tolerance are usually also present, particularly white oak but sometimes also southern red oak. Virginia pine and loblolly pine, which are dominant in the pine-dominated forest, are also present. The lower shrub and herbaceous layers, if present, may be sparse or moderately dense.

Floodplain Forest

Floodplain forests occur on floodplains of smaller streams and the James River, where fine-textured silt and clay sediment are dominant. Depositional landforms, such as a natural levee, are often distinctly present but fairly small. They help create variation in the duration of flooding and nutrient input. Soils are generally fertile and not strongly acidic. Flooding is generally seasonal but may range to nearly semi-permanent. Vegetation consists almost entirely of forests of wetland trees. Bald cypress and tupelo dominate in wetter sites. Forested stands with oaks and other bottomland hardwoods are possible. The understory, shrub, and herbaceous layers are generally well developed.

Freshwater Marsh and Shrub Swamp

The refuge's tidal freshwater marshes are characterized by fresh to

slightly saltwater (oligohaline) waters driven by irregular tides. They are predominantly found in the drowned creeks and inland estuary shores of the embayed region. The marshes typically occur as complexes dominated by large grasses (graminoids), such as salt hay, bulrushes, cattails, and rushes, sometimes with species-rich associations of shorter grasses, forbs, and floating or submerged aquatics.

Aquatic Habitats

Open water on the refuge is primarily present as the waters of the James River and Powell Creek. To a lesser extent, open water exists in small streams that flow into Flowerdew Hundred Creek. Three small seasonal inland ponds are also mapped on the refuge. This habitat supports a variety of aquatic species and other terrestrial species that rely on water for parts of their lifecycles.

SAV can be found in the open waters of Powell Creek and just beyond the refuge boundary in Flowerdew Hundred Creek. SAV is characterized by the presence of horned, sago, and claspingleaf pondweed. A host of macroalgae is also an important system component. Although the refuge does not actively manage SAV habitats, the Chesapeake Bay Foundation (CBF) has organized volunteer events for SAV plantings at the refuge.

Erosional Bluff

This habitat consists of steep, linear cliffs where erosion in alluvial deposits has left nearly vertical banks more than 9 feet high (3 meters) high of sand, silt, clay, or a mixture. They typically develop in landscapes that are otherwise of rather low relief. The substrate is unconsolidated and provides habitat for animals that burrow into steep banks, such as bank swallows and certain invertebrates. Vegetation here is sparse, mostly herbaceous, and variable in composition.

Non-forested Upland

Non-forested upland occurs on the refuge as small, localized patches of grass among the other habitats. These areas include remnants of former farm fields and homesteads, and they are maintained for administrative purposes. Where ongoing maintenance is not performed to retain these lands in grasses, tree and shrub species are beginning to develop and dominate the habitat. Mowing is generally needed on at least an annual basis to prevent tree and shrub species from becoming dominant in the non-forested upland.

Federal and State-listed Plants

In Virginia, the VDCR Natural Heritage Program maintains the database and rankings of plant and animal species. Determining which plants and animals are thriving and which are rare or declining is crucial for targeting conservation towards those species and habitats

in greatest need. For individual plant and animals, the ranking provides an estimate of extinction risk, and for ecological communities they provide an estimate of the risk of elimination. Conservation status ranks are based on a one to five scale, ranging from critically imperiled (G1) to demonstrably secure (G5). Status is assessed and documented at three distinct geographic scales: global (G), national (N), and state/province (S). These status assessments are based on the best available information, and consider a variety of factors such as abundance, distribution, population trends, and threats (<http://www.natureserve.org/explorer/ranking.htm#interpret>; accessed May 2013).

In 2001, the VDCR Natural Heritage Program conducted targeted botanical surveys to look for rare plant species at James River NWR (Belden et al. 2002). Surveyors targeted the following species:

- Blue hearts
- Cuthbert turtlehead
- Little-leaf sensitive-briars
- Long stalked crowfoot
- New Jersey rush
- Parker's pipewort
- Red milkweed
- Sensitive joint-vetch
- Small whorled pogonia
- Sun-facing coneflower
- Swamp pink
- Virginia least trillium

Of these 12 species, none were found to occur at James River (Belden et al. 2002). Surveyors noted that the refuge does have suitable habitat for the sensitive joint-vetch (federally threatened) and small whorled pogonia (federally threatened) (Belden et al. 2002). The refuge lies within the documented distribution of sensitive joint-vetch on the James River, which currently spans approximately 41 river miles (USFWS 2012c). The nearest known occurrence of small whorled pogonia is from uplands between the York and Chickahominy Rivers (<http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?sPCODE=Q1XL>; accessed November 2013).

3.11.3 Invasive Plants

EO 13112, "Invasive Species," signed on February 3, 1999, guides Federal management of nonnative, invasive plant species. This EO requires that a Council of Departments dealing with invasive species be created and develop a National Invasive Species Management Plan every 2 years. The first plan was released in January 2001, providing the basis for Federal management of invasive species. The EO defines an invasive species as "...an alien (or non-native) species whose introduction does, or is likely to cause economic or environmental harm or harm to human health."

The presence of invasive plants can have an adverse impact on the biological integrity, diversity, and environmental health of refuges and other natural areas. Several invasive plants are known to occur in refuge habitats:

- Pine-dominated Forest
 - ❖ Shrubby lespedeza
- Moist Hardwood Forest
 - ❖ Princess tree
 - ❖ Periwinkle
- Aquatic Habitats
 - ❖ Hydrilla
- Moist Hardwood Forest and Non-forested Upland
 - ❖ Japanese privet
 - ❖ Japanese stiltgrass
 - ❖ Japanese wisteria
 - ❖ Tree-of-heaven

Refuge staff actively control invasive species by using a combination of mechanical removal (brush hogging and pulling), prescribed fire and herbicide applications (typically glyphosate and triclopyr products). On average, refuge staff control invasive species on between 1 and 5 acres per year on the refuge.

3.11.4 Wildlife

Since James River NWR was established to conserve fish, wildlife, and plants that are listed as endangered or threatened species, we highlight species of conservation concern under each of the following groups. A comprehensive list of potential wildlife species of conservation concern for the refuge is included in appendix A.

Birds

James River NWR occurs within BCR 30, New England/Mid-Atlantic Coast; however, it is located near BCR 30's southern edge. The refuge is also located just north of BCR 27, the Southeastern Coastal Plain. Although James River NWR is not physically located in BCR 27, we consider it relevant to include BCR 27 in our planning considerations. BCR planning boundaries are based on ecologically distinct regions with similar bird communities, habitats, and management issues. When initially developed in 1999, the U.S. North American Bird Conservation Initiative (NABCI) believed that boundaries may change over time as more information becomes available (<http://www.nabci-us.org/bcrs.htm>; accessed May 2013). Factors like climate change, which may result in a shift in species ranges due to warmer temperatures or change in habitat, may increase the importance of the refuge to bird conservation in both BCR 27 and BCR 30.

Of the 219 bird species confirmed or highly likely to be present on the refuge, 118 are priority species common to BCR 27, BCR 30, or the

Virginia WAP, including 66 landbirds, 16 waterbirds, 12 shorebirds, and 24 waterfowl (ACJV 2007, Watson 2008, VDGIF 2005).

Discussion about bird abundance on the refuge is based on data collected from the National Audubon Society's annual CBC and the VDGIF Mid-Winter Waterfowl Survey. The annual CBC is an early winter bird census, where volunteers follow specified routes through a designated 15-mile (24-kilometer) diameter circle, counting every bird they see or hear all day. The Hopewell (site code VAHO) CBC has occurred annually since 1929. James River NWR is located approximately 1 mile east of the 15-mile diameter count circle; while this count may not be truly representative of refuge habitats, for our purposes, it is considered representative of regional bird species.

Bald Eagle

James River NWR is located within the summer and winter concentration area for bald eagles along the James River watershed (VDGIF 2014). Bald eagles nest, roost, and winter on refuge lands.

In July 2007, the bald eagle was removed from the Federal list of threatened and endangered species; in January 2013, it was removed from Virginia's list of endangered and threatened species. However, the bald eagle is still afforded special protection as a Federal species of concern through BGEPA and the MBTA. The bald eagle currently is globally secure, is imperiled to uncommon as a breeding species, and is rare to uncommon as a non-breeder in Virginia. The Virginia WAP lists the bald eagle as being of very high conservation need (tier II) because it occurs within a very limited distribution (VDGIF 2005).

Since 1977, the CCB at the College of William and Mary has conducted Statewide annual surveys of breeding bald eagles in partnership with a variety of partners. During the 2011 breeding



Steve Jurvetson

Bald eagle and its nest

season, the annual survey documented 726 occupied bald eagle territories in Virginia, a 6.2 percent increase over 2010. More than 130 new nests were mapped within 45 counties and 10 independent cities. Within Prince George County, there were 25 occupied territories, 23 active nests, and 42 chicks produced (Watts and Byrd 2011).

Most known territories continue to be concentrated within the coastal plain, with less than 5 percent of pairs occurring in the piedmont and mountain regions. The Virginia population continues to have tremendous reproductive momentum. Of 11,030 chicks documented in the past 35 years, 8.5 percent were produced in 2010 and 73.2 percent were produced since 2000. In general, this momentum is the combined result of an overall increase in the breeding population, the breeding success rate and the average brood size (Watts and Byrd 2011).

The Chesapeake Bay-Virginia bald eagle population favors habitat with mature, super-canopy trees that overlook broad expanses of marsh, river, or fields with relatively clear understory below and in close proximity to water bodies where fish are abundant. Bald eagles in Virginia more frequently use pines as nest trees, but nests are also found in beeches and bald cypress. Pines, hardwoods, or snags with extended branches free of obstructing vegetation are favored for perches. The forested riparian habitats along the tidal portion of the James River and the abundant fish provide ideal bald eagle nesting conditions (USFWS 2007d).

There are five known nests on the refuge; four are located along the northern boundary near the James River, and one is on the western edge near Powell Creek (<http://www.cbbirds.org/what-we-do/research/species-of-concern/virginia-eagles/nest-locator/>; accessed May 2013). From April 1998 through August 2007, refuge staff conducted shoreline surveys for the bald eagle over multiple iterations each year. Over the 10-year study, 75 separate surveys of adult and juvenile birds were conducted. The results of these surveys documented an average of 27 individuals using the refuge each summer (USFWS unpubl. data 2007c).

The refuge staff follows measures developed by the Service and VDGIF to limit disturbance to nests during the nesting season, as well as roosts and important forage areas throughout the year (VDGIF and USFWS 2000). During the nesting season (December 15 to July 15), human activity is restricted within a 330-foot buffer zone around nests. This requires that refuge staff and visitors be restricted from certain areas surrounding known nest sites during the breeding season, as well as sensitive areas during the wintering season. Without such restrictions, eagles may abandon their nests and young when nesting and may experience additional stress and mortality during the wintering months. Prescribed burns are also implemented when they will have the least impact on eagles (USFWS 2007b).

Landbirds

Since 2001, approximately 93 landbird species have been identified on or near the refuge based on data collected by refuge staff or through volunteer activities such as the Hopewell CBC (Richmond Audubon Society, no date). From 2000 to 2008, the most abundant landbird species were red-eyed vireo, Acadian flycatcher, pine warbler, ovenbird, hooded warbler, tufted titmouse, blue-gray gnatcatcher, Carolina wren, northern cardinal, and American crow (Spencer 2009 personal communication). Records during the Hopewell CBC from 2001 to 2011 document the following dominant species of landbirds during early winter: European starling, red-winged blackbird, American robin, cedar waxwing, white-throated sparrow, common grackle, mourning dove, dark-eyed junco, song sparrow, and northern cardinal.

A total of 66 landbirds found on the refuge are a priority in one or more of the conservation plans or lists reviewed. Twenty of these 66 landbird species are BCR 27 priority species, BCR 30 priority species, Virginia WAP tier category species, and have been observed or are likely to occur during the breeding season at the refuge (table 3.10).

Table 3.10. BCR 27, BCR 30, and Virginia WAP Landbird Priority Species on the Refuge or Project Area

Species	BCR 27 Priority Status ¹	BCR 30 Priority Status ¹	Virginia WAP Tier ²	Season of Occurrence ³
Brown thrasher	H	H	IV	B
Brown-headed nuthatch	H	M	IV	B,W
Cerulean warbler	HH	M	II	B
Chimney swift	H	H	IV	B
Eastern kingbird	H	H	IV	B
Eastern towhee	H	H	IV	B,W,M
Field sparrow	H	H	IV	B,M
Grasshopper sparrow	H	M	IV	B
Kentucky warbler	H	H	IV	B
Louisiana waterthrush	M	H	IV	B
Marsh wren	M	H	IV	B, W
Northern bobwhite	H	H	IV	B,W
Prairie warbler	H	HH	IV	B
Prothonotary warbler	H	H	IV	B
Rusty blackbird	H	H	IV	B
Sedge wren	M	M	III	B,W,M
Swainson's warbler	H	M	II	B
Wood thrush	H	HH	IV	B
Worm-eating warbler	H	H	IV	B
Yellow-throated vireo	M	H	IV	B

¹ BCR priority status levels: HH = highest; H = high; M = Moderate (Watson 2008 [BCR 27], USFWS 2008b [BCR 30])

² Virginia WAP Tiers: I= Critical Conservation Need; II= Very High Conservation Need; III= High Conservation Need; and IV= Moderate Conservation Need

³ Conservation Habitat Need based on Table 1 in Watson 2008 and Table 5 in USFWS 2008b; B=Breeding; W=Wintering, M=Migration.

Pine-dominated forests support at least eight bird species with high concern scores distributed among the forest successional stages, from early successional, shrub stage, and forest stages (Watts 1999). Of these eight species, five have been recorded at the refuge: Chuck-will's-widow, brown-headed nuthatch, eastern wood-pewee, prairie warbler, and red-headed woodpecker. Cavity-nesting species (such as the brown-headed nuthatch, red-headed woodpecker, and prothonotary warbler) prefer older pine stands that contain snags for roosting (Smith et al. 2000, Wilson and Watts 1999) and high insect populations for foraging (McCarty 1996, O'Halloran and Conner 1987, Straight and Cooper 2012). Open understories created from prescribed burning increases foraging and breeding opportunities for Chuck-will's-widow. The eastern wood-pewee uses the high canopy of this habitat for nesting (Straight and Cooper 2012, McCarty 1996).

Other high priority species recorded within the refuge during breeding season include bald eagle, prothonotary warbler, Louisiana waterthrush, worm-eating warbler, scarlet tanager, wood thrush, and yellow-throated vireo. Bald eagles and other raptor species use larger trees within the pine-dominated, moist hardwood and floodplain forests for nesting and roosting (USFWS 1996). Breeding Louisiana waterthrush and prothonotary warbler use the late-successional moist hardwood and floodplain forests (Mattsson et al. 2009, Wilson and Watts 1999). Mature moist hardwood forest provides shrub understory nesting and foraging cover for the wood thrush and warbler species while mature trees are used by nesting scarlet tanagers (Evans et al. 2011, Vitz et al. 2013, Mowbray 1999).

In addition to landbirds supported by our forested habitats, the erosional bluff habitat along the James River provides breeding habitat for bank swallows. Males of the colony excavate burrows or cavities into the banks of the bluffs to build nests in early spring. Sites are often selected because of the alluvial soils and the open vertical space around nest burrows (Garrison 1999). Erosional bluff habitat has been declining locally due to the closure of sand and gravel pits in Virginia that provided steep, unvegetated banks (Blem and Blem 1990).

The limited freshwater marsh and swamp habitat at the refuge supports the marsh wren, a priority species. This songbird uses coastal plain marshes year-round and prefers cattail marshes with scattered patches of bulrush. Over time, marshes have been destroyed and created throughout their range, and marsh wren populations have matched these fluctuations. Little is known about how habitat fragmentation effects populations (Kroodsma and Verner 1997).

Waterbirds

Because interior wetland and marsh habitat is limited on the refuge, relatively few waterbird species have been observed in these habitats.

The linear wetland corridors along the river and creeks that border the refuge offer suitable habitat. The least bittern is one of the priority species that this habitat supports. This small heron forages along marsh and swamp habitats and builds platform nests within the emergent vegetation (Poole et al. 2009).

During the 2001 to 2011 Hopewell CBC, 13 waterbird species were observed, including priority species such as American bittern and Forster's tern. In 2001, as many as 243 great blue herons were counted; the Lower James River IBA is known for several great blue heron rookeries along this portion of the river. More information about the Lower James River IBA is provided in section 3.9.3.

Eight waterbird species are BCR 27 priority species, BCR 30 priority species, Virginia WAP tier category species, and have been observed or are likely to occur during the breeding season at the refuge (table 3.11).

Table 3.11. BCR 27, BCR 30, and Virginia WAP Waterbird Priority Species on the Refuge or Project Area

Species	BCR 27 Priority Status ¹	BCR 30 Priority Status ¹	Virginia WAP Tier ²	Season of Occurrence ³
Black-crowned night-heron	H	M	III	B,W
Common tern	HH	M	III	B,M
Forster's tern	M	H	IV	B,M
Glossy ibis	H	H	III	B
Least bittern	H	M	III	B
Little blue heron	H	M	II	B,W
Tricolored heron	H	M	III	B
Yellow-crowned night-heron	H	M	III	B,M

¹BCR priority status levels: HH = highest; H = high; M = Moderate (Watson 2008 [BCR 27], USFWS 2008b [BCR 30])

²Virginia WAP Tiers: I= Critical Conservation Need; II= Very High Conservation Need; III= High Conservation Need; and IV= Moderate Conservation Need

³Conservation Habitat Need based on Table 1 in Watson 2008 and Table 5 in USFWS 2008b; B=Breeding; W=Wintering, M=Migration.

Shorebirds

Few shorebird species use the inland and drier habitats of the refuge. Suitable habitat for these species is limited to areas along the narrow gravel beaches and mudflats below the refuge's erosional bluffs, the early successional forest stands in moist hardwoods and floodplain forest, and freshwater marshes along the James River, Powell Creek, and Flowerdew Hundred Creek.

At various times of the year, 12 shorebird species of conservation concern on the BCR 27 or BCR 30 lists may occur on the refuge. Five shorebird species are BCR 27 priority species, BCR 30 priority species, Virginia WAP tier category species, and have been observed

or are likely to occur during the breeding season at the refuge (table 3.12).

The most familiar shorebirds in the refuge area are killdeer, American woodcock, and spotted sandpiper. During the 2001 to 2011 Hopewell CBC, nine species of shorebirds were observed. Killdeer, Wilson's snipe, and American woodcock are the most commonly observed. American woodcock and red knot are on the highest priority shorebird species in both BCR 27 and BCR 30 and are listed in the Virginia WAP as tier IV moderate conservation need species; James River NWR provides little habitat for red knot. Dunlin and short-billed dowitcher are listed as high in both BCR 27 and BCR 30 plans and are of moderate conservation need in the Virginia WAP.

Table 3.12. BCR 27, BCR 30, and Virginia WAP Shorebird Priority Species on the Refuge or Project Area

Species	BCR 27 Priority Status ¹	BCR 30 Priority Status ¹	Virginia WAP Tier ²	Season of Occurrence ³
American woodcock	HH	HH	IV	B,W,M
Dunlin	H	H	IV	W,M
Red knot	HH	HH	IV	M
Short-billed dowitcher	H	H	IV	M
Upland sandpiper	H	M	I	B,M

¹ BCR priority status levels: HH = highest; H = high; M = Moderate (Watson 2008 [BCR 27], USFWS 2008b [BCR 30])

² Virginia WAP Tiers: I= Critical Conservation Need; II= Very High Conservation Need; III= High Conservation Need; and IV= Moderate Conservation Need

³ Conservation Habitat Need based on Table 1 in Watson 2008 and Table 5 in USFWS 2008b; B=Breeding; W=Wintering, M=Migration.

Waterfowl

The tidal tributaries of the lower Chesapeake Bay are important wintering grounds for waterfowl. VDGIF annually conducts aerial Mid-Winter Waterfowl Surveys throughout the Chesapeake Bay and its tributaries. The following information is based on 2006 to 2011 data obtained from those surveys for a section of the river within 5 miles of the refuge. Mallards, American black duck, gadwall, and green-winged teal were the most numerous of the dabbling ducks. Among the divers, ring-necked ducks and bufflehead were the most numerous. Among the geese and swan species, Canada goose, snow goose, and tundra swan dominate the survey totals. The counts for Canada geese over this period averaged more than 7,500 individuals, while snow geese averaged more than 2,500 individuals. Between 2006 and 2011, more than 2,500 tundra swans were observed within a 5-mile radius of the refuge on an annual basis during the VDGIF Mid-Winter Waterfowl Surveys.

In addition to the VDGIF Mid-Winter Waterfowl Surveys, the Hopewell CBC also has provided some on-the-ground visual observations of waterfowl within the count circle (a much smaller

observation area compared to the aerial surveys). Of the 30 species on the compiled 2001 and 2011 list, the most dominant included Canada goose, snow goose, double-crested cormorants, mallard, ring-necked duck, gadwall, American black duck, bufflehead, hooded merganser, and ruddy duck.

Through the various surveys, 28 different waterfowl species have been observed to use the refuge. American black duck is the only waterfowl species that is a BCR 27 priority species, BCR 30 priority species, and Virginia WAP tier category species that has been observed on the refuge (table 3.13).

Table 3.13. BCR 27, BCR 30, or Virginia WAP Waterfowl Priority Species on the Refuge or Project Area

Species	BCR 27 Priority Status ¹	BCR 30 Priority Status ¹	Virginia WAP Tier ²	Season of Occurrence ³
American black duck	HH	HH	II	B,W,M
American wigeon	H	M		W,M
Blue-winged teal	H			W, M
Brant	HH	HH	III	W, M
Bufflehead		H		B,W,M
Canada goose	HH	HH		W,M
Canvasback	HH	H		W,M
Common goldeneye	H	M		B,W,M
Gadwall		M		B,W,M
Greater scaup		H	IV	W,M
Green-winged teal		M		B,W,M
Hooded merganser		M		B,W,M
Lesser scaup	HH	H		W,M
Long-tailed duck		H		W,M
Mallard		H		B,W,M
Northern pintail	HH	M		W,M
Red-breasted merganser		M		W,M
Redhead	HH		III	W
Ruddy duck		M		W,M
Snow goose	HH			W
Tundra swan		H		W,M
Wood duck		M		B,W,M

¹ BCR priority status levels: HH = highest; H = high; M = Moderate (Watson 2008 [BCR 27], USFWS 2008b [BCR 30])

² Virginia WAP Tiers: I= Critical Conservation Need; II= Very High Conservation Need; III= High Conservation Need; and IV= Moderate Conservation Need

³ Conservation Habitat Need based on Table 1 in Watson 2008 and Table 5 in USFWS 2008b; B=Breeding; W=Wintering, M=Migration.

Mammals

VDGIF lists 45 species of mammals that are present in Virginia. Of these, 17 species are designated as game or furbearer species, and 6 species are designated as pest or nuisance species (<http://vafwis.org/fwis>; accessed May 2013). However, Linzey (1998) describes 49 native species of mammals that are possible based on

distribution ranges, but does not include non-native species such as domestic cat, nutria, escaped pigs, goats, dogs, Norway rat, or black rat.

Many mammal species are known to be present within James River NWR. Mice are the most abundant and are found in all habitat types, followed by white-tailed deer. Other known species includes eastern cottontail rabbit, gray squirrel, muskrat, opossum, American beaver, and raccoon. At least six bat species were confirmed present on the refuge in 2014 including the big brown, hoary, eastern red, silver-haired, evening, and tricolored (Billodeaux 2014 personal communication). All these mammal species are common for this part of Virginia. Less frequently observed is the North American river otter.

The white-tailed deer population within James River NWR is relatively stable when evaluated using doe to fawn ratios. The buck to doe harvest ratio is considered sufficient to provide a stabilized herd (Proctor 2013 personal communication). Little evidence of browse lines can be found throughout refuge forests. Harvest data from the early 1990s to present show little evidence of hemorrhagic or other diseases and rare reports of piebald deer (VDGIF 2012).

Four mammal species of concern potentially occur within James River NWR. The State endangered Rafinesque's big-eared bat, also a Virginia WAP tier 1 species of critical conservation need, could potentially use the large tracts of forest on the refuge for roosting habitat. The cotton mouse is listed as a Virginia WAP tier IV species of moderate conservation need and has a range that may include the refuge. The marsh rabbit, which is also a Virginia WAP tier IV species of moderate conservation need, has been found in Surry County, though its potential habitat on the refuge is limited. The southeastern fox squirrel, a Virginia WAP tier III species of high conservation need, may possibly be extending its range northward; suitable habitat for this species is readily abundant on the refuge.

Rafinesque's Big-eared Bat

Rafinesque's big-eared bat is a State-endangered species and a Virginia WAP tier I species of critical conservation need for the coastal plain. It is considered globally vulnerable to secure and State rare, as it has never been an abundant species (www.natureserve.org; accessed May 2013). It is documented in nearby counties (Sussex and James City) with the core of the Virginia population occurring closer to the North Carolina border. It prefers forested wetlands, and its main foods are moths. Essential habitat for roosting is hollow trees in wooded areas and mature hardwood floodplain forests, which the refuge does supply in modest quantity. More information is needed on the bat community of the James River NWR to confirm its presence or absence within the refuge. The moist hardwood and floodplain forest of the refuge may provide roosting and foraging habitat for this

species (VDGIF 2005).

Reptiles and Amphibians

Within a 3-mile radius of the refuge, 82 species of reptiles and amphibians are either potentially or likely to occur (VDGIF 2005). Of these, 17 species have State status or are tiered species in the Virginia WAP. These include species such as oak toad (tier II), eastern box turtle (tier III), spotted turtle (tier III), eastern spadefoot (tier IV), and eastern hog-nosed snake (tier IV). The riparian forests and wetlands along the James River, Powell Creek, and Flowerdew Hundred Creek, as well as the isolated vernal pools, swamps, and marshes on the interior of the refuge provide breeding and foraging habitat for many species of reptiles and amphibians.

Few baseline surveys have been conducted at James River NWR. In 2001, the VDCR Natural Heritage Program conducted surveys for rare species and communities and documented eight amphibian species and four reptile species (Belden et al. 2002). All of the species observed were common to Virginia, and none were Virginia WAP conservation species. In 2006, the Virginia Herpetological Society and VCU conducted a spring survey at the refuge and found similar results. While the refuge was found to contain numerous reptiles and amphibians, none of the species were of significant conservation concern. Refuge staff and visitors have observed two tier III species, eastern box turtle and spotted turtle (Spencer 2009 personal communication), indicating that species of concern are using the refuge and that additional surveys may provide a better picture into the reptiles and amphibians of the refuge.

Eastern Box Turtle

The eastern box turtle is listed in the Virginia WAP as a tier III high conservation need species and as a vulnerable species on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species with the most severe threats to the species listed as pesticide effects, habitat destruction and fragmentation, and vehicle strikes (VDGIF 2005, van Dijk 2011). Data sets from multiple studies point to an estimated 30 percent decline in populations over the last three generations (van Dijk 2011). Eastern box turtles are considered habitat generalists (Erb 2011); however, microhabitat conditions of temperature and moisture are driving factors for habitat selection more than vegetation structure (Reagan 1974). Diet of the eastern box turtle includes mushrooms, plant stems, leaves, flowers, slugs, and snails (van Dijk 2011). Homeranges can vary from 0.005 acres to 47.4 acres depending on habitat quality and fragmentation (Kapfer et al. 2013, Iglay et al. 2007).

Spotted Turtle

Spotted turtle is a Virginia WAP tier III high conservation need species. This species is common throughout Virginia's coastal plain

and has been documented on the refuge (Brame 2013 personal communication). Mating occurs in shallow water and nests are constructed in well-drained soils of marshy pastures, tussocks and hammocks, or in open areas at the edges of thick vegetation. Industrial pollution, increases in water depths, and the loss of wetland habitats are significant factors in the decline of populations.

Spotted Salamander

Spotted salamanders occur throughout most of Virginia in well-shaded deciduous forest stands close to swamps and vernal pools (Hammerson 2004, Faccio 2003, <http://www.dgif.virginia.gov/wildlife/information/?s=020049>; accessed November 2013). Recent studies of breeding pools shows that microclimate variables of deeper water, abundant submerged vegetation, and cooler temperatures are used in selection (Kern et al. 2013). During fall through early spring, small mammal burrows are used almost exclusively as terrestrial refuges (Madison 1997). Maintaining connectivity of forest habitat around pools should be considered a management priority due to avoidance of open areas and edges by amphibians (Regosin et al. 2005). Maintaining corridors along riparian areas especially can also aid in dispersal and gene flow between populations (Purrenhage et al. 2009).

While conducting a reptile and amphibian survey in 2006, the Virginia Herpetological Society examined individual animals for evidence of parasites, infection, or malformations. Of particular note, many of the eastern fence lizards caught were found to be heavily infested with ticks. Also at that time, a snake lesion and blood sampling study was initiated for non-threatened and non-endangered snakes. Snakes that were captured were analyzed for lesions and biopsied; if appropriate, blood samples were taken, and snakes were tagged prior to release. This study was prompted by an earlier study conducted in June 2005 at the Rappahannock River Valley NWR, where an unusually high incidence of skin lesions and eye infections were noted among several species of snakes. Researchers sought to expand their investigations to the nearby James River and Presquile NWRs to determine the extent and find clues for potential cause(s). No major concerns have been noted to date with populations on James River NWR since the 2006 study (Ware 2012 personal communication).

Fish

VDGIF lists 50 fish species to be present within 3 miles of the refuge (VDGIF 2010). During general surveys that VDCR Natural Heritage Program staff conducted in 2001, three fish species were identified at the refuge: spottail shiner, banded killifish, and bluegill (Belden et al. 2002).

Within the portion of the James River watershed that includes the refuge and its waterways, the following fish species may find suitable

spawning and nursing sites: bridge shiner, alewife, American shad, blueback herring, gizzard shad, hickory shad, and striped bass (http://www.fws.gov/refuge/james_river.html; accessed June 2013). Atlantic sturgeon uses the waters adjacent to refuge and has been observed breaching the water during eagle surveys (Brame 2013 personal communication).

Species of fish listed in the Virginia WAP and in the Virginia Fish and Wildlife Information Services Biota of Virginia Database that have been identified within a 3-mile radius from the refuge are listed in table 3.14. Federal and State statuses are also included, where applicable.

Table 3.14. Virginia WAP Fish Species

Common Name	State and Federal Status ¹	Virginia WAP Tier ²
Alewife		IV
American brook lamprey		IV
American eel		IV
American shad		IV
Atlantic sturgeon	FE/SE	II
Banded sunfish		IV
Black-banded sunfish	SE	I
Bridle shiner		I
Ironcolor shiner		IV
Lake chubsucker		IV
Least brook lamprey		IV
Mud sunfish		IV
Roanoke bass		II

¹ FE = Federally Endangered; SE = State Endangered

² Virginia WAP Tiers: I= Critical Conservation Need; II= Very High Conservation Need; III= High Conservation Need; and IV= Moderate Conservation Need

Atlantic Sturgeon

In February 2012, the NOAA's National Marine Fisheries Service listed the Chesapeake Bay population of Atlantic sturgeon as federally endangered (NOAA 2010, NOAA 2012b). In addition to being a globally vulnerable species, Atlantic sturgeon is also a State-endangered species.

According to State fishery biologists, a small but viable sturgeon population occurs in the lower James River, and the James River remains one of the best places in the Chesapeake Bay watershed to find sturgeon. Service staff have been working with VCU by supporting tagging and recapture efforts, establishing the Atlantic Sturgeon Research Station nearby at Presquile NWR, and assisting with preliminary studies to investigate potential effects of river

channel dredging on the population. In 2013, 162 sturgeon were captured and tagged within the lower James River (Belazik 2013 personal communication).

In 2010, the JRA partnered with State and private entities to construct an artificial spawning reef adjacent to Presquile NWR. Partner agencies and organizations are conducting ongoing monitoring to evaluate whether or not the artificial reef site is promoting spawning by sturgeon. Other fish species have been noted to use the area for spawning. However, use by sturgeon has not been confirmed to date (Frederickson 2011 personal communication).

Alewife and Blueback Herring

Alewife (tier IV) and blueback herring were recently proposed for Federal listing as threatened in the *Federal Register* (76 FR 67652), primarily due to concerns with habitat loss, habitat alteration, impaired water quality, and overutilization. According to the *Federal Register* Notice, the substrate preferred for spawning varies greatly and can include gravel, detritus, and SAV. Blueback herring prefer swifter moving waters than alewife. According to the VDGIF Fish and Wildlife Information Service (FWIS), alewife has been documented to be within a 3-mile radius of the refuge (<http://vafwis.org>; accessed March 2013).

Invertebrates

During general surveys conducted in 2001 by the VDCR Natural Heritage, 11 species of dragonflies and damselflies, 18 species of butterflies and skippers, and 110 species of moths were identified at the refuge. Representative dragonflies included common green darner, eastern pond hawk, great blue skimmer, and eastern amberwing. Only two damselflies were noted, big bluet and fragile forktail (Belden et al. 2002). The extensive list is on file at the refuge office; see Belden 2002.

VDGIF lists 59 species of invertebrates within 3 miles of the refuge. Two species of invertebrates of conservation concern may also occur on or near the refuge: the alewife floater mussel (tier IV) and the Diana fritillary (Federal species of concern; tier IV). VDGIF also lists six species of crayfish known in Prince George County, but none is either State or federally listed nor do any have Virginia WAP rankings. There are no known rare crayfish, isopods, or amphipods within the refuge.

In 2001, the VDCR Natural Heritage Program staff conducted a zoological inventory at the refuge for targeted rare species. Targeted species for the zoological inventory included yellow lampmussel, Ohio shrimp, rare skipper, tidewater interstitial amphipod, and insects of varying conservation ranks (See Belden et al. 2002 for complete lists). During surveys, two rare dragonflies and damselflies formerly listed

on the VDCR Natural Heritage Program's Watch List were collected. The blue dragonlet was collected in a ponded section of a small tributary to Flowerdew Hundred Creek, near the James River NWR. The big bluet damselfly was found to be common and was collected along the vegetated banks of Powell Creek at the refuge.

Insect Pests

The southern pine beetle poses a far more significant threat than other insect pests known to occur on the refuge. Highest risk areas include dense pine stands (greater than 1,000 stems per acre), over mature trees (greater than 60 years old), and generally unhealthy stands (for example, just after crown closure). Typical outbreaks of this beetle occur every 10 to 15 years, and it has been about 11 or 12 years since the last outbreak in Prince George County (Lacey 2007 personal communication). Although a full assessment of the refuge's pine stands has not been conducted, refuge staff has documented suspected pine beetle infestations at four sites and confirmed pine beetle presence at two sites (Brame 2013 personal communication). Each of these six sites is approximately 0.25 acres or less and contains three to nine dead trees in a cluster. Increasing the distance between individual pine trees limits the spread of the southern pine beetle through the entire stand.



U.S. Department of Agriculture

S-shaped egg galleries of the southern pine beetle under pine bark

The gypsy moth, which can defoliate numerous species of trees, is known to occur in Prince George County and may occur at the refuge. However, gypsy moth was not among the 110 species of moths collected during a natural history survey conducted at the refuge by VDCR Natural Heritage Program staff in 2001 (Belden et al. 2002). Furthermore, according to the VDOF (Lacey 2007 personal communication), complete stand defoliation occurs only in western Virginia. Evidence of gypsy moth has not been detected on the refuge, but we have also not yet conducted a refugewide survey.

Of much less concern, the pales weevil feeds on all pine species within its range and symptoms, which include dead seedlings or shoot tips on larger trees; pitch or resin bleeding, occur from June through August (<http://pubs.ext.vt.edu/2902/2902-1102/2902-1102.html>; accessed May 2013).

Invasive Wildlife

Invasive wildlife species of potential management concern include feral hogs, nutria, and mute swans. However, none of these species has been detected on the refuge to date.

3.12 Cultural Resources

A variety of Federal laws require that the Service identify and preserve its important historic structures, archaeological sites, and artifacts. NEPA mandates consideration of cultural resources in planning Federal actions. The Improvement Act calls for identification of the archaeological and cultural values of each refuge in the comprehensive conservation plans.

Federal agencies are also required by the NHPA to locate and protect historic resources (e.g., archaeological sites and historic structures eligible for or listed in the National Register, museum property) on their land or on land affected by their activities. In addition, agencies are required to establish a program for these activities and carry out their preservation activities in consultation with SHPO. The Service's Regional Historic Preservation Officer (RHPO) in Hadley, Massachusetts, oversees compliance with these laws and consults with the SHPOs in 14 states. In Virginia, the SHPO is the VDHR.

The NHPA makes site preservation depend on the National Register eligibility, a measure of the site or structure's quality or importance. Federal agencies are also charged with locating, evaluating and nominating sites on their land to the National Register. The Service maintains an inventory of so far discovered archaeological sites and historic structures in the Service's Regional Office, with copies of the site files at each refuge.

Section 110 of NHPA requires the each Federal agency to identify and nominate to the National Register all resources under its jurisdiction that appear eligible, including cultural landscapes. Research and preliminary field surveys are conducted to determine the existence of cultural landscapes. Identifying the significant characteristics and features of a landscape involves understanding its physical modifications and use, along with any ethnographic values and affiliations.

In addition, the Service complies with the ARPA, which requires that we protect our archaeological sites from vandalism and looting, and we require permits for site excavation. The RHPO manages these activities for Region 5.

The Service also owns and cares for museum property. Archaeological collections, art, zoological and botanical collections, historical photographs, and historic objects are our most common types of museum property. Each refuge maintains an inventory of museum property. Museum property care on refuges is guided by the Museum Property Coordinator in the Region 5 Regional Office, and helps the Service comply with the NAGPRA, as well as Federal regulations guiding curation of Federal archaeological collections. The program ensures that Service collections will continue to be available to people for learning and research.

Applicability to James River NWR

James River NWR contains significant cultural resources that have contributed to and have the potential to advance our understanding of Virginia prehistory and history. The heritage surviving at the refuge includes a material culture chronicling Native American culture, initial settlement of the James River by Europeans, Native American response to European settlement, Plantation society, military history, and post-Civil War rural agriculture.

An archaeological overview has been compiled for this refuge (Goode et al. 2009). Within the refuge 7 known archeological sites, 53 potential historic locations, and a large area of prehistoric high probability have been inventoried. Additionally, the 2011 update to the 1993 Civil War Sites Advisory Commission Report identified portions of the potentially eligible Petersburg II Battlefield on refuge lands (VDHR ID#123-5025; Eaton 2014 personal communication). As summarized in section 3.3, the refuge also has the potential to contain Paleo-Indian sites, known prehistoric archeological sites include Early Archaic through Late Woodland sites, and historic sites include occupations dating from the 17th to the 20th century. Until National Register eligibility has been evaluated, each of these sites and areas is treated as if eligible.

The following sections provide more specific details about the known

National Register eligible properties, cultural landscapes, and archaeological resources known to occur on the refuge.

3.12.1 National Register Eligible Properties

The National Register is composed of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, engineering, and culture. The National Register defines an archaeological site as “*the place or places where the remnants of a past culture survive in a physical context that allows for the interpretation of these remains*” (Little et al. 2000). Such properties may meet criteria for inclusion in the National Register for a variety of reasons, not the least of which may be because “*they have yielded, or may be likely to yield, information important to prehistory or history*” (National Register Criteria for Evaluation, 36 CFR 60.4). It is possible that additional unrecorded archaeological sites exist at James River NWR, awaiting identification. When an action is proposed in an area of archaeological sensitivity, it may be necessary to perform an archaeological investigation to locate any archaeological sites that may be present, and to evaluate their eligibility for the National Register.

The Hatch Site at James River NWR is the only site within the refuge listed on the National Register (44PG0051). The Hatch Site is also listed in the on the Virginia Landmarks Register. Analysis and reporting for this site are incomplete, but remains include Early Archaic (8000 B.C. to 6500 B.C.) through Late Woodland Period (A.D. 900 to European Contact) artifacts. The area has been capped with clean fill. An excavation was conducted in 2004 in an attempt to analyze ethno-botanical samples, but the sample size was inadequate to conduct the analysis. There are no current plans to conduct further archaeological work at this site (Small 2013 personal communication).

Goode et al. (2009) examined historic maps of the refuge vicinity and determined that 53 different buildings or structures (e.g., ruins, cemeteries) appeared on maps throughout the 19th and 20th centuries. Until sites and structures have been evaluated for National Register eligibility, they are treated as if eligible. VDHR recently suggested that we prepare the determination of eligibility documentation for Maycock’s Point Site (44PG0040; Eaton 2014 personal communication). The Maycock’s Point Site was part of a plantation from 1620 to 1690. Prior to this, Native Americans used the location. Deposits seem to begin as early as the Early Archaic Period and continue into the Contact Period, but the heaviest use was during the Middle Woodland Period. Based on carbon dates, the Middle Woodland Period site was occupied between A.D. 300 and A.D. 800. The site may take up 20 to 30 acres, but a systematic modern archaeological survey to define site boundaries has not been completed. Additional survey work at this site was conducted in 2004 and 2005 (Small 2013 personal communication).

3.12.2 Cultural Landscapes

Refuge lands have been used by a variety of peoples through time, and understanding the changes in land use helps us better understand the relationship between people and events. We aim to promote a deeper understanding of America's diverse peoples and to inspire refuge stewardship by telling a more complete story of the area's significance in the past, present, and future.

In this section, we characterize the various cultural landscapes associated with refuge lands. The NPS defines a cultural landscape as “a geographic area (including both cultural and natural resources and the wildlife or domestic animals therein), associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values” (NPS 2006). We conducted a preliminary survey for cultural landscapes at the refuge. Formal documentation, evaluation, and registration of these cultural landscapes has not been completed.

Indigenous Cultural Landscapes

James River NWR is a good example of a new concept of place known as an “*indigenous cultural landscape*” (Beacham 2011 personal communication). Developed during planning for the Captain John Smith Chesapeake NHT, the concept is intended to represent large landscapes from the perspective of American Indian nations at the time of their first contact with Europeans. The indigenous cultural landscapes identified in the Chesapeake Bay area still have many of the cultural and natural resources that would have supported the historic lifestyles and settlement patterns of American Indian peoples in their totality. The concept also attempts to demonstrate that American Indian places were not confined to the sites of houses, towns, or settlements. It emphasizes that the American Indian view of one's homeland is holistic rather than compartmentalized into the discrete site elements typically described by European-descended peoples as hunting grounds, villages, or sacred sites. More on this concept is described at

<http://www.nps.gov/chba/parknews/upload/ICL-Paper.pdf> (accessed June 2014).

The conclusion that indigenous cultural landscapes occur at James River NWR is supported by the presence of several archaeological sites with artifacts from the Early Archaic period (8000 B.C. to 6500 B.C.) through European contact in May 1607 (Goode et al. 2009), documentation from early European exploration of the James River (<http://www.smithtrail.net/captain-john-smith/smiths-journals>; accessed November 2013), and persistence of many landscape elements that supported American Indian communities and peoples (Beacham 2011 personal communication). The transportation routes on and adjacent to the James River and its tributaries, accessible landing places, marshes, brushy areas, mixed deciduous forest, high bluffs, and uplands that could support hunting were all central



Meghan Powell/USFWS

Indigenous cultural landscape along Powell Creek

elements that supported American Indian communities for centuries prior to and following European settlement. The combination of these natural landscape elements gives refuge visitors the feeling that they are walking through the past and encourages them to imagine living off the land and waters as a Virginia Indian or early European settler despite the presence of paved roads, few modern facilities on refuge land, and motorized boat traffic on the James River.

Interpretation that the refuge has indigenous cultural landscapes on and adjacent to the James River and its tributaries is wholly consistent with the Service mission “to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people,” which includes Native Indian peoples independent of Federal or State recognition.

European Settlement and Plantation Landscapes

Lands near present-day James River NWR were among the earliest of the 50-acre land patents granted to private individuals in an effort to encourage and expand European settlement in Virginia (Goode et al. 2009). Early settlements clustered along the rivers and major streams, including Powell Creek and Flowerdew Hundred Creek. Much of the 1,700 acres granted to Captain Samuel Maycock in 1618 is located within the present-day refuge. The 600-acre Powell-Brooke farm was settled on the west side of present-day Powell Creek, and the 1,000-acre Flowerdew Hundred farm was settled to the east of the present-day refuge. European settlement remained sparse until the late 19th century.

Evidence of early European settlement on the refuge persists. Historic documentation, structural ruins, cemeteries, and artifacts offer additional information about the early European settlement landscape (Goode et al. 2009). The property divisions in place by the 19th century remained largely intact until the early 20th century, and settlement remained concentrated in the western part of the present-day refuge and along the James River. Today, refuge staff maintains a portion of the Maycock farm in open grassland as representation of the former tenant farm. Adjacent to the refuge, the Flowerdew Hundred Plantation retains some characteristics of the former tenant farm, such as the expansive and unobstructed views of the grasslands bounded by fence lines, hedgerows, and densely vegetated swamp or upland forests in the distance. Partners, such as the VDHR and Prince George County, have assisted in assessing cultural resource sites and coordinating efforts to preserve these areas.

Strategic Military Positions

Many of the same landscape features that served to protect and support American Indian and early European settlement were key features that factored into military actions during the Revolutionary War, War of 1812, and the Civil War. Popular river crossing locations and defensible bluffs within and adjacent to the present-day refuge were frequented during each of these wars (Goode et al. 2009).

African-American Settlement

In the early 20th century, and possibly the late 19th century, a somewhat dispersed African-American community was located in nearly the center of the present-day refuge. No evidence of this cultural landscape remains obvious today because the buildings of this community were largely demolished by the mid-20th century (Goode et al. 2009).

3.12.3 Archaeological Resources and Collections

All of the archaeological sites and artifacts within the refuge are protected under the provisions of NHPA, ARPA, and other laws.

Within the refuge, the past archeological investigations have only focused on the largest and densest archeological sites. It is highly likely that additional archeological sites remain to be found. The known archeological sites are not isolated within the landscape. Additional ancillary and support sites related to the known sites of occupation should be present within the refuge.

Seven previously identified archaeological sites are located within James River NWR. Previous archeological investigations have included large scale and extensive excavations. However, these investigations have not resulted in site reports. Consequently, the state of current information about the past contains a significant gap. Significant information, which would advance the current understanding of the past, is in danger of being lost forever.

Erosion is threatening intact archeological deposits. This may not only result in the loss of valuable information, but the presence of artifacts at a location where the public has access may result in unlawful artifact collection. Of the potential effects of climate change, sea level rise would potentially affect sites in the refuge's tidal marshes by 2025. We anticipate that the sites within the refuge's dry lands, inland-fresh marshes, and non-tidal swamps would be relatively resilient to sea level rise (Clough and Larson 2010).

Formal Phase I field investigations involving surface collections, shovel testing, and metal detection to identify and define the boundaries of archeological resources within the refuge have not been conducted by the Service.

3.13 Public Uses

This section describes the public access, education, and recreation opportunities at James River NWR. Information about the refuge's recreation features and access are available from the refuge website (http://www.fws.gov/refuge/james_river; accessed November 2013) and refuge staff. In 1993, the Service prepared a public use management plan for James River NWR.

Currently the refuge's wildlife refuge specialist spends between 6 and 9 percent of his time annually administering activities and facilitating visits to James River NWR. According to the most current Refuge Annual Performance Planning Workbook, 485 people visited the refuge in 2012, primarily for hunting.

The Refuge Administration Act identified six priority public uses: hunting, wildlife observation, photography, environmental education, interpretation, and fishing. In accordance with this act and Service policy, these uses receive enhanced consideration over general public

uses in the Refuge System. Compatibility determinations are included in appendix B of this CCP.

3.13.1 Hunting

The refuge opened to big game hunting in 1992, specifically hunting of white-tailed deer (57 FR 58108; codified at 50 CFR 32.66); the refuge remains closed to small game hunting, waterfowl, and turkey (USFWS 1993). Proposed changes to the refuge-specific big game hunt regulation revisions have been published in the *Federal Register* and Title 50 in the CFRs annually since that time. We prepared a compatibility determination and categorical exclusion for our big game hunt program in 1994 (USFWS 1994).

The refuge is currently open to the hunting of white-tailed deer on specific days during the State's archery, muzzleloader, and shotgun seasons. Participation in each hunt on the refuge requires a refuge-issued permit. The refuge allows hunting in designated areas; the refuge does not allow hunting on the refuge in safety zones, administrative areas, and on public roads. The use of pursuit dogs during deer hunting on the refuge is prohibited.

Hunters wishing to participate in the refuge's archery hunt apply through the State's quota hunt lottery system. Hunters may apply by mail, telephone, or through the VDGIF's website (<http://vaquotahunts.com>; accessed April 2014), and the application fee is \$7.50. Up to 25 archery hunters are selected by lottery. Each selected hunter may be accompanied by one guest hunter, who must acquire a refuge permit to participate in the hunt. Up to 50 hunters may participate on any or all of a 19-day still archery season in October, excluding Sundays (950 hunt use days annually). A refuge archery hunt permit fee of \$50 is charged to each hunter participating in the 19-day archery deer season. For the past 5 years, the refuge has issued 50 archery hunt permits annually, but no single hunter has actively hunted on every one of the 19 days of the season. On average, seven hunters participate in the archery hunt per available day (15 percent participation annually) (Brame 2013 personal communication).

Hunters wishing to participate in the refuge's muzzleloader or shotgun hunts are selected on a first-come, first served basis; hunters report to the refuge's hunter check station (maps 3.1 and 3.2) on the hunt day to acquire a refuge-issued permit for the day.

The refuge accommodates up to 70 hunters per day on each of two muzzleloader hunting days, on the first two Saturdays of the season (140 hunter use days annually). On average, 38 hunters participate in the muzzleloader hunt per available day (54 percent participation annually). Muzzleloader hunters are required to use portable tree stands to hunt.



Designated hunt location #8

The refuge accommodates up to 70 hunters per day on each of four shotgun hunting days, typically in late November and early December (280 hunter use days annually). On average, 33 hunters participate in the shotgun hunt per available day (46 percent participation annually). Use of portable tree stands by shotgun hunters is optional.

Currently, the bag limit for the refuge's archery, muzzleloader, and shotgun hunts is two deer of either sex per hunt day. The refuge harvest totals support that objective of having a stable deer population, with a female harvest rate of approximately 40 percent of the total deer kill (VDGIF 2012).

The refuge hunt program is part of the State's Deer Management Assistance Program (DMAP). The primary goal of DMAP is to allow landowners and hunt clubs to work together on a local level to manage their deer herds. Secondary objectives are to increase the Department's biological deer database and to improve communication between deer hunters, landowners, and the Department. Participation in the DMAP contributes information about the refuge's deer population and helps us to ensure a harvestable surplus of deer exists within the refuge. We coordinate closely with our VDGIF District Biologist throughout the year to evaluate herd size, disease issues, and current regulations. Current hunting information is available at the refuge website (http://www.fws.gov/refuge/james_river; accessed May 2013).

3.13.2 Wildlife Observation, Photography, Environmental Education, and Interpretation

The refuge is open to and allows access to organized groups and individuals to engage in environmental education. We prepared a compatibility determination and categorical exclusion for use of the refuge as an outdoor classroom in 1994 (USFWS 1994). Refuge visitors may be unchaperoned or may request an orientation from staff or a partner organization. In all instances, visitors are required to notify the refuge three business days in advance of each visit to make reservations, and after each trip report back to the refuge the total number of people involved in the visit. Partner organizations, such as VCU, CCB, CBF, and JRA, have assisted in offering environmental education opportunities at the refuge. VCU and CCB have provided environmental education regarding their research efforts on the refuge. CBF offers unique environmental education opportunities to local teachers, informing them about the refuge and the potential to use the refuge and similar types of places as outdoor classrooms. The JRA has led canoe trips for students and members of the public that highlight the importance of clean waters and healthy watersheds.

Refuge staff provide a limited number of public opportunities for wildlife observation, photography, and interpretation annually. We also collaborate with Richmond Audubon to conduct bird walks and similar interpretation opportunities. CBF incorporates interpretive messaging about the refuge into SAV plantings and other associated group visits to the refuge. The Appalachian Trail Club has been an integral partner in providing volunteers to perform trail maintenance activities and assist in maintaining other public use facilities for visitors participating in wildlife observation, photography, and interpretation.

In December 2007, the Service and JRA entered into a MOU to formalize a partnership to encourage the public to develop an appreciation for, and stewardship ethic toward, the protection and conservation of natural and cultural resources at James River and Presquile NWRs. Our partnership with JRA exemplifies the Service's commitment to fulfilling the goals of President Obama's AGO Initiative, EO 13508: Chesapeake Bay Protection and Restoration, and the Refuge System's renewed vision, detailed in *Conserving the Future: Wildlife Refuges and the Next Generation* (USFWS 2011). The MOU outlines the terms under which JRA may use the properties for the purposes of environmental education, nature study, wildlife observation, and other uses as specified and detailed in a SUP, and includes the creation of the James River Ecology School (Ecology School) program. The current focus of this environmental education program is to offer single- and multi-day environmental education programs on Presquile NWR. The Ecology School opened on Presquile NWR in early 2013. Currently, no environmental education programs through the Ecology School are being offered at James River NWR.



Cyrus Brame/USFWS

Boy Scout troop observing refuge wildlife

3.13.3 Fishing

The James River is Virginia's premier trophy blue cat fishery, due to having large quantities of fish 50 pounds and larger (VDGIF 2011). However, James River NWR has not been opened to fishing from refuge property and does not allow herring dipping (USFWS 1993). The intent of this status is to protect sensitive shoreline habitat and minimize disturbance to wildlife. Ample fishing opportunities exist on nearby waters where allowed by State regulation and on adjacent lands where permitted by the landowner.

3.13.4 Findings of Appropriateness and Compatibility Determinations for Public Uses

In addition to the priority public uses described above, we have evaluated other general uses for their appropriateness and compatibility. Appendix B includes our updated evaluations and decisions.

The following activities were found to be appropriate and compatible public uses on the refuge:

- Commercial forest management for habitat management.
- Hunting.
- Research by non-Service personnel.

- Wildlife observation, photography, environmental education, and interpretation.

The following activities were determined to be not appropriate uses of the refuge:

- Camping.
- Collecting natural products.
- Firing range.
- Horseback riding.
- Pets on the refuge.
- Public motorized boat ramp.
- Swimming and sunbathing.
- Use of pursuit dogs for hunting.



USFWS

Children hiking

Chapter 4



Cyrus Brame/USFWS

Bald eagle nest tree

Management Direction and Implementation

- 4.1 Introduction
- 4.2 Overview of Refuge Management Direction
- 4.3 General Refuge Management
- 4.4 Goals, Objectives, and Strategies

4.1 Introduction

This chapter begins with a description of refuge goals, objectives, and strategies, and provides an overview of management direction. We present those actions that are required by law or regulation, have been previously approved, or that help to achieve multiple refuge goals. We also identify decisions we are not making at this time and that will require additional NEPA analysis before a final decision can be made. We conclude with details on our goals, objectives, and strategies for managing the refuge. The array of management actions described are those that, in our professional judgment, will best achieve the refuge's purposes, vision, goals, and best respond to public issues.

4.1.1 Relating Goals, Objectives, and Strategies

Goals

Refuge goals are intentionally broad, descriptive statements of the desired future condition of refuge resources. They articulate the principal elements of the refuge purposes and our vision statement, and provide a foundation for developing specific management objectives and strategies. By design, they are less quantitative, and more prescriptive, in defining the target of our management. As noted in chapter 1, developing a strategic plan to achieve refuge goals is the purpose for developing the CCP.

Objectives

The objectives we developed are incremental steps toward achieving a goal. Objectives further define management targets in measurable terms. They provide the basis for determining more detailed strategies, monitoring refuge accomplishments, and evaluating successes. We followed guidance in “Writing Refuge Management Goals and Objectives: A Handbook” (USFWS 2004b) for writing “SMART” objectives that possess five characteristics:

- Specific.
- Measurable.
- Achievable.
- Results-oriented.
- Time-fixed.

A rationale accompanies each objective to explain its context and why we think it is important. We will use the objectives to develop or revise refuge step-down plans, described later in this chapter. We will measure our successes by how well we achieve the objectives. Unless otherwise noted, the objectives and strategies will be implemented by refuge staff.

Strategies

Strategies are the specific actions, tools, or techniques we may use to achieve the objectives. The list of strategies under each objective represents the potential suite of actions we may implement. We will further evaluate most of the strategies in the refuge step-down plans. We will measure our successes by how well our strategies achieve our objectives and goals.

Inventory and Monitoring Activities

For most objectives, we also identify inventory and monitoring activities that will help us measure our success toward meeting refuge goals and objectives. The activities listed may be further refined in the refuge's inventory and monitoring plan.

4.2 Overview of Refuge Management Direction

It is important here to re-emphasize that CCPs provide long-term guidance for management decisions through goals, objectives, and strategies. They represent our best estimate of future needs. This CCP details program levels and activities that are above current budget allocations and, as such, should be viewed as strategic in nature. Congress determines our budgets annually, which are then distributed through our Washington and regional offices before arriving at field stations. Final CCPs do not constitute a Service commitment for staffing increases or funding for operations, maintenance, or future land acquisition. Implementation must be adjusted annually given the reality of budgets, staffing, and unforeseen critical priorities.

Over the life of this plan, we will manage the existing pine-dominated forest in a manner to allow it to transition to a mature pine savanna habitat with an open midstory and understory. We will reduce the density of trees in the pine-dominated forest by mechanical thinning and prescribed burning, which will promote the growth of larger and healthier pine trees, and help establish and maintain this habitat at a high quality for the benefit of priority refuge species, such as the brown-headed nuthatch and Chuck-will's-widow. We will experimentally plant longleaf pine seedlings and saplings and monitor their progress.

We will continue to protect the biological integrity, diversity, and environmental health of the existing moist hardwood forest, floodplain forest, freshwater marsh and shrub swamp, and aquatic habitats at their current acreages. Their locations will remain the same, and we will not undertake any new management activities in these habitats. However, we will increase monitoring and control of invasive species in these areas. We will conduct baseline inventories and long-term monitoring of priority refuge species and invasive species. We will

investigate the hydrologic flow between the wetlands in the southwestern portion of the refuge and Powell Creek.

To help stabilize the 3 miles of erosional bluff, we will consider employing erosion control techniques, such as planting bald cypress to break up wave action, and formally monitor erosion rates and bank loss, to help stabilize bluffs, reduce erosion, and benefit priority refuge species, such as the bank swallow. Because this habitat is also important to protecting bald eagles, we will use the spring and summer bald eagle surveys as an additional time to evaluate the condition of the shoreline.

We will continue to mow the existing 13 acres of non-forested upland for administrative purposes. We will convert 2 acres of pine-dominated forest around the weather station to non-forested upland to prevent interference of the signal transmission in the future.

We will conduct expanded cultural resources activities. We will conduct fieldwork to better understand the location of archaeological sites, to help prevent against adverse impacts from activities related to the pine-dominated forest transition, as well as to protect those resources located in the other refuge habitat areas. We will implement recommendations in the Archaeological Overview (Goode et al. 2009).

We will gradually expand the number and diversity of public use opportunities on the refuge available for a broad range of audiences. Although some improvements to existing visitor support facilities can be accomplished within 5 years of CCP approval, the majority of the following proposed expansions of existing public uses and opening the refuge to new uses require completion of additional planning documents and NEPA review. We will accommodate public deer hunting on the refuge for 1,460 hunter use days annually, allowing for an increased hunt participation overall. In addition, we will open the refuge to turkey hunting, offering up to 1,200 hunter use days annually, most of which will be in conjunction with the deer hunt. We will also promote youth involvement in hunting by providing youth hunt opportunities for deer, turkey, and waterfowl. We will open the refuge to fishing at two designated locations. We will designate one area to support regular use by refuge visitors interested self-guided and organized wildlife observation, photography, environmental education, and interpretation opportunities between sunrise and sunset throughout the year; no permit will be required for visitors participating in these wildlife-dependent uses in the designated public use areas after approval of a VSP and completion of infrastructure improvements.

Because James River NWR is considered by the Service to be an urban refuge, we anticipate that interest in the refuge and annual visitation will increase in the future. To support this, we will enhance

on-refuge infrastructure to support those increases, including an expanded and improved trail system, improved roads, and designated public use parking areas. We will further support increased visitors through our partnerships with a variety of entities outside of the Service, which we will develop further to support the refuge's purpose, provide research support, and meet the refuge's goals and objectives for resource management.

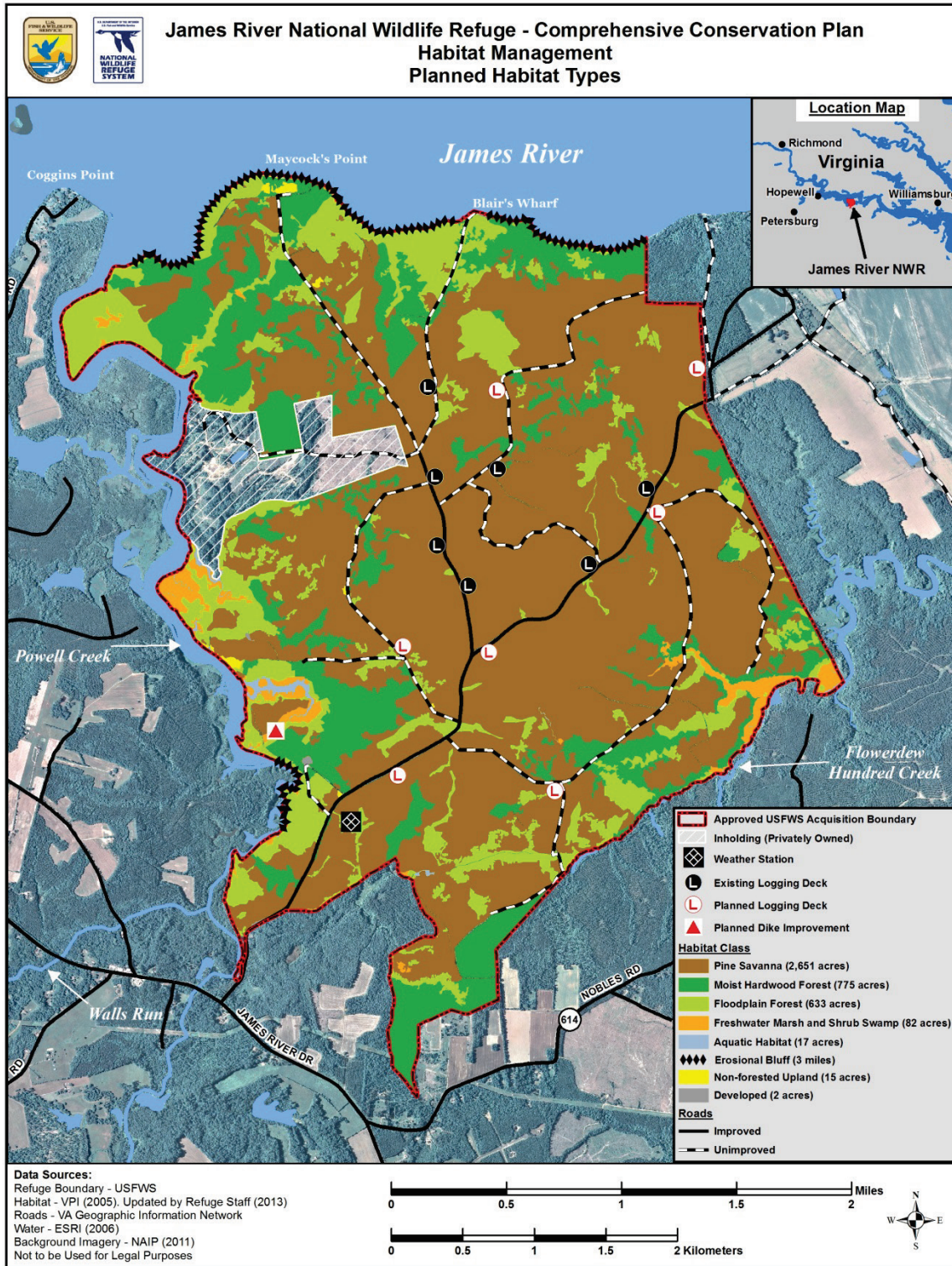
Planned habitat conditions and public use focus areas are depicted in maps 4.1 through 4.3.



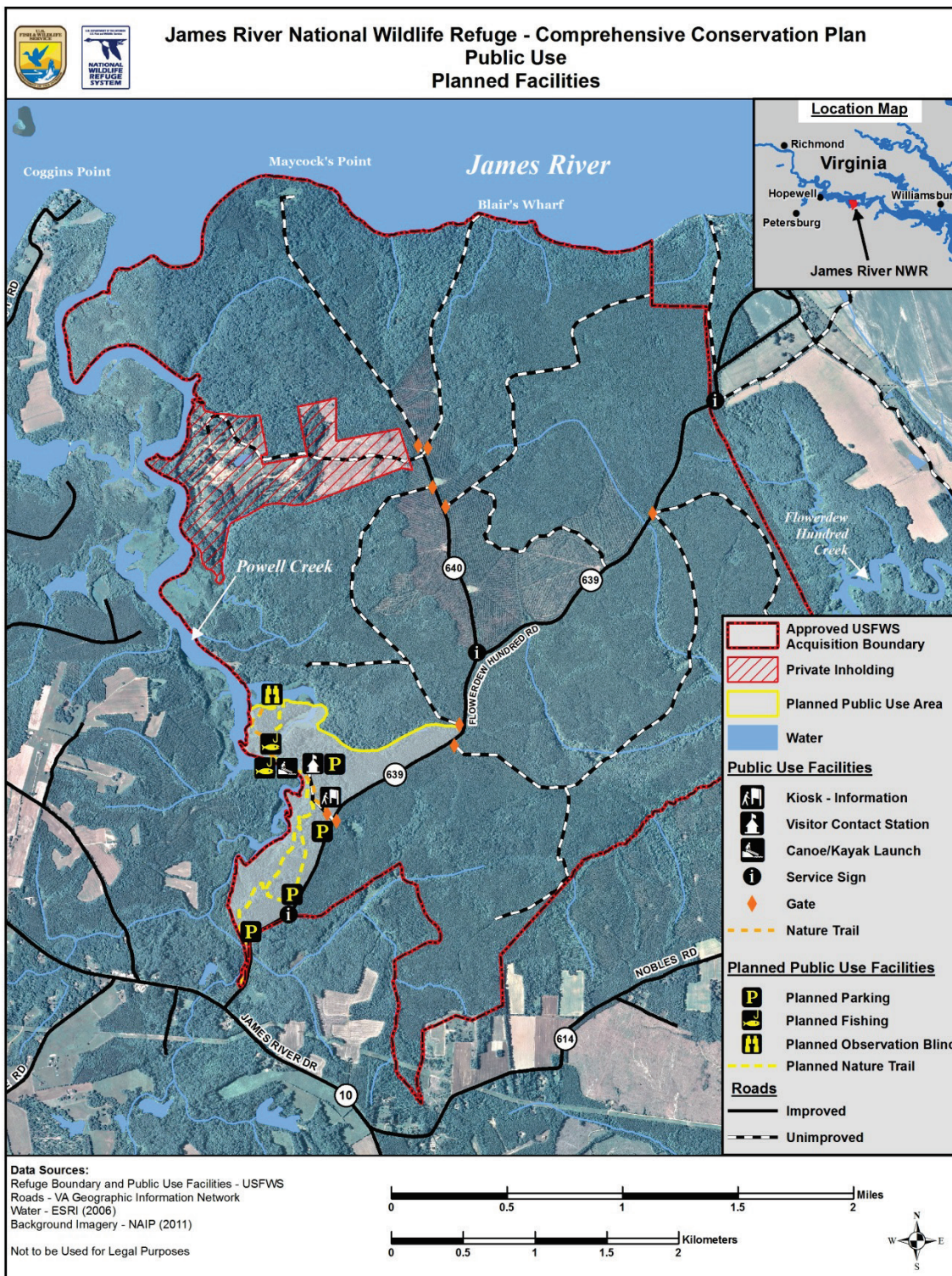
Rebekah Wilson/VDCR

Fire crew partnership: The Nature Conservancy, Burrowsville Volunteer Fire Department, Virginia Department of Conservation and Recreation, National Park Service, and U.S. Fish and Wildlife Service

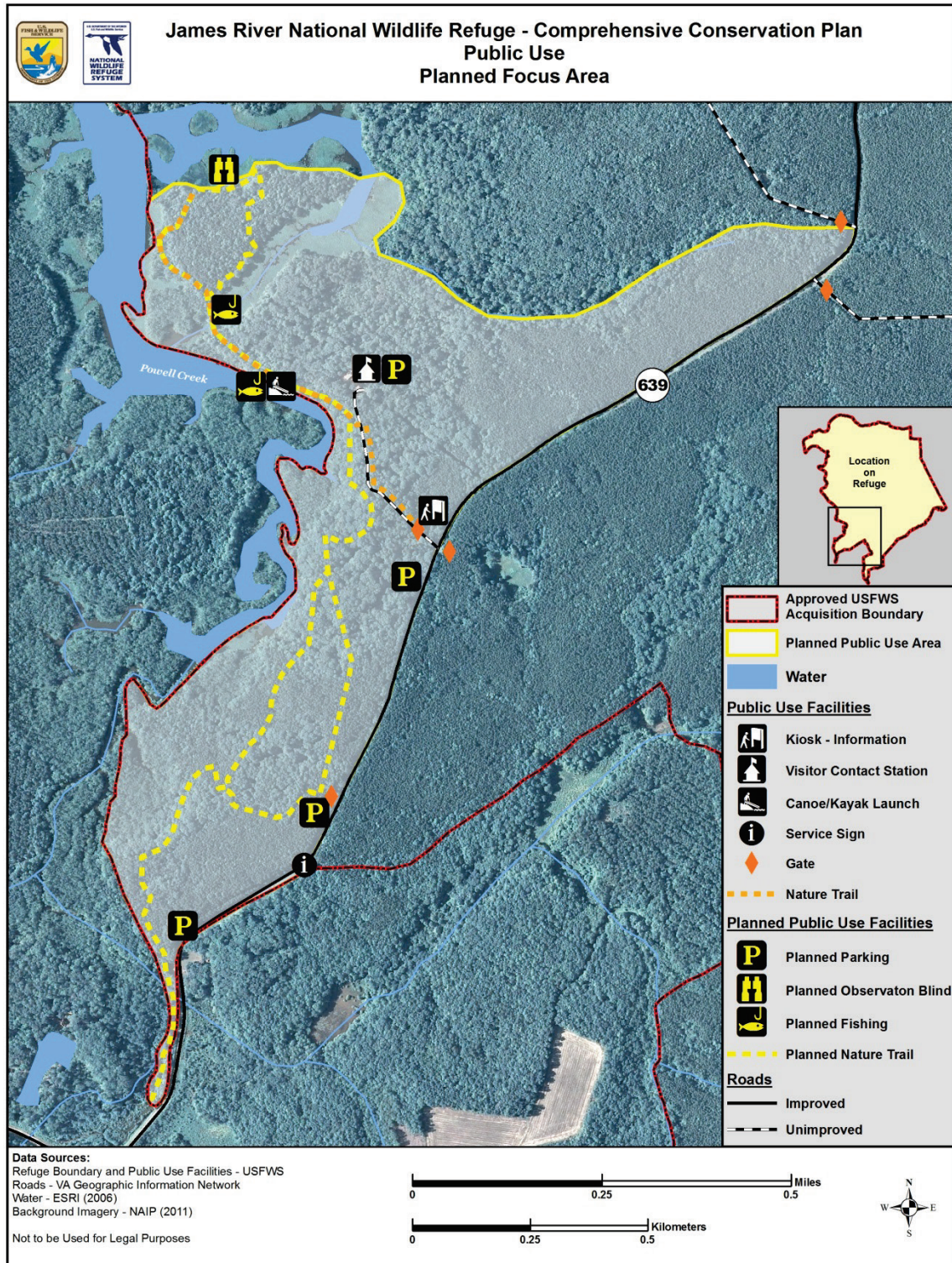
Map 4.1 Planned Habitat Management at James River NWR



Map 4.2 Planned Public Use Facilities at James River NWR



Map 4.3 Planned Public Use Focus Area at James River NWR



4.3 General Refuge Management

Some action we propose to take in managing James River NWR over the next 15 years are required by law or policy, or represent actions that have undergone previous NEPA analysis, public review, agency review, and approval. Others may be administrative actions that do not require public review, but are those that we want to highlight in this public document.

Certain current practices and policies will continue, as discussed in more detail below, related to the following topics:

- Refuge staffing and administration.
- Species and habitat conservation.
- Cultural resources management.
- Visitor services management.
- Findings of appropriateness and compatibility determinations.
- Refuge revenue sharing payments.
- Special designation areas.
- Additional NEPA analysis.

4.3.1 Refuge Staffing and Administration

Refuge Staff

Continue to share staff across the Eastern Virginia Rivers NWR Complex, including the three new positions: visitor services specialist, refuge biological science technician, and maintenance worker (appendix C, USFWS 2007c, USFWS 2012c).

Discussion and Rationale

In 2000, a decision was made by the Service to administratively group James River NWR with Rappahannock River Valley and Presquile NWRs to form the Eastern Virginia Rivers NWR Complex. In 2003, Plum Tree Island NWR joined the refuge complex. The intent of administratively grouping these refuges was to create management efficiencies, to the maximum extent possible, due to declining budgets. The refuge manager for the refuge complex is responsible for setting staff priorities and resource distribution across the four refuges.

In 2007, our Regional Directorate completed the “Strategic Workforce Plan for the National Wildlife Refuge System in Region 5” (Phase 2; January 16, 2007) to support a new base budget approach. The goal of the plan is a maximum of 75 percent of a refuge station budget to cover salaries and fixed costs, while the remaining 25 percent or more would be operating and maintenance funds. An analysis of refuge

staffing using the National Staffing Model resulted in a proposed increase of three staff, with shared responsibilities among the four refuges in the refuge complex (USFWS 2007c). Increasing refuge complex staff by three would help support management on James River NWR, including increased visitor services opportunities and management of the natural and built resources on the refuge. The three new positions would be allocated across each of the four refuges as needed to ensure efficient operation and management throughout the refuge complex.

Our strategy is to improve the capability of each refuge manager to do the highest priority work, and not to have most of a refuge budget tied up in inflexible fixed costs. This strategy was successful for a few fiscal years; however, we now anticipate a level or declining budget environment, which will affect our flexibility in managing financial resources and may have implications for the level of permanent staffing. A new round of workforce planning began in 2013 in response to the Federal Government's sequestration directive and anticipated future budget reductions.

Requiring a Permit for Refuge Access

Continue to require a permit for refuge access not associated with refuge-sponsored programs or planned activities.

Discussion and Rationale

Since refuge establishment, the refuge has been closed to general public access. Only those visitors who participate in the refuge's deer hunts or made advanced reservations to participate in a refuge program, partner-sponsored event, or conduct a visit are allowed access to the refuge. People interested in visiting the refuge outside of refuge-or partner-sponsored programs are required to request permission to access the refuge at least three business days in advance of their visit. If the request is determined to be compatible and is granted, refuge staff issue a SUP that visitors are required to carry a copy of while on the refuge. Requiring permission to visit the refuge has worked well because it:

- Proactively prevents incompatible or unauthorized uses from occurring on the refuge.
- Minimizes wildlife disturbance on the refuge by stipulating in the permit that access is in designated areas only.
- Minimizes cultural resource disturbances by requiring people to stay in designated areas.
- Enhances safety for the children that are participating in the environmental education programs offered year-round.
- Allows for stricter monitoring of who is on the refuge and why.

- Minimizes conflicts between user groups (e.g., bird watchers and deer hunters) for safety purposes and supports high quality experiences.
- Protects the visitor experience of being immersed in nature in a secluded and remote area.
- Provides a mechanism for law enforcement to prevent people from beaching their boat on the fragile shoreline and engaging in other unauthorized uses.

This practice will continue until a VSP is approved and signage and visitor support facility improvements are completed. Improvements of the existing 0.5-mile trail, parking, restroom, and development of the refuge's VSP are needed prior to relaxing the refuge's permit requirement for wildlife observation, photography, environmental education, interpretation, and fishing in the designated public use area. As discussed in the "Refuge Step-down Plans" section below, we will complete the signage installation, facility improvements, and VSP within 5 years of CCP approval. If the VSP includes proposals for modifying existing visitor service facilities and/or additional visitor service improvements, additional NEPA and approvals may be necessary prior to implementing those actions. We anticipate that NEPA analysis and implementation of facility improvements or other improvements needed to support appropriate and compatible uses on the refuge will be completed 5 to 10 years after CCP approval.

Permit availability (i.e., the number of permits issued) is not a concern and is not predicted to become a major concern over the next 5 years. Very few permit requests are denied annually and are denied in accordance with Service policy (603 FW 2).

Additional details about this permit requirement are provided in the compatibility determination for "Wildlife Observation, Photography, Environmental Education, and Interpretation" in appendix B.

Refuge Step-down Plans

Continue to complete refuge step-down plans according to the identified schedule. The habitat management plan, inventory and monitoring plan, and visitor services plan are priorities for completion.

Discussion and Rationale

The Service uses CCPs to detail the "what, why, and how" of refuge management priorities that would be explored further in step-down plans, which detail the "how, where, and when" we would accomplish the refuge's goals and objectives. Step-down plans will be prepared in accordance with Service guidance, handbooks, and this CCP. As discussed in chapter 1, we have completed some step-down plans for the refuge. We would develop new plans and revise existing plans once the final CCP is approved. The following three step-down plans are a

priority for completion on James River NWR. Under each description, we identify a timeline for their completion.

Habitat Management Plan: A HMP for the refuge is the requisite first step to achieving the objectives of the biological goals, goals 1 and 2 (USFWS 2013c). We will complete a HMP within 5 years of CCP approval. The HMP will provide more details on the habitat management strategies we will use to accomplish CCP goals and objectives over the next 15 years. In particular, the HMP will detail the specific areas and habitat types we will manage for, as well as the tools and techniques we will use and the timing of our management actions. Additional analysis of the impacts of specific methods may be necessary to fulfill our responsibilities under NEPA. The HMP will also incorporate the results of appendix A, which identifies how we derived priority refuge species and habitats for the refuge. We will not prepare a separate Forest Management Plan because the HMP will serve the same purpose for this refuge.

The goals, objectives, and strategies in this CCP identify how we intend to manage habitats on the refuge. Both the CCP and HMP are based on current resource information, published research, and our own field experiences. Our methods, timing, and techniques will be updated as new, credible information becomes available. To facilitate our management, we will regularly maintain our databases, including Geographic Information Systems data, documenting any major vegetation changes on at least a 5-year basis.

Inventory and Monitoring Plan: The IMP will outline and prioritize inventorying and monitoring activities for the refuge based on the priorities identified in this CCP and detailed in the HMP. The IMP will be completed within 5 years of completing the HMP. We will use our inventory and monitoring program to assess whether our original assumptions and proposed management actions are supporting the refuge's habitat and species objectives, as well as Service priorities at the regional, flyway, and landscape scales. The results of inventories and monitoring will provide us with more information on the status of our natural resources and allow us to make more informed management decisions. The IMP will incorporate recommendations from the "Strategic Plan for Inventories and Monitoring on National Wildlife Refuges: Adapting to Environmental Change" (USFWS 2010a) to ensure a coordinated approach to inventory and monitoring across refuges.

Visitor Services Plan: A VSP is required by Service policy (605 FW 1, Section 1.8.A) and, along with the HMP, is among the highest priority step-down plans for all refuges (USFWS 2013c). Exhibit 1 of that policy includes an outline for the plan. The VSP will further detail strategies to help meet the visitor services goals and objectives contained in this CCP over the next 15 years, including finding ways to

increase the understanding and appreciation for fish and wildlife conservation by urban audiences (<http://americaswildlife.org/wp-content/uploads/2012/04/Recommendation-131.pdf>; accessed September 2013). We will complete a VSP within 5 years of CCP approval. If the VSP includes proposals for modifying existing visitor service facilities and/or additional visitor service improvements, additional NEPA and approvals may be necessary prior to implementing those actions. We anticipate that NEPA analysis and implementation of facility improvements or other improvements needed to support appropriate and compatible uses on the refuge would be completed 5 to 10 years after CCP approval.

Known and Potentially Hazardous Materials

Conduct an ecological risk assessment at former skeet range.

Discussion and Rationale

As discussed in section 3.10.4, a 25-acre skeet range exists on present-day refuge land and refuge staff are working with our Ecological Services Virginia Field Office to assess the extent and nature of the contamination associated with the former skeet range. The site characterization will consist of conducting a field reconnaissance, designing a sampling plan (i.e., surficial soil samples collected either through a sampling grid or transect design), implementing this plan, and comparing analytical results to ecological soil screening levels for contaminants to evaluate potential risk to ecological receptors. If ecological risk is confirmed, remedies to mitigate this risk will be evaluated.

The primary constituent of concern associated with the former skeet range is from the lead shot. Firing of lead shot can create lead dust, which can be carried off site by either wind or water erosion. The heat of firing projectiles can also atomize lead into vapor, which can precipitate or condense on soil particles at the firing line. The normal operation of a range can produce lead concentrations of several percent (1 percent = 10,000 ppm) in soils located behind and adjacent to targets and impact areas within the range.

Lead is a particularly hazardous element for fish and wildlife resources. The ecological and toxicological aspects of lead in the environment have been extensively studied and reported in the scientific literature (Eisler 1988). Lead concentrates in organic-rich soils and may be mobilized through exposure to acidic rainwater and groundwater (USEPA 2001). Lead is neither essential nor beneficial to living organisms, and measured effects to biota are adverse (Eisler 1988). It is toxic in most of its chemical forms. In plants, excessive lead levels can cause growth inhibition, as well as reduced photosynthesis, mitosis, and water absorption (Demayo et al. 1982). In animals, lead is a nonspecific toxicant at the molecular level and inhibits the activities of many enzymes necessary for normal biological functions (Pattee

and Pain 2003). Mortality, neurological dysfunctions, immune suppression, and reproductive impairment are documented effects of lead exposure in birds (Kendall et al. 1996). Lead can be incorporated into the body by inhalation, ingestion, dermal absorption, and placental transfer to the fetus. An accumulative metabolic poison, lead affects behavior as well as the vascular, nervous, renal, and reproductive systems. Lead is known to be fetotoxic and teratogenic. Ingestion of lead-contaminated soil and prey are principal pathways for wildlife exposure (Kendall et al. 1996, Pattee and Pain 2003). Lethal or sublethal effects depend on lead absorption and distribution within the body and other factors including age, sex, environment, and diet (Pattee and Pain 2003).

Facilities Maintenance

Continue to address the refuge's maintenance backlog of high priority maintenance and construction projects.

Discussion and Rationale

Periodic maintenance and renovation of existing facilities will continue to ensure safety and accessibility for staff and visitors. The refuge's existing facilities are described in chapter 3. Construction and maintenance projects currently listed in the RONS and SAMMS databases would be undertaken in accordance with the regional and refuge rankings for each project (see appendix D).

As we undertake these projects, the refuge will consult with other Federal, State, and local government agencies with jurisdiction and authority to ensure that activities are consistent, to the maximum extent practicable. We will conduct further consultations, as warranted, to ensure compliance with Federal laws such as the NHPA and the ESA. We will also work to ensure consistency, to the maximum extent practicable, with the enforceable policies of the Virginia Coastal Management Program in compliance with the Coastal Zone Management Act of 1972 (see appendix F); to acquire required permits prior to commencing with projects; and to ensure that the Service and its agents use appropriate and required mitigation measures if required during project implementation.

The Council on Environmental Quality guidelines for implementing NEPA also require examining energy requirements and conservation potential in environmental documents. We will meet these guidelines by incorporating principles of sustainability in the design, construction, and operation of existing and new facilities constructed on the refuge.

Rights-of-way Easements

Continue to coordinate with right-of-way easement holders regarding maintenance activities.

Discussion and Rationale

While purchasing land to complete the refuge boundary, the Service has acquired land with reserved rights, rights-of-way, leases, and other agreements. Currently there are three easements for electricity and power service on lands now included within the refuge. The refuge will follow policy guidance when any of these reserved rights are exercised. Specifically we follow 50 CFR 29.21-9, as well as ensure compliance under the refuge compatibility policy (603 FW 2) and biological integrity, diversity and environmental health policy (601 FW 3). Depending on the location and the extent of disturbance required to exercise reserved rights on refuge lands, other laws may apply. In general, the refuge will coordinate with all private parties exercising their rights to ensure the protection of refuge resources. The refuge will issue SUPs as necessary to manage these uses and to ensure that impacts to refuge resources are as minimal as possible.

4.3.2 Species and Habitat Conservation

Protecting Federally Listed and Recently De-listed Species

Continue to protect and enhance bald eagle nesting and roosting habitat throughout the refuge forests by protecting active bald eagle nests (independent of habitat type), as well as providing and maintaining communal nocturnal roost and feeding habitat in a condition capable of supporting a minimum of 150 bald eagles.

Protect and enhance existing habitat throughout the refuge for federally listed species found to exist on the refuge.

Discussion and Rationale

The bald eagle was removed from the Federal list of threatened and endangered species in 2007 and removed from the State list in 2013. However, the bald eagle continues to be protected federally under BGEPA and the MBTA. We will continue to protect nesting bald eagles and their habitat on the refuge because their protection was the primary purpose for establishing the refuge. There are currently five nesting bald eagle pairs on the refuge, and we will continue to monitor the nests and breeding activities and prohibit the public from disturbing them.

We will continue to protect federally listed and recently de-listed species as follows:

- Bald eagles:
 - ❖ Protecting and enhancing the active nests on the refuge, while improving the habitat to a condition that will support additional nesting pairs.
 - ❖ Protecting and enhancing the existing nocturnal roost and feeding roost habitat on the refuge, while improving the habitat to a condition that will support additional roost areas.

- ❖ Continually identifying, protecting, and enhancing potential nest and roost trees to ensure that high quality habitat will continue to exist within the refuge.
- Sensitive joint-vetch and small whorled pogonia:
 - ❖ In cooperation with the VDCR Natural Heritage Program, continue to survey for these species. If located, we will work with the respective species' recovery lead and other experts to develop plans to protect them.

Adaptive Management

Continue to employ an adaptive management approach for improving our resource decisions and management.

Discussion and Rationale

We will employ an adaptive management approach for improving resource management by better understanding ecological systems through iterative learning.

The Department of the Interior's technical guidebook to assist managers and practitioners in adaptive management provides the following definition for adaptive management (U.S. Department of the Interior 2009):

Adaptive management is a decision process that promotes flexible decisionmaking that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Careful monitoring of these outcomes both advances scientific understanding and helps adjust policies or operations as part of an iterative learning process. Adaptive management also recognizes the importance of natural variability in contributing to ecological resilience and productivity. It is not a 'trial and error' process, but rather emphasizes learning while doing. Adaptive management does not represent an end in itself, but rather a means to more effective decisions and enhanced benefits. Its true measure is in how well it helps meet environmental, social and economic goals, increases scientific knowledge, and reduces tensions among stakeholders.

This definition gives special emphasis to the uncertainty about management impacts, iterative learning to reduce uncertainty, and improved management as a result of continuous learning. This approach recognized that we can never achieve perfect understanding of the natural world and that we must implement management in the face of uncertainty. At the refuge level, adaptive management is an integral part of management planning, research design, and monitoring. Uncertainties about ecological systems are addressed through targeted monitoring of resource response to management

actions and predictive models that mimic the function of the natural world.

Adaptive management gives the refuge manager flexibility to adjust management action or strategies if they do not meet goals or objectives. Significant changes from what we present in this CCP may warrant additional NEPA analysis and public comment. Minor changes from what we present in this CCP may not warrant additional NEPA analysis and public comment, but we would document them in our project evaluation, annual reports, or 5-year reviews, as appropriate. Implementing an adaptive management approach supports all refuge goals. Furthermore, adaptive management is all the more compelling in light of climate change concerns.

Climate Change

Continue to address climate change by maintaining and restoring healthy, connected, and genetically diverse wildlife populations and ecological communities, monitoring conditions over the long-term; promoting energy efficient practices; and promoting other carbon reduction activities.

Discussion and Rationale

Climate Change: There is consensus among the scientific community that global climate change, occurring in part as a result of emissions of carbon dioxide and other greenhouse gases from human activities, will lead to significant impacts across the U.S. and the world (Joint Science Academies 2005). The effect of climate change on wildlife and habitats is expected to be variable and species-specific, with a predicted general trend of species ranges and vegetation communities shifting northward and higher in elevation.

Uncertainty about the future effects of climate change requires refuge managers to use adaptive management to maintain healthy ecosystems in light of unpredictability (Inkley et al. 2004). This involves improving or adjusting policies and practices based on the outcomes of monitoring or management activities and may result in changes to regulations, shifts in active habitat management, or changes in management objectives. A few recommendations include:

- Prepare for diverse and extreme weather conditions (e.g., drought and flood).
- Maintain or restore healthy, connected, and genetically diverse wildlife populations to increase resiliency in wildlife and habitats.
- Employ monitoring and adaptive management. (see Inkley et al. 2004 for more recommendations).

James River NWR may play an important role in monitoring and predicting the effects of global climate change. At the refuge level, it

will be increasingly important to understand how the refuge and its habitats and communities respond to potential changes such as habitat shifts, changes in temperature, changes in waterway salinity, and storm intensification.

In forests, climate change will likely result in shifts in forest composition and structure (Iverson and Prasad 1998) that will greatly change the availability of habitat for many species. Shifts in the dominant vegetation type or even small changes in the understory composition may result in significant changes in animal communities. The goal of adaptation is to reduce the vulnerability of ecosystems to climate change and increase their resilience to climate-induced changes in ecological conditions.

Forest management strategies include those listed above, as well as the following:

- Reduce the impacts of stresses that can exacerbate the effects of climate change, particularly from wildland fire, insects, and diseases.
- Step-up measures to prevent and control the spread of invasive species.
- Prevent or reduce barriers to species migration, such as forest fragmentation.
- Improve forest health monitoring for early detection of climate change impacts.
- Help forests regenerate after disturbances (e.g., through reforestation).
- Support research to better understand forest vulnerability to multiple stressors and to find ways to enhance forest resilience.
- Consider establishing a continuous forest inventory monitoring system.

Energy Efficient Practices: We will continue to make incremental progress in maintaining and constructing facilities in a manner consistent, to the maximum extent practicable, with the most current guidance. We will continue to identify and remove those structures that have no useful purpose or that pose safety hazards. We must also take care to maintain both new and rehabilitated facilities to Service standards to keep them safe, functional, and attractive.

We will continue to service, repair, and maintain existing renewable energy infrastructure as needed. The Refuge Manager will fully evaluate the alternative energy structures on the refuge and, if

necessary, remove them, modify their design, move them to more effective locations or add additional infrastructure. The Service remains committed to use of renewable energy sources to the fullest extent feasible on refuge lands.

Carbon Reduction Practices: Carbon sequestration is one mitigation strategy used to offset effects of climate change. The USFS provides widely accepted calculations of carbon stored in various forest types (Smith et al. 2004). Opinions in the literature regarding the effect of active forest management on carbon sequestration capability of forests are not consistent among scientists (Nunery and Keeton 2010, Hennigar et al. 2008). Management of refuge forests will be focused on providing wildlife habitat, promoting healthy native forests, and support the ability of refuge forests to sequester carbon effectively. These strategies also support the carbon sequestration activities within the Service's proposed climate change objectives, as outlined in the draft strategic plan for responding to accelerating climate change (USFWS 2009b).

Invasive Plant Species Control

Continue to control invasive species on refuge lands as funding, staffing, and equipment logistics allow, with particular attention to controlling Japanese privet and stiltgrass in moist hardwood forest, as well as tree-of-heaven and princess tree along roadsides and within non-forested upland.

Discussion and Rationale

EO 13112 defines an invasive species as “...an alien (or non-native) species whose introduction does, or is likely to cause economic or environmental harm or harm to human health.” The unchecked spread of invasive plants threatens the biological diversity, integrity, and environmental health of all refuge habitats. In many cases, invasive species out-compete native species and become the dominant cover. This situation reduces the availability of native plants as food and cover for native wildlife. Over the past several decades, government agencies, conservation organizations, and the public have become more aware of the negative effects of invasive species. One report estimated the economic cost of invasive species in the U.S. at \$137 billion every year (Pimentel et al. 2000). Up to 46 percent of the plants and animals federally listed as threatened and endangered have been negatively impacted by invasive species (Wilcove et al. 1998, National Invasive Species Council 2001).

The Service's Northeast Region initiated an effort to systematically identify, locate, and map invasive plant species occurring on refuge lands, leading to an effective integrated management plan. James River NWR staff has begun identifying and mapping locations of invasive species on the refuge as time and resources allow. Japanese privet, Japanese stiltgrass, and tree-of-heaven are the biggest

concerns on the refuge currently. We will use this information to guide the development of monitoring, control, and eradication projects. When control is deemed necessary, the refuge will use the most effective combinations of mechanical, biological, and chemical controls to achieve long-term control or eradication. Only herbicides approved by the national contaminants coordinator will be used, and only in accordance with the approved rate and timing of application. Currently, the refuge uses triclopyr and glyphosate to treat invasive species, when resources allow.

We will continue to implement the following strategies related to invasive species control:

- Follow the national guidance on invasive species provided in the Service Manual (620 FW 1.7G).
- Complete the inventory and mapping of invasive plant species and prioritize invasive species to be controlled or eradicated.
- Implement integrated pest management using biological, ecological, mechanical, prescribed fire, or chemical techniques, as needed.
- When using heavy equipment on refuge property, we would ensure all equipment brought on to and taken off the refuge for this work is clean and free from reproductive plant parts, to minimize opportunities for invasive species transport.

Pest Management

Continue to participate with State and Federal partners to monitor and manage nuisance issues from wildlife, such as pine beetle, feral hogs, and nutria.

Discussion and Rationale

In controlling pests, whether invasive or native species, we will continue to use an integrated approach. The Refuge Manual (7 RM 14.4C) defines integrated pest management as “*a dynamic approach to pest management which utilizes a full knowledge of a pest problem through an understanding of the ecology of the pest and ecologically related organisms and through continuous monitoring of their populations. Once an acceptable level of pest damage is determined, control programs are carefully designed using a combination of compatible techniques to limit damage to that level.*”

An integrated approach uses various methods, including natural, biological, cultural, mechanical, and chemical controls. Some examples of pest management problems and solutions follow.

- *Existing problem:* The southern pine beetle outbreaks in dense pine stands, over mature trees, and generally unhealthy stands

poses a significant threat to the health of the refuge's pine-dominated forest.

Existing solution: Proper silviculture management techniques of thinning and promoting a stand of large, healthy trees should reduce susceptibility to infestations.

Potential solution: If infestation is severe, chemical treatments may be needed.

- *Potential problem:* If documented on the refuge in the future, small populations of feral hogs can grow exponentially and decimate habitat and food resources that are important for native wildlife species.

Potential solutions: If documented on the refuge in the future, use control methods to eliminate population on refuge property. Methods may be conducted by USFWS staff, partners, or through SUPs.

- *Potential problem:* If documented on the refuge in the future, nutria eating of roots and stems of wetland plants can convert marshes and swamps into unvegetated mudflats.

Potential solutions: If documented on the refuge in the future, use control methods to eliminate population on refuge property. Methods may be conducted by USFWS staff, partners, or through SUPs.

- *Potential problem:* If documented on the refuge in the future, mute swans can have a direct adverse impact on plant diversity, fish assemblages, water quality/erosion control, and vegetation available to native waterfowl.

Potential solution: If documented on the refuge in the future, we will work with other Federal and State partners to capture and remove mute swans from the refuge. The Service goal is zero productivity for mute swans in the Northeast Region, due to the swan's negative impact on native waterfowl and their habitats.

We do not intend to initiate a public or recreational trapping program at this time. Trapping is considered a commercial activity and must meet a higher standard of compatibility than priority wildlife-dependent public recreational uses or other non-commercial uses. We will reconsider our position if future situations arise in which predation, habitat loss, or disease is severe, and we determine public trapping to be an effective, essential element in managing them. Until that is necessary, we will use trapping only on a case-by-case basis to help alleviate a particular problem. In this context, trapping will be

considered a management or administrative activity and not subject to compatibility review.

4.3.3 Cultural Resources Management

Protection and Maintenance Recommendations

Continue to comply with Section 106 of the NHPA through consultation with the RHPO and SHPO when new ground-altering activities are proposed, evaluate existing facilities for National Register eligibility before altering, and require compliance with standard terms and conditions agreed to by refuge staff for forest management.

Discussion and Rationale

As a Federal land management agency, we are entrusted with the responsibility to locate and protect cultural resources, including archaeological sites and historic structures that are eligible for the National Register. As described in chapter 3, there are 7 known archaeological sites, 53 potential historic locations, and a large area of prehistoric high probability. Considering the refuge's location on the lower James River, it is likely that additional sites of various periods would be identified in the future.

The Service Manual, 614 FW 1, outlines the process of refuge managers and regional office archaeologists for analyzing the potential for our projects to affect archeological and historical resources, and consulting with the SHPO and Tribes as appropriate in order to comply with the NHPA. Projects involving soil moving or building alteration are most likely to damage archaeological sites and historic buildings. Identifying sites and buildings through archaeological or architectural survey early in the project planning process may enable the Service to avoid the cultural resources. Preserving important sites and structures is always the preferred outcome. If we cannot avoid an important site, we design mitigation for the impact in consultation with the SHPO, federally recognized Tribes, and other constituencies. NHPA requires that we consider the important sites and historic structures in planning the activity and get the advice of the SHPO during planning.

We also plan to work with the NPS, Tribal representatives, the SHPO, the Archaeological Society of Virginia, and local historical societies to interpret the Pre-Contact Period and history on the refuge and to explain the importance of protection and preservation of cultural resources.

Outreach and Communications

Continue to actively communicate with federally recognized Tribes, unrecognized Virginia Tribal organizations, and descendant communities to discuss proposed refuge activities and share periodic progress reports on refuge activities.

Discussion and Rationale

James River NWR provides an ideal place to demonstrate to the public how an appreciation of indigenous values regarding stewardship of land and wildlife can enhance public and personal attachment to the James River watershed. The refuge consults with eight federally recognized Indian Tribes when NEPA and NHPA are relevant. In addition, there are 11 unrecognized Indian Tribes represented in Virginia: Cheroenhaka (Nottoway), Chickahominy, Eastern Chickahominy, Mattaponi, Monocan Nation, Nansemond, Nottoway of Virginia, Pamunkey, Pattawomeck, Rappahannock, and Upper Mattaponi (<http://www.ncsl.org/issues-research/tribal/list-of-federal-and-state-recognized-tribes.aspx#s-va>; accessed August 2013). All of these Tribes are State recognized, and some are actively seeking Federal recognition. Federal recognition of the Pamunkey Indian Tribe has preliminary approval from the Department of the Interior for Federal recognition, and a decision is pending (<https://federalregister.gov/a/2014-01349>, accessed June 2014; <http://bit.ly/1DpUCtc>, accessed February 2015).

Through early 20th century residents, the refuge's history is linked to the nearby Eastern Chickahominy Tribe's history. We will continue to actively communicate with all recognized and unrecognized Virginia Tribal organizations with regard to identification, education, and interpretation efforts on the refuge to ensure information is shared about how the refuge was part of the history of Virginia's Native Americans.

4.3.4 Visitor Services Management

Outreach and Communications

Continue to work with partners to promote the protection and preservation of the refuge for the benefit of wildlife through environmental education and interpretation about the natural environment and wildlife of the James River.

Discussion and Rationale

Developing and maintaining partnerships is key to fulfilling the Service's mission. Refuge staff has established working relationships with a variety of partners to promote wildlife and habitat conservation through environmental education and interpretation. We will continue to participate in these partnerships and develop a better understanding of the refuge's and the Service's role in surrounding communities.

EO 13508, "Protection and Restoration of the Chesapeake Bay" (signed May 2009), outlines actions for the Federal government to take to make progress toward restoring the health of the Chesapeake Bay. The Federal Leadership Committee was created for the Chesapeake Bay, which in September 2010 issued the EO Strategy, outlining specific efforts to undertake. As part of the James River

watershed, actions at James River NWR are related to the overall health of the Chesapeake Bay. Of the nine goals in the EO Strategy, the refuge is most directly connected to the goals of conserving land, increasing public access, and expanding citizen stewardship.

We will continue to participate in the *Envision the James* initiative, a watershed-wide community outreach and engagement initiative to promote natural resource conservation stewardship and to develop recreational opportunities within the James River watershed (<http://www.EnvisionTheJames.org>; accessed November 2013). By participating in this effort, we will develop a better understanding of the refuge's role in the promoting an understanding and appreciation of natural and cultural resources in communities along the James River.

At both James River NWR and Presquile NWR, we will continue working with the JRA and NPS to promote the Captain John Smith Chesapeake NHT and Chesapeake Bay Gateways and Watertrails Network by enhancing place-based interpretation, providing public access, and fostering conservation and restoration of natural and cultural resources related to the Chesapeake Bay through programming, outreach, and citizen involvement. We will work with the NPS to ensure that Captain John Smith Chesapeake NHT-related activities proposed to occur at the refuge will be conducted in a manner compatible with the purpose and intent of the refuge.

Additionally, our partnership with the JRA for the Ecology School emphasizes our shared interest in encouraging the public to develop an appreciation for, and stewardship ethic toward, the protection and conservation of natural and cultural resources at James River and Presquile NWRs. Although the current focus of our partnership is to offer environmental education programs on Presquile NWR through the Ecology School, we will continue to work with the JRA to explore opportunities to host environmental education programs and projects at James River NWR that engage communities throughout the greater Richmond metropolitan area.

4.3.5 Findings of Appropriateness and Compatibility Determinations

Chapter 1 describes the requirements for findings of appropriateness and compatibility determinations. Uses are evaluated based on whether or not they contribute to meeting refuge purposes, goals, and objectives. Appendix B includes all approved findings of appropriateness and compatibility determinations for James River NWR.

Activities Allowed

In accordance with approved compatibility determinations, we will:

- Support a quality, public deer hunt on the refuge.

- Support wildlife observation, photography, environmental education, and interpretation opportunities on the refuge by maintaining quality facilities, offering quality programs, and supporting existing partnerships.
- Support compatible research and investigations on the refuge by non-Service personnel that help further our knowledge of refuge resources, or that address regional or national conservation concerns of the Service.

Activities Not Allowed

Continue to prohibit certain activities on the refuge that were determined by the refuge manager to be not appropriate.

Discussion and Rationale

We occasionally receive requests for activities that are prohibited on refuges (50 CFR 25-26). Other activities are not allowed because the refuge manager has determined that the activities are not appropriate on the refuge or are sufficiently provided elsewhere nearby on other ownerships. Appendix B documents the refuge manager's justification for why they are deemed not appropriate.

These activities will continue to be prohibited on this refuge:

- Camping.
- Collecting natural products.
- Firing range.
- Horseback riding.
- Pets on refuge.
- Public motorized boat ramp.
- Swimming and sunbathing.
- Use of pursuit dogs for hunting.

Any exceptions will be at the discretion of the refuge manager, under specific, special circumstances (e.g., to accommodate visitors with disabilities). All other uses not explicitly allowed or not allowed that require a SUP will be evaluated on a case-by-case basis by the refuge manager for appropriateness and compatibility (50 CFR 26, 603 FW 2).

4.3.6 Refuge Revenue Sharing Payments

Continue to issue annual refuge revenue sharing payments to counties in accordance with law and annual congressional appropriations.

Discussion and Rationale

NWRs contribute to local economies through shared revenue payments. Federally owned lands are not taxable; however, under the provisions of the Refuge Revenue Sharing Act (16 U.S.C. 715s), the municipality or other local unit of government receives an annual refuge revenue sharing payment to offset the loss of property taxes that would have been collected if the land had remained in private ownership. In addition, federally owned land requires few services from municipalities, yet it provides valuable recreational opportunities for local residents. As we describe in chapter 3, we pay annual refuge revenue sharing payments based on the acreage and the appraised value of refuge lands. The annual payments are calculated by formula determined by, and with funds appropriated by, Congress. We will continue those payments in accordance with the law, commensurate with changes in the appraised market value of refuge lands, or new appropriation levels dictated by Congress.

4.3.7 Special Designation Areas

Continue to protect key characteristics of the refuge habitats and resources that supported their special area designations.

Discussion and Rationale

In chapter 3, we describe the various special area designations that include the refuge. Most relate to significant natural and cultural resources in the region, and the unique opportunities the area affords to protect and interpret these resources. Our existing and proposed activities on the refuge will be consistent with, or not detract from, those special area designations.

We will continue to protect the refuge habitats and resources that supported their designation. For example, we will:

- continue to support and promote bald eagle nesting and roosting within the summer and winter bald eagle concentration area on the Lower James River;
- continue to support and promote other bird species of concern associated with the Lower James River IBA; and
- continue to promote anadromous fish use waterways within and adjacent to the refuge.

We will continue to conduct reviews every 15 years as required by Service policies by following the planning process outlined in 602 FW 1 and 3 to determine if the refuge meets criteria for Wilderness Areas, National Wild and Scenic Rivers, or other Federal special status designations.

4.3.8 Additional NEPA Analysis

The draft CCP and EA was developed with sufficient detail to account for the greatest potential impacts that could result from future step-down planning efforts. However, if we determine that our analysis of potential impacts on the human and natural environments is inadequate during subsequent planning (e.g., refuge step-down plans), additional NEPA review and NHPA compliance may be required prior to implementing those plans, actions, or activities (40 CFR 1508.28).

Examples of proposed actions that may require further analysis include:

- Developing a LPP with appropriate NEPA documentation to meet habitat needs for Service Trust species and to contribute to the network of conservation lands and wildlife resources in the regional landscape by expanding the refuge's acquisition boundary.
- Improving or removing existing facilities and construction of new facilities.
- Expanding the existing hunt program and adding new hunting opportunities for adults and youth.
- Removing nuisance wildlife using lethal and non-lethal methods, if deemed necessary.

4.4 Goals, Objectives, and Strategies

GOAL 1

FOREST HABITAT

Protect, enhance, and restore the ecological integrity of inner coastal plain forest ecosystems of the lower James River to support native wildlife and plant communities, including species of conservation concern, and to ensure those ecosystems are resilient in anticipation of climate change.

Objective 1.1

Pine-dominated Forest

Over the life of the plan, promote transformation of up to 2,651 acres of pine-dominated forest towards a mature pine savanna with 80 to 100 trees per acre containing mature trees with a minimum average diameter at breast height (DBH) of 10 inches, an open midstory, and an understory with an average diversity of 23 plant species per square meter to increase resident brown-headed nuthatch populations and breeding populations of Chuck-will's-widow.

Discussion and Rationale

While there are small pockets of pine savanna in Virginia, this habitat is missing from the larger landscape context surrounding the refuge and is disappearing in the southeast region of the U.S. Today, pine savanna only covers 3.6 percent of its original range (Kelly and Bechtold 1990). Pine savannas are open, fire-dependent plant communities dominated by well-developed ground cover and some low-growing shrubs with only scattered trees. The open herbaceous understory of the dry pine ecosystem provides more diversity than almost any other upland habitat type in North America, an average diversity of 23 plants per square meter (Walker and Peet 1983), and the structure suitable for many ground nesting and foraging species including Chuck-will's-widow, bobwhite quail, and wild turkey (Straight and Cooper 2012, Stoddard 1931, Markley 1967). Decline of this habitat has been attributed to landscape fragmentation, logging operations, and fire suppression (Platt et al. 2006).

Regionally and locally important species are dependent on this habitat type. For example, the nesting brown-headed nuthatch populations would benefit from increased stand age and fire management practices because of the increase in dead standing trees for cavity nests (Wilson and Watts 1999, Wilson and Watts 2000). Brown-headed nuthatches almost exclusively forage on mature pine trees, focusing on insects in the spring/summer months and pine seeds during winter (Slater et al. 2013). Chuck-will's-widow nesting populations would benefit from a more open forest for nesting habitat. Though limited data on nesting Chuck-will's-widow exists, local birders have noticed increase in occurrence of individuals on the refuge in areas where thinning and prescribed burning operations are being conducted (Straight and Cooper 2012; Bose 2013 personal communication).



Robert B. Clontz/The Nature Conservancy

Pine savanna at The Nature Conservancy's Piney Grove Preserve in Sussex County, Virginia

The previous forest management techniques of thinning the dense pine plantations were employed to increase forest health, reduce disease risk, and improve wildlife habitat. Under this CCP, we will undertake more intense active management through thinning and prescribed fire to work toward pine savanna as the desired future condition that would be achieved over the next 30 or more years. Within 10 years after approval of this plan, we will actively thin pines and use prescribed fire to reduce tree density to 200 trees per acre, control hardwood regeneration, and allow release of pines to increase DBH of mature trees to a minimum average DBH of 10 inches (25.6 cm), as preferred by brown-headed nuthatch (O'Halloran and Conner 1987). Over the next 30 or more years, the density of pine trees will be reduced to between 80 and 100 trees per acre. Active pine thinning and prescribed burning will also encourage herbaceous plant growth in the understory to develop the savanna habitat. Pine thinning and prescribed burning will enable ample sunlight to reach the forest floor; most herbaceous plants require ample sunlight (Kelly and Bechtold 1990).

We will experimentally plant longleaf pine using the existing thinned areas within the forest as our experimental planting sites. Though loblolly pine is the dominant pine species and most of our habitat objectives can be reached in a loblolly pine ecosystem, the refuge lies along the northern edge of the historic range of longleaf pine (Bhuta et al. 2008). Longleaf pine is better adapted than loblolly to the dry, sandy soils often found in southeastern Virginia. Compared to loblolly,

longleaf pine is a more long-lived species and is resistant to invasive pine beetles (Kelly and Bechtold 1990). The older, more closely spaced, and slower growing the pines, the more likely they are to be infested and killed by bark beetles. Furthermore, during southern pine beetle outbreaks, infestation can spread much more rapidly when trees are closer together (VDOF 2007). For these reasons, as well as for restoring some of the original biodiversity and aesthetic appeal that was lost with the disappearance of this habitat, there is great interest throughout the South in restoring longleaf in selected areas (VDOF 2007). We will widen the thinned corridors to allow more light to the planting area and promote longleaf pine growth (Kelly and Bechtold 1990). This method is preferred over a complete clear cut of the whole unit because of reduced cost and habitat that would still be available for wildlife.

Strategies

Continue to:

- Protect potential nest and roost trees to ensure ideal bald eagle habitat would continue to exist on the refuge.

Throughout the life of the plan:

- Protect 75 percent of trees with 24-inch DBH or greater.
- Protect snags that do not pose a threat to safety of refuge operations. Create dead trees in the interior of management units to replace snags that are removed.
- Actively work to remove the midstory through mechanical and fire treatments to promote development of pine savanna habitat.
- Promote an open understory of savanna habitat by mimicking natural fire regimes.
- Seed 1- to 1.5-acre decks used in logging operations with native grasses (e.g., broomsedge) to limit woody regrowth between thinning operations.

Within 5 to 10 years of CCP approval:

- Investigate longleaf pine restoration options by planting longleaf pine seedlings and/or saplings in widened thinning corridors as part of the existing forest management actions.

Within 10 years of CCP approval:

- Perform active thinning and fire management projects to reduce tree density to 200 trees per acre and allow release of pines to increase DBH of mature trees to a minimum average DBH of 10 inches (25.6 cm).

Inventory and Monitoring Activities

Continue to:

- Conduct annual forest breeding bird point count survey.

Throughout the life of the plan:

- Coordinate with regional forester to conduct regular timber assessments.

Within 5 years of CCP approval:

- Conduct baseline inventory and identify long-term monitoring protocols for brown-headed nuthatch and breeding Chuck-will's-widow populations.

Within 10 to 15 years of CCP approval:

- Assess survivorship and cost-effectiveness of planting longleaf pine seedlings and/or saplings.

Objective 1.2

Moist Hardwood Forest

Over the life of the plan, maintain 775 acres of moist hardwood forest with 75 percent ground cover in leaf litter, 50 percent midstory cover from more than 10 native species, and 30 percent mature trees with a minimum DBH of 20 inches to protect year-round habitat for eastern box turtle and nesting habitat for breeding red-shouldered hawks and wood thrushes.

Discussion and Rationale

The refuge contains 775 acres of hardwood forest, which is approximately 18 percent of the total refuge area.

Since refuge establishment, the emphasis for moist hardwood forest management has been to protect native tree species, especially those large trees with the potential to be used by nesting eagles, and limit public activities that would disturb eagles. The moist hardwood forest also provides important feeding and roost sites for wild turkey, stopover site habitat for neotropical migratory birds, feeding and bedding habitat for white-tailed deer, as well as feeding and nesting sites for cavity-nesting birds, hawks, gray squirrels and other native mammalian species (USFWS 1996, 2003, 2013).

Our forest management activities will continue to benefit bald eagles, as well as wild turkey, cavity-nesting avian species, various hawk species, and native mammalian species (USFWS 1996). Activities in the moist hardwood forest will contribute toward satisfying the following conditions applicable to all refuge forests:

- Produce up to 20 potential bald eagle nesting trees per acre over the next 60 to 80 years, with the potential addition of one to two additional active nest sites on the refuge within 60 years, and to result in no net loss of nest trees over the next 60 to 80 years.

- Provide and maintain nocturnal roost and feeding roost habitat in a condition capable of supporting a minimum of 150 bald eagles by identifying and protecting the existing and potential roost trees to assure ideal bald eagle habitat will continue to exist within the refuge.
- Provide for nesting and feeding habitats for cavity-nesting birds including wood ducks, woodpeckers, and songbirds. Retain all snags that do not pose a hazard during refuge operation.
- Develop a forest with three stages of foliage heights including mature, pole size, and seedling/brush cover types.

We will focus on using three species as indicators of habitat quality and to trigger habitat management actions: eastern box turtle, wood thrush, and red-shouldered hawk. These species were chosen because their habitat requirements focus on different aspects of this habitat type. Although eastern box turtles are considered habitat generalists, they have more specific requirements when it comes to overwintering. The refuge's moist hardwood forest floor provides ideal habitat for burrowing in soil or leaf litter to protect themselves from weather extremes (Erb 2011). The breeding wood thrush uses the midcanopy portion of the forest and is found in areas with a variety of mature deciduous tree species, moderate structure in the subcanopy and shrub layer, and a fairly open forest floor (Evans et al. 2011). The red-shouldered hawk nesting habitat is characterized by bottomland hardwoods with larger trees and reduced canopy cover (Moorman and Chapman 1996).

To satisfy all three of these species' needs, the moist hardwood forest will need to be intact at the forest floor, midstory, and canopy levels. We will continue to protect these mature forests that are important for this each of these species. We will work to improve our understanding of these species on refuge property and monitor their populations during seasons of use. Monitoring changes in resident and breeding populations of the eastern box turtle, wood thrush, and red-shouldered hawk will give staff indication of the success of management strategies to protect this habitat.

Strategies

Throughout the life of the plan:

- Limit activities (e.g., human and mechanical) that will disturb bald eagles and other forest dwelling species during the nesting season.
- Limit disturbance of forest floor to protect wildlife species dependent on this microhabitat.

Inventory and Monitoring Activities

Continue to:

- Conduct annual forest breeding bird point count survey.

Within 5 to 10 years of CCP approval:

- Conduct baseline inventory and identify long-term monitoring protocols for eastern box turtle, wood thrush, and red-shouldered hawk.
- Conduct periodic habitat/vegetation assessment surveys.

Objective 1.3

Floodplain Forest

Over the life of the plan, maintain 633 acres of floodplain forest containing 30 percent mature trees with a minimum DBH of 20 inches, 20 percent trees with DBH between 15 and 20 inches, and 3,530 to 10,600 cubic feet per hectare of coarse woody debris to promote forest health and to protect nesting and roosting bald eagles, breeding prothonotary warblers, and resident spotted salamander populations.

Discussion and Rationale

The refuge's existing 633 acres of floodplain forest will be maintained to provide nesting habitat for the benefit of bald eagles, the refuge purpose. We will focus on nest and roost habitat for bald eagles. Mature trees adjacent to bodies of water are the most important for use as roost and foraging sites year round for both juvenile and adult bald eagles (USFWS 1996). As protection of this habitat from development or disturbance is limited outside of the refuge boundaries, these 633 acres provide an important sanctuary for both migratory and resident bald eagles.

We will expand our focus to include prothonotary warblers and spotted salamander populations. Prothonotary warblers, a species in decline due to habitat loss on breeding and wintering grounds, are cavity nesters that select nesting sites in flooded, well-shaded bottomland hardwood forests with sparse understory (Petit 1999). With only 10 percent of the U.S. original bottomland forest remaining (Dickson et al. 1995), protecting forested tracts that are more than 247 acres (100 hectares) (Robbins et al. 1989) and riparian woodlands that are less than 98 feet wide (30 meters wide) (Kahl et al. 1985) is important for providing prothonotary warbler breeding grounds.

Most of the amphibian populations in the U.S. are declining nationally, with amphibian occupancy declining by 3.7 percent from 2002 to 2011. Those species that are red-lined by the IUCN declined an average of 11.6 percent annually (Adams et al. 2013). The spotted salamander is listed as an overall stable population (Hammerson 2004), but threats to local populations include intensive timber harvesting practices that reduce canopy closure, understory vegetation, uncompacted forest litter, or coarse woody debris (moderately to well-decayed) in areas surrounding breeding sites (deMaynadier and Hunter 1999). Resident spotted salamander populations require maintained forest habitat greater than 328 feet (100 meters) around breeding pools for dispersal during winter months. Maintaining connectivity of large forest blocks

is a priority for this species and other amphibians as they avoid open areas and edges (Regosin et al. 2005). Butts and McComb (2000) recommend that 3,530 to 10,600 cubic feet per hectare (100 to 300 cubic meters per hectare) of coarse woody debris be retained for terrestrial salamanders.

There is little information on amphibian populations for either species on refuge property, but understanding their use of the refuge and monitoring their populations will be the inventory and monitoring focus in this habitat. We will use this information to inform management decisions and future plans to benefit wildlife species that depend on this habitat.

Strategies

Continue to:

- Protect native trees.
- Not thin any floodplain forest areas.
- Limit activities that will disturb bald eagles, especially during nesting season.

Inventory and Monitoring Activities

Continue to:

- Conduct spring and summer shoreline bald eagle surveys.
- Conduct annual forest breeding bird point count survey.

Within 5 to 10 years of CCP approval:

- Conduct baseline inventory and identify long-term monitoring protocols for prothonotary warblers and spotted salamanders.
- Conduct periodic habitat/vegetation assessment surveys.

GOAL 2

NON-FOREST HABITAT

Protect, enhance, and restore the ecological integrity of non-forest ecosystems to support native wildlife and plant communities, including species of conservation concern, and to ensure those ecosystems are resilient in anticipation of climate change.

Objective 2.1

Freshwater Marsh and Shrub Swamp

Over the life of the plan, maintain and promote natural hydrology and native plant species in 82 acres of freshwater marsh and shrub swamp for resident marsh wren populations and breeding least bitterns.

Discussion and Rationale

Approximately 80 percent of America's breeding population and more than 50 percent of its 800 species of protected migratory birds rely on wetlands (Mitsch and Gosselink 1993, citing Wharton et al. 1982).

More than 95 percent of the commercially harvested fish and shellfish

species are wetland dependent. Most freshwater fish depend on wetlands for spawning, and anadromous fish rely on them as nurseries for young fry. Wetlands also provide essential ecosystem functions that technology has yet to rival such as flood mitigation (especially riverine wetlands), storm abatement, and nutrient and toxic material filtering. Wetlands are significant for global cycles of nitrogen, sulfur, methane, and carbon dioxide (Mitsch and Gosselink 1993). Freshwater marshes and shrub swamps are types of freshwater wetland ecosystems.

The refuge contains 82 acres of freshwater marsh and shrub swamp, which is approximately 2 percent of the total refuge area. Freshwater marshes and shrub swamps are located primarily along Powell Creek and Flowerdew Hundred Creek adjacent to the floodplain forests. As discussed in chapter 3, these marshes typically occur as complexes dominated by large grasses, such as salt hay, bulrushes, cattails, and rushes.

Currently, much of the freshwater marsh and shrub swamp habitat is ecologically intact, with minimal presence of invasive species. Controlling and preventing the spread of invasive plants and animals, particularly common reed, nutria, and feral hogs, is an essential component of wetland protection and management. Most of the system is hydrologically intact; however, the culvert in the dike located in the southwestern portion of the refuge has filled in, reducing water from flowing between the wetlands on either side of the dike. The reduced water flow has resulted in an increase in sediment being deposited on the eastern side of the dike. We will investigate the hydrologic flow between the wetlands in the southwestern portion of the refuge and Powell Creek.

Freshwater marsh and shrub swamp habitats provide breeding, migratory, and overwintering habitat for a variety of waterfowl and waterbirds. The American black duck, which is a priority species in BCR 27, BCR 30, and the Virginia WAP, has been observed on the



Mark Vance

Least bittern

refuge during spring and fall migration and during the overwintering period. Tidal habitats in the mid-Atlantic are essential overwintering habitat for this species (Longcore et al. 2000).

The freshwater marshes on the James River support colonies of breeding and wintering marsh wrens, a species of high priority in the BCR 30 plan. Because marsh wrens are pseudo-colonial nesters that will not nest in isolation, they require marshes large enough to accommodate multiple male breeding territories (Kale 1965, Picman et al. 1988, Spencer 2000). Marsh wrens breed in large freshwater or brackish marshes that have tall vegetation such as cattails, bulrushes, reeds, cordgrass, or needlerush (Gutzwiller and Anderson 1987). Least bitterns, a priority species in BCR 27, BCR 30, and the Virginia WAP, also occupy freshwater or brackish marshes with tall, dense emergent vegetation and clumps of woody plants over deep water (Poole et al. 2009), like those at the refuge. Because least bitterns are so secretive, population trend data is lacking and contradictory. The least bittern is sensitive to structurally different vegetation types (Winstead and King 2006); therefore, the invasion of common reed into refuge marshes may alter the wetland habitat and eliminate least bitterns from infested wetlands.

We will conduct an inventory and monitoring program of existing and future conditions to identify potential changes and trends in freshwater marsh and shrub swamp habitat conditions or marsh wren and least bittern populations. Creating an inventory and monitoring program will also allow us to detect and respond to the presence of invasive species rapidly. We plan to use the inventory and monitoring program to inform us on potential changes, as well as to inform us on the outcomes of our management decisions. Ultimately, the inventory and monitoring program will direct our future management actions. For example, the inventory and monitoring program will enable us to understand the hydrologic conditions at the dike in the southwestern portion of the refuge.

Strategies

Continue to:

- Protect all native vegetation by limiting disturbance from refuge operations and public use in freshwater marsh and shrub swamp areas.

Inventory and Monitoring Activities

Within 3 years of CCP approval:

- Investigate the hydrologic flow between the wetlands in southwestern portion of the refuge and Powell Creek.

Within 5 to 10 years of CCP approval:

- Conduct baseline inventory and identify long-term monitoring protocols for marsh wren and least bittern populations.

Objective 2.2

Aquatic Habitats

Over the life of the plan, support efforts of partners to maintain or increase submerged aquatic vegetation in 17 acres of aquatic habitat for the benefit of native species (e.g., Atlantic sturgeon, alewife, blueback herring) and protect this habitat from being degraded.

Discussion and Rationale

The James River and its associated backwater habitats, including tidal creeks, are important spawning habitats for resident and migratory fish, such as alewife, American shad, freshwater mussels, and as foraging and resting habitat for migratory and overwintering waterfowl, water birds, and bald eagles. In 2012, the Atlantic sturgeon was federally listed as endangered. With the recent listing, we anticipate our role in supporting the recovery of this species will increase as we work with our partners.

Similar to Atlantic sturgeon, American shad spend a significant portion of their life in marine waters and migrate to freshwater to spawn. The Virginia Marine Resources Commission (VMRC) issued a moratorium on American shad harvest in the Chesapeake Bay and its tributaries due to concerns with overfishing, habitat degradation such as pollution, dams, and land use changes. Information about the specific spawning and nursery habitat characteristics required for American shad in Virginia's rivers is incomplete (Bilkovic et al. 2002). Within James River NWR, Powell Creek is relatively intact and may provide habitat for freshwater mussels and other non-migratory fish species, such as bridle shiner, alewife, and blueback herring (collectively referred to as river herring), and gizzard shad. The adjacent marsh provides potential nursery habitat for fish that can use the larger James River and Chesapeake Bay system.

The James River adjacent to the refuge is listed as a category 5 impaired waterway for aquatic life and fish consumption uses, due to inadequate benthic community shores and elevated levels of PCB in fish tissues (VDEQ 2012). This news is countered by evidence that SAV has been increasing annually since 2006 along Powell Creek, the refuge's western border. In 2011, SAV was observed to cover the headwaters between 70 and 100 percent in fragmented patches throughout the majority of Powell Creek extending to its mouth at the James River (VIMS 2013). Continued efforts to improve water quality in refuge and adjacent waters are necessary.

Management of the James River and associated backwaters habitats will be fairly minimal. The aquatic habitat acreage within the refuge boundary is only 17 acres of non-contiguous waters. While it is a small component when considered in the context of the entire 10,432-square mile watershed, under this plan, we will engage activities that will maximize our beneficial contribution to the James River watershed's health.

The ability for Service to manage this habitat type is limited jurisdictionally. A variety of Federal and State agencies (including, but not limited to, U.S. Army Corps of Engineers, VDEQ, VMRC, and VDGIF) oversee activities tied to waterway bottoms, water quality management and navigation. Coordination with the appropriate agencies will be required for any action tied to this habitat type.

The 4,324-acre refuge will employ best management practices on refuge lands to minimize sedimentation to the James River. Additionally, existing wetlands and riparian buffer protection will continue within the refuge throughout the life of the plan.

We will investigate the hydrologic flow between the wetlands in the southwestern portion of the refuge and Powell Creek. The existing earthen dike restricts natural flow patterns of waters. This 300-foot-long by 20-foot-wide earthen dike was originally constructed to provide access to a 30-acre island for logging operations. The presence of the dike affects marsh hydrology. The existing culvert that is buried within the dike is no longer functional. The dike functions as a barrier to tidal flooding in the channel immediately south of the island. The impacts are most pronounced in the emergent marsh immediately east of the dike and south of the island. By restricting the connection with Powell Creek, the dike lengthens the flow path for tidal water. Instead of water flowing approximately 0.10 miles from Powell Creek, water must now pass about 0.60 miles through the tidal channel that wraps around the north and east side of the island. In the emergent marsh east of the dike, there is less tidal fluctuation than there was prior to dike construction (Wurster 2013 personal communication).

Water quality monitoring and data collection projects initiated by local universities or watershed organization will be encouraged. Monitoring of tidal creeks and aquatic habitats may provide critical reference information, because other aquatic resources outside of the refuge are affected by global climate change and land use changes.

Strategies

Continue to:

- Implement best management practices for construction and land management activities to minimize potential release of sediment load and deposition in the James River.
- Maintain vegetated riparian areas and natural habitats.
- Collaborate with State and Federal partners to maintain fish populations suitable for wildlife consumption (i.e., bald eagles) and public recreation opportunity.
- Support partner efforts to restore federally listed Atlantic sturgeon habitat.

- Assist partners in promoting James River watershed protection and health, and contribute to the recovery of species of conservation concern (e.g., Atlantic sturgeon, alewife, blueback herring).

Within 10 to 15 years of CCP approval:

- Plant native species along disturbed or denuded riparian areas.

Inventory and Monitoring Activities

Continue to:

- Work with partners to monitor water quality stations in refuge vicinity.
- Support partner efforts to monitor federally listed Atlantic sturgeon habitat.
- Work with partners to monitor SAV.

Throughout the life of the plan:

- Make use of the Virginia Institute of Marine Science monitoring of SAV to evaluate success.

Within 3 years of CCP approval:

- Investigate the hydrologic flow between the wetlands in the southwestern portion of the refuge and Powell Creek.

Objective 2.3

Erosional Bluff

Over the life of the plan, maintain and promote native vegetation on 3 shoreline miles to help stabilize bluffs, reduce erosion, and provide nesting substrate for breeding bank swallows.

Discussion and Rationale

Three shoreline miles of erosional bluff occur along the refuge's border with the James River. While the unconsolidated soils along the bluffs provide habitat for burrowing wildlife, the soils are easily eroded and transported into adjacent waterways. Since refuge establishment, our habitat management activities have emphasized using best management practices to localize and minimize soil disturbance, as well as alteration of existing topography and limiting disturbance to roosting bald eagles, throughout the refuge (USFWS 1989, USFWS 1996, USFWS 2003).

We will continue to maintain the existing erosional bluff habitat by limiting activities that will disturb existing topography and standing vegetation, whether live or dead. We will increase our shoreline monitoring efforts to determine if any erosion is occurring at a rate that is adversely impacting the refuge and assess the sediment load transported into the James River. We will also monitor this habitat for any potential impacts that could be attributed to climate change, such as sea level rise or salinity change effects on vegetation. By formally

monitoring our shoreline conditions, we will be better able to determine how best to balance our responsibilities to provide nesting habitat for species that are dependent on this erosional bluff habitat (such as bank swallow) while also limiting the transport of sediment in to the James River.

According to the national breeding bird survey data for 1966 through 2007, bank swallow populations nationwide are experiencing a significant decline of approximately 2 percent per year (NatureServe 2009). Habitat alteration by humans has been identified as the only major known threat to this species. The growing emphasis on implementing flood and erosion control projects and streamflow regulation projects has eliminated much of the nesting habitat for bank swallows in California (Garrison 1998). Conversely, sand and gravel mining activities can create new nesting habitats.

Strategies

Continue to:

- Protect all standing, live or dead, native trees in erosional bluff areas by not removing vegetation and limiting mechanical equipment use in areas around waterways and steep slopes.

Within 10 to 15 years of CCP approval:

- Investigate and employ shoreline erosion control techniques to promote bank stabilization and protect bank swallow habitat, if appropriate.
- Strategically plant key plant species (e.g., bald cypress) to break up wave energy, if appropriate.

Inventory and Monitoring Activities

Within 5 years of CCP approval:

- Conduct shoreline erosion surveys and document bank loss.

Within 5 to 10 years of CCP approval:

- Conduct baseline inventory and identify long-term monitoring protocols for breeding bank swallow populations.



Cyrus Braune/USFWS

Erosional bluff habitat along the James River

Objective 2.4

Non-forested Upland

Over the life of the plan, maintain 15 acres of non-forested upland for administrative purposes (e.g., weather station operation).

Discussion and Rationale

The refuge currently mows 13 acres as non-forested upland, which is less than 1 percent of the total refuge area. We regard these areas as incidental habitat of low value to wildlife, especially grassland birds, because of their small size and low-quality vegetation.

To prolong the onset of succession to transitional and eventually mature forest, and to support administrative uses of these areas, non-forested upland will continue to be mown at least once a year and cedars will be thinned or removed (USFWS 1996). Maintaining a mature forest with small pockets of non-forested upland is in keeping with the historic natural landscape of the area (Watts 1999).

We will selectively cut up to 2 acres of pine-dominated forest adjacent to the existing weather station as preventative maintenance to promote functioning of the station. Tall trees in the vicinity of the weather station can adversely affect signal transmission from the weather station to the satellites (National Wildfire Coordinating Group 2012; Craig 2013 personal communication). A total of 15 acres will be maintained as non-forested upland for administrative purposes.

We will continue to monitor infestations of invasive species and increase control of specific highly invasive species as resources allow. The VDCR published an advisory list of invasive alien plant species of Virginia to inform land managers of potential risks associated with certain plant species known to exhibit invasive behavior in some situations

(http://www.dcr.virginia.gov/natural_heritage/invspdflist.shtml; accessed August 2013). This list details light and moisture requirements, habitat regions, and degree of invasiveness for Virginia's most troublesome invaders. The species are ranked as highly invasive, moderately invasive, or occasionally invasive. Tree-of-heaven and Japanese stiltgrass are among the highly invasive species known to occur within or along the edges of the refuge's non-forested upland (Brame 2013 personal communication).

Strategies

Continue to:

- Mow at least once a year.

Within 3 years of CCP approval:

- Selectively cut up to 2 acres of pine-dominated forest around the weather station and manage it as non-forested upland to maintain equipment functions.

Inventory and Monitoring Activities

None.

GOAL 3**CULTURAL RESOURCES**

Protect and conserve the refuge's cultural resources and landscape, and seek opportunities to increase knowledge and appreciation of the refuge's history as part of the lower James River.

Objective 3.1**Cultural Resource Protection**

Within 5 years, use more precise information about archaeological sites to protect known archaeological sites and better inform refuge management decisions.

Discussion and Rationale

James River NWR contains significant archeological sites that have the potential to advance our understanding of Virginia prehistory and history. The sites surviving at the refuge chronicle Native American culture, initial settlement of the James River by Europeans, Native American resistance against European settlement, Plantation society, military history, post-Civil War rural agriculture, and 20th century African and Native American adaptation to the lack of economic opportunity. The sites are potentially significant regionally and perhaps nationally.

The management and protection of cultural resources is an integral element in fulfilling refuge goals. Service-initiated actions likely to affect archaeological and historic sites are routinely reviewed and assessed under the provisions of Section 106 of the NHPA. We will continue to consult the RHPO and SHPO early in project planning for activities that may involve ground disturbance. To date, projects requiring such review on the refuge have been limited. In preparation for this CCP, an archaeological overview of the refuge was prepared (Goode et al. 2007). That study located 47 new archaeological sites based on historic background research. A model of prehistoric archaeological site location and areas of high sensitivity were developed and can now be used to inform future refuge management actions.

The existing fire management plan (USFWS 2006) calls for protecting known archaeological sites and sensitive areas by delineated an area where forest management activities are not conducted. Conducting archaeological surveys before ground disturbing activities occur helps to ensure that vulnerable archaeological sites are identified and appropriate management actions are developed for the sites. In addition, by more precisely locating the sites, less acreage will need to be excluded from logging. Such surveys are conducted under Section 106 of the NHPA in advance of the proposed logging or could be conducted as part of a more comprehensive inventory of sensitive areas designed to improve management information for the refuge in



Cyrus Brame/USFWS

Skids used by forest management equipment

the future to satisfy Section 110 of the NHPA.

We will continue to conduct forest management activities at James River in accordance with SHPO-reviewed standard operating procedures and VDOF Best Management Practices (USFWS 2006), to allow logging to occur without further SHPO review. If necessary, we will work cooperatively to update the standard operating procedures to ensure protection of the refuge's cultural resources.

The current standard operating procedures include:

- Outfitting any equipment with high flotation tires.
- Marking known archaeological sites in the field and excluding these areas from any forest management activities.
- Using grapple skidders instead of cable skidders.
- Creating any new log landings without lowering the grade.
- Using skid trails only on level stands where no water diversion will be needed.
- Using only low pressure equipment for pre-mechanical thinning of small diameter trees.
- Identifying areas excluded from being logged.

We suspect archaeological sites along the refuge's shoreline and steep slopes may have been damaged by erosion. Three known archaeological sites will be evaluated and will possibly need stabilization (Small 2013 personal communication). Shoreline protection efforts we plan under objective 2.2 will also serve cultural resource protection; however, development and implementation of restoration plans will likely take more than 5 years to adequately prevent further shoreline erosion. At the same time, some of the shoreline protection efforts, such as tree planting and promoting forest succession on the refuge, could negatively impact archaeological sites. For example, the growing roots of trees could damage intact cultural levels and features (Kirchen 2013 personal communication). The development of a proactive NHPA Section 110 initiative prior to the implementation of these management activities will help ensure that vulnerable archaeological sites are identified and appropriate management actions are developed for the sites.

Strategies

Continue to:

- Consult with the RHPO and SHPO regarding refuge activities that have the potential to disturb the ground.
- Ensure that refuge activities are conducted in accordance with the approved standard operating procedures for mechanical pine thinning and fire management.

Throughout the life of the plan:

- Stabilize sites vulnerable to erosion.
- Conduct targeted archaeological Phase I surveys on strategically determined sensitive locations related to habitat management and survey structures on the refuge to determine eligibility for the National Register.
- Protect indigenous cultural landscapes of the moist hardwood forest, floodplain forest, freshwater marsh and shrub swamp, aquatic habitats, and erosional bluff.
- Promote professionally qualified and permitted archaeological research and study to expand professional knowledge and understanding of the objects, their context, and relevance.
- Assemble artifacts and field records of previous archaeological excavations on the refuge in a repository that meets Department of the Interior standards to make them available for research and interpretation.

Within 5 years of CCP approval:

- In advance of conducting forest management activities, refuge staff will prepare a list of the pine-dominated stands to be logged

and Service archaeologists will map and flag archaeological sites and sensitive areas with a buffer zone of 200 feet.

Inventory and Monitoring Activities

Within 5 years of CCP approval:

- Establish an archaeological site monitoring program, including both a baseline assessment of the two major excavated archaeological sites, site visits, and mapping to record location information and monitor site condition.

GOAL 4

WILDLIFE-DEPENDENT RECREATION

Provide wildlife dependent recreational opportunities for visitors to connect with nature and foster enhanced stewardship of the lower James River, Chesapeake Bay estuary, and the Refuge System.

Objective 4.1

Hunting

Over the next 3 to 5 years, provide high quality recreational hunting opportunities and complete all the administrative requirements to expand the existing deer hunt, add new hunts, and promote youth hunt involvement.

Discussion and Rationale

Hunting is one of the six priority public uses as outlined in the Refuge Improvement Act. We recognize deer hunting as a long-established, traditional outdoor pastime in this area of Virginia. When managed responsibly, it can instill a unique appreciation of wildlife, their behavior, and their habitat needs. Service policy also states that, where practicable, we should make our hunt regulations consistent with State regulations.

We will continue to administer the refuge's existing deer hunt while completing administrative requirements to expand the refuge's existing deer hunt and open the refuge to wild turkey and waterfowl hunting within 5 years of CCP approval. Promoting youth involvement in the refuge's existing deer hunt does not require us to complete any additional administrative documentation.

We will provide visitors with information related to the hunting opportunities at the refuge and to refuge-specific and State hunting regulations through various media, including the refuge website, signage, and brochures. For example, all materials related to the hunting program will promote the use of lead-free shot by hunters. Ingestion of lead-contaminated soil and prey are principal pathways for wildlife exposure (Kendall et al. 1996, Pattee and Pain 2003). Sensitivity to lead toxicity varies among bird species, but in most instances a single lead shot can kill a bird (Eisler 1988, Sanderson and Bellrose 1986). Lead shot has been found to have harmful effects on birds, particularly waterbirds, because of their feeding habits (Michael 2006). Laboratory studies show that an amount of lead as small as 82.5

milligrams can be lethal for a bald eagle (Pattee et al. 1981, Hoffman et al. 1981); this lethal amount represents less than one percent of a single 12-gauge slug, a single 20-gauge slug, or a single muzzleloader bullet. Promotional materials regarding lead-free shot will provide hunters with information on the impacts of lead shot on wildlife; encouragement to use cost-effective, lead-free ammunition when hunting deer and turkey on the refuge, as well as at non-refuge locations; and actions that can be taken to protect wildlife from contamination when lead shot is used.

Lead-free shot is required by Federal and State regulation for hunting all waterfowl, mergansers, coots, moorhens, gallinules, snipe, and rails (51 FR 23443, codified at 50 CFR 20.21; <http://www.dgif.virginia.gov/hunting/regulations/2013-2014-waterfowl-booklet.pdf>, accessed July 2014), but lead-free shot is not currently required by State law or refuge-specific regulation for deer or turkey hunting. While completing the administrative requirements for the proposed expanded hunt program, we will investigate the required use of lead-free ammunition for deer and turkey hunting. This will include identifying the impacts of lead exposure from hunting activities on wildlife as well as the impacts of lead ammunition restrictions on hunters.

Expanded Deer Hunt

Deer are common in the upland hardwood and mixed forested areas of the refuge. Woody herbaceous and fruit-producing plants are important to deer populations throughout the southeast (including Virginia). Acorns are a major component of whitetails' fall diet (Dickson 2001), and oak trees are common in the moist hardwood forests on the refuge. A substantial amount of escape cover, used for fleeing predators and bedding, is available in the refuge's pine forest. The refuge has a harvestable population, habitat that deer prefer, and the means to administer public hunting opportunities. The hunt is provided as a recreational opportunity and contributes to maintaining county herd populations.

Since the 1940s, VDGIF has based deer populations on harvest totals. The estimated deer population has been steadily increasing throughout the State, from low of 4,019 in 1947 to a high of 259,147 in 2008. The 5-year average for Prince George County is 2,254 deer, and this number is both holding relatively stable and similar to Statewide trends (<http://www.dgif.virginia.gov/wildlife/deer/harvest/index.asp>; accessed August 2013).

As detailed in chapter 3, the refuge offers public deer hunting opportunities to maintain the population of white-tailed deer at a level commensurate with the biological carrying capacity of the available refuge habitat and to provide high quality wildlife-oriented recreation. We offer hunting opportunities for public deer hunting on specific

days during the State's archery, muzzleloader, and shotgun seasons. The refuge harvest totals support that objective of having a stable deer population, with a female harvest rate of approximately 40 percent of the total deer kill (VDGIF 2012a). Based on the past 5 years of refuge participation data and harvest success ratios, deer hunters participating in the refuge muzzleloader and shotgun seasons have a harvest success ratio that is slightly better than the 2014-2015 State average (Brame 2015 personal communication).

We will continue to offer public deer hunting opportunities to maintain the population as determined by the State, and to continue providing this type of high quality wildlife-oriented recreation. We will offer a mix of archery, shotgun, and muzzleloader hunting opportunities on 1,460 hunter use days. We will increase the total number of hunter use days on the refuge by increasing the number of muzzleloader hunt days and participating in the State's Youth Deer Hunt Day.

We will increase the number hunt days in the muzzleloader hunting season, as opposed to increasing the archery or shotgun season, for two reasons. First, hunters wishing to participate in muzzleloader hunting opportunities are also interested in participating in shotgun hunting opportunities. We have heard from hunters that increasing the number of muzzleloader hunt days on the refuge will be of interest because they have less opportunity on non-refuge lands to hunt, largely due to private hunt club restrictions, during muzzleloader season (Brame 2013 personal communication). Second, we have documented that hunters participating in our muzzleloader season have a higher rate of success than hunters participating in the refuge's archery or shotgun hunt seasons (Brame 2013 personal communication). Increasing our muzzleloader hunt days will help to satisfy the public request for more deer hunting opportunities on the refuge and meet our need to provide a quality hunt.

We will make administrative changes to our hunt program and enhance our promotional efforts to increase hunter participation in each of the hunts offered. We will enhance our promotional efforts through various media, including our refuge website and VDGIF, to reach a larger audience. By having a large pool of hunters that are familiar with the refuge opportunity, we will fill available hunting spaces and issue more permits on the day of the hunt on a first-come, first-served basis. We aim to increase hunter participation to 35 percent annually, across the three hunt seasons. This will include the 19-day archery season, during which participants are authorized to hunt every day available to them, but rarely do. A 35 percent hunter participation means that hunting will occur on at least 511 of the total 1,460 hunter use days offered annually.

New Hunts

Turkey Hunting: VDGIF and the public requested we consider providing opportunities for turkey hunting at James River NWR. Turkey hunting is an extremely popular form of hunting in Virginia. During the 2011-2012 hunt season, turkey hunters accounted for 38 percent of all hunters in Virginia (VDGIF 2013b). In 2011 to 2012, Virginia hunters were asked how important different forms of hunting were to them; spring turkey season ranked 2nd and fall turkey season ranked 3rd most important (VDGIF 2013b). In addition, a Service-led visitor services review (USFWS 2010b) recommended that James River NWR explore possibility of fall turkey hunting opportunities that could couple with or complement the deer hunt without additional staff involvement. VDGIF established a youth spring gobbler hunt day in 2004 and a youth fall turkey hunt day in 2008. In 2013, nearly 3 percent of the spring gobbler harvest (522 birds) occurred during the Special Youth Season (<http://www.dgif.virginia.gov/wildlife/turkey/springharvestsummary.asp>; accessed June 2014).

Wild turkeys are common in the hardwood and mixed forested areas of the refuge (USFWS 1992). Oak mast is the most important spring and winter food for wild turkeys (Hurst 1992) and greatly influences wild turkey population dynamics (Steffen et al. 2002). Oak trees are common in the moist hardwood forests on the refuge. While no reliable, economically feasible method exists for accurately estimating turkey populations in Virginia, research shows that the best indices of turkey population trends and abundance are spring gobbler harvests and success by hunters (VDGIF 2013b). Relative densities of wild turkey populations in the immediate vicinity of the refuge in 2012 were found to be high with populations stable or increasing across the region from 2003 to 2012 (VDGIF 2013b).

We will open the refuge to accommodate up to 1,260 turkey hunter use days annually. We will offer wild turkey hunting during the State's fall season in conjunction with the refuge's fall archery and muzzleloader deer hunt seasons and 3 days of wild turkey hunting during the State's spring season. A hunter participating in a refuge hunt during a fall designated deer and turkey hunt day will be allowed to take either species or both.

Developing a wild turkey hunting program will give us the opportunity to provide additional hunting opportunities to the surrounding community, potentially attracting a new hunter user group of hunters interested in taking only turkey during a combined deer and turkey hunt. Offering a spring turkey season will also enable us to offer a different hunt opportunity that will attract a new and different hunter user group. Gobbler-only hunting in the spring is a different hunting approach that taking turkey while hunting for other species.

We will be able to open the refuge to limited spring turkey hunt opportunities when we complete the administrative requirements for opening the refuge to this new hunting opportunity, establish the necessary thinning and burning regime for the pine-dominated forest to transition toward a pine savanna, and complete public use infrastructure improvements to support this new hunting opportunity. We will coordinate closely with VDGIF to keep informed about State hunting regulations, trends in turkey populations, and disease outbreaks to most effectively manage the wild turkey hunting program at the refuge.

Waterfowl Hunting: The public requested we consider providing opportunities for waterfowl hunting at James River NWR. A 2010 survey of Virginia waterfowl hunters showed that what made for an enjoyable waterfowl hunting experience included being in the field and enjoying the outdoors (89 percent); seeing waterfowl (87 percent); and being able to hunt with friends or family (85 percent). Only 9 percent of Virginia waterfowl hunters accompanied a youth on the designated youth waterfowl hunting day during the 2009 to 2010 season (Jagnow et al. 2010).

In the late 1990s, the Service began promoting youth waterfowl hunting. To promote youth involvement in waterfowl hunting at James River NWR, we will open the refuge to accommodate up to four hunters (at least one youth hunter per licensed adult companion on each of 10 days; 40 waterfowl hunter use days) during the State's season. Waterfowl hunting will be allowed on the refuge from one stationary blind that will accommodate up to four people, which will also serve as a wildlife observation and photography blind on non-hunt days. We will construct the blind at the northern most tip of the Powell Creek trail. On waterfowl hunt days, we will close a portion of the wildlife observation trail to minimize the potential for user conflicts and safety concerns.



Susan Heisey/USFWS

Youth hunting

Promote Youth Hunt Involvement

The VDGIF and public requested that we consider promoting youth hunt involvement. State fish and wildlife agencies across the Nation have reported significant declines in the number of youth hunters (Engelmeyer 2013 personal communication). Virginia has observed a 30-year decline in hunting license sales and, in response, has implemented a youth hunting program (<http://www.dgif.virginia.gov/about/board/issues/hunter-recruitment-retention/hunter-recruitment-retention-presentation.pdf>; accessed August 2013). The State has designated specific youth hunt days outside of regular hunt seasons to provide youth with the opportunity to learn how to hunt from experienced, licensed hunters.

We will offer youth hunting at the refuge on the State youth deer, turkey, and waterfowl hunt days that are designated in the annual issue of *Hunting and Trapping in Virginia* Regulations Digest. By providing separate youth hunt days on the refuge, we will contribute to the State and Service's goals of developing a new generation of hunters and fostering a sense of stewardship for the environment.

Although no new specialized infrastructure will be required to solely support youth hunting opportunities, we will renovate the interior and exterior of the hunter check station to become a visitor contact station. The visitor contact station will have the look and feel of an old-time hunting and fishing lodge. We will include features such as archival hunting and fishing photos and wildlife mounts to complement a comfortable, down-home setting. We will highlight how hunters and anglers contributed to the early conservation movement, as well as the rich history of the Service. Sustainable materials and green technologies will be featured throughout the visitor contact station. The footprint of the visitor contact station will not change unless required to meet ADA requirements. If any required changes result in an increase in footprint, we aim to avoid or minimize the potential for ground disturbance. The visitor contact station will continue to be a staging and registration area for all hunt programs.

Strategies

Continue to:

- Administer public deer hunt in accordance with the approved hunt management plan (1993) and subsequent amendments to accommodate up to:
 - ❖ Fifty hunters to hunt on any or all days within one 19-day archery season (950 hunter use days annually).
 - ❖ Seventy hunters per day on each of 2 muzzleloader hunting days (140 hunter use days annually).
 - ❖ Seventy hunters per day on each of 4 shotgun hunting days

(280 hunter use days annually).

Throughout the life of the plan:

- Allow adaptive management of hunt days offered based on State monitoring program (DMAP) recommendations for herd management.

Within 3 years of CCP approval:

- Improve hunt administration processes to increase hunter participation.
- Enhance promotion of the hunt to a larger audience, including youth.
- Construct a four-person stationary blind along the northern peninsula of the Powell Creek trail.

Within 5 years of CCP approval:

- Complete all administrative requirements for the proposed expanded hunt program once the CCP is approved and resources are available, including developing a separate NEPA document, compatibility determination, hunt plan, and further public involvement, to accommodate up to:

❖ Deer:

- Fifty hunters on any or all days within one 19-day fall archery season (950 hunter use days annually).
- Seventy hunters per day on each of 3 fall muzzleloader hunting days (210 hunter use days annually).
- Seventy hunters per day on each of 4 fall shotgun hunting days (280 hunter use days annually).
- Twenty youth hunters to participate in the 1 fall State Youth Deer Hunt Day (20 hunter use days annually).

❖ Turkey:

- Fifty hunters per day on any or all 19 days, in conjunction with the 19-day fall archery deer hunt season (950 hunter use days annually).
- Seventy hunters per day on each of 3 hunt days, in conjunction with fall muzzleloader deer hunt season (210 hunter use days annually).
- Twenty hunters per day on 3 days during the State's spring season (60 hunter use days annually)

- Twenty youth hunters on 1 spring day and 1 fall day, in conjunction with the State's Youth Turkey Hunt Day (40 hunter use days annually).
- ❖ Waterfowl:
 - Open one location on Powell Creek for four hunters (at least one youth per licensed adult) on each of 10 hunt days (40 hunter use days annually).
- Provide visitors with general information on the expanded hunting program and refuge-specific and State regulations through the refuge website, information signs, and a hunting brochure. In all materials related to the hunting program, promote use of lead-free ammunition.
- Investigate the required use of lead-free ammunition for deer and turkey hunting, including identifying the impacts of lead exposure from hunting activities on wildlife and the impacts of lead ammunition restrictions on hunters.

Within 5 to 15 years of CCP approval:

- Renovate the hunter check station with features that are similar to an old-time hunting and fishing lodge (archival hunt/fishing photos, mounts, and comfortable/downhome setting). The facility will highlight the rich history of the Service and the conservation movement and serve as a staging/registration area for all hunt programs.

Inventory and Monitoring Activities

Continue to:

- Monitor harvest success ratios, harvested game species health, and public safety.
- As needed throughout the year, coordinate with DGIF District Biologist to evaluate game species population size, disease issues, and current regulations.
- Participate in the VDGIF DMAP.

Within 5 years of CCP approval:

- Request that each waterfowl hunt participant complete the Migratory Bird Hunt Report (FWS form 3-2361).

Objective 4.2

Wildlife Observation, Photography, Environmental Education, and Interpretation

Over the next 10 years, provide infrastructure within a designated area to support opportunities for visitors to participate in wildlife observation, photography, environmental education, and interpretation to improve the quality of visitor experiences.

Discussion and Rationale

Wildlife observation, photography, environmental education, and interpretation are four of the six priority public uses as outlined in the Refuge Improvement Act. When managed responsibly, these uses can instill refuge visitors with a deeper appreciation for wildlife, their behavior, and their habitat needs.

As part of the data gathering process for developing the Virginia Outdoor Plan (VOP), VDCR sponsored an outdoor demand survey in 2011. The Statewide survey asked respondents to select up to three recreation opportunities that are most needed in Virginia from a list of possibilities. The most frequently selected choices were trails for hiking and walking (68 percent); public access to State waters for fishing, swimming, and beach use (60 percent); and access to natural areas (55 percent) (Ellis et al. 2012).

A Service-led visitor services review (USFWS 2010b) recommended that the refuge:

- Provide unreserved access to Powell Creek Trail.
- Consider extending the Powell Creek Trail to provide a richer experience.
- Ensure part of this trail is ADA-compliant.
- Consider converting the existing hunter check station into a visitor contact station.

Within 5 years of CCP approval, we will complete a VSP to designate a 240-acre area adjacent to Powell Creek in which we will develop public use infrastructure (maps 4.2 and 4.3) to support wildlife observation, photography, environmental education, and interpretation. We believe that designating a total of 240 acres to support these public uses will dovetail well with our habitat management actions.

Within the public use area, we will improve public parking by providing an area to support up to 20 vehicles and a bus (approximately 14,000 square feet). The new parking area will include a trailhead that will provide access to the existing 0.5-mile trail. Following the development of the parking area and trailhead, we will open the existing 0.5-mile trail to wildlife observation, photography, environmental education, and interpretation from sunrise to sunset. The public use area will be open throughout the year, including on refuge hunt days. However, we will administer the hunt programs in a manner that ensures public safety. Wildlife observation, photography, environmental education, and interpretation will be conducted on designated refuge roads and trails in all Service-owned areas open to the public.

We will improve the refuge's restroom facilities and renovate the hunter check station to become the refuge's visitor contact station as discussed under objective 4.1. We will upgrade the existing equipment shed to serve as an outdoor meeting space for partners promoting Service mission-related topics. The location for new facilities will be selected based on ease of access, high value for watchable wildlife opportunities, clearly defined man-made features and natural barriers (e.g., archaeological resources, roads, and waterways), and placement away from conflicting upland habitat management and consumptive recreational activities (e.g., prescribed burns, mechanical thinning, and hunting). Completion of these facility improvements and other improvements that may be proposed in the VSP will allow us to accommodate an increase in refuge visitation and lift our refuge permit requirement to visit, while ensuring compatibility with the Refuge System mission and refuge's purpose.

We will also provide local, regional, and national visitors an opportunity to connect with nature and learn about our diverse ecosystem. Within Prince George County, green spaces designated for wildlife observation opportunities and preserved native habitats are lacking. We will work more actively with Prince George County Parks and Recreation Department to provide environmental education and interpretation programs. James River NWR is located within a 25-mile radius of Richmond, which makes it a candidate for an urban refuge. To reach out to this key audience, we will develop an urban partnership to coordinate with local schools to establish regular visitation and introduce community youth to the natural resources within their county. Biology classes could use the trails and facilities as an outdoor classroom, as a location for stewardship project, or as a place to encourage connections with nature.

Within 5 to 10 years of CCP approval, we will continue to improve visitor support facilities in designated areas. For example, we will extend the existing 0.5-mile trail to 3 miles, including a portion that will be ADA-compliant; improve vehicular ingress and egress route(s) on the refuge and establish two additional parking areas, each of which will accommodate up to five vehicles for trail users; and improve the existing canoe/kayak launch to provide access to Powell Creek for canoes, kayaks, and non-trailerred, hand-launched boats with small electric motors. Completion of these and other facility improvements will support an increase in refuge visitation in the long term.

Within the life of the plan, we will relocate the maintenance complex from the public use area to a less public location that will also improve our refuge operational efficiency.

We will monitor existing and newly constructed infrastructure used by visitors to determine use patterns and capacity limits, as well as monitor impacts on vegetation and wildlife within public use area and

track trends.

Strategies

Continue to:

- Require participants to request a refuge-issued permit three business days in advance of proposed visit until signage and visitor support facility improvements are completed.

Within 5 years of CCP approval:

- Designate a 240-acre area adjacent to Powell Creek in which we will develop public use infrastructure.
- Improve public parking (approximately 14,000 square feet, sufficient for 20 vehicles and a bus) and establish a trailhead that will provide access to the existing 0.5-mile trail.
- Open public access from sunrise to sunset.
- Improve restroom facilities and renovate hunter check station to become a visitor contact station.
- Upgrade equipment shed to serve as an outdoor meeting space for partners promoting Service mission-related topics.
- Partner with Prince George County Parks and Recreation Department to administer environmental education and interpretation programs.

Within 5 to 10 years of CCP approval:

- Improve visitor use facilities in designated areas, in particular:
 - ❖ Extend the existing 0.5-mile trail to become a 3-mile wildlife observation trail system with:
 - A pedestrian walkway as part of the trail, which doubles as an observation platform along steep valleys.
 - An improved canoe/kayak launch.
 - An improved vehicular ingress and egress route(s) and establish two additional parking areas (combined total of approximately 7,000 square feet, sufficient for five vehicles each).
 - An improved access at Powell Creek to accommodate nature trail users' access to island.
 - Develop interpretive signs and brochures to address topics of interest including, but not limited to, bald eagle life history and recovery success, forest management, and indigenous cultural landscapes.

➤ Construct a four-person wildlife observation/photography blind along Powell Creek.

- Provide refuge or partnered-sponsored programs throughout the year, using a reservation system only when space or equipment is limited (such as boat trips or canoe sojourns).
- Offer two boat tours annually, specifically to observe bald eagles.
- Develop an urban partnership to coordinate with local schools to establish regular visitation and introduce community youth to the natural resources within their county.

Within the life of the plan:

- Relocate the maintenance complex from the area of high visitor use to a more centralized, non-public location.

Inventory and Monitoring Activities

Continue to:

- Monitor conditions of existing facilities and infrastructure used by visitors (e.g., trail, restrooms, kiosk).

Throughout the life of the plan:

- Monitor existing and newly constructed infrastructure used by visitors to determine use patterns and capacity limits.
- Monitor impacts on vegetation and wildlife within public use area and track trends, adjust public access as necessary.

Objective 4.3

Fishing

Over the next 5 years, open the refuge to year-round fishing at up to two designated locations to accommodate up to 1,460 anglers annually.

Discussion and Rationale

The Refuge Improvement Act identifies fishing as a priority wildlife-dependent recreation activity. It states, “*Compatible wildlife-dependent recreation is a legitimate and appropriate general public use of the System.*” As with hunting, we recognize fishing as a healthy, traditional outdoor past time and an important cultural activity in this area of Virginia. Fishing promotes public understanding and appreciation of natural resources and their management on lands and waters in the Refuge System.

We received public comments requesting that the refuge be opened to recreational fishing and that we provide public access to waterways for fishing. Additionally, according to the 2007 VOP (VDCR 2007), fishing ranked as the seventh most popular outdoor recreational activity; improved access to Virginia’s rivers and streams is necessary to meet water-related recreational demands.

The refuge will remain closed to fishing until we completed the administrative requirements to open the refuge to fishing. We will complete these administrative requirements within 5 years of CCP approval.

After completion of the administrative requirements and within 5 years of CCP approval, we will open the refuge to fishing at up to two designated locations. Both locations will provide access to fishing in Powell Creek. At the first location, we will improve the infrastructure at the canoe launch site to establish it as a fishing location. Improvements at this site will also facilitate non-trailerred, hand-launching of canoes, kayaks, and boats with small electric motors for fishing access to Powell Creek. At a second location along Powell Creek (yet to be determined), we will create infrastructure to establish a fishing location. The second fishing location will be sited to ensure that a quality fishing opportunity will be offered and easily accessible.

Fishermen will park at designated parking areas for public access to the 3-mile trail network (e.g., gravel corridors, unimproved dirt trails, and boardwalk) on foot and travel to the two designated fishing locations (maps 4.2 and 4.3). To facilitate access to the fishing locations, we will improve and maintain roads and parking areas. Designating these two sites for fishing access will enable us to open the refuge to a traditional, priority wildlife-dependent recreation activity while continuing to protect the shoreline, particularly in areas of eagle nests or high concentration roosting activity. We anticipate that up to 1,460 fishermen will be accommodated annually, assuming two anglers per day will use each of the two sites daily. Fishing of some sort can be accommodated throughout the year, as determined by VDGIF.

We will provide visitors with information related to the fishing opportunities at the refuge and to refuge-specific and State fishing regulations through various media, including the refuge website, signage, and brochures. For example, we will advise fishermen that the refuge will remain closed to herring dipping in accordance with State regulations (4 VAC 20-1260-10 et seq.). All materials related to the fishing program will promote the use of lead-free tackle by anglers. Lead tackle has been found to have harmful effects on birds, particularly waterbirds, because of their feeding habits (Michael 2006). Sensitivity to lead toxicity varies among bird species, but in most instances a single fishing weight can kill a bird (Eisler 1988, Sanderson and Bellrose 1986). Promotional materials regarding lead-free tackle will inform anglers about the impacts of lead tackle and encourage them to utilize cost-effective, lead-free tackle alternatives when fishing on the refuge as well as at non-refuge locations.

We will monitor the refuge support facilities at both designated fishing locations for fishing-related impacts. We will coordinate closely with

VDGIF to keep informed about State fishing regulations, trends in fish populations, and disease outbreaks in fish to most effectively manage the fishing program at the refuge.

Strategies

Within 5 years of CCP approval:

- Complete all administrative requirements for the proposed opening of the refuge to fishing once the CCP is approved and resources are available, including developing a separate NEPA document, compatibility determination, sport fishing plan, and further public involvement.

Within 5 to 10 years of CCP approval:

- Allow fishing (rod and hook) at up to two designated sites on Powell Creek.
- Improve and maintain access roads and parking areas for accessing both fishing locations.
- Work with partners and volunteers to improve the infrastructure at the canoe/kayak launch site to establish it as a fishing location and to facilitate non-trailerered, hand-launched boat access to Powell Creek.
- Provide visitors with general information on the fishing program and refuge-specific and State regulations through the refuge website, information signs, and a fishing brochure. In all materials related to the fishing program, promote use of lead-free tackle.

Inventory and Monitoring Activities

Throughout the life of the plan:

- Monitor the refuge support facilities associated with fishing.
- Coordinate with VDGIF regarding angler regulations, fish populations, and disease notifications.
- Monitor impacts on vegetation and wildlife within public use area and track trends, adjust public access as necessary.

GOAL 5

PARTNERSHIPS

Develop new partnerships and strengthen existing partnerships to promote natural and cultural resource conservation and the mission of the Refuge System.

Objective 5.1

Partnerships

Over the life of the plan, enhance existing partnerships and develop new partnerships with Federal, State, and local government agencies, non-government organizations, academic institutions, conservation organizations, and volunteers to fulfill mutual natural resource conservation mandates and help meet wildlife, habitat, and visitor

services objectives.

Discussion and Rationale

Developing and maintaining partnerships is key to fulfilling the Service's mission. At the heart of the Service's mission are the conservation and management of the Federal Trust Species: migratory birds, threatened and endangered species, interjurisdictional fish, certain marine mammals, and species of international concern. It is estimated that 73 percent of our Nation's land is privately owned and that the majority of our fish and wildlife resources occur on those lands. Consequently, we recognize that other government agencies, organizations, conservation groups, and individuals share our interest in providing for fish and wildlife needs.

We will expand our wildlife, habitat, and public use management programs while also anticipating that a level or declining budget environment will affect our flexibility in managing financial resources and may have implications for the level of permanent staffing. Maintaining and expanding our existing partnerships, as well as developing new partnerships, will promote the refuge in its effort to fulfill its wildlife, habitat, and public use management programs despite budgetary and staffing uncertainties. The potential for developing existing and new partnerships with other government agencies and organizations was highlighted in the 2007 VOP as a way to allow additional recreational access and involve volunteers in assisting refuge staff in managing and monitoring of the refuge. (http://www.dcr.virginia.gov/recreational_planning/documents/voppd19.pdf; accessed April 2014)

Our existing partnerships with VDGIF, VDOF, TNC, and VDCR Natural Heritage Program provide needed assistance for managing habitat resources on the refuge and increase our success in effectively managing habitats for species of concern. Habitat management activities will increase with the transformation of the pine-dominated forest towards a mature pine savanna forest. This increase in activity will require an expansion of existing partnerships as well as the creation of new partnerships to help inform management decisions, to conduct management activities, and to fully understand the impacts of management activities on habitats and species. Increased habitat management activity will also require an increase in volunteers to assist in performing these activities, such as monitoring the effects of a thinning operation or prescribed fire.

Research is essential to successful habitat and species management; however, refuge staff is extremely limited in our ability to design and conduct research projects. The research conducted by our Ecological Services Virginia Field Office, VCU, CCB, and Richmond Audubon provides important data and information that helps guide refuge management decisions and activities. The Service will undertake a

number of new activities and develop a suite of new questions regarding the effectiveness of management techniques, the impacts of climate change on habitats and species, the benefits of management to habitats and species, and the effects of increase visitor use opportunities on the refuge and the public. Expanding existing partnerships and developing new partnerships offers the opportunity to conduct research to answer these and other questions. The refuge will continue to collaborate with existing partners, as well as develop new partnerships, to enhance the existing research program.

Public outreach improves recognition of the refuge, the Refuge System, and the Service among neighbors, local leaders, conservation organizations, and elected officials. By participating in community events, refuge staff is better able to engage with the public in direct communication and raising awareness about the refuge. Although we are constrained by limited available resources and staffing, we are able to effectively reach the public through partnerships. Our partnerships with the NPS for the Captain John Smith Chesapeake NHT, Richmond Audubon, CBF, and JRA enable us to conduct more effective outreach and provide more wildlife-dependent recreational opportunities on the refuge than we could do alone. Our collective public outreach efforts garner support for conservation in the region. Implementing this CCP will result in increased visitor use and public outreach opportunities that will be supported by building and maintaining a variety of new visitor use support facilities, such as an expanded trail, fishing platforms, and canoe/kayak launch. The refuge will expand existing partnerships and develop new partnerships to conduct outreach on and off-refuge, and providing wildlife-dependent recreational opportunities on the refuge, as well as involve volunteers in the construction and maintenance of new visitor use support facilities. Past refuge volunteers have provided a great service to us and enjoyed themselves. We will offer increased opportunities for volunteers to engage with our staff, each other, and the public.

Since refuge establishment, we have developed and maintained partnerships with a variety of groups to fulfill the refuge's purpose and meet management goals and objectives. Some of our partnerships have been formally documented, while others remain informal agreements. For example, the Service entered into a cooperative agreement with NPS, USFS, and Commonwealth of Virginia for wildland fire management and Stafford Act response. In contrast, there is no formal agreement or documentation between the Service or refuge with the Appalachian Trail Club for habitat management assistance and infrastructure maintenance at James River NWR. We will significantly increase our work with partners and volunteers on the refuge in a strategic way that will help achieve our expanded wildlife, habitat, and public use objectives.

Strategies

Continue to:

- Maintain existing partnerships to manage forests and respond to wildfires; conduct formal and informal biological inventory, monitoring, and research; conduct cultural resource surveys; offer environmental education and wildlife interpretation programs; and maintain refuge infrastructure.

Within 5 years of CCP approval:

- Expand partnership with NPS to accomplish Captain John Smith Chesapeake NHT interpretive and resource protection goals associated with Powell Creek and indigenous cultural landscapes, as well as partnership for improving the existing canoe/kayak launch on Powell Creek.

Within 5 to 10 years of CCP approval:

- Expand existing partnerships individually, and in small groups, with JRA, CBF, and Virginia Master Naturalists Chapters.
- Develop new and expand on existing partnerships with universities for research and environmental education programs.
- Create a Friends group or develop new partnerships with other organizations in support of off-refuge environmental education.
- Encourage long-term volunteers and seasonal volunteers by constructing a building or recreational vehicle hookups near where water and electricity are available.

Inventory and Monitoring Activities

Within 5 years of CCP approval:

- Assess effectiveness of expanded public use opportunities including youth engagement and outreach efforts, promotion of conservation messages, and visitor satisfaction.

Chapter 5



Meghan Powell/USFWS

CCP Planning Team members spot a prothonotary warbler

Consultation, Coordination, and Preparation

- 5.1 Introduction
- 5.2 Planning Process
- 5.3 List of Preparers

5.1 Introduction

This chapter describes how we engaged others in developing this CCP. It details our efforts to encourage the involvement of the public and conservation partners, including other Federal and State agencies, county officials, civic groups, non-governmental conservation and education organizations, and user groups. It also identifies who contributed significantly to the content or writing of the plan.

According to Service policy, we must review and update this final CCP at least once every 15 years. We may need to revise it sooner, either in response to significant new information that would markedly change management direction, or if the Service Director or our Regional Director deem it necessary. If so, we will once again announce our revised planning and encourage your participation.

5.2 Planning Process

January 11, 2012	Notice of intent to prepare CCP published in the <i>Federal Register</i> (77 FR 1716).
March 27-28, 2012	Two-day kick-off meeting for CCP Core Team members, including representatives from the Service's Northeast Regional Office, Eastern Virginia Rivers NWR Complex, Great Dismal Swamp NWR, and VDGIF.
August 28, 2012	Distributed planning newsletter (#1) to 566 parties on our mailing list, including media outlets and posted announcements on the refuge website.
September 9-10, 2012	Media coverage in the <i>Richmond Times-Dispatch</i> , <i>Virginian Pilot</i> via <i>HamptonRoads.com</i> , <i>The Record</i> via <i>North Jersey.com</i> , ABC 13 WSET-TV, and the Department of the Interior's News Briefing.
September 11, 2012	Hosted a government and agency partners scoping meeting in Richmond, Virginia.
September 12, 2012	Hosted two public open house scoping meetings in Prince George, Virginia, along with representative from VDGIF and meeting facilitator (MAP Environmental Inc.).
September 17, 2012	Media coverage in <i>The Hopewell News</i> .
September 25, 2012	Briefed the Chester Lions Club at one of their regular, semi-monthly meetings held in Chester, Virginia.

October 13, 2012	Informally discussed CCP development process and progress with attendees of the open house event at Presquile NWR in Chesterfield County, Virginia.
October 14, 2012	Informally discussed CCP development process and progress with attendees of the “GO WILD” Event at Rappahannock River Valley NWR in Warsaw, Virginia.
November 30, 2012	Distributed planning update newsletter (#2) and public comment summary to 594 parties on our mailing list, including media outlets and posted announcements on the refuge website.
February 12, 2013	Informally discussed CCP development process and progress with attendees of The Wildlife Society, Virginia State Chapter meeting at the 4-H Center in Wirtz, Virginia.
February 4, 2014	Met with Prince George County staff to listen to the County’s interests in public boating access to the James River at a meeting held in Charles City, Virginia.
October 22-23, 2014	Announced the availability of draft CCP and EA for public review and comment in the <i>Federal Register</i> (79 FR 63161). Distributed notification of the draft CCP and EA availability and public meetings via email and hardcopy newsletter to all parties on our mailing list, including media outlets. Updated website with newsletter and announcement of two public meetings.
October 24-25, 2014	Media coverage in <i>The Examiner.com</i> and <i>Daily Press</i> .
November 12, 2014	Hosted two public meetings in Prince George, Virginia, attended by 23 individuals. Gave a short overview of the refuge and the CCP planning process and encouraged meeting attendees to submit written comments while at the meeting or by the close of the public comment period.
December 2014	Received 48 correspondences, representing 126 individual comments on our draft CCP and EA.

January 2015	Reviewed comments and revised CCP where appropriate (appendix F).
January 26, 2015	Met with Prince George County Administrators to explain why a public motorized boat ramp at the refuge is not appropriate and discuss potential collaboration with others to identify an alternative location on the James River.
January 30, 2014	Article in the <i>The Hopewell News</i> .
Spring 2015	Compiled the final CCP for our Regional Supervisor, Regional Chief, and Regional Solicitor's Office before submitting it to the Regional Director for review and approval. Final CCP notice of availability to be published in the <i>Federal Register</i> after approval from our Regional Director.

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Wild turkeys

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Glossary, Acronyms, and Species Names



Frank Miles/USFWS

Pine warbler

Glossary, Acronyms and Abbreviations, and Species Scientific Names

- **Glossary**
- **Acronyms and Abbreviations**
- **Species Scientific Names**

Glossary

adaptive management	A process in which projects are implemented within a framework of scientifically driven experiments to test predictions and assumptions outlined within the comprehensive conservation plan. The analysis of the outcome of project implementation helps managers determine whether current management should continue as is or whether it should be modified to achieve desired conditions.
abiotic	Nonliving; a physical feature of the environment such as climate, temperature, geology, soils.
ADA-accessible	A site, building, facility, or portion thereof that complies with the Americans with Disabilities Act guidelines
alluvium	An unconsolidated accumulation of stream-deposited sediments, often including sands, silts, clays, or gravels.
alternative	A set of objectives and strategies needed to achieve refuge goals and the desired future condition.
anadromous fish	Fish that spend a large portion of their life cycle in the ocean and return to freshwater to breed.
appropriate use	A proposed or existing use on a refuge that meets at least one of the following three conditions: <ul style="list-style-type: none">• The use is a wildlife-dependent one;• The use contributes to fulfilling the refuge purpose(s), the System mission, or goals or objectives described in a refuge management plan approved after October 9, 1997, the date the National Wildlife Refuge System Improvement Act was signed into law; or• The use has been determined appropriate as specified in section 1.11 of that act.
approved acquisition boundary	A project boundary that the Director of the U.S. Fish and Wildlife Service approves upon completion of the planning and environmental compliance process. An approved acquisition boundary only designates those lands that the Service has authority to acquire or manage through various agreements. The approval of an acquisition boundary does not grant the Service jurisdiction or control over lands within the boundary, and it does not make lands within the refuge boundary part of the National Wildlife Refuge System. Lands do not become part of the Refuge System until the Service buys them or they are placed under an agreement that provides for their management as part of the

	Refuge System.
avian	Of or having to do with birds.
basal area	The area of a given section of land that is occupied by the cross-section of tree trunks and stems at their base.
basin	The surrounding land that drains into a water body.
best management practice	Land management practices that produce desired results (usually describing forestry or agricultural practices effective in reducing non-point source pollution.
biological diversity	The variety of life forms and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur.
biological integrity	Biotic composition, structure, and functioning at genetic, organism, and community levels comparable with historic conditions, including natural biological processes that shape genomes, organisms, and communities.
bird conservation region	Ecologically distinct regions in North America with similar bird communities, habitats, and resource management issues.
brackish	Brackish water is water that is more salty than freshwater, but less salty than seawater. It is generally defined as water with a salinity of 0.5 to 30 dissolved salts parts per thousand.
buffer	Lands bordering water bodies that reduce runoff and nonpoint source pollution.
canopy	The layer of foliage formed by the crowns of trees in a stand. For stands with trees of different heights, foresters often distinguish among the upper, middle and lower canopy layers. These represent foliage on tall, medium, and short trees. The uppermost layers are called the overstory.
carbon neutrality	Achieving net zero carbon emissions by balancing a measured amount of carbon released with an equivalent amount that is sequestered.
carbon sequestration	The process through which agricultural and forestry practices remove carbon from the atmosphere. USFWS policy 656 FW 1: http://www.fws.gov/policy/565fw1.html .
categorical exclusion	A category of Federal agency actions that do not individually or cumulatively have a significant effect on the human environment.

climate change	A change in the state of the climate characterized by changes in the mean and/or the variance of its properties, persisting for an extended period, typically decades or longer. (IPCC 2007a)
compatible use	A wildlife-dependent recreational use, or any other use on a refuge that will not materially interfere with or detract from the fulfillment of the mission of the Service or the purposes of the refuge.
compatibility determinations	A required determination for wildlife-dependent recreational uses or any public uses of a refuge.
Comprehensive Conservation Plan	A document that describes the desired future conditions of the refuge, and specifies management direction to achieve refuge goals and the mission of the National Wildlife Refuge System.
community	A distinct assemblage of plants that develops on sites characterized by particular climates and soils, and the species and populations of wild animals that depend on the plants for food, cover, and/or nesting.
conservation	Managing natural resources to prevent loss or waste [N.B. Management actions may include preservation, restoration, and enhancement.]
cover type	The current vegetation of an area.
cultural resource	Those parts of the physical environment-natural and built-that have cultural values to some sociocultural group or institution. Cultural resources include historic sites, archaeological sites and associated artifacts, sacred sites, buildings, and structures.
diameter at breast height	The diameter of the stem of tree measure at breast height (usually 4.5 feet above the ground). The term is commonly used by foresters to describe tree size.
disturbance	A disruption in the natural plant succession of a community or ecosystem resulting in a new community.
early successional habitat	Succession is the gradual replacement of one plant community by another. In a forested ecosystem, tree cover can be temporarily displaced by natural or human disturbance (e.g., flooding by beaver, or logging). The open environments created by removal of tree cover are referred to as “early-successional” habitats because as time passes, trees will return. The open conditions occur “early” in the sequence of plant communities that follow disturbance. We define <i>early successional forest</i> in this CCP as: the shrub-sapling stage; 0 to 20 years old.

ecological integrity	Native species populations in their historic variety and numbers naturally interacting in naturally structured biotic communities. For communities, integrity is governed by demographics of component species, intactness of landscape-level ecological processes (e.g., natural fire regime), and intactness of internal community processes (e.g., pollination).
ecoregion	A territory defined by a combination of biological, social, and geographic criteria, rather than geopolitical considerations; generally, a system of related, interconnected ecosystems.
ecosystem	A dynamic and interrelated complex of plant and animal communities and their associated non-living environment.
emergent marsh	Wetlands dominated by erect, rooted, herbaceous plants.
endangered species	Any species of plant or animal defined through the Endangered Species Act as being in danger of extinction throughout all or a significant portion of its range, and published in the <i>Federal Register</i> .
Environmental Assessment	A systematic analysis to determine if proposed actions would result in a significant effect on the quality of the environment.
environmental health	The composition, structure, and functioning of soil, water, air, and other abiotic features comparable with historic conditions, including the natural abiotic processes that shape the environment.
exotic species	A species that is not native to an area and has been introduced intentionally or unintentionally by humans.
extinction	The termination of existence of a lineage of organisms (e.g., a subspecies or species).
federally listed species	A species listed either as endangered, threatened, or species at risk (formerly a “candidate” species) under the Endangered Species Act of 1973, as amended.
fetotoxic	Toxic to fetuses
fragmentation	The process of reducing the size and connectivity of habitat patches; the disruption of extensive habitats into isolated and small patches.
geographic information system	A computer system capable of storing and manipulating spatial mapping data; more commonly referred to by the acronym GIS.
goals	Descriptive statements of desired future conditions.

habitat	The sum of environmental factors—food, water, cover, and space—that each species needs to survive and reproduce in an area.
hectare	Equal to 2.47 acres.
historic conditions	The composition, structure, and functioning of ecosystems resulting from natural processes that we believe, based on sound professional judgment, were present prior to substantial human-related changes to the landscape.
impoundment	A body of water, such as a pond, confined by a dam, dike, floodgate, or other barrier, that is used to collect and hold water.
interjurisdictional fish	Populations of fish that are managed by two or more State or national or tribal governments because of the scope of their geographic distributions or migrations.
invasive species	A non-native species whose introduction causes or is likely to cause economic or environmental harm or harm to human health.
issue	Any unsettled matter that requires a management decision. For example, a resource management problem, concern, a threat to natural resources, a conflict in uses, or in the presence of an undesirable resource condition.
marl	An unconsolidated sedimentary rock or soil consisting of clay and lime.
mast	The fruit of forest trees, such as acorns and other nuts.
migratory bird	A bird species that migrates between wintering and breeding grounds.
National Wildlife Refuge System	All lands, waters, and interests therein administered by the U.S. Fish and Wildlife Service as wildlife refuges, wildlife ranges, wildlife management areas, waterfowl production areas, and other areas for the protection and conservation of fish, wildlife and plant resources.
nonpoint source pollution	A diffuse form of water quality degradation in which wastes are not released at one specific, identifiable point but from a number of points that are spread out and difficult to identify and control.
objectives	Actions to be accomplished to achieve a desired outcome or goal. Objectives are more specific, and generally more measurable, than goals.
oligohaline	Brackish water with between 0.5 and 3.0 parts per million salinity.

physiographic area	A bird conservation planning unit with relatively uniform vegetative communities, bird populations, and species assemblages, as well as land use and conservation issues, developed by Partners in Flight.
point source pollution	A source of pollution that involves discharge of waste from an identifiable point, such as a smokestack or sewage-treatment plant.
preferred alternative	The Service's selected alternative identified in the Draft Comprehensive Conservation Plan.
prescribed burning/fire	The application of fire to wildland fuels, either by natural or intentional ignition, to achieve identified land use objectives.
priority public use	A compatible wildlife-dependent recreational use of a refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation.
priority refuge species and habitats	A suite of plants, animals, and their habitats whose restoration, management, or maintenance at the refuge fulfills the refuge purposes and/or can contribute beneficially toward the maintenance or recovery of species currently under review for inclusion on the Federal Endangered or Threatened Species list or for whom rangewide conservation concern exists (see appendix A).
range	The geographic area within which a particular species is found.
restoration	Management of a disturbed or degraded habitat that results in the recovery of its original state (e.g., restoration may involve planting native species, removing invasive shrubs, prescribed burning).
riparian	Relating the floodplains, banks, and terraces that line rivers.
riparian area	Habitat along the banks of a stream, river, or wetland.
scoping	A process for determining the scope of issues to be addressed by a comprehensive conservation plan and for identifying the significant issues. Involved in the scoping process are Federal, state, and local agencies; private organizations; and individuals.
spawn	The act of reproduction of fishes-the mixing of the sperm from the male fish and the eggs of a female fish.
special use permit	A permit authorized by the refuge manager for an activity that is not usually available to the general public.
species	A distinctive kind of plant or animal having distinguishable characteristics, and that can interbreed and produce young. In taxonomy, a category of biological classification that refers to one

	or more populations of similar organisms that can reproduce with each other but is reproductively isolated from—that is, incapable of interbreeding with—all other kinds of organisms.
species richness	A simple measure of species diversity calculated as the total number of species in a habitat or community.
stand	An easily defined area of the forest that is relatively uniform in species composition or age and can be managed as a single unit.
step-down management plan	A plan for dealing with specific refuge management subjects, strategies, and schedules (e.g., cropland, wilderness, and fire [602 FW 1.4])
stopover habitat	Habitat where birds rest and feed during migration. Also called staging area.
strategies	A general approach or specific actions to achieve objectives.
structure	The horizontal and vertical arrangement of trees and other vegetation having different sizes, resulting in different degrees of canopy layering, tree heights, and diameters within a stand.
succession	The natural, sequential change of species composition of a community in a given area.
teratogenic	Of, relating to, or causing developmental malformations
terrestrial	Living on land.
threatened species	Those plant or animal species likely to become endangered species throughout all of or a significant portion of their range within the foreseeable future. A plant or animal identified and defined in accordance with the 1973 Endangered Species Act and published in the <i>Federal Register</i> .
trust resources	National resources entrusted by Congress to the U.S. Fish and Wildlife Service for conservation and protection. These “trust resources” include migratory birds, federally listed endangered and threatened species, inter-jurisdictional fishes, wetlands, and certain marine mammals.
understory	The lower layer of vegetation in a stand, which may include short trees, shrubs, and herbaceous plants.
unimproved soft launch	Where no concrete was used in the construction of a land-water access for canoes and kayaks
vernal pool	Depressions holding water for a temporary period in spring and other high water periods, and in which several species of

amphibians lay eggs.

water rights

The right of a user to use water from a source such as a river, stream, pond, or groundwater source.

watershed

The geographic area within which water drains into a particular river, stream, or body of water. A watershed includes both the land and the body of water into which the land drains.

Wilderness Area

An area designated by Congress as part of the National Wilderness Preservation System.

wilderness study area

Lands and waters identified by inventory as meeting the definition of wilderness and being evaluated for a recommendation that they be included in the Wilderness System.

wildfire

An unplanned, unwanted wildland fires including unauthorized human-caused fires, escaped wildland fires, escaped prescribed fires, and all other wildland fires where the objective is to put the fire out.

wildland fire

Any non-structure fire that occurs in the wildland. Three distinct types of wildlife fire have been defined and include wildfire, wildland fire use, and prescribed fire.

wildlife-dependent recreation

A use of a Refuge involving hunting, fishing, wildlife observation, wildlife photography, environmental education, or interpretation. The National Wildlife Refuge System Improvement Act of 1997 specifies that these are the six priority general public uses of the National Wildlife Refuge System.

Acronyms and Abbreviations

§	Section
°C	Degrees Celsius
°F	Degrees Fahrenheit
ACJV	Atlantic Coast Joint Venture
A.D.	(Medieval Latin) Anno domini, meaning “in the year of the Lord”
AGO	America’s Great Outdoors
ARPA	Archaeological Resources Protection Act
Bay Act	Chesapeake Bay Preservation Act
B.C.	Before Christ
BCR	Bird Conservation Region
BECAR	Bald Eagle Concentration Areas and Roosts
BGEPA	Bald and Golden Eagle Protection Act
CBC	Christmas Bird Count
CBF	Chesapeake Bay Foundation
CBGN	Chesapeake Bay Gateways and Watertrails Network
CCB	Center for Conservation Biology
CCP	Comprehensive Conservation Plan
CD	Compatibility Determination
CFR	Code of Federal Regulations
CFU/100mL	Colony Forming Units per 100 milliliters
cm	Centimeter
DBH	Diameter at Breast Height
DDT	Dichlorodiphenyltrichloroethylene
DM	Departmental Manual

DMAP	Deer Management Assistance Program
EA	Environmental Assessment
Ecology School	James River Ecology School
EIS	Environmental Impact Statement
EO	Executive Order
EO Strategy	Executive Order # 13508: Strategy for Protecting and Restoring the Chesapeake Bay
et seq.	(Latin) et sequentes or et sequentia, meaning "and the following"
FONSI	Finding of No Significant Impact
FR	Federal Register
FW	U.S. Fish and Wildlife Service Manual
FWIS	Fish and Wildlife Information Service
GSA	General Services Administration
HMP	Habitat Management Plan
HUC	Hydrologic Unit Code
IBA	Important Bird Area
IMP	Inventory and Monitoring Plan
IPCC	International Panel on Climate Change
IUCN	International Union for Conservation of Nature
JRA	James River Association
LPP	Land Protection Plan
LWCF	Land and Water Conservation Fund
MOU	Memorandum of Understanding
MSA	Metropolitan Statistical Area
NABCI	North American Bird Conservation Initiative

NAGPRA	Native American Grave Protection and Repatriation Act
National Register	National Register of Historic Places
NEPA	National Environmental Policy Act
NFH	National Fish Hatchery
NHPA	National Historic Preservation Act
NHT	National Historic Trail
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NWPS	National Wilderness Preservation System
NWR	National Wildlife Refuge
PCB	Polychlorinated Biphenyls
Pub.L.	Public Law
ppb	Parts per billion
ppm	Parts per million
RAWS	Remote Automatic Weather Station
Refuge	James River National Wildlife Refuge
Refuge System	National Wildlife Refuge System
RHPO	Regional Historic Preservation Officer
RMA	Resource Management Area
RONs	Refuge Operations Needs System
RPA	Resource Protection Area
SAMMS	Service Asset Maintenance Management System
SAV	Submerged Aquatic Vegetation
Service	United States Fish and Wildlife Service
SHPO	State Historic Preservation Officer

SLAMM	Sea-Level Affecting Marshes Model
SUP	Special Use Permit
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
tpa	Trees per acre
U.S.	United States
U.S.C.	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VCU	Virginia Commonwealth University
VDCR	Virginia Department of Conservation and Recreation
VDCR Natural Heritage	Virginia Department of Conservation and Recreation, Division of Natural Heritage
VDEQ	Virginia Department of Environmental Quality
VDGIF	Virginia Department of Game and Inland Fisheries
VDHR	Virginia Department of Historic Resources
VDOF	Virginia Department of Forestry
VMRC	Virginia Marine Resources Commission
VOP	Virginia Outdoor Plan
VPI	Virginia Polytechnical Institute
VSP	Visitor Services Plan
WAP	Wildlife Action Plan

Species Scientific Names

Common Name	Scientific Name
Acadian flycatcher	<i>Empidonax virescens</i>
Alewife	<i>Alosa pseudoharengus</i>
Alewife floater	<i>Anodonta implicata</i>
American beaver	<i>Castor canadensis</i>
American bittern	<i>Botaurus lentiginosus</i>
American black duck	<i>Anas rubripes</i>
American brook lamprey	<i>Lethenteron appendix</i>
American coot	<i>Fulica americana</i>
American crow	<i>Corvus brachyrhynchos</i>
American eel	<i>Anguilla rostrata</i>
American holly	<i>Ilex opaca</i>
American robin	<i>Turdus migratorius</i>
American shad	<i>Alosa sapidissima</i>
American wigeon	<i>Anas americana</i>
American woodcock	<i>Scolopax minor</i>
Atlantic sturgeon	<i>Acipenser oxyrinchus</i>
Bald cypress	<i>Taxodium distichum</i>
Bald eagle	<i>Haliaeetus leucocephalus</i>
Baltimore oriole	<i>Icterus galbula</i>
Banded killfish	<i>Fundulus diaphanus</i>
Banded sunfish	<i>Enneacanthus obesus</i>
Bank swallow	<i>Riparia riparia</i>
Barking treefrog	<i>Hyla gratiosa</i>
Barn owl	<i>Tyto alba</i>
Beech	<i>Fagus</i> sp.
Big bluet	<i>Enallagma durum</i>

Species Scientific Names

Big brown bat	<i>Eptesicus fuscus</i>
Black-and-white warbler	<i>Mniotilta varia</i>
Black-banded sunfish	<i>Enneacanthus chaetodon</i>
Blackburnian warbler	<i>Dendroica fusca</i>
Black gum	<i>Nyssa sylvatica</i>
Blackjack oak	<i>Quercus marilandica</i>
Black kingsnake	<i>Lampropeltis getula niger</i>
Black oak	<i>Quercus velutina</i>
Blackpoll warbler	<i>Dendroica striata</i>
Black rat	<i>Rattus rattus</i>
Black-throated green warbler	<i>Dendroica virens</i>
Blueback herring	<i>Alosa aestivalis</i>
Bluegill	<i>Lepomis macrochirus</i>
Blue jay	<i>Cyanocitta cristata</i>
Blue-winged teal	<i>Anas discors</i>
Blue-winged warbler	<i>Vermivora pinus</i>
Bobolink	<i>Dolichonyx oryzivorus</i>
Bobwhite quail	<i>Colinus virginianus</i>
Bonaparte's gull	<i>Chroicocephalus philadelphia</i>
Brant	<i>Branta bernicla</i>
Bridle shiner	<i>Notropis bifrenatus</i>
Broad-winged hawk	<i>Buteo platypterus</i>
Broomsedge	<i>Andropogon virginicus</i>
Brown creeper	<i>Certhia americana</i>
Brown-headed nuthatch	<i>Sitta pusilla</i>
Brown thrasher	<i>Toxostoma rufum</i>
Bufflehead	<i>Bucephala albeola</i>
Canada goose	<i>Branta canadensis</i>
Canada warbler	<i>Wilsonia canadensis</i>

Canvasback	<i>Aythya valisineria</i>
Carolina chickadee	<i>Poecile carolinensis</i>
Carolina wren	<i>Thryothorus ludovicianus</i>
Caspian tern	<i>Hydroprogne caspia</i>
Cedar waxwing	<i>Bombycilla cedrorum</i>
Cerulean warbler	<i>Dendroica cerulea</i>
Chimney swift	<i>Chaetura pelagica</i>
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>
Cliff swallow	<i>Petrochelidon pyrrhonota</i>
Common brushtail	<i>Trichosurus vulpecula</i>
Common goldeneye	<i>Bucephala clangula</i>
Common grackle	<i>Quiscalus quiscula</i>
Common greenbrier	<i>Smilax rotundifolia</i>
Common green darner	<i>Anax junius</i>
Common merganser	<i>Mergus merganser</i>
Common moorhen	<i>Gallinula chloropus</i>
Common nighthawk	<i>Chordeiles minor</i>
Common periwinkle	<i>Littorina littorea</i>
Common reed	<i>Phragmites australis</i>
Common ribbon snake	<i>Thamnophis sauritus</i>
Common snipe	<i>Gallinago gallinago</i>
Common tern	<i>Sterna hirundo</i>
Confused cloudywing butterfly	<i>Thorybes confusis</i>
Cooper's hawk	<i>Accipiter cooperii</i>
Cotton mouse	<i>Peromyscus gossypinus</i>
Crayfish	<i>Cambarus</i> sp.
Cuthbert turtlehead	<i>Chelone cuthbertii</i>
Dark-eyed junco	<i>Junco hyemalis</i>
Devil crayfish	<i>Cambarus diogenes</i>

Species Scientific Names

Diana fritillary	<i>Speyeria diana</i>
Dickcissel	<i>Spiza americana</i>
Domestic cat	<i>Felis catus</i>
Double-crested cormorant	<i>Phalacrocorax auritus</i>
Douglas fir	<i>Pseudotsuga menziesii</i>
Dunlin	<i>Calidris alpina</i>
Dwarf waterdog	<i>Necturus punctatus</i>
Eastern amberwing	<i>Perithemis tenera</i>
Eastern box turtle	<i>Terrapene carolina</i>
Eastern cottontail	<i>Sylvilagus floridanus</i>
Eastern fence lizards	<i>Sceloporus undulatus</i>
Eastern hog-nosed snake	<i>Heterodon platirhinos</i>
Eastern kingbird	<i>Tyrannus tyrannus</i>
Eastern lesser siren	<i>Siren intermedia intermedia</i>
Eastern meadowlark	<i>Sturnella magna</i>
Eastern mud salamander	<i>Pseudotriton montanus montanus</i>
Eastern mud snake	<i>Farancia abacura abacura</i>
Eastern painted turtle	<i>Chrysemys picta picta</i>
Eastern pond hawk	<i>Erythemis simplicicollis</i>
Eastern red bat	<i>Lasiurus borealis</i>
Eastern slender glass lizard	<i>Ophisaurus attenuates longicaudus</i>
Eastern spadefoot toad	<i>Scaphiopus holbrookii</i>
Eastern towhee	<i>Pipilo erythrophthalmus</i>
Eastern wood-pewee	<i>Contopus virens</i>
European starling	<i>Sturnus vulgaris</i>
Evening bat	<i>Nycticeius humeralis</i>
Feral hogs	<i>Sus scrofa</i>
Field sparrow	<i>Spizella pusilla</i>
Flowering dogwood	<i>Cornus florida</i>

Forster's tern	<i>Sterna forsteri</i>
Fox squirrel	<i>Sciurus niger</i>
Fragile forktail	<i>Ischnura posita</i>
Gadwall	<i>Anas strepera</i>
Gizzard shad	<i>Dorosoma cepedianum</i>
Glossy crayfish snake	<i>Regina rigida</i>
Glossy ibis	<i>Plegadis falcinellus</i>
Golden-crowned kinglet	<i>Regulus satrapa</i>
Grasshopper sparrow	<i>Ammodramus savannarum</i>
Gray catbird	<i>Dumetella carolinensis</i>
Gray fox	<i>Urocyon cinereoargenteus</i>
Gray squirrel	<i>Sciurus carolinensis</i>
Great blue heron	<i>Ardea herodias</i>
Great blue skimmer	<i>Libellula vibrans</i>
Great crested flycatcher	<i>Myiarchus crinitus</i>
Great egret	<i>Ardea alba</i>
Greater scaup	<i>Aythya marila</i>
Greater siren	<i>Siren lacertina</i>
Green heron	<i>Butorides virescens</i>
Green-winged teal	<i>Anas crecca</i>
Gypsy moth	<i>Lymantria dispar</i>
Hermit thrush	<i>Catharus guttatus</i>
Herring gull	<i>Larus argentatus</i>
Hickory shad	<i>Alosa mediocris</i>
Hoary bat	<i>Lasiurus cinereus</i>
Hooded merganser	<i>Lophodytes cucullatus</i>
Hooded warbler	<i>Wilsonia citrina</i>
Hydrilla	<i>Hydrilla verticillata</i>
Indigo bunting	<i>Passerina cyanea</i>

Species Scientific Names

Ironcolor shiner	<i>Notropis chalybaeus</i>
Japanese privet	<i>Ligustrum japonicum</i>
Japanese stiltgrass	<i>Microstegium vimineum</i>
Japanese wisteria	<i>Wisteria floribunda</i>
Kentucky warbler	<i>Oporornis formosus</i>
Killdeer	<i>Charadrius vociferus</i>
King rail	<i>Rallus elegans</i>
Lake chubsucker	<i>Erimyzon sucetta</i>
Least bittern	<i>Ixobrychus exilis</i>
Least brook lamprey	<i>Lampetra aepyptera</i>
Least sandpiper	<i>Calidris minutilla</i>
Lesser scaup	<i>Aythya affinis</i>
Little blue heron	<i>Egretta caerulea</i>
Little brown bat	<i>Myotis lucifugus</i>
Littleleaf sensitive-briar	<i>Mimosa microphylla</i>
Loblolly pine	<i>Pinus taeda</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>
Longleaf pine	<i>Pinus palustris</i>
Long-stalked crowfoot	<i>Ranunculus hederaceus</i>
Long-tailed duck	<i>Clangula hyemalis</i>
Louisiana waterthrush	<i>Seiurus motacilla</i>
Magnolia warbler	<i>Dendroica magnolia</i>
Mallard	<i>Anas platyrhynchos</i>
Many-lined salamander	<i>Stereochilus marginatus</i>
Marsh senna	<i>Chamaecrista fasciculata</i> var. <i>macrosperma</i>
Marsh wren	<i>Cistothorus palustris</i>
Mockernut hickory	<i>Carya tomentosa</i>
Moth species	Apameini spp.
Mourning dove	<i>Zenaida macroura</i>

Mud sunfish	<i>Acantharchus pomotis</i>
Muscadine	<i>Vitis rotundifolia</i>
Muskrat	<i>Ondatra zibethicus</i>
Mute swan	<i>Cygnus olor</i>
Nashville warbler	<i>Vermivora ruficapilla</i>
New Jersey rush	<i>Juncus caesariensis</i>
Northern bobwhite	<i>Colinus virginianus</i>
Northern cardinal	<i>Cardinalis cardinalis</i>
Northern diamondback terrapin	<i>Malaclemys terrapin terrapin</i>
Northern flicker	<i>Colaptes auratus</i>
Northern harrier	<i>Circus cyaneus</i>
Northern parula	<i>Parula americana</i>
Northern pintail	<i>Anas acuta</i>
Northern river otter	<i>Lontra canadensis</i>
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>
Northern scarlet snake	<i>Cemophora coccinea copei</i>
Northern shoveler	<i>Anas clypeata</i>
Northern waterthrush	<i>Seiurus noveboracensis</i>
Norway rat	<i>Rattus norvegicus</i>
Nutria	<i>Myocastor coypus</i>
Oak toad	<i>Anaxyrus quercicus</i>
Ohio shrimp	<i>Macrobrachium ohione</i>
Orchard oriole	<i>Icterus spurius</i>
Ovenbird	<i>Seiurus aurocapillus</i>
Pales weevil	<i>Hylobius pales</i>
Parker's pipewort	<i>Eriocaulon parkeri</i>
Peregrine falcon	<i>Falco peregrinus</i>
Pied-billed grebe	<i>Podilymbus podiceps</i>
Pine warbler	<i>Dendroica pinus</i>

Species Scientific Names

Poison ivy	<i>Toxicodendron radicans</i>
Post oak	<i>Quercus stellata</i>
Prairie warbler	<i>Dendroica discolor</i>
Princess tree	<i>Paulownia tomentosa</i>
Prothonotary warbler	<i>Protonotaria citrea</i>
Purple finch	<i>Carpodacus purpureus</i>
Queen snake	<i>Regina septemvittata</i>
Raccoon	<i>Procyon lotor</i>
Rafinesque's big-eared bat	<i>Plecotus rafinesquii</i>
Rainbow snake	<i>Farancia erythrogramma</i>
Rare skipper	<i>Problema bulenta</i>
Red-bellied woodpecker	<i>Melanerpes carolinus</i>
Red-breasted merganser	<i>Mergus serrator</i>
Red-breasted nuthatch	<i>Sitta canadensis</i>
Red-eyed vireo	<i>Vireo olivaceus</i>
Red fox	<i>Vulpes vulpes</i>
Redhead	<i>Aythya americana</i>
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>
Red knot	<i>Calidris canutus</i>
Red maple	<i>Acer rubrum</i>
Red milkweed	<i>Asclepias rubra</i>
Red-necked phalarope	<i>Phalaropus lobatus</i>
Red oak	<i>Quercus rubra</i>
Red-shouldered hawk	<i>Buteo lineatus</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Ring-necked duck	<i>Aythya collaris</i>
River bulrush	<i>Bolboschoenus fluviatilis</i>
River herring	<i>Alosa chrysochloris</i>
River shrimp	<i>Macrobrachium</i> sp.

Roanoke bass	<i>Ambloplites cavifrons</i>
Rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>
Ruddy duck	<i>Oxyura jamaicensis</i>
Rusty blackbird	<i>Euphagus carolinus</i>
Savannah sparrow	<i>Passerculus sandwichensis</i>
Scarlet kingsnake	<i>Lampropeltis triangulum elapsoides</i>
Scarlet tanager	<i>Piranga olivacea</i>
Sedge wren	<i>Cistothorus platensis</i>
Sensitive joint-vetch	<i>Aeschynomene virginica</i>
Short-billed dowitcher	<i>Limnodromus griseus</i>
Short-eared owl	<i>Asio flammeus</i>
Shrubby lespedeza	<i>Lespedeza bicolor</i>
Silver-haired bat	<i>Lasionycteris noctivagans</i>
Small whorled pogonia	<i>Isotria medeoloides</i>
Snow goose	<i>Chen caerulescens</i>
Song sparrow	<i>Melospiza melodia</i>
Sora	<i>Porzana carolina</i>
Southeastern fox squirrel	<i>Sciurus niger niger</i>
Southern chorus frog	<i>Pseudacris nigrita</i>
Southern pearly-eye butterfly	<i>Enodia portlandia</i>
Southern pine beetle	<i>Dendroctonus frontalis</i>
Southern red oak	<i>Quercus falcata</i>
Southern sugar maple	<i>Acer barbatum</i>
Spottail shiner	<i>Notropis hudsonius</i>
Spotted salamander	<i>Ambystoma maculatum</i>
Spotted sandpiper	<i>Actitis macularius</i>
Spotted turtle	<i>Clemmys guttata</i>
Spring azure butterfly	<i>Celastrina ladon</i>
Striped bass	<i>Morone saxatilis</i>

Species Scientific Names

Striped skunk	<i>Mephitis mephitis</i>
Summer tanager	<i>Piranga rubra</i>
Sunfacing coneflower	<i>Rudbeckia heliopsidis</i>
Swainson's thrush	<i>Catharus ustulatus</i>
Swainson's warbler	<i>Limnothlypis swainsonii</i>
Swamp bay	<i>Persea palustris</i>
Swamp pink	<i>Helonias bullata</i>
Swamp sparrow	<i>Melospiza georgiana</i>
Sweetgum	<i>Liquidambar styraciflua</i>
Tidewater interstitial amphipod	<i>Stygobromus araeus</i>
Tidewater mucket	<i>Leptodea ochracea</i>
Tree-of-heaven	<i>Ailanthus altissima</i>
Tricolored bat	<i>Glyphonhycteris sylvestris</i>
Tricolored heron	<i>Egretta tricolor</i>
Tufted titmouse	<i>Baeolophus bicolor</i>
Tundra goose	<i>Anser fabalis</i>
Tundra swan	<i>Cygnus columbianus</i>
Turkey oak	<i>Quercus laevis</i>
Upland sandpiper	<i>Bartramia longicauda</i>
Vesper sparrow	<i>Pooecetes gramineus</i>
Virginia least trillium	<i>Trillium pusillum</i> var. <i>virginianum</i>
Virginia pine	<i>Pinus virginiana</i>
Wax myrtle	<i>Morella cerifera</i>
White oak	<i>Quercus alba</i>
Wild turkey	<i>Meleagris gallopavo</i>
Willet	<i>Tringa semipalmata</i>
Willow oak	<i>Quercus phellos</i>
Wilson's snipe	<i>Gallinago delicata</i>
Whip-poor-will	<i>Caprimulgus vociferus</i>

White-eyed vireo	<i>Vireo griseus</i>
White-tailed deer	<i>Odocoileus virginianus</i>
White-throated sparrow	<i>Zonotrichia albicollis</i>
Willow flycatcher	<i>Empidonax traillii</i>
Winter wren	<i>Troglodytes troglodytes</i>
Wood duck	<i>Aix sponsa</i>
Wood frog	<i>Lithobates sylvaticus</i>
Wood thrush	<i>Hylocichla mustelina</i>
Worm-eating warbler	<i>Helmitheros vermivorum</i>
Yellow-bellied flycatcher	<i>Empidonax flaviventris</i>
Yellow-bellied sapsucker	<i>Sphyrapicus varius</i>
Yellow-bellied slider	<i>Trachemys scripta scripta</i>
Yellow-billed cuckoo	<i>Coccyzus americanus</i>
Yellow-breasted chat	<i>Icteria virens</i>
Yellow-crowned night-heron	<i>Nyctanassa violacea</i>
Yellow lampmussel	<i>Lampsilis cariosa</i>
Yellow perch	<i>Perca flavescens</i>
Yellow poplar	<i>Liriodendron tulipifera</i>
Yellow-throated vireo	<i>Vireo flavifrons</i>
Yellow-throated warbler	<i>Dendroica dominica</i>
Yellow warbler	<i>Dendroica petechia</i>

Appendix A



Matt Tillet

Brown-headed nuthatch

Resources of Concern

Introduction

Congress has entrusted the U.S. Fish and Wildlife Service (USFWS, Service, we, our) to conserve and protect migratory birds and fish, federally listed threatened and endangered species, interjurisdictional fishes, wetlands, and certain marine mammals. These are known as “trust resources.”

In addition to this Service mandate, each refuge has one or more purposes for which it was established that guide its management goals and objectives. Further, refuges support other elements of biological diversity including invertebrates, rare plants, unique natural communities, and ecological processes that contribute to biological diversity, integrity, and environmental health at the refuge, ecosystem, and broader scales (USFWS 1999, USFWS 2003).

Given the multitude of purposes, mandates, policies, regional, and national plans that can apply to a refuge, there is a need to identify the potential resources of concern and then prioritize those resources that the refuge is best suited to focus on in its management strategies. We followed the process detailed in the *Identifying Refuge Resources of Concern and Management Priorities: A Handbook* (Paveglio and Taylor 2010). The following narrative details the process we used to identify priority resources of concern and develop habitat goals, objectives, and strategies to benefit these resources associated with James River National Wildlife Refuge (NWR).

I. What is a Resource of Concern?

The Habitat Management Plan policy (620 FW) defines “resources of concern” as

*All plant and/or animal **species, species groups, or communities** specifically identified in Refuge purpose(s), System mission, or international, national, regional, State, or ecosystem conservation plans or acts. For example, waterfowl and shorebirds are a resource of concern on a refuge whose purpose is to protect ‘migrating waterfowl and shorebirds.’ Federal or State threatened and endangered species on that same refuge are also a resource of concern under terms of the respective endangered species acts.*

II. Identifying Potential Resources of Concern for the Refuge

In collaboration with refuge planning staff and technical experts (see chapter 5), we developed a matrix of potential resources of concern for the refuge. To determine the potential resources of concern that would guide the management priorities at James River NWR, we examined a multitude of guiding documents and other information sources. These documents, plans, or policies typically identify resources of concern, species groups, or habitats. These sources fall into four categories:

- Legal Mandates.
- USFWS Trust Resources.
- Biological Integrity, Diversity, and Environmental Health Policy.
- Regional Conservation Plans.

a. Legal Mandates

i. Statutory Authority

National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd–668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Refuge Improvement Act) (Public Law 105-57; 111 Stat. 1253) provides guidelines and directives for administration and management of all areas in the system, including “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.”

The Refuge Improvement Act states that each refuge shall be managed to fulfill the mission of the Refuge System: “*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.*” (Public Law 105-57)

ii. Enabling Legislation

The enabling legislation is the legal authority used to establish a new refuge and acquire lands for that refuge.

The purpose of the Endangered Species Act of 1973, as amended (ESA; 7 U.S.C. § 136; 16 U.S.C. 1531 et seq.), is to protect and recover imperiled species and the ecosystems upon which they depend. The ESA provides authority to acquire habitat specifically for endangered species, in addition to acquisition authorities previously vested in the Secretary of the Interior.

The ESA authority was used to establish and acquire land for the creation of the James River NWR. The Chesapeake Bay Bald Eagle Recovery Team recommended the establishment of this refuge to protect vital bald eagle roosting and nesting habitat. At the time of refuge establishment, bald eagles were federally listed endangered and the James River NWR was the fourth refuge established specifically for the protection of bald eagles.

iii. Refuge Purpose

Purposes of a refuge are those 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.

The purpose of James River NWR is derived from the ESA, and is specifically “*...to conserve (A) fish or wildlife which are listed as endangered species or threatened species...or (B) plants.*”

b. USFWS Trust Resources

Although the refuge purposes are the first obligation, managing for trust resources (defined above) is also a priority for the refuge. Trust resources are further defined as follows:

i. Migratory Birds

A list of all species of migratory birds protected by the Migratory Bird Treaty Act (MBTA, 16 U.S.C. 703–711) and subject to the regulations on migratory birds are contained in subchapter B of 50 CFR § 10.13. The Migratory Birds Program also maintains subsets of this list that provide priorities at the national, regional, and ecoregional (bird conservation region) scales.

The primary sources of information that the refuge used to identify potential migratory birds species of concern included:

- ❖ The South Atlantic migratory bird initiative plan (Bird Conservation Region [BCR] 27).
- ❖ The Mid-Atlantic/Southern New England draft implementation plan (BCR 30).
- ❖ Partners in Flight (PIF) Mid-Atlantic Coastal Plain Priority Species List (PIF 44).
- ❖ USFWS's 2008 birds of conservation concern list.
- ❖ The North American Waterbird conservation plan.
- ❖ The Atlantic Coast Joint Venture (ACJV) Waterfowl implementation plan.

ii. Interjurisdictional Fish

This group includes those fish populations “...that two or more States, nations, or Native American tribal governments manage because of their geographic distribution or migratory patterns” (710 FW 1.5H). Examples include anadromous species of salmon and free-roaming species endemic to large river systems, such as paddlefish and sturgeon (FWS Director’s Order No. 132, Section 6[c]).

The primary sources of information that the refuge used to identify potential fish species of concern included the Atlantic States Marine Fisheries Commission list of interjurisdictional fish.

iii. Marine Mammals

The Marine Mammal Protection Act of 1972 (16 U.S.C. 1361-1407) prohibits, with certain exceptions, the taking of marine mammals in U.S. waters and by U.S. citizens on the high seas, and the importing of marine

mammals and marine mammal products into the U.S. No marine mammals were found to utilize James River NWR.

iv. Wetlands

The Emergency Wetlands Resources Act of 1986 (Public Law 99-645; 100 Stat. 3582) authorizes the purchase of wetlands from Land and Water Conservation Fund monies, removing a prior prohibition on such acquisitions. It requires the Secretary to establish a National Wetlands Priority Conservation Plan, requires the States to include wetlands in their Comprehensive Outdoor Recreation Plans, and transfers to the Migratory Bird Conservation Fund amounts equal to the import duties on arms and ammunition.

James River NWR wetlands are included in the list of wetlands that warrant protection (USFWS Regional Wetlands Concept Plan, Emergency Wetlands Resources Act, October 1990).

v. Threatened and Endangered Species

The ESA states that “*The Secretary of the Interior ... is designated as the Management Authority and the Scientific Authority for purposes of the Convention and the respective functions of each such Authority shall be carried out through the United States Fish and Wildlife Service.*” The ESA also requires all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act.

To identify Federal threatened or endangered species of relevance to James River NWR we reviewed:

- ❖ Federal Threatened and Endangered Species
 - FWS Environmental Online Conservation System (ECOS) database
 - National Marine Fisheries list
- ❖ Recovery Plans for federally listed species in our region

c. Biological Integrity, Diversity, and Environmental Health (BIDEH)

The 1997 National Wildlife Refuge System Improvement Act states that in administering the System the Service shall “... *ensure that the biological integrity, diversity, and environmental health of the System are maintained...*” (601 FW 3; also known as the “Integrity Policy”). The USFWS (2003) defines these terms as:

- **Biological Diversity**—the variety of life and its processes, including the variety of living organisms, the genetic differences between them, and the communities and ecosystems in which they occur.
- **Biological Integrity**—biotic composition, structure, and functioning at genetic, organism, and community levels comparable with historic conditions, including the natural biological processes that shape genomes, organisms, and communities.

- **Environmental Health**—composition, structure, and functioning of soil, water, air, and other abiotic features comparable with historic conditions, including the natural abiotic processes that shape the environment.

Where possible management on the refuge restores or mimics natural ecosystem processes or functions and thereby maintains biological diversity, integrity, and environmental health. Given the continually changing environmental conditions and landscape patterns of the past and present (e.g., rapid development, climate change, sea level rise), relying on natural processes is not always feasible nor always the best management strategy for conserving wildlife resources. Uncertainty about the future requires that the refuge manage within a natural range of variability rather than emulating an arbitrary point in time. This maintains mechanisms that allow species, genetic strains, and natural communities to evolve with changing conditions, rather than necessarily trying to maintain stability.

As stated by Meretsky et al. (2006), the Integrity Policy directs refuges to assess their importance across landscape scales and to “*forge solutions to problems arising outside refuge boundaries.*” Some of these regional land use problems include habitat fragmentation/lack of connectivity, high levels of contaminants, and incompatible development or recreational activities.

To assess the historical condition, site capability, current regional landscape conditions, and biological diversity and environmental health data pertinent to James River NWR, we used the following resources:

- Current maps of the refuge with existing vegetative communities.
- Descriptions from the Northeast Terrestrial Wildlife Habitat Classification (Gawler 2008).

Table A.1 describes the BIDEH elements for existing habitats on the refuge.

Table A.1 Summary of Biological Integrity, Diversity, and Environmental Health (BIDEH) Elements of James River NWR

Broad Habitat Type	Population/Habitat Attributes	Natural Processes Responsible for these Conditions	Limiting Factors
Pine-dominated Forest	<p>Abandoned loblolly pine plantations or early-successional loblolly pine forests established after agriculture ended. Soil and topography result in more moist conditions than upland pine stands in sandy conditions. Canopy dominated by loblolly pine with varying amounts of white, red, black, and post oaks in both upper and mid-canopy. Sweetgum may be present but not generally dominant. Shrub layer is of variable closure and often characterized by American holly, wax myrtle, or swamp bay. Vines such as common greenbrier, muscadine, and poison ivy can contribute considerable midstory cover. Herbaceous layer is sparse to non-existent, or made of exotic species such as Japanese stiltgrass.</p> <p><i>Potential Conservation Species: brown-headed nuthatch, chuck-will's-widow, eastern hognose snake, eastern slender glass lizard, northern scarletsnake, oak toad, pine warbler, red-headed woodpecker, silver-haired bat, southeastern fox squirrel, southern chorus frog, yellow-billed cuckoo</i></p>	<p>Historical agricultural use removed original forest cover and kept areas clear of woody vegetation until farming stopped. Most recently loblolly pines were densely planted for silviculture. Periodic natural-process fire reduces understory vegetation.</p>	<p>Disease occurs in high density stands. Invasive species spread in the understory. Large storm events with strong wind components. Legacy of historic plantings driving current community composition and structure. Suppression of fire.</p>
Moist Hardwood Forest	<p>Moist upland forested areas typically found on lower slopes, bluffs along streams and rivers in dissected terrain, mesic flats between drier pine-dominated uplands and floodplains, and local raised areas within bottomland terraces or wet flats. Forest stands are naturally sheltered from frequent fire. Soils are variable in both texture and pH. Vegetation consists of tree-dominated forest and includes a significant component of mesophytic deciduous hardwood species, such as beech or southern sugar maple. Upland and bottomland oaks at the mid range of moisture tolerance are also usually present, particularly white oak, but sometimes also southern red oak, Virginia pine, and loblolly pine are present but not dominant. Shrub and herb layers may be sparse or moderately dense.</p>	<p>Located on active floodplains or river terraces and subject to temporary or seasonal flooding. Also occurs along or on steep slopes or ravines. Dominant hardwood species composition and moist soils reduces fire's effect on this habitat.</p>	<p>Altered hydrology due to mechanical treatments or draining of moist areas. Invasive species can spread and change the composition of understory vegetation.</p>

Broad Habitat Type	Population/Habitat Attributes	Natural Processes Responsible for these Conditions	Limiting Factors
Moist Hardwood Forest (cont.)	<i>Potential Conservation Species: Apameini spp., barking treefrog, black-and-white warbler, cerulean warbler, chimney swift, eastern box turtle, eastern mud salamander, eastern spadefoot, eastern wood-pewee, ovenbird, red-shouldered hawk, small whorled pogonia, whip-poor-will, wood thrush, worm-eating warbler</i>		
Floodplain Forest	<p>Includes forest that occurs on floodplains of smaller streams, where fine-textured silt and clay sediment predominates. Depositional landforms, such as a natural levee, are often distinctly present but fairly small. They help create variation in the duration of flooding and nutrient input. Soils are generally fertile and not strongly acidic. Flooding is generally seasonal but may range to nearly semi-permanent. Bald cypress and tupelo dominate in wetter sites. Forested stands with oaks and other bottomland hardwoods are present in more mesic areas. Understory, shrub, and herb layers are generally well-developed.</p> <p><i>Potential Conservation Species: acadian flycatcher, bald eagle, confused cloudywing butterfly, cotton mouse, dwarf waterdog, eastern lesser siren, eastern mudsnake, hoary bat, hooded warbler, Kentucky warbler, little brown bat, Louisiana waterthrush, many-lined salamander, marbled salamander, prothonotary warbler, Rafinesque's big-eared bat, spotted salamander, wood duck, yellow-throated vireo, yellow-throated warbler</i></p>	Relies on seasonal flooding or perched water tables. Soils typically contain a shallow organic layer over mineral soils. Dominant species composition and flooded soils reduces the effect of fire.	Altered hydrology due to a change in the duration or frequency of seasonal flooding. Invasive species spread and change the composition of the understory.
Freshwater Marsh and Shrub Swamp	<p>Tidal freshwater marshes characterized by fresh to oligohaline waters driven by irregular tides. Predominantly found in the drowned creeks and inland estuary shores of the embayed region. Marshes typically occur as complexes dominated by large graminoids such as salt hay, bulrushes, cattails, and rushes, sometimes with species-rich associations of shorter graminoids, forbs, and floating or submerged aquatics.</p> <p><i>Potential Conservation Species: American black duck, common ribbon snake, eastern painted turtle, king rail, least bittern, marsh rabbit, marsh senna, marsh wren, northern river otter, rainbow snake, rare skipper, river bulrush, sensitive joint-vetch, sora, spotted turtle</i></p>	Irregular flooding and fire are both important forces in this system.	Sea level rise as a result of climate change altering water levels that could affect species composition. Dredging of James River and the placement of dredged soils around this habitat. Spread of monospecific colonies of common reed and/or other invasive species.

Broad Habitat Type	Population/Habitat Attributes	Natural Processes Responsible for these Conditions	Limiting Factors
Aquatic Habitats	<p>Open water on the refuge, primarily present as waters of James River and Powell Creek, but also includes to lesser degree streams that flow into Flowerdew Hundred Creek and three small seasonal inland ponds. Also includes submerged aquatic vegetation, characterized by presence of horned, sago, and claspingleaf pondweed. A host of macroalgae is also an important system component.</p> <p><i>Potential Conservation Species: alewife, alewife floater, American eel, American shad, Atlantic sturgeon, blueback herring, devil crayfish, hickory shad, river shrimp, striped bass, tidewater mucket</i></p>	Continuously flooded and occurs in deepwater pools and tidal creeks.	Sea level rise as a result of climate change altering water depth and clarity that can effect light penetration. Vulnerable to pollution run-off.
Erosional Bluff	<p>Steep, linear cliffs where erosion in alluvial deposits has left tall (great than 3 meters), nearly vertical banks of sand, silt, clay, or a mixture. Typically develop in landscapes that are otherwise of rather low relief. Substrate is unconsolidated and provides habitat for animals that burrow into steep banks, such as bank swallows and certain invertebrates. Vegetation is sparse, mostly herbaceous, and variable in composition.</p> <p><i>Potential Conservation Species: bank swallow</i></p>	Formed through erosion of soft bank soils by river flow.	Storms and major weather events cause increased slope sloughing and removal of vegetation.

d. Regional Conservation Plans

James River NWR exists within a larger conservation landscape. To evaluate the role that the refuge can play in supporting the priorities of other agencies, groups, and entities, other conservation plans were reviewed. The first priority for the refuge is to meet the obligations of its purpose and other legal mandates. Supporting other conservation priorities can be considered when they align within the framework of the refuge purpose and legal mandates.

The primary sources of information that the refuge used to identify other conservation priorities included:

- North Atlantic Landscape Conservation Cooperative’s (LCC) representative species list for the mid-Atlantic sub-region.
- North Atlantic LCC list of priority fish species within the Lower Chesapeake watershed.
- Virginia Wildlife Action Plan (WAP).
- The Nature Conservancy (TNC) Chesapeake Bay Lowlands Ecoregional Plan.

e. Summary Table

Table A.2 is a comprehensive list of species potentially occurring or known to occur in the refuge vicinity that are considered to be conservation priorities by the Service, as well as other agencies, groups, or entities. A complete list of species known to be present on the refuge, regardless of conservation priority status, is available upon request.

*Guide to Table A-2*¹ Refuge Purpose

X = Species 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.

² Potential Priority Refuge Resources of Concern

X = All species considered either priority refuge resources of concern or other benefitting species.

³ Refuge Occurrence

X = Species occurrence on the refuge provided by several physical surveys, observations, and species inventories compiled by USFWS.

⁴ Federal T&E

Federal Endangered Species List. E - Endangered; T - Threatened; C - Candidate.

⁵ VA T&E

Virginia Endangered Species List. E - Endangered; T - Threatened.

⁶ VA NHP

Virginia Natural Heritage Program (VA NHP). S1 - Extremely Rare; S2 - Very Rare; S3 - Rare; S4 - Common; SH - Potentially Rediscoverable Species; SX - Extirpated; SU - Uncertain; S_S_ - Range of Rank; S_B - Breeding Status; S_B/S_N - Breeding and Nonbreeding Status.

⁷ BCR 27

BCR 27. HH - Highest Priority; H - High Priority; M - Moderate Priority.

⁸ BCR 30

BCR 30. HH - Highest Priority; H - High Priority; M - Moderate Priority.

⁹ PIF 44

PIF Mid-Atlantic Coastal Plain Priority Species Table. 1A - High Continental Priority, High Regional Responsibility; 1B - High Continental Priority, Low Regional Responsibility; 2A - High Regional Concern; 2B - High Regional Responsibility; 2C - High Regional Threats; 3 - National Priority (No Regional Priority).

¹⁰VA WAP

1 - Critical Conservation Need (Tier 1); 2 - Very High Conservation Need (Tier 2); 3 - High Conservation Need (Tier 3); 4- Moderate Conservation Need (Tier 4).

¹¹USFWS Birds of Conservation Concern

X = Species considered to be of conservation concern for the USFWS.

¹²North American Waterbird Plan

HH: Highest - Population declines and low population numbers; H: High - Population declines; M: Moderate - Population declines or stable population with potential threats but restricted distributions or small population and restricted distribution; L: Low - Populations stable with threats or populations increasing with threats and restricted distributions or large populations with threats and restricted distributions.

¹³ACJV Waterfowl Conservation Need

HH: Highest; H: High; MH: Moderately High; M: Moderate; ML: Moderately Low; L: Low. When both breeding and non-breeding populations occur, the highest ranking is used.

¹⁴TNC Chesapeake Bay Lowlands Ecoregional Plan

1 - Primary Priority; 2 - Secondary Priority.

¹⁵North Atlantic LCC

X = Representative species in Mid-Atlantic sub-region of the North Atlantic LCC; Numerical values denote General Habitat Type in the plan that corresponds to habitat mapped on the refuge; AQ = Representative species for aquatic systems in the North Atlantic LCC.

Table A.2 Comprehensive List of Conservation Priority Species Potentially Occurring or Known to Occur at James River NWR

Common Name	Refuge Purpose ¹	Potential Priority Refuge Resources of Concern ²	Refuge Occurrence ³	Federal T&E ⁴	VA T&E ⁵	VA NHP ⁶	BCR 27 ⁷	BCR 30 ⁸	PIF 44 ⁹	VA WAP ¹⁰	USFWS Birds of Conservation Concern ¹¹	North American Waterbird Plan ¹²	ACJV Waterfowl Conservation Need ¹³	TNC Chesapeake Bay Lowlands Ecoregional Plan ¹⁴	North Atlantic LCC ¹⁵
LANDBIRDS															
Acadian flycatcher		X	X				M		2B						
Bald eagle	X	X	X			S2S3B/ S3N		M		II	X				
Baltimore oriole								H							
Bank swallow		X				S3B									27
Barn owl						S3B/ S3N				III					
Black-and-white warbler		X	X					H		IV					3
Blackburnian warbler						S2B		M							
Blackpoll warbler							M								
Black-throated green warbler							HH			I					
Blue-winged warbler						S3B		HH	1B	IV	X				29
Bobolink			X			S1B	M								
Broad-winged hawk								H							
Brown creeper			X			S3B/ S5N				IV				2	
Brown thrasher			X				H	H	2A	IV					29
Brown-headed nuthatch		X	X			S3S4	H	M	1B	IV	X			2	13
Canada warbler						S3S4B		M		IV					

Common Name	Refuge Purpose ¹	Potential Priority Refuge Resources of Concern ²	Refuge Occurrence ³	Federal T&E ⁴	VA T&E ⁵	VA NHP ⁶	BCR 27 ⁷	BCR 30 ⁸	PIF 44 ⁹	VA WAP ¹⁰	USFWS Birds of Conservation Concern ¹¹	North American Waterbird Plan ¹²	ACJV Waterfowl Conservation Need ¹³	TNC Chesapeake Bay Lowlands Ecoregional Plan ¹⁴	North Atlantic LCC ¹⁵
Carolina chickadee			X						2A						
Cerulean warbler		X				S3S4B	HH	M	1B	II	X				
Chimney swift		X	X				H	H	2A	IV					
Chuck-will's-widow		X	X				H		3B	IV					
Cliff swallow						S3S4B									
Common nighthawk															21
Cooper's hawk			X			S3B/ S3N									
Dickcissel						S2S3B									
Eastern kingbird							H	H	2A	IV					
Eastern meadowlark							H			IV					28
Eastern towhee			X				H	H	2A	IV					22
Eastern wood-pewee		X	X				H		2A	IV					4
Field sparrow							H	H	1A	IV					
Golden-crowned kinglet			X			S2B/ S5N									
Grasshopper sparrow							H	M	2C	IV					28
Gray catbird			X					M	2A	IV					
Great crested flycatcher			X					H							
Hermit thrush			X			S1B/ S5N									

Common Name	Refuge Purpose ¹	Potential Priority Refuge Resources of Concern ²	Refuge Occurrence ³	Federal T&E ⁴	VA T&E ⁵	VA NHP ⁶	BCR 27 ⁷	BCR 30 ⁸	PIF 44 ⁹	VA WAP ¹⁰	USFWS Birds of Conservation Concern ¹¹	North American Waterbird Plan ¹²	ACJV Waterfowl Conservation Need ¹³	TNC Chesapeake Bay Lowlands Ecoregional Plan ¹⁴	North Atlantic LCC ¹⁵
Hooded warbler		X	X				M		1A					2	
Indigo bunting			X				M								
Kentucky warbler		X	X				H	H	1A	IV	X			2	23
Loggerhead shrike					T	S2B/ S3N		M		I	X				
Louisiana waterthrush		X	X				M	H		IV					23
Magnolia warbler						S2B									
Marsh wren		X					M	H	2A	IV					10
Nashville warbler						S1B									
Northern bobwhite							H	H	2A	IV					
Northern flicker			X				H	H							
Northern harrier						S1S2B/ S3N				III				2	
Northern parula			X				M			IV					
Northern rough-winged swallow										IV					
Northern saw-whet owl						S1B/ S2N				II					
Northern waterthrush						S1B									
Orchard oriole							M								
Ovenbird		X	X							IV					4
Peregrine falcon					T	S1B/ S2N				I	X				

Common Name	Refuge Purpose ¹	Potential Priority Refuge Resources of Concern ²	Refuge Occurrence ³	Federal T&E ⁴	VA T&E ⁵	VA NHP ⁶	BCR 27 ⁷	BCR 30 ⁸	PIF 44 ⁹	VA WAP ¹⁰	USFWS Birds of Conservation Concern ¹¹	North American Waterbird Plan ¹²	ACJV Waterfowl Conservation Need ¹³	TNC Chesapeake Bay Lowlands Ecoregional Plan ¹⁴	North Atlantic LCC ¹⁵
Pine warbler		X	X				M		2B						
Prairie warbler			X				H	HH	1A	IV	X				13
Prothonotary warbler		X	X				H	H	1A	IV				2	23
Purple finch			X			S1B/ S5N									
Red-bellied woodpecker			X				M								
Red-breasted nuthatch			X			S2B/ S4N									
Red-headed woodpecker		X	X				H	M	3B		X				
Red-shouldered hawk		X	X												3
Rose-breasted grosbeak										IV					
Rusty blackbird			X				H	H		IV	X				
Savannah sparrow						S3S4B/ S4N									
Scarlet tanager			X					H	1A	IV					
Sedge wren						S1B/ S1S2N	M	M	2C	III	X				
Short-eared owl						S1B/ S2N			2C		X				
Summer tanager			X				M								
Swainson's thrush						S1B									
Swainson's warbler			X			S2B	H	M	1B	II				2	
Swamp sparrow			X			S1B/ S4S5N									

Common Name	Refuge Purpose ¹	Potential Priority Refuge Resources of Concern ²	Refuge Occurrence ³	Federal T&E ⁴	VA T&E ⁵	VA NHP ⁶	BCR 27 ⁷	BCR 30 ⁸	PIF 44 ⁹	VA WAP ¹⁰	USFWS Birds of Conservation Concern ¹¹	North American Waterbird Plan ¹²	ACJV Waterfowl Conservation Need ¹³	TNC Chesapeake Bay Lowlands Ecoregional Plan ¹⁴	North Atlantic LCC ¹⁵
Vesper sparrow							H								
Whip-poor-will		X						H	1A	IV	X				3
White-eyed vireo			X				M								
White-throated sparrow			X				H								
Willow flycatcher								H		IV					
Winter wren						S2B/ S4N				II					
Wood thrush		X	X				H	HH	1A	IV	X				3
Worm-eating warbler		X	X				H	H	1A	IV	X			2	3
Yellow warbler										IV					
Yellow-bellied flycatcher			X			S1B									
Yellow-bellied sapsucker			X			S1B/ S4N				I					
Yellow-billed cuckoo		X	X				H		2A	IV					
Yellow-breasted chat			X							IV					
Yellow-throated vireo		X	X				M	H		IV					
Yellow-throated warbler		X	X				M		1A						
WATERBIRDS															
American coot						S1B/ S2N	HH					L			
Black-crowned night-heron						S3B/ S4N	H	M		III		M			

Common Name	Refuge Purpose ¹	Potential Priority Refuge Resources of Concern ²	Refuge Occurrence ³	Federal T&E ⁴	VA T&E ⁵	VA NHP ⁶	BCR 27 ⁷	BCR 30 ⁸	PIF 44 ⁹	VA WAP ¹⁰	USFWS Birds of Conservation Concern ¹¹	North American Waterbird Plan ¹²	ACJV Waterfowl Conservation Need ¹³	TNC Chesapeake Bay Lowlands Ecoregional Plan ¹⁴	North Atlantic LCC ¹⁵
Bonaparte's gull			X				M					M			
Caspian tern			X			S1B/ S2N						L			
Common moorhen						S1B/ S1N	H					M			
Common tern						S3B	HH	M		III		L			20
Double-crested cormorant			X			S2B/ S4S5N									
Forster's tern			X			S3B/ S3N	M	H	2B	IV		M			
Glossy ibis						S2B/ S1N	H	H		III		L			
Great blue heron			X			S3B/ S5N									
Great egret						S2S3B/ S3N	M								
Green heron										IV		L			
Herring gull			X									L			
King rail		X				S2B/ S3N		M		II		H			10
Least bittern		X				S3B/ S3N	H	M		III	X	H			10
Little blue heron			X			S2B/ S3N	H	M		II		H			
Pied-billed grebe						S1S2B/ S3N	H				X	H			
Sora		X				S1B/ S2N		M				H			
Tricolored heron						S2B/ S3N	H	M		III		H			
Yellow-crowned night-heron						S2S3B/ S3N	H	M		III		M			

Common Name	Refuge Purpose ¹	Potential Priority Refuge Resources of Concern ²	Refuge Occurrence ³	Federal T&E ⁴	VA T&E ⁵	VA NHP ⁶	BCR 27 ⁷	BCR 30 ⁸	PIF 44 ⁹	VA WAP ¹⁰	USFWS Birds of Conservation Concern ¹¹	North American Waterbird Plan ¹²	ACJV Waterfowl Conservation Need ¹³	TNC Chesapeake Bay Lowlands Ecoregional Plan ¹⁴	North Atlantic LCC ¹⁵
SHOREBIRDS															
American woodcock							HH	HH	1A	IV					
Common snipe								M							
Dunlin							H	H		IV					
Killdeer			X					M							
Least sandpiper							H	M							
Red knot	X			C		S2N	HH	HH		IV	X				20
Red-necked phalarope								M							
Short-billed dowitcher							H	H		IV	X				
Spotted sandpiper						S2B	M	M							
Upland sandpiper					T	S1B	H	M	2C	I	X				
Willet							H	H	3B						14
Wilson's snipe							H								
WATERFOWL															
American black duck		X	X				HH	HH	1A	II			H	2	23
American wigeon			X				H	M					ML		
Blue-winged teal						S1B/ S2N	H						M H		
Brant							HH	HH		III			H		
Bufflehead			X					H					M H		26

Common Name	Refuge Purpose ¹	Potential Priority Refuge Resources of Concern ²	Refuge Occurrence ³	Federal T&E ⁴	VA T&E ⁵	VA NHP ⁶	BCR 27 ⁷	BCR 30 ⁸	PIF 44 ⁹	VA WAP ¹⁰	USFWS Birds of Conservation Concern ¹¹	North American Waterbird Plan ¹²	ACJV Waterfowl Conservation Need ¹³	TNC Chesapeake Bay Lowlands Ecoregional Plan ¹⁴	North Atlantic LCC ¹⁵
Canada goose			X				HH	HH					HH		
Canvasback							HH	H					M H		26
Common goldeneye							H	M					ML		
Common merganser			X			S1B/ S4N							L		25
Gadwall			X			S2B/ S4N		M					ML		
Greater scaup								H		IV			H		
Green-winged teal			X					M					ML		
Hooded merganser			X					M					H		
Lesser scaup							HH	H					H		
Long-tailed duck								H					ML		
Mallard			X					H					H		
Northern pintail			X				HH	M					M		10
Northern shoveler			X										ML		
Red-breasted merganser								M					H		
Redhead							HH			III			ML		
Ring-necked duck			X										ML		25
Ruddy duck			X					M					M H		
Snow goose							HH								

Common Name	Refuge Purpose ¹	Potential Priority Refuge Resources of Concern ²	Refuge Occurrence ³	Federal T&E ⁴	VA T&E ⁵	VA NHP ⁶	BCR 27 ⁷	BCR 30 ⁸	PIF 44 ⁹	VA WAP ¹⁰	USFWS Birds of Conservation Concern ¹¹	North American Waterbird Plan ¹²	ACJV Waterfowl Conservation Need ¹³	TNC Chesapeake Bay Lowlands Ecoregional Plan ¹⁴	North Atlantic LCC ¹⁵
Tundra swan			X					H					H		
Wood duck		X	X					M					H		23
MAMMALS															
Cotton mouse		X				S3				IV					
Eastern red bat															23
Hoary bat		X				SUB/ S3N									
Little brown bat		X													
Marsh rabbit		X				S3				IV					
Northern river otter		X	X			S4									
Rafinesque's big-eared bat		X			E					I				1	
Silver-haired bat		X				SUB/ S4N									
Southeastern fox squirrel		X				S3				III					
REPTILES															
Black kingsnake						S2				III					
Common ribbon snake		X								IV					
Eastern box turtle		X								III					3
Eastern hognose snake		X								IV					13
Eastern mudsnake		X								IV					
Eastern painted turtle		X													25

Common Name	Refuge Purpose ¹	Potential Priority Refuge Resources of Concern ²	Refuge Occurrence ³	Federal T&E ⁴	VA T&E ⁵	VA NHP ⁶	BCR 27 ⁷	BCR 30 ⁸	PIF 44 ⁹	VA WAP ¹⁰	USFWS Birds of Conservation Concern ¹¹	North American Waterbird Plan ¹²	ACJV Waterfowl Conservation Need ¹³	TNC Chesapeake Bay Lowlands Ecoregional Plan ¹⁴	North Atlantic LCC ¹⁵
Eastern slender glass lizard		X								IV					
Glossy crayfish snake						S1				III					
Northern diamond-backed terrapin						S4				II					X
Northern scarlet snake		X								IV					
Queen snake										IV					
Rainbow snake		X				S3				IV					
Scarlet kingsnake						S2S4									
Spotted turtle		X								III					
Yellow-bellied slider										IV					
AMPHIBIANS															
Barking treefrog		X			T	S1				II				2	
Dwarf waterdog		X				S2S3				III					
Eastern lesser siren		X				S2S3				III					
Eastern mud salamander		X								IV					
Eastern spadefoot toad		X								IV					
Greater siren						S3				IV					
Many-lined salamander		X				S3				IV					
Marbled salamander		X													23

Common Name	Refuge Purpose ¹	Potential Priority Refuge Resources of Concern ²	Refuge Occurrence ³	Federal T&E ⁴	VA T&E ⁵	VA NHP ⁶	BCR 27 ⁷	BCR 30 ⁸	PIF 44 ⁹	VA WAP ¹⁰	USFWS Birds of Conservation Concern ¹¹	North American Waterbird Plan ¹²	ACJV Waterfowl Conservation Need ¹³	TNC Chesapeake Bay Lowlands Ecoregional Plan ¹⁴	North Atlantic LCC ¹⁵
Oak toad		X				S2				II					
Southern chorus frog		X				S3				IV					
Spotted salamander		X	X												24
Wood frog															24
FISH															
Alewife	X		X	C						IV					AQ
American brook lamprey			X			S3				IV					
American eel			X							IV					AQ
American shad			X							IV					AQ
Atlantic sturgeon	X		X	E	E	S2				II				1	
Banded sunfish						S3				IV					
Blackbanded sunfish					E	S1				I					
Blueback herring	X		X	C											
Bridle shiner						S2				I					
Ironcolor shiner						S3				IV					
Lake chubsucker						S2				IV					
Least brook lamprey						S3				IV					
Mud sunfish										IV					

Common Name	Refuge Purpose ¹	Potential Priority Refuge Resources of Concern ²	Refuge Occurrence ³	Federal T&E ⁴	VA T&E ⁵	VA NHP ⁶	BCR 27 ⁷	BCR 30 ⁸	PIF 44 ⁹	VA WAP ¹⁰	USFWS Birds of Conservation Concern ¹¹	North American Waterbird Plan ¹²	ACJV Waterfowl Conservation Need ¹³	TNC Chesapeake Bay Lowlands Ecoregional Plan ¹⁴	North Atlantic LCC ¹⁵
Roanoke bass						S3				II					
INVERTEBRATES															
Alewife floater						S3				IV					
Apameini spp.		X													
Confused cloudywing butterfly		X				S2S4									
Crayfish						S3									
Devil crayfish						S3									
Diana fritillary						S3				IV					
Rare skipper		X				S1S2				II				1	
River shrimp						S1				IV					
Southern pearly-eye butterfly						S3S4									
Spring azure butterfly						S2S4									
Tidewater interstitial amphipod						S3				III				1	
Tidewater mucket										IV					
Yellow lampmussel						S2				III					
HERBACEOUS VEGETATION															
Blue-hearts						S1S2									
Cuthbert turtlehead						S2								1	
Little-leaf sensitive-briars		X				S2									

Common Name	Refuge Purpose ¹	Potential Priority Refuge Resources of Concern ²	Refuge Occurrence ³	Federal T&E ⁴	VA T&E ⁵	VA NHP ⁶	BCR 27 ⁷	BCR 30 ⁸	PIF 44 ⁹	VA WAP ¹⁰	USFWS Birds of Conservation Concern ¹¹	North American Waterbird Plan ¹²	ACJV Waterfowl Conservation Need ¹³	TNC Chesapeake Bay Lowlands Ecoregional Plan ¹⁴	North Atlantic LCC ¹⁵
Marsh senna		X	X												
New Jersey rush						S2								1	
Parker's pipewort						S2								2	
Red milkweed						S2									
River bulrush		X				S2									
Sensitive joint-vetch	X	X		T	T	S2								1	
Small whorled pogonia	X	X		T	E	S2								1	
Sun-facing coneflower						S1									
Swamp pink	X			T	E	S2								1	
Virginia least trillium						S2								1	
TREES															
Blackjack oak						S2									
Longleaf pine						S1									
Turkey oak						S3									

III. Prioritizing Resources of Concern

The comprehensive list of conservation priority species table (A.2) contains a large number of species with a broad array of habitat needs. The refuge prioritized these species and their associated habitats as refuge resources of concern, while concurrently developing a reasonable range of habitat management alternatives to support these species.

To guide us in prioritizing this list, we considered the following concepts:

- Achieving refuge purposes and managing for trust resources, as well as biological diversity, integrity, and environmental health, can be addressed through the habitat requirements of resources of concern, or species that may represent guilds that are highly associated with important attributes or conditions within habitat types. The use of resources of concern is particularly valuable when addressing USFWS trust resources such as migratory birds.
- The surrogate species approach is a conservation management method to reduce the burden of addressing the requirements of many species individually. Surrogate species are defined by Caro (2010) as “*species that are used to represent other species or aspects of the environment.*” The method provides direction for setting biological objectives and discusses the importance of establishing new and refining existing collaborations within the conservation community to help us collectively meet the conservation needs of the nation’s fish, wildlife and plants. Used consistently, this will improve our efficiencies and impacts through identifying where on the landscape to target efforts and will result in more cost-effective management decisions and investments in conservation. Technical guidance on selecting species for design of landscape-scale conservation is available at: <http://www.fws.gov/landscape-conservation/pdf/DraftTechnicalGuidanceJuly2012.pdf>.
- The BCR plans are increasing their effectiveness at ranking and prioritizing those migratory birds most in need of management of conservation focus. Although all species that make it to a ranked BCR priority list are in need of conservation attention, we considered resources of concern that were ranked High or Moderate in Continental concern with a High to Moderate BCR Responsibility. The BCR rules used to rank birds are available at: <http://www.abcbirds.org/nabci>.
- Priority species selected that were not birds were identified as resources of concern due to range-wide concern over their population status or because they are currently under review for inclusion on the Federal Endangered or Threatened Species list. Fish species were reviewed using information available from the limited number plans for fish species and consulting local State and Federal fisheries experts on the capacity of the refuge to support or contribute to particular fish species.
- Habitat conditions on or surrounding the refuge may limit the refuge’s capability to support or manage for a potential species of concern. The following site-specific factors were evaluated:
 - ❖ Patch size requirements.
 - ❖ Habitat connectivity.
 - ❖ Incompatibility surrounding land uses.

-
- ❖ Environmental conditions: soils, hydrology, disturbance patterns, contaminants, predation, invasive species.
 - ❖ Specific life history needs.
- The likelihood that a potential species of concern would have a positive reaction to management strategies.
 - The ability to rely on natural processes to maintain habitat conditions within a natural range of variability suitable to the resources of concern.
 - The ability to use adaptive management (flexibility and responsiveness of the refuge and the habitats) in the face of changing environmental conditions (e.g., climate change).
 - Consultation with State and Federal taxonomic and natural resource experts.

To select the final priority resources for the preferred habitat management alternative (alternative B), we used a decision support matrix process, with scores associated with each of the criteria described above and developed from information in Paveglio and Taylor (2010). Each category had a possible range of scores (10, 7, 5, 3, or 1, with 10 being the best), and each species was given a score under each criteria. The separate scores were then added to obtain a total score for each species, so that each potential priority resource of concern had a score that could be compared against other potential resources. The exercise of scoring each potential resource against set criteria allowed us to systematically evaluate each resource and provide a relatively quantitative and transparent analysis to support the final selection of priority resources.

Refuge management is most often focused on restoring, managing, or maintaining habitats or certain habitat conditions to benefit a suite of priority species or a suite of plants and animals associated with a particular habitat. James River NWR identified priority habitats on the refuge based on information compiled in Section I (e.g., site capability, historic condition, current vegetation, conservation needs of wildlife associates). The designation of Priority I and Priority II habitats was used instead of an alternative classification such as high, moderate, or low priorities because all habitats are important to the refuge. The designation of a habitat into the Priority I category helps refuge management focus efforts when funding and resources are limited. As part of this process, we identified any limiting factors that affect the refuge's ability to maintain these habitats (see table A.3).

Table A.3. Priority I and II Habitats on James River NWR under Alternative B

Habitat Type	Reason for Ranking	Limiting Factors/Threats
Priority I		
Pine-dominated Forest	Largest habitat acreage on the refuge. Mature, pine-dominated forest is lacking on the landscape due to intensive forest management practices since European development. High intensity of management needed to restore this habitat to high quality. <i>Priority Refuge Resources of Concern: brown-headed nuthatch, chuck-will's-widow.</i>	Disease occurs in high density stands. Invasive species spread in the understory. Large storm events with strong wind components. Legacy of historic plantings driving current community composition and structure. Suppression of fire.
Moist Hardwood Forest	Provides habitat for wood thrush, considered to be an indicator of a gradient of forest conditions and representative of conditions required by many other species (Watts 1999). <i>Priority Refuge Resources of Concern: eastern box turtle, red-shouldered hawk, wood thrush.</i>	Altered hydrology. Invasive species can spread and change the composition of understory vegetation.
Floodplain Forest	Provides nesting and foraging habitat for breeding and overwintering bald eagles, the primary refuge establishing purpose species. <i>Priority Refuge Resources of Concern: bald eagle, prothonotary warbler, spotted salamander.</i>	Altered hydrology due to a change in the duration or frequency of seasonal flooding. Invasive species spread and change the composition of the understory.
Freshwater Marsh and Shrub Swamp	Provides habitat migratory waterfowl and waterbird species. Vulnerable to sea level rise that can dramatically change the characteristics of the habitat. <i>Priority Refuge Resources of Concern: least bittern, marsh wren.</i>	Sea level rise as a result of climate change altering water levels that could affect species composition. Dredging of James River and the placement of dredged soils around this habitat. Spread of monospecific colonies of common reed and/or other invasive species.
Priority II		
Erosional Bluff	Too limited in extent to make a meaningful difference. <i>Priority Refuge Resources of Concern: bank swallow</i>	Storms and major weather events cause increased slope sloughing and removal of vegetation.
Aquatic Habitats	Outside the management authority or jurisdiction of the refuge. Too limited in extent to make a meaningful difference. <i>Priority Refuge Resources of Concern: none</i>	Sea level rise as a result of climate change altering water depth and clarity that can effect light penetration. Vulnerable to pollution run-off.

a. **Priority Refuge Resources of Concern**

Based on the habitat types identified on the refuge as described in table A.3, we then developed a table of the priority resources of concern with their associated habitat types (table A.4) for the preferred habitat management alternative,

alternative B. This table also described the habitat structured required by each priority species and identifies other species that would benefit from the same or similar habitat conditions.

Table A.4. Priority Refuge Resources of Concern for James River NWR under Alternative B

Priority Refuge Resources of Concern	Habitat Type	Habitat Structure	Life History Requirement	Other Benefitting Species
Brown-headed nuthatch	Pine-dominated Forest	Uses mature, open pine stands where natural fire patterns are present. Nesting and roosting occurs in snags while foraging occurs on live trees (Withgott and Smith 1998).	Breeding, foraging	eastern hognose snake, eastern slender glass lizard, northern scarlet snake, oak toad, pine warbler, red-headed woodpecker, silver-haired bat, southeastern fox squirrel, southern chorus frog, yellow-billed cuckoo
Chuck-will's-widow		Occurs in deciduous, pine, and mixed forest stands with open understories for nesting (Watts 1999, Straight and Cooper 2012). Forest openings are important for foraging (Watts 1999).	Breeding, foraging	
Eastern box turtle	Moist Hardwood Forest	Inhabits a variety of forest and field habitats. Prefers open canopied woodlands with significant understory (Mitchell 1994; Hammerson 2010).	Year-round	<i>Apameini</i> sp., barking treefrog, black-and-white warbler, cerulean warbler, chimney swift, eastern mud salamander, eastern spadefoot, eastern wood-pewee, ovenbird, small whorled pogonia, whip-poor-will, worm-eating warbler
Red-shouldered hawk		Uses a variety of extensive forest stands with mature or old-growth canopy trees and varying understory (Dykstra et al. 2008). Nests below the canopy, typically between 12 and 19 meters above the ground (Crocoll and Parker 1989).	Breeding	
Wood thrush		Uses mixed and deciduous forest edges and interiors with trees greater than 16 meters high, moderate subcanopy and shrub density, shade, fairly open forest floor, moist soil, and decaying leaf litter (Evans et al. 2011).	Breeding, foraging	

Priority Refuge Resources of Concern	Habitat Type	Habitat Structure	Life History Requirement	Other Benefitting Species
Bald eagle	Floodplain Forest	Nests typically in forested areas less than 2 kilometers from large bodies of water. Forested tracts with nests have relatively open canopies, some form of habitat discontinuity or edge, or high levels of foliage-height diversity that provides access to nest trees (Buehler 2000).	Breeding, migration	Acadian flycatcher, confused cloudywing butterfly, cotton mouse, dwarf waterdog, eastern lesser siren, eastern mudsnake, hoary bat, hooded warbler, Kentucky warbler, little brown bat, Louisiana waterthrush, many-lined salamander, marbled salamander, Rafinesque’s big-eared bat, wood duck, yellow-throated vireo, yellow-throated warbler
Prothonotary warbler		Requires the presence of water near wooded areas with suitable cavity nest sites. Nest sites are typically over water or within 5 meters of water’s edge and found on low, flat terrain with shaded forest greater than 100 hectares and sparse understory (Petit 1999). Canopy height of forest cover is 12 to 40 meters with 50 to 75 percent canopy and sparse ground vegetation less than 0.5 meters high (Kahl et al. 1985).	Breeding, foraging	
Spotted salamander		Inhabits deciduous forest stands with semi-permanent pools less than one meter deep (Bishop 1943, VDGIF 2013).	Year-round	
Least bittern	Freshwater Marsh and Shrub Swamp	Uses wetlands with tall, dense growths of bulrush and cattail and low-lying, “wetter” sites with a maximum water depth of 70 centimeters (Poole et al. 2009).	Breeding, foraging	American black duck, common ribbon snake, eastern painted turtle, king rail, marsh rabbit, marsh senna, northern river otter, rainbow snake, rare skipper, river bulrush, sensitive joint-vetch, sora, spotted turtle
Marsh wren		Uses dense stands of cattails and bulrushes in deeper water for nesting (Kroodsma and Verner 1997).	Breeding, foraging	
Bank swallow	Erosional Bluff	Nests in colonies along streams and rivers with vertical eroding banks comprised of alluvial, friable soils (Garrison 1999).	Breeding	None

IV. Adaptive Management

The priority resources of concern and their respective habitat attributes were used to develop specific habitat objectives for the preferred alternative. Refuge habitat management objectives must be achievable. Many factors, such as lack of resources, existing habitat conditions, species response to habitat manipulations, climatic changes, contaminants or invasive species, may reduce or eliminate the ability of the refuge to achieve objectives.

Although these limiting factors were considered during the development of refuge objectives, conditions may and are likely to change over the next 15 years and beyond.

The refuge will use adaptive management to respond to changing conditions that impair our ability to measure and achieve the habitat objectives. This requires that we establish and maintain a monitoring program to ensure that we can detect and respond to changing conditions.

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Appendix B



Ryan Hagerly/USFWS

Boy observing a monarch butterfly

Findings of Appropriateness (FOAs) and Compatibility Determinations (CDs)

This appendix reflects our evaluation of various public uses for the James River National Wildlife Refuge (NWR). Table B.1 provides a summary of our conclusions.

Table B.1. Findings of Appropriateness and Compatibility Determinations for James River NWR

Use	Not Appropriate	Appropriate and Compatible	Page
Camping	X		B-2
Collecting Natural Products	X		B-4
Firing Range	X		B-7
Horseback Riding	X		B-11
Pets on the Refuge	X		B-13
Public Motorized Boat Ramp	X		B-15
Swimming and Sunbathing	X		B-19
Use of Pursuit Dogs for Hunting	X		B-21
Commercial Forest Management for Habitat Management		X	B-24
Public Deer Hunting		X	B-35
Research Conducted by Non-Service Personnel		X	B-48
Wildlife Observation, Photography, Environmental Education, and Interpretation		X	B-69

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: James River National Wildlife Refuge

Use: Camping

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: *Andrew D. Hol* Date: 5/18/15

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: *Joe M. Githens* Date: 5/27/15

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

FWS Form 3-2319
02/06

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: James River National Wildlife Refuge

Use: Camping

NARRATIVE:

In accordance with the 2006 U.S. Fish and Wildlife Service Appropriate Use Policy (603 FW 1), the refuge manager must first determine if the use is appropriate prior to allowing any non-priority public use on the refuge. Camping is not identified as a priority public use of the National Wildlife Refuge System (Refuge System) under the Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the Refuge System Improvement Act of 1997 (Pub.L. 105-57). This use is considered a general public use that is not a wildlife-dependent recreational use (as defined in the Refuge System Improvement Act) and does not contribute to fulfillment of refuge purpose, goals, or objectives as described in current refuge management plans. In accordance with the Appropriate Use Policy (603 FW 1), general public uses are the lowest priorities for refuge managers to consider. Camping has been found to be not an appropriate public use of James River National Wildlife Refuge (NWR) for the following reasons.

Allowing camping would not support any of the goals and objectives for James River NWR, as outlined in the comprehensive conservation plan for the refuge (USFWS 2015). These goals and objectives emphasize conserving habitats and wildlife species of conservation concern. This use is not consistent with any approved refuge management plan.

Resources needed to manage an overnight, primitive camping program that adequately provides for public and employee sanitation and safety, without disturbing or harming wildlife species, would divert existing and future resources from accomplishing priority refuge tasks. Primitive “backcountry” camping on the refuge presents unacceptable levels of risk from the potential escape of campfires to wildfires and the possible disturbance to sensitive habitats, migratory birds, and other wildlife species, and could present conflicts with other refuge users. Camping cannot be accommodated at the refuge without impairing existing wildlife-dependent recreational uses or the potential to provide quality compatible, wildlife-dependent recreation.

For these reasons, we have determined that camping is not an appropriate public use for the refuge.

LITERATURE CITED:

U.S. Fish and Wildlife Service (USFWS). 2015. James River National Wildlife Refuge, Comprehensive Conservation Plan. Prince George County, Virginia. Accessed at: http://www.fws.gov/refuge/James_River/what_we_do/conservation.html.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: James River National Wildlife Refuge

Use: Collecting Natural Products

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:

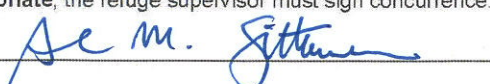
Not Appropriate Appropriate

Refuge Manager:  Date: 5/18/15

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: 5/27/15

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

FWS Form 3-2319
02/06

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: James River National Wildlife Refuge

Use: Collecting Natural Products

NARRATIVE:

In accordance with the 2006 U.S. Fish and Wildlife Service Appropriate Use Policy (603 FW 1), the refuge manager must first determine if the use is appropriate prior to allowing any non-priority public use on the refuge. The collection of natural products for personal use or consumption includes living and non-living materials such as firewood, berries, mushrooms, native vegetation, deer antler sheds, amphibians, reptiles. Collecting natural products is not identified as a priority public use of the National Wildlife Refuge System (Refuge System) under the Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the Refuge System Improvement Act of 1997 (Pub.L. 105-57). This use is considered a general public use that is not a wildlife-dependent recreational use (as defined in the Refuge System Improvement Act) and does not contribute to fulfillment of refuge purpose, goals, or objectives as described in current refuge management plans. In accordance with the Appropriate Use Policy (603 FW 1), general public uses are the lowest priorities for refuge managers to consider. Collecting natural products has been found to be not an appropriate public use of James River National Wildlife Refuge (NWR) for the following reasons.

The Service policy on Appropriate Refuge Uses (603 FW 1) states that: “General public uses that are not wildlife-dependent recreational uses (as defined by the Refuge System Improvement Act) and do not contribute to the fulfillment of refuge purpose or goals or objectives as described in current refuge management plans are the lowest priorities for refuge managers to consider. These uses are likely to divert refuge management resources from priority general public uses or away from our responsibilities to protect and manage fish, wildlife, and plants, and their habitats. Therefore, both law and policy have a general presumption against allowing such uses within the Refuge System.”

Allowing collection of natural products would not support any of the goals and objectives for James River NWR, as outlined in the comprehensive conservation plan for the refuge (USFWS 2015). These goals and objectives emphasize conserving habitats and wildlife species of conservation concern. Allowing visitors to collect natural materials may lead to negative impacts to eagles, other wildlife species, and the habitats they rely upon. Negative impacts may include trampling of vegetation and wildlife disturbance. Visitors walking off established public use trails may impact plants by compacting soils, increasing erosion, and walking on young plants thereby reducing their survival and regeneration (Trails and Wildlife Task Force 1998). Berries, native plants, and shed antlers can be important sources of food for various wildlife species, and the removal of these can have adverse effects on native wildlife. This use is not consistent with any approved refuge management plan.

Allowing the collection of natural products would divert existing and future resources from accomplishing priority tasks. It also presents unacceptable levels of risk from the potential negative impacts on sensitive habitats, migratory birds, and other wildlife species, and could present conflicts with other refuge users.

For these reasons, we have determined that collecting natural products is not an appropriate public use for the refuge.

LITERATURE CITED:

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U.S. Fish and Wildlife Service (USFWS). 2015. James River National Wildlife Refuge, Comprehensive Conservation Plan. Prince George County, Virginia. Accessed at:
http://www.fws.gov/refuge/James_River/what_we_do/conservation.html.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: James River National Wildlife Refuge

Use: Firing Range

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: 5/18/15

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: 5/27/15

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

FWS Form 3-2319
02/06

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: James River National Wildlife Refuge

Use: Firing Range

NARRATIVE:

In accordance with the 2006 U.S. Fish and Wildlife Service Appropriate Use Policy (603 FW 1), the refuge manager must first determine if the use is appropriate prior to allowing any non-priority public use on the refuge. The use of a firing range is not identified as a priority public use of the National Wildlife Refuge System (Refuge System) under the Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the Refuge System Improvement Act of 1997 (Pub.L. 105-57). This use is considered a general public use that is not a wildlife-dependent recreational use (as defined in the Refuge System Improvement Act) and would not contribute to fulfillment of refuge purpose, goals, or objectives as described in current refuge management plans. In accordance with the Appropriate Use Policy (603 FW 1), general public uses are the lowest priorities for refuge managers to consider. The use of a firing range has been found to be not an appropriate public use of James River National Wildlife Refuge (NWR) for the following reasons.

The primary reason for this determination is derived from Service policy on Appropriate Refuge Uses (603 FW 1). The policy states that: “General public uses that are not wildlife-dependent recreational uses (as defined by the Refuge System Improvement Act) and do not contribute to the fulfillment of refuge purpose or goals or objectives as described in current refuge management plans are the lowest priorities for refuge managers to consider. These uses are likely to divert refuge management resources from priority general public uses or away from our responsibilities to protect and manage fish, wildlife, and plants, and their habitats. Therefore, both law and policy have a general presumption against allowing such uses within the Refuge System.”

Allowing the use of a firing range would not support any of the goals and objectives for James River NWR, as outlined in the comprehensive conservation plan for the refuge (USFWS 2015). These goals and objectives emphasize conserving habitats and wildlife species of conservation concern, particularly bald eagles. This use is not consistent with any approved refuge management plan.

The use of a firing range is not consistent with Service policy on secondary uses and would divert existing and future resources from accomplishing priority tasks. It also presents unacceptable levels of risk from the potential negative impacts on sensitive habitats, migratory birds, and other wildlife species, and could present conflicts with other refuge users.

Allowing the use of a firing range on the refuge could negatively impact sensitive habitats, migratory birds, and other wildlife species. Contaminants identified at skeet and trap shooting ranges and rifle and pistol firing ranges have been identified as the cause of mortality and health impacts to birds and mammals (Bennett et al. 2007, Lewis et al. 2001, Vyas et al. 2000). Contaminants have also been found to bioaccumulate in earthworms and vegetation and to be transported in surface waters draining from shooting ranges (Bennett et al. 2007, Craig et al. 1999).

Grubb and King (1991) analyzed a variety of human activities, including gunshots, and the response of bald eagles to those activities. The study found that human activities that are distant, of short duration, out of sight, few in number, below the eagle, and quiet have the least impact. The operation of a firing range that is within 1,000 feet of bald eagle breeding and nesting activity, operates for hours each day, is in open sight, allows repetitive firing during operation, and is classified as noisy would cause eagles to take flight and potentially leave the area. In a separate study, gunshots were found to be the only noises that elicited overt escape behavior in eagles (Stalmaster and Newman 1978).

Similarly, other wildlife species have been shown to modify their behavioral patterns as a result of noise impacts. Many animals depend on acoustic signals to find their young, mate, and locate prey; therefore, noise interference with these signals can endanger the individual organism or cause temporary or permanent habitat abandonment (Bender 1977).

The use of a firing range on the refuge may also conflict with public use goals and objectives because the displacement of wildlife by activity and noise from the range could materially interfere with wildlife observation, a priority public use of the refuge. The close proximity of the proposed trail and public use infrastructure to the firing range location would impact wildlife-dependent recreational visitors seeking a tranquil and serene opportunity to observe wildlife and connect with nature. The natural soundscape of James River NWR is an important natural feature that contributes to the visitor's experience at the refuge. The natural sounds of the refuge change seasonally with vegetation changes and migration, but include the rustling and crunching of leaves, the snapping of twigs, the barking of squirrels, and the drumming of woodpeckers. The calls of a wide variety of birds and frogs add a harmony of pitches and melodies, wind whistles through the forests, and waves may lap gently against the shore or crash into the sandy beach with a dull roar. The natural soundscape of James River NWR is serene and calm, explaining to the listening visitor great detail about the surrounding ecosystem and wildlife. The operation of a firing range would materially detract from the visitor experience at James River NWR.

For these reasons, we have determined that the use of a firing range is not an appropriate use of James River NWR.

LITERATURE CITED:

- Bennett, J.R., C.A. Kaufman, I. Koch, J. Sova, and K.J. Reimer. 2007. Ecological risk assessment of lead contamination at rifle and pistol ranges using techniques to account for site characteristics. *Science of the Total Environment* 374(1): 91-101. Accessed May 2014 at: <http://www.sciencedirect.com/science/article/pii/S0048969706009983>.
- Bender, A. 1977. Noise Impact on Wildlife: An Environmental Impact Assessment. *In* NASA. Goddard Space Flight Center Ninth Conference on Space Simulation. Silver Spring, Maryland. Pgs. 155-165.
- Craig A., L. Hare, and A. Tessier. 1999. Experimental evidence for cadmium uptake via calcium channels in the aquatic insect *Chironomus staegeri*. *Aquatic Toxicology* 44(4): 225-262. Accessed May 2014 at: <http://www.sciencedirect.com/science/article/pii/S0166445X98000861>.
- Grubb, T.G. and R.M. King. 1991. Assessing human disturbance of breeding bald eagles with classification tree models. *The Journal of Wildlife Management* 55(3): 500-511. Accessed May

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Lewis, L.A., R.J. Poppenga, W.R. Davidson, J.R. Fischer, and K.A. Morgan. 2001. Lead toxicosis and trace element levels in wild birds and mammals at a firearms training facility. *Archives of Environmental Contamination and Toxicology* 41: 208-214. Accessed May 2014 at: <http://www.ncbi.nlm.nih.gov/pubmed/11462145>.

Stalmaster, M.V. and J.R. Newman. 1978. Behavioral responses of wintering bald eagles to human activity. *The Journal of Wildlife Management* 42(3): 506-513. Accessed May 2014 at: <http://www.jstor.org/stable/3800811>.

U.S. Fish and Wildlife Service (USFWS). 2015. James River National Wildlife Refuge, Comprehensive Conservation Plan. Prince George County, Virginia. Accessed at: http://www.fws.gov/refuge/James_River/what_we_do/conservation.html.

Vyas, N.B., J.W. Spann, G.H. Heinz, W.N. Beyer, J.A. Jaquette, and J.M. Mengelkoch. 2000. Lead poisoning of passerines at a trap and skeet range. *Environmental Pollution* 107: 159–166. Accessed May 2014 at: <http://www.sciencedirect.com/science/article/pii/S0269749199001128>.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: James River National Wildlife Refuge

Use: Horseback Riding

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

Decision Criteria:	YES	NO
(a) Do we have jurisdiction over the use?	✓	
(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: *Andrew D. Hoff*

Date: 5/18/15

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: *A. M. Sittman*

Date: 5/27/15

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

FWS Form 3-2319
02/06

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: James River National Wildlife Refuge

Use: Horseback Riding

NARRATIVE:

In accordance with the 2006 U.S. Fish and Wildlife Service Appropriate Use Policy (603 FW 1), the refuge manager must first determine if the use is appropriate prior to allowing any non-priority public use on the refuge. The use of horseback riding is not identified as a priority public use of the National Wildlife Refuge System (Refuge System) under the Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the Refuge System Improvement Act of 1997 (Pub.L. 105-57). This use is considered a general public use that is not a wildlife-dependent recreational use (as defined in the Refuge System Improvement Act) and would not contribute to fulfillment of refuge purpose, goals, or objectives as described in current refuge management plans. In accordance with the Appropriate Use Policy (603 FW 1), general public uses are the lowest priorities for refuge managers to consider. Horseback riding has been found to be not an appropriate public use of James River National Wildlife Refuge (NWR) for the following reasons.

Allowing horseback riding would not support any of the goals and objectives for James River NWR, as outlined in the comprehensive conservation plan for the refuge (USFWS 2015). These goals and objectives emphasize conserving habitats and wildlife species of conservation concern. Allowing horseback riding on the refuge could negatively impact sensitive resources, migratory birds, and other wildlife species. This use is not consistent with any approved refuge management plan.

Resources needed to manage a horseback riding program that adequately provides for public and employee sanitation and safety, without disturbing wildlife species, would divert existing and future resources from accomplishing priority refuge tasks. It also presents unacceptable levels of risk from the potential spread of invasive species from horse droppings and could present conflicts with other refuge users. The refuge does not have parking space to support horse trailers in our designated parking areas. Refuge roads and trails are unable to safely accommodate horseback riding in addition to the existing vehicular and pedestrian wildlife-dependent recreational uses.

Horseback riding does not contribute to visitor understanding or appreciation of refuge resources and would not benefit natural or cultural resources within the refuge.

For these reasons, we have determined that horseback riding is not an appropriate public use for the refuge.

LITERATURE CITED:

U.S. Fish and Wildlife Service (USFWS). 2015. James River National Wildlife Refuge, Comprehensive Conservation Plan. Prince George County, Virginia. Accessed at: http://www.fws.gov/refuge/James_River/what_we_do/conservation.html.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: James River National Wildlife Refuge

Use: Pets on the Refuge

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: *Andrew S. Hall*

Date: 5/18/15

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: *A. M. Gittman*

Date: 5/27/15

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

FWS Form 3-2319
02/06

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: James River National Wildlife Refuge

Use: Pets on the Refuge

NARRATIVE:

In accordance with the 2006 U.S. Fish and Wildlife Service (Service) Appropriate Use Policy (603 FW 1), the refuge manager must first determine if the use is appropriate prior to allowing any non-priority public use on the refuge. Allowing pets on the refuge is not identified as a priority public use of the National Wildlife Refuge System (Refuge System) under the Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the Refuge System Improvement Act of 1997 (Pub.L. 105-57). This use is considered a general public use that is not a wildlife-dependent recreational use (as defined in the Refuge System Improvement Act) and does not contribute to fulfillment of refuge purpose, goals, or objectives as described in current refuge management plans. In accordance with the Appropriate Use Policy (603 FW 1), general public uses are the lowest priorities for refuge managers to consider. Pets on the refuge have been found to be not an appropriate public use of James River National Wildlife Refuge (NWR) for the following reasons.

Allowing pets on the refuge does not support the biological goals and objectives for James River NWR, as defined in the comprehensive conservation plan for the refuge (USFWS 2015). These goals and objectives emphasize conserving habitats and species of conservation concern. This use is not consistent with any approved refuge management plan.

Allowing pets, particularly dogs and cats, on the refuge is a concern for refuge management. Within the Eastern Virginia Rivers NWR Complex, pet owners are known to have allowed their animals to run free on our refuges, which then materially interferes with existing wildlife-dependent recreational uses on the refuge. Free-roaming dogs have accosted refuge visitors and disrupted wildlife observation. Free-roaming domestic cats are estimated to kill approximately 1.4 to 3.7 billion birds and 6.9 to 20.7 billion mammals in the United States on an annual basis. Thirty-one percent of the bird mortality and 11 percent of the mammal mortality is estimated to be caused by owned cats. As such, free-roaming domestic cats on the refuge may have a significant impact on the mortality of refuge wildlife (Loss et al. 2013).

For these reasons, we have determined that allowing pets on the refuge is not an appropriate public use for the refuge.

LITERATURE CITED:

- Loss, S.R., T. Will, and P.P. Marra. 2013. The impact of free-ranging domestic cats on wildlife of the United States. *Nature Communications* 4. Accessed May 2014 at: <http://dx.doi.org/10.1038/ncomms2380>.
- U.S. Fish and Wildlife Service (USFWS). 2015. James River National Wildlife Refuge, Comprehensive Conservation Plan. Prince George County, Virginia. Accessed at: http://www.fws.gov/refuge/James_River/what_we_do/conservation.html.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: James River National Wildlife Refuge

Use: Public Motorized Boat Ramp

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: *Andrew D. Hoff*

Date: 5/18/15

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: *A. M. Sittman*

Date: 5/27/15

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

FWS Form 3-2319
02/06

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: James River National Wildlife Refuge

Use: Public Motorized Boat Ramp

NARRATIVE:

In accordance with the 2006 U.S. Fish and Wildlife Service (Service) Appropriate Use Policy (603 FW 1), the refuge manager must first determine if the use is appropriate prior to allowing any non-priority public use on the refuge. The use of a public motorized boat ramp is not identified as a priority public use of the National Wildlife Refuge System (Refuge System) under the Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the Refuge System Improvement Act of 1997 (Pub.L. 105-57). This use is considered a general public use that is not a wildlife-dependent recreational use (as defined in the Refuge System Improvement Act) and would not contribute to fulfillment of refuge purpose, goals, or objectives as described in current refuge management plans. In accordance with the Appropriate Use Policy (603 FW 1), general public uses are the lowest priorities for refuge managers to consider. The use of a public motorized boat ramp has been found to be not an appropriate public use of James River National Wildlife Refuge (NWR) for the following reasons.

The primary reason for this determination is derived from Service policy on Appropriate Refuge Uses (603 FW 1). The policy states that: “General public uses that are not wildlife-dependent recreational uses (as defined by the Refuge System Improvement Act) and do not contribute to the fulfillment of refuge purpose or goals or objectives as described in current refuge management plans are the lowest priorities for refuge managers to consider. These uses are likely to divert refuge management resources from priority general public uses or away from our responsibilities to protect and manage fish, wildlife, and plants, and their habitats. Therefore, both law and policy have a general presumption against allowing such uses within the Refuge System.”

The operation of a public motorized boat ramp on the refuge would directly conflict with the refuge purpose and applicable laws and regulations. James River NWR was established in March 1991 under the authority of the Endangered Species Act (ESA) to protect essential nesting, foraging, and roosting habitat for bald eagles. James River NWR is one of two refuges in Virginia, and only one of four refuges in the nation, created specifically for bald eagle conservation; land acquisition and refuge establishment significantly complemented recovery efforts for the Chesapeake Bay bald eagle population. Despite recently being removed from the Federal and State endangered species lists, units of the Refuge System will continue to be managed in ways that contribute substantially to the conservation of bald eagles and meet their habitat needs (72 FR 37351). The bald eagle continues to be protected federally under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c) and the Migratory Bird Treaty Act (16 U.S.C. 703-712). The National Bald Eagle Management Guidelines (USFWS 2007) recommend locating long-term and permanent water-dependent facilities, such as motorized boat ramps, away from important eagle foraging areas. The Service previously denied a request to establish public motorized boat access to the James River at James River NWR in 2006 because of conflicts with the ESA, the Bald and Golden Eagle Protection Act, and the Station Management Plan for James River NWR (USFWS 1991).

Allowing the use of a public motorized boat ramp would not support any of the goals and

objectives for James River NWR as outlined in approved refuge management plans. The goals and objectives identified in the refuge’s earliest management plans emphasized maintenance and enhancement of bald eagle nesting, foraging, and roosting habitats (USFWS 1989, USFWS 1991, USFWS 1996). The refuge’s recently approved comprehensive conservation plan emphasizes the continued protection and enhancement of bald eagle nesting and roosting habitats throughout refuge habitats, including protecting active bald eagle nests, as well as providing and maintaining communal nocturnal roost and foraging habitat (USFWS 2015).

The refuge is within the James River Winter and Summer Bald Eagle Concentration Zone, designated by the Virginia Department of Game and Inland Fisheries (VDGIF). Concentration zones are defined as “locations along waterways where eagles congregate in numbers much greater than can be accounted for by local breeding pairs and their offspring.” These areas are used by juveniles, sub-adults, and non-breeding adults, as well as by breeding adults for foraging, perching, and roosting (VDGIF and CCB 2012). According to a 2013 VDGIF report, 14 Bald Eagle Concentration Areas and Roosts and 67 bald eagle nests occur within 3 miles of the refuge. Construction and use of a public motorized boat ramp at James River NWR would disturb nesting, foraging, and roosting bald eagles on the refuge and could cause them to move away from their river food sources, abandon nests, and expend energy reserves needed to provide for nestlings. Actions that would impair essential behavioral patterns including breeding, feeding, and sheltering meet the legal definition of “disturb” under the Bald and Golden Eagle Protection Act. Grubb and King (1991) analyzed a variety of human activities, including motorized boating, and the response of bald eagles to those activities. The study found that human activities that are distant, of short duration, out of sight, few in number, occur below the eagle, and quiet have the least impact (Grubb and King 1991). McGarigal et al. (1991) confirmed that boating activities have the potential to significantly affect eagle spatial use patterns and recommend buffer zones 400 to 800 meters around high-use foraging areas of bald eagles.

Resources needed to construct and manage a public motorized boat ramp that adequately provides for public and employee safety would divert existing and future resources from accomplishing priority refuge tasks. The construction and operation of a public motorized boat ramp on the refuge presents unacceptable levels of risk from the possible disturbance to sensitive habitats, bald eagles, migratory birds, and other wildlife species, and could present conflicts with other refuge users. This use can not be accommodated at the refuge without impairing existing wildlife-dependent recreational uses or the potential to provide quality compatible, wildlife-dependent recreation. In itself, the use of a public motorized boat ramp does not contribute to the understanding or appreciation of natural or cultural resources.

The use of a public motorized boat ramp on the refuge may also conflict with public use goals and objectives because the displacement of wildlife by activity and noise from vehicles traveling to and using the public boat ramp could materially interfere with priority wildlife-dependent recreation including wildlife observation, photography, environmental education, and interpretation. The natural soundscape of James River NWR is an important natural feature that contributes to the visitor’s experience at the refuge. The operation of a public motorized boat ramp would impair wildlife-dependent recreation on the refuge.

For these reasons, we have determined that the use of a public motorized boat ramp is not an appropriate use of James River NWR.

LITERATURE CITED:

Grubb, T.G. and R.M. King. 1991. Assessing human disturbance of breeding bald eagles with classification tree models. *The Journal of Wildlife Management* 55(3): 500-511. Accessed May 2014 at: <http://www.jstor.org/stable/3808982>.

McGarigal, K., R.G. Anthony, and F.B. Isaacs. 1991. Interactions of humans and bald eagles on the Columbia River Estuary. *Wildlife Society*. Accessed September 2013 at: <http://www.jstor.org/discover/10.2307/3830569?uid=2&uid=4&sid=21102642463611>.

U.S. Fish and Wildlife Service (USFWS). 1989. Final Environmental Assessment: Proposal to Protect Endangered Bald Eagle Habitat, Prince George County, Virginia. U.S. Fish and Wildlife Service, Newton Corner, Massachusetts.

---. 1991. Station Management Plan: James River National Wildlife Refuge. U.S. Fish and Wildlife Service, Service, Newton Corner, Massachusetts.

---. 1996. Forest Management Plan: James River National Wildlife Refuge, Prince George County, Virginia. U.S. Fish and Wildlife Service, Hopewell, Virginia.

---. 2007. National bald eagle management guidelines. Accessed February 2015 at: <http://www.fws.gov/southdakotafielddoffice/NationalBaldEagleManagementGuidelines.pdf>.

Virginia Department of Game and Inland Fisheries (VDGIF). 2013. Supporting map for “Bald Eagle Nests, Concentration Areas, and Communal Roosts in Virginia: A Guide for Landowners”. Accessed January 2013 at: <http://vafwis.org/fwis/BaldEagleSearchMap.html#>.

Virginia Department of Game and Inland Fisheries (VDGIF), and the Center for Conservation Biology (CCB) at the College of William and Mary, and Virginia Commonwealth University. 2012. Management of bald eagle nests, concentration areas, and communal roosts in Virginia: A guide for landowners. Richmond, VA. Accessed May 2013 at: <http://www.dgif.virginia.gov/environmental-programs/files/virginia-bald-eagle-guidelines-for-landowners.pdf>.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: James River National Wildlife Refuge

Use: Swimming and Sunbathing

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: *Andrew D. Holt*

Date: 5/18/15

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: *A. M. Jittner*

Date: 5/27/15

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

FWS Form 3-2319
02/06

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: James River National Wildlife Refuge

Use: Swimming and Sunbathing

NARRATIVE:

In accordance with the 2006 U.S. Fish and Wildlife Service Appropriate Use Policy (603 FW 1), the refuge manager must first determine if the use is appropriate prior to allowing any non-priority public use on the refuge. Swimming and sunbathing are not identified as priority public uses of the National Wildlife Refuge System (Refuge System) under the Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the Refuge System Improvement Act of 1997 (Pub.L. 105-57). This use is considered a general public use that is not a wildlife-dependent recreational use (as defined in the Refuge System Improvement Act) and would not contribute to fulfillment of refuge purpose, goals, or objectives as described in current refuge management plans. In accordance with the Appropriate Use Policy (603 FW 1), general public uses are the lowest priorities for refuge managers to consider. Swimming and sunbathing have been found to be not appropriate public uses of James River National Wildlife Refuge (NWR) for the following reasons.

Allowing swimming and sunbathing would not support any of the goals and objectives for James River NWR, as outlined in the comprehensive conservation plan for the refuge (USFWS 2015). These goals and objectives emphasize conserving habitats and wildlife species of conservation concern. This use is not consistent with any approved refuge management plan.

Resources needed to manage swimming and sunbathing that adequately provides for public and employee sanitation and safety, without disturbing or harming wildlife species, would divert existing and future resources from accomplishing priority refuge tasks. It also presents unacceptable levels of risk from the potential negative impacts on sensitive habitats, migratory birds, and other wildlife species, and could present conflicts with other refuge users.

For these reasons, we have determined that swimming and sunbathing are not an appropriate uses of James River NWR.

LITERATURE CITED:

U.S. Fish and Wildlife Service (USFWS). 2015. James River National Wildlife Refuge, Comprehensive Conservation Plan. Prince George County, Virginia. Accessed at: http://www.fws.gov/refuge/James_River/what_we_do/conservation.html.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: James River National Wildlife Refuge

Use: Use of Pursuit Dogs for Hunting

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: 5/18/15

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: 5/27/15

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

FWS Form 3-2319
02/06

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: James River National Wildlife Refuge

Use: Use of Pursuit Dogs for Hunting

NARRATIVE:

In accordance with the 2006 U.S. Fish and Wildlife Service (Service) Appropriate Use Policy (603 FW 1), the refuge manager must first determine if the use is appropriate prior to allowing any non-priority public use on the refuge. The use of pursuit dogs for hunting is not identified as a priority public use of the National Wildlife Refuge System (Refuge System) under the Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the Refuge System Improvement Act of 1997 (Pub.L. 105-57). This use is considered a general public use that is not a wildlife-dependent recreational use (as defined in the Refuge System Improvement Act) and does not contribute to fulfillment of refuge purpose, goals, or objectives as described in current refuge management plans. In accordance with the Appropriate Use Policy (603 FW 1), general public uses are the lowest priorities for refuge managers to consider. The use of pursuit dogs for hunting has been found to be not an appropriate public use of James River National Wildlife Refuge (NWR) for the following reasons.

No unconfined domestic animals, including but not limited to dogs, are permitted to enter upon any national wildlife refuge or to roam at large upon such an area, except as specifically authorized under the provisions for refuge-specific regulations, field trials, or economic uses in Title 50 of the Code of Federal Regulations (50 CFR 26.34, 27.91, and 29.2, respectively). No current refuge-specific regulations or special use permits for field trials or economic uses allow the use of pursuit dogs at James River NWR.

The use of pursuit dogs does not support the biological goals and objectives for James River NWR, as defined in the comprehensive conservation plan for the refuge (USFWS 2015). These goals and objectives emphasize conserving habitats and species of conservation concern. The use of pursuit dogs is not consistent with the approved refuge deer hunting plan (USFWS 1993).

Resources needed to allow the use of pursuit dogs that adequately provides for public and employee sanitation and safety, without disturbing or harming wildlife species, would divert existing and future resources from accomplishing priority refuge tasks. It also presents unacceptable levels of risk from the potential negative impacts on sensitive habitats, migratory birds, and other wildlife species, and could present conflicts with other refuge users. If the refuge allowed the use of dogs, the refuge staff would have no way to adequately control the number and actions of dogs used for hunting. Dogs could not be prevented from entering the closed areas of the refuge. Hunting from portable tree stands has long been recognized as an effective way of hunting white-tailed deer and is the desired method to be used on James River NWR.

The use of pursuit dogs for hunting is not consistent with certain criteria for a quality refuge recreational experience and may conflict with priority public uses. The Service Manual (603 FW 2) states that a quality recreational experience minimizes or eliminates conflicts with other compatible wildlife-dependent recreation, minimizes conflict with neighboring landowners, promotes accessibility and availability to a broad spectrum of the American people, and promotes stewardship and conservation. Free-roaming dogs may jeopardize the safety of refuge visitors and

staff, and may interfere with priority recreational uses. Displacement of wildlife by dogs, for instance, may disrupt wildlife observation.

For these reasons, we have determined that the use of pursuit dogs for hunting is not an appropriate public use for the refuge.

LITERATURE CITED:

U.S. Fish and Wildlife Service (USFWS). 1993. Sport Hunting Decision Document Package for James River NWR. U.S. Fish and Wildlife Service, Newton Corner, Massachusetts.

---. 2015. James River National Wildlife Refuge, Comprehensive Conservation Plan. Prince George County, Virginia. Accessed at:
http://www.fws.gov/refuge/James_River/what_we_do/conservation.html.

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: James River National Wildlife Refuge

Use: Commercial Forest Management for Habitat 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: *Amber W. [Signature]*

Date: 5/18/15

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: *A. M. [Signature]*

Date: 5/27/15

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

FWS Form 3-2319
02/06

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: James River National Wildlife Refuge

Use: Commercial Forest Management for Habitat Management

NARRATIVE:

In accordance with the 2006 U.S. Fish and Wildlife Service (Service) Appropriate Use Policy (603 FW 1), the refuge manager must first determine if the use is appropriate prior to allowing any non-priority public use on the refuge. The use of commercial forest management is not identified as a priority public use of the National Wildlife Refuge System (Refuge System) under the Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the Refuge System Improvement Act of 1997 (Pub.L. 105-57). This use is considered a specialized use that is not a wildlife-dependent recreational use (as defined in the Refuge System Improvement Act).

Commercial forest management is a refuge management economic activity, meaning that it (a) must contribute to the purposes for which the refuge was established or the mission of the Refuge System (50 CFR 29.1) and (b) is a management activity on a national wildlife refuge that results in generation of a commodity which is or can be sold for income or revenue or traded for goods or services (50 CFR 25.12). The use of commercial forest management has been found to be an appropriate public use of James River National Wildlife Refuge (NWR) for the following reasons.

Forest management at James River NWR is integral to meeting the refuge's wildlife habitat objectives (USFWS 2015). Since refuge establishment in 1991, we have employed sound forest management techniques with the intention of maximizing refuge bald eagle production. Specifically, we aimed to maximize the number and use of refuge nocturnal roost sites, increase the use of the refuge diurnal foraging roost, and transform James River NWR into a world-class showcase for the management of the bald eagles in eastern North America (USFWS 1996).

From a practical standpoint, the optimum means to achieve this goal is with commercial forest management, subject to management prescriptions prepared and overseen by a refuge forester. Commercial loggers have the capability to treat the acreages desired and can do so most efficiently and economically. In many cases, commercial logging will attain our desired outcome at no cost to the refuge and a slight financial gain for the American public. The refuge lacks the equipment and personnel to carry out timber thinning program unaided. As of August 2013, 450 acres of dense loblolly pine stands have been mechanically thinned by commercial loggers (USFWS 2013).

Timber sales are based on current market value. Funds generated by the sale of timber are used to support the refuge's forest management program, including additional stand inventories and related roadwork. When appropriate, infrastructure maintenance funds projects directly associated with timber sales, such as road maintenance, culvert repair, gate and sign fabrication and installation. Sufficient funds from the sale are retained by the permittee to purchase supplies, materials, and labor necessary to address any impacts to the refuge resulting from current or future phases of the operation.

Commercial forest management facilitates the management of the refuge's forests and is the preferred method of meeting the habitat needs of forest-dependent birds. For these reasons, we have found commercial forest management contributes to the purposes for which the refuge was

established and the mission of the Refuge System and, therefore, is an appropriate refuge use under the Service's policy on the appropriateness of refuge uses (603 FW 1). For these reasons, we have determined that the use of commercial forest management is an appropriate use of James River NWR.

LITERATURE CITED:

U.S. Fish and Wildlife Service (USFWS). 1996. Forest Management Plan: James River National Wildlife Refuge, Prince George County, Virginia. U.S. Fish and Wildlife Service, Hopewell, Virginia.

---. 2013. FY2013-2016 Prescribed Fire Plan for James River National Wildlife Refuge.

---. 2015. James River National Wildlife Refuge, Comprehensive Conservation Plan. Prince George County, Virginia. Accessed at:
http://www.fws.gov/refuge/James_River/what_we_do/conservation.html.

COMPATIBILITY DETERMINATION

USE:

Commercial Forest Management for Habitat Management

REFUGE NAME:

James River National Wildlife Refuge

ESTABLISHMENT DATE:

March 27, 1991

ESTABLISHING AND ACQUISITION AUTHORITY(IES):

Endangered Species Act of 1973 (16 U.S.C. 1531-1543), as amended

REFUGE PURPOSE(S):

“...to conserve (A) fish or wildlife which are listed as endangered species or threatened species...or (B) plants...”

NATIONAL WILDLIFE REFUGE SYSTEM MISSION:

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.

DESCRIPTION OF USE:

(a) What is the use? Is the use a priority public use?

The use is commercial forest management, specifically thinning of overstocked pine stands using commercial contractors. This use is not a priority public use of the National Wildlife Refuge System (Refuge System) under the Refuge System Administration Act of 1966 (16 U.S.C. § 668dd-668ee), as amended by the Refuge System Improvement Act of 1997 (Pub.L. 105-57).

Commercial forest management will be performed for the primary purpose of creating and/or improving wildlife habitat to ensure a diversity of forest structure and composition. Commercial forest management contributes to the refuge’s purposes and habitat and species goals when conducted to manage and improve habitat for wildlife. Commercial forest management may include a variety of accepted silvicultural practices, such as thinnings and release cuttings to remove pole, or pulpwood; regeneration cuts such as seed tree, selection, or shelterwood cuts which would yield products ranging from pulpwood to saw timber; and salvage cuts performed as a result of storm, insect or disease damage which could result in the sale of any or all of the above mentioned forest products. Commercial management practices are the preferred method to safely and efficiently manage refuge forests in a cost-effective manner. It is impractical for the refuge to

acquire the necessary equipment and staff to efficiently conduct these management actions.

(b) Where would the use be conducted?

Commercial forest management may occur on any of the refuge's 2,653 acres of pine-dominated forest, progressing through 100- to 150-acre units at a time as determined in advance by refuge manager or his/her designee.

(c) When would the use be conducted?

Commercial forest management operations may occur at any time of the year, but will not be conducted continuously through the year. Thinning of pine trees may occur on more than one tract each year, and thinning of each tract may occur at different times of the year depending on individual site characteristics, stand conditions, and other resource concerns. All forest management will occur at times designed to minimize unacceptable impacts on resources (e.g., erosion, rutting, or wildlife disturbance), while maximizing the desired silvicultural results such as forest health improvements and native understory regeneration. Soil moisture levels, bald eagle nesting, and seasonal ground nesting bird activity will determine the appropriate timing for forest management efforts on each selected tract.

(d) How would the use be conducted?

Sites for mechanical stem reduction by commercial loggers would be identified in advance by refuge using pine-dominated forest tract information from a refuge timber cruise (Carolina Silvics 2006). Refuge staff would prepare a list of the pine-dominated stands to be logged. U.S. Fish and Wildlife Service (USFWS, Service) archaeologists would map and flag archaeological sites and sensitive areas with a buffer zone of 200 feet.

Commercial loggers would use mechanized equipment to remove 30 to 40 percent of the stems per acre, leaving a residual basal area of 85 to 100 square feet per acre. We will continue to conduct forest management activities at James River in accordance with standard operating procedures that were reviewed by the State Historic Preservation Officer (SHPO), as well as Virginia Department of Forestry Best Management Practices (USFWS 2006), to allow logging to occur without further SHPO review. If necessary, we would work cooperatively to update the standard operating procedures to ensure protection of the refuge's cultural resources. The current standard operating procedures include:

- Outfit any equipment with high flotation tires.
- Mark known archaeological sites in the field and excluding these areas from any forest management activities.
- Use grapple skidders instead of cable skidders.
- Create any new log landings without lowering the grade.
- Use skid trails only on level stands where no water diversion will be needed.
- Use only low pressure equipment for pre-mechanical thinning of small diameter trees.
- Identify some areas to be excluded from logging.

Prospective bidders will be sought on the basis of their demonstrated ability and willingness to comply with standard operating procedures developed to ensure the protection of natural and cultural resources during forest thinning. Bids will be reviewed by refuge staff in consultation with the Division of Contracting and General Services and other Service staff with experience in forest management. The successful bidder will be issued a contract and a special use permit to conduct the thinning project, with special conditions that include the special operating procedures, other best management practices, time of year restrictions, and other conditions as necessary to ensure a safe, effective operation to minimize impacts on resources. If any conditions are violated, the permit and contract could be revoked and work would cease. If the permit is revoked, an allowance would be agreed upon between the Service and the contractor for the removal of the contractor's equipment only. The severity of the response will depend on the severity of the violation. In cases where the refuge is pleased with the work completed, multi-year agreements may be approved.

Timber sales will be based on current market value. Funds generated by the sale of timber will be used to support the forest management program, including additional stand inventories and related roadwork. When appropriate infrastructure maintenance is needed, the refuge will identify and authorize funding for the contractor or its agents to conduct projects directly associated with timber sales, such as road maintenance, culvert repair, gate and sign fabrication and installation. Sufficient funds from the sale will be retained by the permittee to purchase supplies, materials, and labor necessary to address any impacts resulting from that or future phases of the operation.

(e) Why is the use being proposed?

The forest management action is prompted by Service policy to ensure that the biological integrity, diversity, and environmental health of the Refuge System is maintained (601 FW 3). In an effort to consider and protect the broad spectrum of fish, wildlife, and habitats potential at the James River NWR, restoration is required within the pine-dominated forest (USFWS 2015). Prior to 1991, the land that is now part of the refuge was owned and managed as a commercial timber operation. Much of the land had been clear cut just prior to refuge establishment.

Regenerating pine forests on the refuge have grown too thickly to be of significant value to migratory birds, and present a wildfire hazard. An overstocked pine forest is a “biological desert” according to the author of the Partners in Flight Physiographic Plan for the Mid-Atlantic Region (Watts 2013 personal communication). Pine stands on the refuge now have up to 700 stems per acre, whereas a desired goal would ultimately be in the range of 100 to 125 trees per acre. A 2006 timber cruise found a basal area of 140 square feet per acre. To improve habitat quality and reduce fire hazard, we will remove 30 to 40 percent of the stems to reach a basal area of 85 to 100 square feet per acre. Thinning pine density and periodic prescribed burning to reduce woody debris will reduce the future potential for wildfire and associated carbon release.

The refuge lacks the equipment and personnel to carry out timber thinning program unaided. Since these trees have commercial value as pulp, bio-fuel, and saw timber, using a commercial contractor to achieve refuge management goals is the most efficient, cost-effective, and safest approach.

AVAILABILITY OF RESOURCES:

Resources required to implement this program include staff time to conduct the following tasks, and their estimated costs are detailed in table B.2.

Table B.2. Current Annual Administrative Costs Associated with Commercial Forest Management.

Activities	Resource	Annual Duration	Rate¹	Cost
Identify forest compartments ready for thinning	Refuge Manager (GS-13)	2 hours	\$51 / hour	\$102
	Deputy Refuge Manager (GS-12)	2 hours	\$43/ hour	\$86
	Wildlife Refuge Specialist (GS-11)	8 hours	\$38/ hour	\$304
	Wildlife Biologist (GS-11)	6 hours	\$38 / hour	\$228
Contract preparation and soliciting bids	Forester (GS-12)	8 hours	\$43 / hour	\$344
Proposal review, coordination, and SUP preparation, oversight	Refuge Manager (GS-13)	2 hours	\$51 / hour	\$102
	Deputy Refuge Manager (GS-12)	2 hours	\$43 / hour	\$86
	Wildlife Refuge Specialist (GS-11)	16 hours	\$38/ hour	\$608
	Wildlife Biologist (GS-11)	8 hours	\$38 / hour	\$304
TOTAL				\$2,164

¹ Maximum hourly rate in 2014 dollars, rounded to nearest dollar.

Funding within the refuge’s base budget is sufficient to support this high priority task, which is supported by fire management and habitat management goals of the refuge. Funding from the timber contract will be held by the contractor for maintenance or repair of infrastructure improvements affected by the thinning project; no refuge funds will be needed for either of these purposes.

ANTICIPATED IMPACTS ON REFUGE PURPOSE:

Commercial forest management to improve forest health and wildlife habitat on the refuge could have the following impacts:

Soil Impacts

The increased use and on-going maintenance of roads, creation of logging decks, and the operation of heavy equipment may impact soil, causing rutting and erosion (Helfrich et al. 1998, Wiest 1998, Cullen 2001). To mitigate potential impacts and minimize erosion, timber harvesting operations will follow the best management practices as recommended by State forestry agencies, and standard operating procedures established for this work at the refuge (USFWS 2006). Timber harvesting will occur during dry periods or in winter months when temperatures freeze the ground sufficiently to reduce soil erosion, compaction, and rutting. Active forest management will occur when site-specific soil conditions are appropriate.

Aquatic Resource Impacts

Forest management operations may have negative impacts on both water quantity and water quality. Data from forested experimental watersheds in the Eastern United States indicated that leaching of nutrients after timber harvesting, especially clear cutting, tend to increase (Bormann et al. 1968, Bormann et al. 1974), while increases in stream water temperature are highest where revegetation of cutover areas is delayed (deMaynadier and Hunter 1995, Cullen 2001). These factors may have detrimental effects on stream organisms, including fish, invertebrates, and amphibians (Campbell and Doeg 1989).

Maintaining forested buffers near streams and other aquatic resources minimizes impacts on water resources and water quality (Osborne and Kovacic 1993, Castelle et al. 1994, Wilkerson et al. 2006, Bennett 2010). To minimize water quality impacts, road improvements, skid trail planning, harvest operations and interaction with surface and groundwater hydrology will follow best management practices advocated by the State's forestry agency. Selective thinning, not clearcutting will be the primary harvest method. Harvesting will use existing refuge roads; no construction of new roads is anticipated. Stream crossings will be avoided.

Wildlife and Vegetation Impacts

Commercial forest management can have a number of localized and broader impacts on wildlife-related components of forests including: damage to understory vegetation (Scheller and Mladenoff 2002), alterations of microhabitat environments (deMaynadier and Hunter 1995), and changes in the abundance and type of coarse woody debris (deMaynadier and Hunter 1995, Siitonen 2001). Less downed wood and fewer large-diameter logs are likely to accumulate under a short-rotation (less than 50 years) harvest, whole-tree harvests, and selection cuts than would occur under long rotations or in uncut forests, affecting soil moisture regimes and forest floor amphibians and small mammals (Gore and Patterson 1986, deMaynadier and Hunter 1995). Harvesting may also leave the remaining trees more susceptible to wind throw (Ruel 1995), facilitate the spread of invasive plants (Sakai et al. 2001), and disturb wildlife temporarily (deMaynadier and Hunter 1995, Campbell et al. 2007, Holmes and Pitt 2007).

Mitigation of such impacts is possible through careful planning and implementation. Use of selective logging methods, equipment with reduced ground disturbing capabilities, and time of year and soil moisture restrictions will minimize disturbance to wildlife and understory vegetation, pre-harvest multi-resource surveys, strategic layout of skid trails, and clear designation of no-cut zones will minimize impacts.

Visitor Impacts

The thinning operation may disturb refuge visitors, cause safety issues, or detract from visitors' aesthetic experience. When safety considerations warrant, areas of the refuge undergoing active management will be temporarily closed. The bulk of the proposed thinning is to occur outside of the designated public use area and only in small tracts (i.e., less than 250 acres) any one time; therefore, impacts to visitors will be minimal.

PUBLIC REVIEW AND COMMENT:

As part of the comprehensive conservation planning process for James River NWR, this compatibility determination underwent extensive public review during a 39-day comment period with the release of the draft comprehensive conservation plan and environmental assessment. We announced the availability of the draft plan for public comment in the *Federal Register* on October 22, 2014 (79 FR 63161), as well as in media news releases, on the refuge's website, and in a newsletter that we distributed to nearly 500 parties on our planning mailing list. This level of public review fully complies with Service policy and NEPA. No change in this compatibility determination was warranted based on comments received.

DETERMINATION (CHECK ONE BELOW):

- Use is not compatible
- Use is compatible, with the following stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

James River NWR has developed a list of criteria for determining whether any given refuge location would be appropriate for selective pine thinning operations. These criteria would apply to current and future forest management programs. Criteria are as follows:

- Areas to be harvested will be determined on an annual basis to ensure that forest management activities support the wildlife and habitat goals outlined in the comprehensive conservation plan (USFWS 2015) and subsequent step-down plans. Individuals issued permits for harvest of forest products on the refuge must adhere to the terms contained therein, including the SHPO-approved standard operating procedures for protecting historic and archaeological resources during mechanical tree cutting activities at Eastern Virginia Rivers NWR Complex in the Commonwealth of Virginia and the Best Management Practices as outlined by the Virginia Department of Forestry.
- Forested areas that are scheduled for thinning are surveyed for wetlands, vernal pools, and other sensitive features. No-cut buffer zones are established around any sensitive features. Permittees are required to use all applicable Best Management Practices as determined by the State forestry agency. In some instances, the refuge may exceed state recommendations for specific resource protection objectives.
- State forestry representatives check refuge timber operations for compliance with State laws and regulations. Refuge staff make regular site inspections to ensure operational compliance with the terms of the special use permit.
- Any forest management on hydric soils or slopes of over 30 percent will forbid the use of heavy equipment.
- The forest management program will employ adaptive management to access and modify silvicultural prescriptions.

JUSTIFICATION:

Timber management is a traditional and effective method of improving habitat for wildlife and reducing the threat of catastrophic wildfire.

Although commercial timber harvesting is not a priority use for the Refuge System, it is a management tool that can help maintain and enhance forest habitat on the refuge for high-priority forest-dwelling migratory birds, such as chuck-wills widow, as well as other native plants and animals. By helping maintain high-quality habitat on the refuge, timber harvesting will contribute to the refuge's purposes, as well as the refuge's biological goals outlined in the comprehensive conservation plan (USFWS 2015). It is therefore determined that commercial timber harvesting within pine-dominated stands is a compatible use for James River NWR.

To fund the thinning effort solely through station funds would otherwise not be possible. We have insufficient resources to conduct this management practice within our current staffing and budget. The commercial value of overstocked refuge pine forests presents an opportunity to use a contractor to conduct needed forest management at no cost to the Service. This provides an economic stimulus to the community and achieves refuge objectives to improve habitat.

In accordance with 50 CFR 29.1, commercial timber management, as described in this compatibility determination, significantly contributes to the fulfillment of the Refuge System mission or the purposes for which the refuge was established.

SIGNATURE:

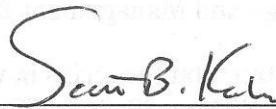
Refuge Manager:


(Signature)

5/18/15
(Date)

CONCURRENCE:

Regional Chief:


(Signature)

6/3/2015
(Date)

MANDATORY 10 YEAR RE-EVALUATION DATE:

6/3/2025

LITERATURE CITED:

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COMPATIBILITY DETERMINATION

USE:

Public Deer Hunting

REFUGE NAME:

James River National Wildlife Refuge

ESTABLISHMENT DATE:

March 27, 1991

ESTABLISHING AND ACQUISITION AUTHORITY(IES):

Endangered Species Act of 1973 (16 U.S.C. 1531-1543), as amended

REFUGE PURPOSE(S):

“...to conserve (A) fish or wildlife which are listed as endangered species or threatened species...or (B) plants...”

NATIONAL WILDLIFE REFUGE SYSTEM MISSION:

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.

DESCRIPTION OF USE:

(a) What is the use? Is the use a priority public use?

The use is public hunting of white-tailed deer on the refuge. Hunting is one of the six priority public uses of the National Wildlife Refuge System (Refuge System) under the Refuge System Administration Act of 1966 (16 U.S.C. § 668dd-668ee), as amended by the Refuge System Improvement Act of 1997 (Pub.L. 105-57).

(b) Where would the use be conducted?

Hunting will occur on approximately 3,900 acres within the 4,324-acre refuge. Hunters must access refuge lands from designated access points. Deer hunting will take place within the refuge boundary only from designated areas. The refuge does not allow hunting on the refuge in safety zones, administrative areas, while in or around vehicles, or on public roads. To maximize visitor safety, we would not allow hunting in the designated public use area. The specific zones and stand locations will be assessed after each hunting season and adjusted as necessary to meet deer management objectives.

(c) When would the use be conducted?

The refuge is currently open to the hunting of white-tailed deer on specific days during the State’s archery, muzzleloader, and shotgun seasons. The use would be conducted in designated areas of the refuge in accordance with Federal, State, and county regulations and seasons (<http://www.dgif.virginia.gov/hunting>; accessed June 2012). Specific dates for hunting on James River NWR are chosen by refuge staff on an annual basis.

Hunting opportunities are offered on a limited season, permit-only basis. The refuge offers up to 19 days of archery deer hunting in October; 2 days of muzzleloader deer hunting on the first two Saturdays of the season (typically in late October and early November); and 4 days of shotgun hunting (typically in mid-November through early December). In accordance with the guidelines set forth in the 1985 National Wildlife Federation publication, *Bald Eagles in the Chesapeake: A Management Guide for Landowners*, hunting will not occur after December 14 (USFWS 1993).

In accordance with the State’s hunting regulations, legal hunting hours are one half-hour before sunrise to one half-hour after sunset. Permitted hunters may enter the refuge no more than one hour before legal hunting time and depart no later than one half-hour after legal hunting time.

(d) How would the use be conducted?

Hunting will occur according to Commonwealth of Virginia’s regulations and will be subject to refuge-specific regulations, according to the Federal regulations published in Title 50 of the Code of Federal Regulations (50 CFR 32.66). However, the refuge manager may, upon annual review of the hunting program and in coordination with the Virginia Department of Game and Inland Fisheries (VDGIF), impose further restrictions on hunting, recommend that the refuge be closed to hunting, or further liberalize hunting regulations within the limits of state seasons and regulations. We may restrict hunting if it conflicts with other, higher priority refuge programs or endangers refuge resources or public safety.

Hunt Administration

In 2011, the Service established a Memorandum of Agreement (MOA #503130-11K006) with VDGIF to administer a quota archery hunt at the refuge. This agreement will be effective for 5 years and renewed as appropriate. VDGIF works through a contractor to process hunter applications, make equitable and random selections of hunters to participate in the hunt, notify all applicants about the selection outcome, and provide applicant contact information to the Service. The VDGIF contractor charges a processing fee to each applicant as reimbursement for services provided; this fee may be modified in the future.

Refuge quota archery hunts are advertised on the refuge and VDGIF websites (http://www.fws.gov/refuge/James_River and <http://www.dgif.virginia.gov/hunting/quotahunts>, respectively), as well as in the annual “Hunting & Trapping in Virginia” regulations digest published by VDGIF. The refuge muzzleloader and shotgun hunts are advertised in local publications (e.g., Hopewell News, Prince George Journal, Progress Index newspapers) and the Prince George County website (<http://www.princegeorgeva.org>). Hunt flyers are distributed at local convenient stores and businesses. Participation instructions are included in these announcements. A limited number of scouting days prior to the application deadline are offered to help interested parties determine if they want to submit an application to hunt on the refuge. Additional scout days are provided just prior to the beginning of each hunt season.

Hunters wishing to participate in the refuge’s archery hunt apply through the State’s quota hunt lottery system. Hunters may apply by mail, telephone, or through the VDGIF’s website (<http://vaquotahunts.com>). Each selected hunter may be accompanied by one guest hunter, who must acquire a refuge permit to participate in the hunt. Up to 50 hunters may participate on any or all of a 19-day still archery season in October, excluding Sundays (950 hunt use days annually). Each archery hunter must each complete a “White-tailed Deer Refuge-specific Hunting Permit Conditions” form, which details requirements of the hunt as identified in 50 CFR 32.66.

Hunters wishing to participate in the refuge’s muzzleloader or shotgun hunts are selected on a first-come, first served basis; hunters report to the refuge’s visitor contact station on the hunt day to acquire a refuge-issued permit for the day. Each hunter must complete a “Quota Deer Hunt Application” (Service Form 3-2354). The refuge accommodates up to 70 hunters per day on each of 2 muzzleloader hunting days, on the first two Saturdays of the season (140 hunt use days annually). The refuge accommodates up to 70 hunters per day on each of 4 shotgun hunting days, typically in mid- to late-November and early December (280 hunt use days annually).

Permit Fees

A refuge archery hunt permit fee of \$50 is charged to each hunter participating in the 19-day archery deer season; this fee may be modified in the future. A maximum of 50 permits are issued annually for the archery deer season.

A refuge firearm hunt permit fee of \$10 per day is charged to each hunter participating on a muzzleloader or shotgun deer season hunt day; this fee may be modified in the future. A maximum of 70 permits per day are issued for the muzzleloader and shotgun deer season days.

Once hunt administrators receive the signed permit conditions form and associated fee payment, they issue a permit and provide additional information about the hunt (e.g., refuge hunt map, details about additional scouting dates). The archery hunt permit is mailed to the selected applicant by the VDGIF contractor. The firearm hunt permit is issued by the refuge to the applicant for one designated hunt day; their designated hunt date is specified on the non-transferrable permit. Each permit specifies that deer may be hunted, as well as the harvest limits in accordance with the State regulations. Harvest limits may change under future State regulations.

Hunt Day

The VDGIF contractor completes the bulk of the administration portion of the archery hunt prior to the commencement of the archery season. Hunters sign-in and sign-out on each day they participate in the refuge’s archery hunt. The sign-in/sign-out sheet is located at the refuge information kiosk, and each hunter provides his name, vehicle type, and hunting zone information. Once completed, the hunter proceeds to his hunt zone and hunts.

On each day of the hunt, interested participants come to the refuge’s visitor contact station to complete required paperwork, choose their hunting location, pay, and receive their permit. Once completed, hunters drive to or near the identified hunt location and hunt. Each hunter is required to hunt within 100 feet from their designated hunt stand location as identified in refuge hunt permit conditions.

All persons participating in the refuge hunt must have a valid State hunting license and refuge permit in their possession while on the refuge. Hunters are required to wear solid-colored, hunter-

orange clothing or material in a conspicuous manner on the head, chest, or back in accordance with State regulations.

Prohibited activities include:

- The use of “man drives,” defined as individual or group efforts intended to “push” or “jump” deer for the purposes of hunting.
- Discharging a firearm within 300 feet of any building.
- Possessing a loaded firearm on road or in “no hunt zones.”
- Hunting with dogs.
- Smoking.
- Use or possession of alcohol.
- Creating fires.
- Hunting while in or around vehicles.
- Hunting on roads.

Harvest Limits and Reporting Requirements

Hunters are solely responsible for the retrieval and transport of harvested deer back to their vehicle. The refuge permits hunting within State guidelines in compliance with a hunt program that we may adjust each year to enhance safety and sound wildlife management.

All archery hunters that successfully harvest deer are to check their game through a State game checking system. Hunters receive a confirmation number for verification of the check-in. The current means of processing this information is by calling 1-866-GOT-GAME (468-4263) or online (<https://www3.dgif.virginia.gov/gamecheck>). Contact VDGIF as this information may change within the life of this document. Refuge staff are developing a more efficient way to collect Deer Management Assistance Program (DMAP) information during our archery season.

Firearms hunters bring all harvested deer to the refuge’s visitor contact station for the hunt administrator to document, weigh, and conduct a health assessment of each deer. This is a requirement for the refuge’s involvement in the DMAP. A VDGIF check card is completed and a copy provided to the hunter. At the end of the season, a copy of all harvest data is mailed to the State.

(e) Why is the use being proposed?

The Refuge System Improvement Act identifies hunting a priority public use that, if compatible, is to receive enhanced consideration over other general public uses. As with fishing, we recognize hunting as a healthy, traditional outdoor past time and an important cultural activity in this area of Virginia. Hunting promotes public understanding and appreciation of natural resources and their management on all lands and waters in the Refuge System.

Hunting is a tool managers use to maintain wildlife populations at an acceptable level. The VDGIF establishes hunting seasons and bag limits to meet population objectives and to offer people the opportunity to experience a traditional outdoor recreational activity. Game species population objectives are determined by a number of factors (such as prior year(s) harvest totals, available habitat, and landowner tolerances), and each year the seasons and bag limits are designed to remove the harvestable surplus without long-term negative impacts to the population. The ability to effectively manage game species populations depends in large part on the availability of land with quality habitat. Providing hunting opportunities on the refuge will aid the Commonwealth in meeting its management objectives and preserve a wildlife-dependent priority public use long associated with this land.

The Service intends to continue the tradition of wildlife-related recreation on the refuge by allowing hunting in compliance with State and refuge-specific regulations (USFWS 2015). By allowing this use to continue, hunters can experience this traditional recreational activity, aid the refuge and State in maintaining acceptable game species population levels, gain a better appreciation of the refuge's high quality wildlife habitats, and become better informed about the refuge and the Refuge System.

The Service encourages the development of hunting programs on national wildlife refuges when they are compatible with the refuge's legal purposes, biologically sound, affordable, properly coordinated with other refuge programs, and meet the Service description of a quality hunt. "Quality hunts" are defined as those which are planned, supervised, conducted, and evaluated to promote positive hunting values and ethics such as fair chase and sportsmanship. The Service strives to provide hunting opportunities on refuges which are superior to those available on other public or private lands, and to provide participants with reasonable harvest opportunities, uncrowded conditions, fewer conflicts among hunters, relatively undisturbed wildlife, and limited interference from, or dependence on, mechanized aspects of the sport (605 FW 2).

The refuge opened to public deer hunting in 1992 (57 FR 58108; codified at 50 CFR 32.66). Proposed changes to the refuge-specific regulation revisions have been published in the Federal Register and Title 50 in the CFRs annually since that time. We prepared a compatibility determination and categorical exclusion in 1994 (USFWS 1994). The compatibility determination emphasizes that the objectives for the hunt were to maintain the population of white-tailed deer at a level commensurate with the biological carrying capacity of the available refuge habitat and to provide high quality wildlife-oriented recreation.

AVAILABILITY OF RESOURCES:

The financial and staff resources necessary to provide and administer these uses at their current levels are now available. We expect the existing financial resources to continue in the future, subject to availability of appropriated funds.

The Refuge Recreation Act requires that funds are available for the development, operation, and maintenance of the permitted forms of recreation. The preseason application fee (required for the James River NWR archery hunt) and refuge hunting permit fee are the minimal amounts needed to offset the cost of facilitating the preseason drawings and manage the hunts. Permit fees may need to be adjusted (increased or decreased) and will be evaluated annually.

Current annual administrative costs associated with the existing refuge-supported operations for

the deer hunt program are detailed in table B.3. However, this table does not address the preseason application portion of the hunt program administered by VDGIF contractor; the contract work is a cost savings to the refuge. Permit fees serve as cost recovery for administration of the public deer hunting program (table B.4).

Table B.3. Current Annual Administrative Costs Associated with Public Deer Hunting.

Activities	Resource	Annual Duration	Rate ¹	Cost
Program review and oversight, approves hunt conditions, submits updated CFR regulations	Deputy Refuge Manager (GS-12)	10 hours	\$43 / hour	\$430
Site preparation, scheduling, collaborates with VDGIF and contractor, responds to public inquiries, promotes use, administers and defines hunt conditions, authors hunt plan	Wildlife Refuge Specialist (GS-11)	105 hours	\$38 / hour	\$3,990
Monitors harvest data, collaborates with VDGIF and contractor, defines hunt conditions, participates in deer health assessments	Wildlife Biologist (GS-11)	32 hours	\$38 / hour	\$1,216
Conducts patrols, coordinates with Federal and State conservation officers, defines hunt conditions	Federal Wildlife Officer (GL-09)	16 hours	\$39 / hour	\$624
Support materials, mailings, and fuel				\$100
TOTAL				\$6,360

Note: Some actions and resulting costs also support other approved public uses (i.e., wildlife observation, photography, environmental education, and interpretation).

¹ Maximum hourly rate in 2014 dollars, rounded to nearest dollar.

Table B.4. Maximum Costs Potentially Recovered from Allowing Public Deer Hunting Annually.

Service Provided	Cost per Unit	Units (on average)	Annual Costs Recovered	Costs Recovered by Service Provider
Application Fee	\$7.50 / application	85 / year	\$637.50	DGIF contractor
Refuge Hunt Permit Fees				Refuge (80%) Region (20%)
Archery	\$50.00 / permit issued [†]	50 / year	\$2,500 [†]	
Muzzleloader	\$10.00 / permit issued	140 / year	\$1,400 [†]	
Shotgun	\$10.00 / permit issued	280 / year	\$2,800 [†]	
			\$7,337.50	COMBINED TOTAL

[†] DGIF contractor receives a portion (\$7.50) from permit fees, as a collection fee

[†] Based on maximum participation and collection of full permit fee payments

ANTICIPATED IMPACTS OF THE USE:

Hunting can result in positive or negative impacts to the wildlife resource. A positive effect of allowing visitors' access to the refuge will be the provision of additional wildlife-dependent recreational opportunities and a better appreciation and more complete understanding of the wildlife and habitats associated with the Chesapeake Bay ecosystems. This can translate into more widespread and stronger support for the refuge, the Refuge System, and the Service. The following is a discussion of refuge-specific impacts, which are supported by a compilation of baseline information relative to the featured topic.

Soils and Vegetation

Repeated visitation to any particular locale at the refuge would continue to cause minor site-specific damage to vegetation. Accidental introduction of invasive plants, pathogens, or exotic invertebrates attached to vehicles, shoes, or clothing is another source of direct minor impacts on vegetation. In places where unmarked paths are created by hunters, little used pathways will retain their dominant vegetation species, but on medium-use pathways some plant species will be replaced and heavily-used paths will often contain invasive species (Liddle and Scorgie 1980).

Using staff observations of past impacts, hunting is expected to have negligible adverse impacts on soils and vegetation in the short and long-term. Disturbance to soils and vegetation may occur when hunters travel off-trail through upland habitats. We expect negligible impacts to soils and vegetation would result because the hunters disperse themselves or are relegated to designated hunt locations across hunting areas, hunters typically only travel as far as needed to find a desirable hunting location, and most vegetative species will have already undergone senescence or become dormant.

Positive indirect effects on the vegetation would result from a reduction in the deer population. The impacts of dense deer populations on forest regeneration and the composition and diversity of the herbaceous understory have been well-documented (Tierson et al. 1966, Behrend et al. 1970, Tilghman 1989). Allowing public deer hunting to continue on the refuge would maintain the habitat as it is now and prevent degradation due to overbrowsing. Well-managed hunting can effectively control deer and produce dramatic changes in the forest vegetation (Behrend et al. 1970). The impact of deer hunting on the vegetation would be positive and result in better regeneration of forest canopy species and an increase in the diversity of the herbaceous understory. In summary, there would be few if any negative impacts from this use on the refuge's vegetation, but there would be beneficial impacts from the decrease of deer browse on the refuge's vegetation due to the decrease in the number of deer on refuge lands.

Wildlife

Prior to refuge establishment in 1991, shotgun deer hunting occurred on this property for over 40 years, with no documented disturbance or impact to the bald eagle, indigenous wildlife, or to the habitat (USFWS 1993).

Virginia's prehunt deer population is estimated to be between 850,000 and 1,000,000 deer, and is not at risk (VDGIF 2007). The State determines seasons and bag limits based on regional deer harvest data. The Commonwealth's deer management program regulates deer hunting toward maintaining at moderate to low population densities, in fair to good physical condition, and below the biological carrying capacity of the habitat (VDGIF 2007). The objective for James River NWR's deer population has been stabilization for 11 of the prior 12 years (VDGIF 2012).

Currently, approximately 65 percent of the available hunt registration spots are filled (Cyrus Brame 2013 personal communication). Information regarding the animal's sex, health, harvest date, harvest means (i.e., archery tackle, muzzleloader, or shotgun), and county of harvest is recorded at the refuge's visitor contact station. Approximately 32 deer have been harvested annually during the past decade. Based on the past 5 years of available State participation data and refuge harvest success ratios, deer hunters participating in our muzzleloader and shotgun seasons have a successful harvest ratio that is nearly the State average for 2012 (Brame 2013 personal communication). Since 2006, no deer have been reported to have sloughing or splitting hooves on two or more feet, a condition indicative of hemorrhagic disease. According to our

VDGIF District Biologist, the weights of deer harvested from the refuge look good and on par with Prince George County data (Proctor 2013 personal communication).

The use does have some disturbance to other native wildlife present on the refuge. However, the timing of the hunt is such that many native wildlife species are not present or dormant at the time of the hunt and, therefore, unlikely to be affected. White-tailed deer hunting is currently the single most important public use on the refuge that would impact mammals, including deer and other forest-dependent wildlife. Impacts on amphibians and reptiles are expected to be negligible because these species are preparing or already hibernating or in torpor (dormancy) during the hunt season on the refuge (typically occurring mid-November through mid-December). Impacts to invertebrates such as butterflies, moths, other insects, and spiders are expected to be negligible. Invertebrates are not active during the majority of the hunting seasons and would have few interactions with hunters during the hunting season.

Managing the deer population at a level that refuge habitat can support prevents direct negative impacts to other wildlife and habitat present. For example, heavily browsed habitats (a result of insufficient food for the herd size) have shown to decrease migratory song bird foraging opportunity (deCalesta 1994).

Fall is the season for bird migration, and hunting may disturb their resting and foraging during this critical time. The impacts from hunting are not known, but related to the frequency, type, and duration of the disturbance. Migrating and wintering birds may be foraging and roosting in upland and wetland habitats. Hunting activity may cause these birds to unnecessarily take flight, expending energy resources when food resources are limited. Because this use is not concentrated in space or time (it occurs on select days throughout the refuge during designated times within the hunting season), the disturbance effects on wildlife that are using the refuge during fall and winter are not expected to be significant.

Access near interior creeks and tributaries may result in flushing of waterfowl and waterbirds. Additionally, waterfowl and waterbirds often move out of the creeks during daylight hours to forage and loaf in and along the main stem of the James River. Other types of migratory birds, namely neotropical migrant species, have already departed the refuge for wintering grounds further south.

Lead-based ammunition used for deer hunting has the potential to cause lead poisoning in bald eagles or other birds of prey. Unrecovered animals and offal (gut) piles from deer can contain lead fragments that, if ingested, could expose birds to lead. We do not collect information from hunters that allow us to estimate the rate or number of unrecovered deer carcasses produced every year; however, over the past 5 years, the muzzleloader and shotgun hunt program has averaged 206 hunters per year with an annual average total harvest of just over 32 deer per year (Brame 2013 personal communication). Areas within the refuge designated for the deer hunt are in the heavily wooded areas of the pine-dominated forest, moist hardwood forest, and floodplain forest away from existing bald eagles nests. We believe that unrecovered animals containing lead shot from the shotgun and muzzleloader hunts would have negligible impacts to bald eagles based on the small number of carcasses potentially produced each year. No eagles or non-target animals have been found to have died from lead poisoning on the refuge, though the potential exists because lead shot is used for deer hunting (Brame 2014 personal communication). We encourage hunters to use lead-free shot on the refuge.

Implementing the refuge’s comprehensive conservation plan will have no effect on listed species or their associated habitats on the refuge (USFWS 2015). Other, non-game special status species are not expected to be impacted by hunting at James River NWR.

The bald eagle continues to be protected federally under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act (BGEPA). The BGEPA, originally passed in 1940, provides for the protection of the bald eagle and the golden eagle (as amended in 1962) by prohibiting the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit (16 U.S.C. 668(a); 50 CFR 22). Bald eagles (*Haliaeetus leucocephalus*) are known to nest, roost, and winter at James River NWR. Since the refuge was opened to any public use, we have imposed geographic and time-of-year restrictions on the public use activities to protect nesting bald eagles. We would continue to provide direct, moderate, long-term impacts to bald eagle nesting areas by managing visitor access in accordance with BGEPA requirements. In accordance with the National Bald Eagle Management guidelines (USFWS 2007), visitor use has not been allowed to occur within 330 feet of active nests. We would continue to manage public use activities in accordance with Federal laws and regulations.

Public Use and Access

Refuge lands have become increasingly important in the region as a place to engage in hunting activity. Hunters have the opportunity to harvest a renewable resource in a traditional manner, which is culturally important to the local community. Refuge lands allow the public to enjoy hunting at no or little cost in a region where private land is leased for hunting, often costing a person several hundred to several thousand dollars per year for membership. Refuge hunting programs provide opportunities to experience a wildlife-dependent recreational activity, instill an appreciation for and understanding of wildlife, the natural world and the environment, and promote a land ethic and environmental awareness. The minor beneficial impacts of providing the existing level of wildlife-dependent activities include helping meet existing and future demands for outdoor recreation and education.

The refuge would also be promoting a wildlife-oriented recreational opportunity that is compatible with the purpose for which the refuge was established. The public would have an increased awareness of the refuge and the Refuge System and public demand for areas to hunt and learn about wildlife would be met. Over time, it is reasonable to believe that public awareness of the refuge would increase. This increase would translate into participation in the hunting program and other approved wildlife-dependent activities. We anticipate that the refuge would continue to meet the demand as it increases in the long term.

PUBLIC REVIEW AND COMMENT:

As part of the comprehensive conservation planning process for James River NWR, this compatibility determination underwent extensive public review during a 39-day comment period with the release of the draft comprehensive conservation plan and environmental assessment. We announced the availability of the draft plan for public comment in the *Federal Register* on October 22, 2014 (79 FR 63161), as well as in media news releases, on the refuge’s website, and in a newsletter that we distributed to nearly 500 parties on our planning mailing list. This level of public review fully complies with Service policy and NEPA. No change in this compatibility determination was warranted based on comments received.

DETERMINATION (CHECK ONE BELOW):

- Use is not compatible
- Use is compatible, with the following stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

The following stipulations will help ensure the refuge white-tailed deer hunting program is compatible with refuge purpose.

- Hunters must abide by all applicable Federal, State, and refuge-specific regulations. Refuge-specific regulations are published annually in the Federal Register, Title 50 of the CFRs, and on a form that hunters must sign to be issued a hunt permit (see attachment 1).
- Hunters are encouraged to use lead-free shot.

All deer hunters must adhere to the following stipulations, which are updated and published annually in 50 CFR 32.66, in addition to State regulations:

- We require hunters to possess and carry a refuge hunting permit (contains date selected to hunt and permit number), along with their State hunting license while on refuge property. We require hunters to display a vehicle permit (contains date selected to hunt and permit number) provided by the refuge on the dashboard of their vehicle while on the refuge so that the permit is visible through the windshield.
- We require firearm hunters to complete and sign a Quota Deer Hunt Application (Service Form 3-2354) and provide the application and hunt fee to the hunt administrator at the Refuge Hunter Check Station on the morning of each hunt on a first-come-first-served basis. The hunt administrator will then provide the applicant a 1-day refuge hunting permit.
- We require persons who wish to hunt during the refuge’s archery season to obtain a refuge hunting permit through a lottery administered by a commercial vendor of VDGIF. We notify successful applicants by mail or email, and if we receive the hunting fee by the date identified in the mailing, we mail refuge hunting permits to successful applicants.
- We allow archery, muzzleloader, and shotgun hunting on designated days as indicated on refuge hunting permits.
- We prohibit dogs.
- We allow only portable tree stands that hunters must remove at the end of each hunt day (see 50 CFR 27.93). We prohibit damage to trees (see 50 CFR 32.2(i)).
- We require that hunters during firearms and muzzleloader seasons remain within 100 feet (30 meters) of their assigned stand while hunting.

- We require that hunters using a muzzleloader must hunt from a stand elevated 10 feet (3 meters) or more above the ground in accordance with the local firearms ordinance (<http://www.dgif.virginia.gov/hunting/regulations/local-ordinances.pdf>, accessed June 2015)
- Persons possessing, transporting, or carrying firearms on national wildlife refuges must comply with all provisions of State and local law. Persons may only use (discharge) firearms in accordance with refuge regulation (see 50 CFR 27.42 and refuge-specific regulations in 50 CFR 32).
- We prohibit the discharge of firearms or archery equipment across or within State-maintained or refuge roads, including roads closed to vehicles, as shown on refuge hunt maps.
- We prohibit the use of flagging to mark trails or for any other purpose.
- An adult age 21 or older, possessing and carrying a valid hunting license and refuge hunting permit, must accompany and directly control youth hunters ages 12 to 17. We prohibit persons under age 12 to hunt on the refuge.
- We prohibit the use or possession of alcohol while hunting on the refuge (see 50 CFR 32.2(j)).
- We require hunters to report accidents or injuries to the refuge office or sheriff's office within 24 hours after the incident. Hunters must report accidents resulting in serious injury to the sheriff's office immediately.
- We require hunters to unload hunting bows, crossbows, muzzleloaders, and shotguns while in or around vehicles or on refuge roads (see 50 CFR 27.42). We define "unloaded" as: arrows or bolts removed from bow or crossbow; muzzleloader primer removed from nipple or powder removed from flashpan; or shotgun shell removed from chamber of shotgun. A muzzleloading firearm is considered "loaded" when the muzzleloader is capped, or has a charged pan, or has a primer or battery installed in the firearm. The definition of a "loaded crossbow" is a crossbow that is cocked and has either a bolt or arrow engaged or partially engaged on the shooting rail or track of the crossbow, or with a "trackless crossbow" when the crossbow is cocked and a bolt or arrow is nocked.
- We require hunters during archery-only seasons to sign in and out at the Hunter Sign-In/Sign-Out stations, and record deer harvest information on the Big Game Harvest Report (Service Form 3-2359).

JUSTIFICATION:

Hunting is a priority public use and is to receive enhanced consideration on refuges, according to the Refuge System Improvement Act. Providing increased wildlife-dependent recreational opportunities at James River NWR promotes visitor appreciation and support for the refuge, Refuge System, and Service; engages communities in local habitat conservation efforts in the lower James River and the Chesapeake Bay; and instills a sense of ownership and stewardship

ethic in refuge visitors.

Hunting, as described above, will not detract from the purpose and intent of the refuge. Stipulations described will ensure proper control over the use and provide management flexibility should detrimental impact develop. Allowing this use furthers the mission of the Refuge System and Service by expanding opportunities for wildlife dependent uses when compatible and consistent with sound fish and wildlife management. We have determined that hunting will not materially interfere with, or detract from, the fulfillment of the Refuge System mission or the purposes for which the refuge was established.

SIGNATURE:

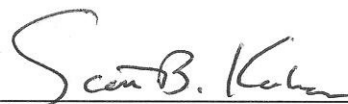
Refuge Manager:


(Signature)

6/2/15
(Date)

CONCURRENCE:

Regional Chief:


(Signature)

6/3/2015
(Date)

MANDATORY 15 YEAR RE-EVALUATION DATE:

6/3/2030

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FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: James River National Wildlife Refuge

Use: Research by Non-Service Personnel

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: *Andrew P. Holt*

Date: 5/18/15

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: *Ac M. Sittman*

Date: 5/27/15

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

FWS Form 3-2319
02/06

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: James River National Wildlife Refuge

Use: Research Conducted by Non-Service Personnel

NARRATIVE:

In accordance with the 2006 U.S. Fish and Wildlife Service (Service) Appropriate Use Policy (603 FW 1), the refuge manager must first determine if the use is appropriate prior to allowing any non-priority public use on the refuge. Research conducted by non-Service personnel is not identified as a priority public use of the National Wildlife Refuge System (Refuge System) under the Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the Refuge System Improvement Act of 1997 (Pub.L. 105-57). However, research by non-Service personnel is often conducted by colleges and universities; Federal, State, and local agencies; nongovernmental organizations; and qualified members of the general public. Research on James River National Wildlife Refuge (NWR, the refuge) would further understanding our basic understanding of the refuge's biological and cultural resources, and to inform our management decisions that affect those resources. In many cases, research by non-Service personnel ensures the perception of unbiased and objective information gathering, which can be important when using the research to develop management recommendations for politically sensitive issues. Additionally, universities and other Federal and State partners can often access equipment and facilities unavailable to refuge staff for analysis of data or biological samples.

Research conducted by non-Service personnel would also help the refuge to better achieve the goals of the Comprehensive Conservation Plan (CCP) because the data would help evaluate objectives and strategies identified in the plan.

The Service would encourage and prioritize research and management studies on refuge lands that would improve and strengthen natural resource management decisions. The refuge manager would particularly encourage research supporting approved refuge goals and objectives that clearly improves land management decisions related to Federal trust resources, helps evaluate or demonstrate state-of-the-art techniques, and/or helps address or adapt refuge lands to climate and land use change impacts.

Refuge staff would also consider research for other purposes that may not be directly related to refuge-specific goals and objectives, but contribute to the broader enhancement, protection, use, preservation, and management of cultural resources and native populations of fish, wildlife, and plants, and their natural diversity within the Northeast region or Atlantic flyway. All research proposals must also comply with the Service's compatibility policy.

Evaluating and accepting or rejecting study proposals, as well as conditioning the special use permits (SUP) appropriately, would minimize the impacts of, and maximize the value of, such research. If a research project occurs during the refuge's hunting season, special precautions would be required and enforced to ensure the researchers' health and safety. If conducted according to refuge-specific stipulations set forth in an approved compatibility determination and in a project-specific SUP, this use would not affect the Service's ability to protect, conserve and manage wildlife and their habitats, nor would it impair existing wildlife-dependent recreational uses or reduce the potential to provide quality, compatible, wildlife-dependent recreation uses into

the future.

Therefore, research has been found appropriate because it is beneficial to the refuge's natural and cultural resources, and is consistent with the goals and objectives of the CCP (USFWS 2015).

LITERATURE CITED:

U.S. Fish and Wildlife Service (USFWS). 2015. James River National Wildlife Refuge, Comprehensive Conservation Plan. Prince George County, Virginia. Accessed at: http://www.fws.gov/refuge/James_River/what_we_do/conservation.html.

COMPATIBILITY DETERMINATION

USE:

Research Conducted by Non-Service Personnel

REFUGE NAME:

James River National Wildlife Refuge

ESTABLISHMENT DATE:

March 27, 1991

ESTABLISHING AND ACQUISITION AUTHORITY(IES):

Endangered Species Act of 1973 (16 U.S.C. 1531-1543), as amended

REFUGE PURPOSE(S):

“...to conserve (A) fish or wildlife which are listed as endangered species or threatened species...or (B) plants...”

NATIONAL WILDLIFE REFUGE SYSTEM MISSION:

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.

DESCRIPTION OF USE:

(a) What is the use? Is the use a priority public use?

This determination covers low impact research projects; namely, those projects with methods that only have a minimal potential to adversely affect cultural resources and native wildlife and plants.

This is not an all-inclusive list, but examples of the types of research that would be allowed include: mist-netting for banding or tagging birds, point count surveys, fish and amphibian tagging, electrofishing, radio-telemetry tracking, use of cameras and recorders, use of live or other passive traps, or non-destructive searches of nests, dens, or burrows.

Research activities allowed under this determination would not result in long-term, negative alterations to species' behavior (e.g., result in wildlife leaving previously occupied areas for long periods; modifying their habitat use; or, causing nest or young abandonment). No project would degrade wildlife habitat, including vegetation, soils, and water. Research associated activities that would not be allowed include, but are not limited to, those that would result in soil compaction or erosion, degrade water quality, remove or destroy vegetation, involve off-road vehicle use, collect and remove animals or whole native plants, cause public health or safety concerns, or result in conflicts with other compatible refuge uses.

Refuge support of research directly related to refuge goals and objectives may take the form of funding, in-kind services such as housing or use of other facilities, vehicles, boats, or equipment, direct staff assistance with the project in the form of data collection, provision of historical records, conducting of management treatments, or other assistance as appropriate.

Research conducted by non-Service personnel is not a priority public use of the National Wildlife Refuge System (Refuge System) under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), and the Refuge System Improvement Act of 1997 (Public Law 105-57).

(b) Where would the use be conducted?

This use will be allowed on all refuge lands, including lands that may be acquired in the future pursuant to the final comprehensive conservation plan (CCP). The location of the research will vary depending on the individual research project that is proposed. An individual research project is usually limited to a particular habitat type, plant, or wildlife species. On occasion, research projects will encompass an assemblage of habitat types, plants, or wildlife. The research location will be limited to those areas of the refuge that are absolutely necessary to conduct the research project. The refuge may limit areas available to research as necessary to ensure the protection of Federal trust resources, or to reduce conflict with other compatible refuge uses. The methods and routes of access to study locations will be identified by refuge staff.

(c) When would the use be conducted?

The timing of the research may depend entirely on the individual research project that is being conducted. Scientific research will be allowed to occur on the refuge throughout the year. An individual research project could be short-term in design, requiring only one or two visits over the course of a few days, or be a multiple year study that may require regular visits to the study site. The timing of each individual research project will be limited to the minimum required to complete the project. If a research project occurs during the refuge's hunting season, special precautions will be required and enforced to ensure public health and safety. The refuge manager would approve the timing (e.g., project length, seasonality, time of day) of the research prior to the start of the project to minimize impacts to wildlife and habitats, ensure safety, and reduce conflicts with other compatible refuge uses.

(d) How would the use be conducted?

Research activities will depend entirely on the individual research project that is conducted. The objectives, methods, and approach of each research project will be carefully scrutinized by the refuge manager before it will be allowed on the refuge. Only low impact research activities, such as those listed under section (a) above, are covered under this determination.

Research projects must have a Service-approved study plan and protocol. A detailed research proposal that follows the refuge's study proposal guidelines (see attachment I) is required from parties interested in conducting research on the refuge. Each research proposal request will be considered, and if determined appropriate and compatible, will be issued a special use permit (SUP) by the refuge manager that includes the stipulations in this determination. The refuge manager will use sound professional judgment and ensure that the request will have no considerable negative impacts to natural or cultural resources, or impact visitors, and does not violate refuge regulations. Before initiating a research project that involves federally listed endangered or threatened species, an interagency Section 7 consultation process should be completed.

If approved, multi-year research projects will be reviewed annually to ensure that they are meeting their intended design purposes, that reporting and communicating with refuge staff is occurring, and that projects continue to be consistent with the mission of the Refuge System and purposes for which the refuge was established.

If the refuge manager decides to deny, modify, or halt a specific research project, the refuge manager will explain the rationale and conclusions supporting their decision in writing. The denial or modification to an existing study will generally be based on evidence that the details of a particular research project may:

- Negatively affect native fish, wildlife, and habitats or cultural, archaeological, or historical resources.
- Detract from fulfilling the refuge’s purposes or conflict with refuge goals and objectives.
- Raise public health or safety concerns.
- Conflict with other compatible refuge uses.
- Not be manageable within the refuge’s available staff or budget time.
- Deviate from the approved study proposal such that impacts to refuge resources are more severe or extensive than originally anticipate.

(e) Why is this use being proposed?

Quality scientific research, including inventory and monitoring projects, are an integral part of refuge operations and management. Thorough research provides critical information for establishing baseline information on refuge resources and evaluating management effects on wildlife and habitat. Research results will help inform, strengthen, and improve future refuge management decisions, as well as inform management decisions on other ownerships with Federal trust resources in the Chesapeake Bay Watershed and possibly elsewhere in the Northeast Region.

Research was first determined to be a compatible use on the refuge in 1994. The refuge manager renewed the determination that research is an appropriate use in 2006 and compatible use in 2007. One example of research completed on the refuge that serves to illustrate the kind of research that may occur in the future is the landbird survey. This project is conducted by Service-authorized agents, and therefore classified as management activity not subject to compatibility review. However, it is an excellent example of the type of research we would consider to be appropriate and compatible. The landbird monitoring protocol is a standardized tool that has been adopted and approved by at least three different regions within the Service to monitor breeding landbirds. The protocol is used to monitor the abundance, density, occupancy, and species richness of breeding landbirds on national wildlife refuges through point count and vegetation surveys. Another objective of this monitoring is to assess how bird communities (composition, distribution, and abundance) respond to changes in landscape structure and vegetation. Development of this protocol was a direct response to the need identified in the Service’s *Fulfilling the Promises* initiative as a high priority, second in importance after waterfowl data. This study has been conducted on James River NWR since 2009. Future research projects may also include evaluating habitat management treatments and the associated wildlife community response, as well as, measures of impacts from public uses on refuge lands.

The refuge manager would particularly encourage research supporting approved refuge goals and objectives that clearly improves land management decisions related to Federal trust resources, helps evaluate or demonstrate state-of-the-art techniques, and/or helps address or adapt to climate and land use change impacts.

AVAILABILITY OF RESOURCES:

The resources necessary to provide and administer this use are available within current and anticipated refuge budgets. The bulk of the cost for research is incurred in staff time to review research proposals, coordinate with researchers, and write SUPs. In some cases, a research project may only require 1 day of staff time to write a SUP. In other cases, a research project may take many weeks, as the refuge staff must coordinate with students and advisors and accompany researchers onsite visits. These responsibilities are accounted for in budget and staffing plans.

We estimate below the annual costs associated with the administration of this use. (table B.5).

Table B.5. Current Annual Administrative Costs Associated with Research by Non-Service Personnel.

Activities	Resource	Annual Duration	Rate ¹	Cost
Proposal review, coordination, and SUP preparation	Refuge Manager (GS-13)	4 hours	\$51 / hour	\$204
	Deputy Refuge Manager (GS-12)	4 hours	\$43 / hour	\$172
	Wildlife Biologist (GS-11)	40 hours	\$38 / hour	\$1,520
	Wildlife Refuge Specialist (GS-11)	8 hours	\$38 / hour	\$304
Field assistance, evaluating resource impacts	Wildlife Refuge Specialist (GS-11)	10 hours	\$38 / hour	\$380
	Wildlife Biologist (GS-11)	160 hours	\$38 / hour	\$6,080
Use of facilities		40 days	\$5 / day	\$200
Use of equipment	Vehicle or watercraft	4 days	\$20 / day	\$80
TOTAL				\$8,940

Note: Some actions and resulting costs also support approved public uses (i.e., hunt program).

¹ Maximum hourly rate in 2014 dollars, rounded to nearest dollar.

ANTICIPATED IMPACTS OF THE USE:

The Service encourages quality research to further the understanding of natural resources. Research by non-Service personnel contributes to the availability of the best available scientific information to support refuge management decisions.

Disturbance to wildlife, vegetation, water, soils, or cultural resources could occur while researchers are accessing study sites on vehicles or by foot, or while they are engaged in their project. The presence of researchers could also indirectly disturb wildlife. Potential impacts include:

- Trampling, damage, and killing of vegetation from walking off-trail (Kuss 1986, Roovers et al. 2004, Hammitt and Cole 1998).
- Soil compaction, soil erosion, and changes in hydrology from hiking on- and off-trail (Kuss 1986, Roovers et al. 2004).

Disturbance to wildlife that causes shifts in habitat use, abandonment of habitat, increased energy demands on affected wildlife, changes in nesting and reproductive success, and singing behavior

(Knight and Cole 1991, Miller et al. 1998, Shulz and Stock 1993, Gill et al. 1996, Arrese 1987, Gill et al. 2001).

Overall, we expect that these impacts would be negligible because of the low number of researchers and because, under this determination, only low impact projects would be allowed. As indicated under (a) above, low impact projects are those that would only minimally impact cultural resources or native wildlife and plants, and would not result in long-term, negative alterations to species' behavior, or their habitat, including vegetation, soils, and water. Research would only be conducted in approved locations and at approved times of day and times of season to minimize impacts to sensitive habitats and wildlife.

Animals may be temporarily disturbed during direct or remote observation, telemetry, capture (e.g., mist-netting), or banding. In very rare cases, direct injury or mortality could result as an unintended result of research activities. Mist-netting and banding, which are common research methods, can cause stress, especially when birds are captured, banded, and weighed. In very rare cases, birds have been injured or killed during mist netting, or killed when predators reach the netted birds before researchers. In a study of mist-netting and banding at 22 bird banding stations in the U.S. and Canada, Spotswood et al. (2012) found that the average rate of injury was very low (0.59 percent; mostly from damage to the wings, stress, cuts, or breaks) and the average rate of mortality was also very low (0.23 percent; mostly from stress and predation). Overall, they found that the likelihood of injury differed among species (e.g., heavier birds were more prone to incidents) and some species were more vulnerable to certain types of injuries. To minimize the potential for injuries, researchers should be properly trained (Fair et al. 2010, Spotswood et al. 2012) and look for signs of stress (e.g., lethargy, panting, raising feathers, closing eyes), wing strain, tangling, and predation (Spotswood et al. 2012). Impacts can also be minimized by considering the species to be captured, mesh size of net, time of day, time of year, weather, the number of birds that need to be captured, and the level of predation (Fair et al. 2010).

Barron et al. (2010) found that transmitters attached for research can also negatively impact bird species by affecting their behavior and ecology. The greatest impacts from transmitters were increased energy expenditure and decreased the likelihood of nesting. They also found that the method of transmitter attachment had an impact on the likelihood of injury or mortality, with anchored and implanted transmitters having the highest mortality due to the need for anesthesia. Collar and harness transmitters also had high mortality rates because they could cause birds to become entangled in vegetation. To minimize these risks, researchers can avoid anchored/implanted transmitters and use adjustable harnesses and collars with weak links that allow the device to detach if it becomes trapped in vegetation (Barron et al. 2010).

The U.S. Department of Agriculture's Animal Welfare Information Center maintains a website with resources to help minimize stress, injury, and mortality of wildlife in field studies at: <https://awic.nal.usda.gov/research-animals/wildlife-field-studies>. Recommendations relevant to refuge research projects would be followed. Included on this site are links to the following guidelines to help researchers limit their impacts on wildlife:

- The Ornithological Council's "Guideline to the Use of Wild Birds in Research" (Fair et al. 2010).
- The American Society of Mammologists, "Guidelines of the American Society of Mammologists for the Use of Wildlife Mammals in Research" (2011).

- American Fisheries Society, “Guidelines for the Use of Fishes Research” (2004).
- American Society of Ichthyologists and Herpetologists, “Guidelines for Use of Live Amphibians and Reptiles in Field Research” (2006).

Researchers may also inadvertently damage plants (e.g. via trampling or equipment use) during the research project. To minimize impacts, the SUP will outline how researchers are allowed to access their study sites and use equipment to minimize the potential for impacts to refuge vegetation, soils, and water. We would not allow the collection and removal, or permanent damage, of any native plants under this determination.

Overall, allowing well-designed, properly reviewed, low impact research to be conducted by non-Service personnel is likely to have very little negative impact on refuge wildlife populations and habitats. We anticipate research will only have negligible to minor impacts to refuge wildlife and habitats because it will only be carried out after the refuge approves a detailed project proposal and issues a SUP including the stipulations in this determination to ensure compatibility. These stipulations are designed to help ensure each project minimizes impacts to refuge cultural resources, wildlife, vegetation, soils, and water. We also anticipate only minimal impacts because Service staff will supervise this activity, and it will be conducted in accordance with refuge regulations. In the event of persistent disturbance to habitats or wildlife, the activity will be further restricted or discontinued. If the research project is conducted with professionalism and integrity, potential minor adverse impacts are likely to be outweighed by the body of knowledge contributed to our understanding of refuge resources and our management effects on those resources, as well as the opportunity to inform, strengthen, and improve future refuge management decisions.

PUBLIC REVIEW AND COMMENT:

As part of the comprehensive conservation planning process for James River NWR, this compatibility determination underwent extensive public review during a 39-day comment period with the release of the draft comprehensive conservation plan and environmental assessment. We announced the availability of the draft plan for public comment in the *Federal Register* on October 22, 2014 (79 FR 63161), as well as in media news releases, on the refuge’s website, and in a newsletter that we distributed to nearly 500 parties on our planning mailing list. This level of public review fully complies with Service policy and NEPA. No change in this compatibility determination was warranted based on comments received.

DETERMINATION (CHECK ONE BELOW):

- Use is not compatible
- Use is compatible, with the following stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

- Only low impact projects are covered under this determination. Low impact projects, as indicated under (a) above, are those that would only have a minimal potential to impact cultural resources and native wildlife and plants. No project should result in long-term

negative alterations to species' behavior (e.g., result in wildlife leaving previously occupied areas for a long term; modifying their habitat use within their range; or, causing nest or young abandonment). No project should degrade wildlife habitat, including vegetation, soils, and water. Nest, dens, and burrows must not be harmed. No research activities should result in soil compaction or erosion, degrade water quality, remove or destroy vegetation, involve off-road vehicle use, or result in collection and removal of animals or whole native plants.

- Research would only be conducted in Service-approved locations, using approved modes of access, and conducted only after the timing, season, duration, numbers of researchers, and areas open and closed is approved. Sensitive wildlife habitat areas will be avoided unless sufficient protection, approved by the Service, is implemented to limit the area and/or resources potentially impacted by the proposed research.
- If a research project occurs during the refuge's hunting season, special precautions will be required and enforced to ensure public health and safety, and otherwise reduce conflicts with other compatible refuge uses.
- The Service will require modifications to research activities, including temporarily closing areas, or changing methods, when warranted, to avoid harm to sensitive wildlife and habitat when unforeseen impacts arise.
- All researchers will be required to submit a detailed research proposal following the refuge's study proposal guidelines (see attachment I) and Service Policy (FWS Refuge Manual Chapter 4 Section 6). The refuge must be given at least 45 days to review proposals before initiation of research. Proposals will include obligations for regular progress reports and a final summary document including all findings.
- The criteria for evaluating a research proposal, outlined in the "Description of Use" section (a) above, will be used when determining whether a proposed study will be approved on the refuge. Projects would be denied if they:
 - Negatively impact native fish, wildlife, and habitats or cultural, archaeological, or historical resources.
 - Detract from fulfilling the refuge's purposes or conflicts with refuge goals and objectives.
 - Cause public health or safety concerns.
 - Conflicts with other compatible refuge uses.
 - Are not manageable within the refuge's available staff or budget time.
- Proposals will be prioritized and approved based on need, benefit to refuge resources, and the level of refuge funding required. Service experts, State agencies, or academic experts may be asked to review and comment on proposals.
- If proposal is approved, a SUP will be issued. The SUP will contain this determination's stipulations as well as project-specific terms and conditions that the researcher(s) must follow relative to the activities planned (e.g., location, duration, seasonality, use of biotic specimens). For example, if biotic specimens are to be collected, the following language will be included in

the SUP (USFWS 2005):

You may use specimens collected under this permit, any components of any specimens (including natural organisms, enzymes, genetic material or seeds), and research results derived from collected specimens for scientific or educational purposes only, and not for commercial purposes unless you have entered into a Cooperative Research and Development Agreement (CRADA) with us. We prohibit the sale of collected research specimens or other transfers to third parties. Breach of any of the terms of this permit will be grounds for revocation of this permit and denial of future permits. Furthermore, if you sell or otherwise transfer collected specimens, any components thereof, or any products or any research results developed from such specimens or their components without a CRADA, you will pay us a royalty rate of 20 percent of gross revenue from such sales. In addition to such royalty, we may seek other damages and injunctive relief against you.

- Researchers must comply with all state and Federal laws and follow all refuge rules and regulations. All necessary State and Federal permits must be obtained before starting research on the refuge (e.g., permits for capturing and banding birds). Any research involving federally listed species may require Section 7 consultation under the Endangered Species Act. Any research involving ground disturbance may require historic preservation consultation with the Regional Historic Preservation Officer and/or State Historic Preservation Officer.
- Researchers will mark any survey routes, plots, and points in as visually unobtrusive a manner as practical. No permanent markers or infrastructure can be left on the refuge.
- Researchers will use every precaution and not conduct activities that would cause damage to refuge property or present hazards or significant annoyances to other refuge visitors. Any damage should be reported immediately to the Refuge Manager
- Researchers must not litter, or start or use open fires on refuge lands.
- All research staff handling wildlife must be properly trained to minimize the potential for impacts to individual wildlife prior to initiating the project. In addition, a review of the U.S. Department of Agriculture’s Animal Welfare Information Center website must be documented by the researcher with identification of practices that will be followed to help further minimize stress, injury, and mortality of wildlife. The website is reached at: <https://awic.nal.usda.gov/research-animals/wildlife-field-studies>.
- Researchers may not use any chemicals (e.g., herbicides to treat invasive plants) or hazardous materials without prior written consent of refuge manager (e.g., the type of chemical, timing of use, and rate of application). All activities will be consistent with Service policy and an approved refuge Pesticide Use Plan.
- Researchers will be required to take steps to ensure that invasive species and pathogens are not inadvertently introduced or transferred to the refuge and surrounding lands (e.g., cleaning equipment).
- Refuge staff will monitor research activities for potential impacts to the refuge. The refuge manager may determine that previously approved research and SUP be modified or terminated due to observed impacts that are more severe or extensive than originally anticipated. The refuge manager will also have the ability to cancel a SUP if the researcher is

not in compliance with the stated conditions.

- Researchers must have the SUP in their possession when engaged in research activities and will present it to refuge officials and State and Federal law enforcement agents upon their request.
- Researchers will submit a final report to the refuge upon completion of their work. For long-term studies, interim progress reports may also be required. The refuge also expects that research findings will be published in peer-reviewed publications. The contribution of the refuge and the Service should be acknowledged in any publications. The SUP will identify a schedule for annual progress reports and the submission of a final report or scientific paper.

JUSTIFICATION:

The Service encourages quality scientific research because it provides critical baseline information on Federal trust and other refuge resources and helps evaluate the management effects on those resources. Research results will help inform, strengthen, and improve future refuge management decisions, as well as inform management decisions on other ownerships in the Chesapeake Bay Watershed and possibly elsewhere in the Northeast Region. Given the stipulations above, and given that only low impact research projects would be conducted under this determination, we do not anticipate this activity will have greater than minor impact on refuge resources. If they occur, impacts would be confined in area, duration, and magnitude, with no long-term consequences predicted. Therefore, research conducted by non-Service personnel on James River NWR will not materially interfere with or detract from the mission of the Refuge System or the purposes for which the refuge was established.

SIGNATURE:

Refuge Manager:


(Signature)

6/2/15
(Date)

CONCURRENCE:

Regional Chief:


(Signature)

6/3/2015
(Date)

MANDATORY 10 YEAR RE-EVALUATION DATE:

6/3/2025

LITERATURE CITED:

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ATTACHMENT I

James River National Wildlife Refuge Research Proposal Guidelines

A study proposal is a justification and description of the work to be done, and includes cost and time requirements. Proposals must be specific enough to serve as "blueprints" for the investigative efforts. Step-by-step plans for the actual investigations must be spelled out in advance, with the level of detail commensurate with the cost and scope of the project and the needs of management. Please submit proposals electronically as a Microsoft Word document or hardcopy to the refuge manager.

The following list provides a general outline of first order headings/sections for study proposals.

- Cover Page.
- Table of Contents (for longer proposals).
- Abstract.
- Statement of Issue.
- Literature Summary.
- Objectives/Hypotheses.
- Study Area.
- Methods and Procedures.
- Quality Assurance/Quality Control.
- Specimen Collections.
- Deliverables.
- Special Requirements, Concerns, Necessary Permits.
- Literature Cited.
- Peer Review.
- Budget.
- Personnel and Qualifications.

Cover Page

The cover page must contain the following information:

- Title of Proposal.
- Current Date.

- Investigator(s): name, title, organizational affiliation, address, telephone and fax numbers and e-mail address of all investigators or cooperators.
- Proposed starting date.
- Estimated completion date.
- Total Funding Support Requested from the U.S. Fish and Wildlife Service.
- Signatures of Principal Investigator(s) and other appropriate institutional officials.

Abstract

The abstract should contain a short summary description of the proposed study, including reference to major points in the Statement of Issue, Objectives, and Methods and Procedures sections.

Statement of Issue

Provide a clear, precise summary of the problem to be addressed and the need for its solution. This section should include statements of the importance, justification, relevance, timeliness, generality, and contribution of the study. Describe how any products will be used, including any anticipated commercial use. What is the estimated probability of success of accomplishing the objective(s) within the proposed timeframe?

Literature Summary

This section should include a thorough but concise literature review of current and past research that pertains to the proposed research, especially any pertinent research conducted within the Connecticut River watershed, and specifically, on refuge units. A discussion of relevant legislation, policies, and refuge planning and management history, goals, and objectives should also be included.

Objectives/Hypotheses

A very specific indication of the proposed outcomes of the project should be stated as objectives or hypotheses to be tested. Project objectives should be measurable. Provide a brief summary of what information will be provided at the end of the study and how it will be used in relation to the problem. These statements should flow logically from the statement of issue and directly address the management problem.

Establish data quality objectives in terms of precision, accuracy, representativeness, completeness, and comparability as a means of describing how good the data need to be to meet the project's objectives.

Study Area

Provide a detailed description of the geographic area(s) to be studied and include a clear map delineating the proposed study area(s) and showing specific locations where work will occur.

Methods and Procedures

This section should describe as precisely as possible how the objectives will be met or how the hypotheses will be tested. Include detailed descriptions and justifications of the field and laboratory methodology, protocols, and instrumentation. Explain how each variable to be measured directly addresses the research objective/ hypothesis. Describe the experimental

design, population, sample size, and sampling approach (including procedures for sub-sampling). Summarize the statistical and other data analysis procedures to be used. List the response variables and tentative independent variables or covariates. Describe the experimental unit(s) for statistical analysis. Also include a detailed project time schedule that includes initiation, fieldwork, analysis, reporting, and completion dates.

Quality Assurance/Quality Control

Adequate quality assurance/quality control (QA/QC) procedures help insure that data and results are: credible and not an artifact of sampling or recording errors; of known quality; able to stand up to external scientific scrutiny; and accompanied by detailed method documentation. Describe the procedures to be used to insure that data meet defined standards of quality and program requirements, errors are controlled in the field, laboratory, and office, and data are properly handled, documented, and archived. Describe the various steps (e.g., personnel training, calibration of equipment, data verification and validation) that will be used to identify and eliminate errors introduced during data collection (including observer bias), handling, and computer entry. Identify the percentage of data that will be checked at each step.

Specimen Collections

Clearly describe the kind (species), numbers, sizes, and locations of animals, plants, rocks, minerals, or other natural objects to be sampled, captured, or collected. Identify the reasons for collecting, the intended use of all the specimens to be collected, and the proposed disposition of collected specimens. For those specimens to be permanently retained as voucher specimens, identify the parties responsible for cataloging, preservation, and storage and the proposed repository.

Deliverables

The proposal must indicate the number and specific format of hard and/or electronic media copies to be submitted for each deliverable. The number and format will reflect the needs of the refuge and the Refuge manager. Indicate how many months after the project is initiated (or the actual anticipated date) that each deliverable will be submitted. Deliverables are to be submitted or presented to the refuge manager.

Deliverables that are required are as follows:

Reports and Publications

Describe what reports will be prepared and the timing of reports. Types of reports required in fulfillment of natural and social science study contracts or agreements include:

- (1) Progress report(s) (usually quarterly, semiannually, or annually): may be required
- (2) Draft final and final report(s): always required

A final report must be submitted in addition to a thesis or dissertation (if applicable) and all other identified deliverables. Final and draft final reports should follow refuge guidelines (see attachment II).

In addition, investigators are encouraged to publish the findings of their investigations in refereed professional, scientific publications and present findings at conferences and symposia. The Refuge manager appreciates opportunities to review manuscripts in advance of publication.

Data Files

Provide descriptions of any spatial (Geographic Information Systems; GIS) and non-spatial data files that will be generated and submitted as part of the research. Non-spatial data must be entered onto Windows CD ROMs in Access or Excel. Spatial data, which includes GPS(Global Position System)-generated files, must be in a format compatible with the refuge's GIS system (ArcGIS 8 or 9, ArcView 3.3, or e00 format). All GIS data must be in UTM 19, NAD 83.

Metadata

For all non-spatial and spatial data sets or information products, documentation of information (metadata) describing the extent of data coverage and scale, the history of where, when, and why the data were collected, who collected the data, the methods used to collect, process, or modify/transform the data, and a complete data dictionary must also be provided as final deliverables. Spatial metadata must conform to U.S. Fish and Wildlife Service (Federal Geographic Data Committee; FDGC) metadata standards.

Oral Presentations

Three types of oral briefings should be included: pre-study, annual, and closeout.

These briefings will be presented to refuge staff and other appropriate individuals and cooperators. In addition, investigators should conduct periodic informal briefings with refuge staff throughout the study whenever an opportunity arises. During each refuge visit, researchers should provide verbal updates on project progress. Frequent dialogue between researchers and refuge staff is an essential element of a successful research project.

Specimens and Associated Project Documentation

A report on collection activities, specimen disposition, and the data derived from collections, must be submitted to the refuge following refuge guidelines.

Other

Researchers must provide the refuge manager with all of the following:

1. Copies of field notes/ notebooks/ datasheets.
2. Copies of raw data (in digital format), including GIS data, as well as analyzed data.
3. Copies of all photos, slides (digital photos preferred), videos, and films.
4. Copies of any reports, theses, dissertations, publications or other material (such as news articles). resulting from studies conducted on refuge.
5. Detailed protocols used in study.
6. Aerial photographs.
7. Maps.
8. Interpretive brochures and exhibits.
9. Training sessions (where appropriate).
10. Survey forms.

11. Value-added software, software developed, and models.

Additional deliverables may be required of specific studies.

Special Requirements, Permits, and Concerns

Provide information on the following topics where applicable. Attach copies of any supporting documentation that will facilitate processing of your application.

Refuge Assistance

Describe any refuge assistance needed to complete the proposed study, such as use of equipment or facilities or assistance from refuge staff. It is important that all equipment, facilities, services, and logistical assistance expected to be provided by the Fish and Wildlife Service be specifically identified in this section so all parties are in clear agreement before the study begins.

Ground Disturbance

Describe the type, location, area, depth, number, and distribution of expected ground-disturbing activities, such as soil pits, cores, or stakes. Describe plans for site restoration of significantly affected areas.

Proposals that entail ground disturbance may require an archeological survey and special clearance prior to approval of the study. You can help reduce the extra time that may be required to process such a proposal by including identification of each ground disturbance area on a U.S. Geological Survey (USGS) 7.5-minute topographic map.

Site Marking and/or Animal Marking

Identify the type, amount, color, size, and placement of any flagging, tags, or other markers needed for site or individual resource (e.g., trees) identification and location. Identify the length of time it is needed and who will be responsible for removing it. Identify the type, color, placement of any tags placed on animals (see SUP for requirements on marking and handling of animals).

Access to Study Sites

Describe the proposed method and frequency of travel to and within the study site(s). Explain any need to enter restricted areas. Describe duration, location, and number of participants, and approximate dates of site visits.

Use of Mechanized and Other Equipment

Describe any vehicles, boats, field equipment, markers, or supply caches by type, number, and location. You should explain the need to use these materials and if or how long they are to be left in the field.

Safety

Describe any known potentially hazardous activities, such as electro-fishing, scuba diving, whitewater boating, aircraft use, wilderness travel, wildlife capture or handling, wildlife or immobilization.

Chemical Use

Identify chemicals and hazardous materials that you propose using within the refuge.

Indicate the purpose, method of application, and amount to be used. Describe plans for storage, transfer, and disposal of these materials and describe steps to remediate accidental releases into

the environment. Attach copies of Material Safety Data Sheets.

Animal Welfare

If the study involves vertebrate animals, describe your protocol for any capture, holding, marking, tagging, tissue sampling, or other handling of these animals (including the training and qualifications of personnel relevant to animal handling and care). If your institutional animal welfare committee has reviewed your proposal, please include a photocopy of their recommendations. Describe alternatives considered, and outline procedures to be used to alleviate pain or distress. Include contingency plans to be implemented in the event of accidental injury to or death of the animal. Include state and Federal permits. Where appropriate, coordinate with and inform state natural resource agencies.

Literature Cited

List all reports and publications cited in the proposal.

Peer Review

Provide the names, titles, addresses, and telephone numbers of individuals with subject-area expertise who have reviewed the research proposal. If the reviewers are associated with the investigator's research institution or if the proposal was not reviewed, please provide the names, titles, addresses, and telephone numbers of three to five potential subject-area reviewers who are not associated with the investigator's institution. These individuals will be asked to provide reviews of the proposal, progress reports, and the draft final report.

Budget

The budget must reflect both funding and assistance that will be requested from the Fish and Wildlife Service and the cooperator's contributions on an identified periodic (usually annual) basis.

Personnel Costs

Identify salary charges for principal investigator(s), research assistant(s), technician(s), clerical support, and others. Indicate period of involvement (hours or months) and pay rate charged for services. Be sure to include adequate time for data analysis and report writing and editing.

Fringe Benefits

Itemize fringe benefit rates and costs.

Travel

Provide separate estimates for fieldwork and meetings. Indicate number of trips, destinations, estimated miles of travel, mileage rate, air fares, days on travel, and daily lodging and meals charges. Vehicle mileage rate cannot exceed standard government mileage rates. Charges for lodging and meals are not to exceed the maximum daily rates set for the locality by the Federal Government.

Equipment

Itemize all equipment to be purchased or rented and provide a brief justification for each item costing more than \$1,000. Be sure to include any computer-related costs. For proposals funded under Service agreement or contract, the refuge reserves the right to transfer the title of purchased equipment with unit cost of \$1,000 or more to the Federal Government following completion of the study. These items should be included as deliverables.

Supplies and Materials

Purchases and rentals under \$1,000 should be itemized as much as is reasonable.

Subcontract or Consultant Charges

All such work must be supported by a subcontractor's proposal also in accordance with these guidelines.

Specimen Collections

Identify funding requirements for the cataloging, preservation, storage, and analyses of any collected specimens that will be permanently retained.

Printing and Copying

Include costs for preparing and printing the required number of copies of progress reports, the draft final report, and the final report. In general, a minimum of two (2) copies of progress reports (usually due quarterly, semiannually, or as specified in agreement), the draft final report, and the final report are required.

Indirect Charges

Identify the indirect cost (overhead) rate and charges and the budget items to which the rate is applicable.

Cooperator's Contributions

Show any contributing share of direct or indirect costs, facilities, and equipment by the cooperating research institution.

Outside Funding

List any outside funding sources and amounts.

Personnel and Qualifications

List the personnel who will work on the project and indicate their qualifications, experience, and pertinent publications. Identify the responsibilities of each individual and the amount of time each will devote. A full vita or resume for each principal investigator and any consultants should be included here.

ATTACHMENT II. INTERIM FINAL REPORT GUIDELINES

Draft final and final reports should follow Journal of Wildlife Management format and should include the following sections:

- Title Page
- Abstract
- Introduction/ Problem statement
- Study Area
- Methods (including statistical analyses)
- Results
- Discussion
- Management Implications
- Management Recommendations
- Literature Cited

COMPATIBILITY DETERMINATION

USE:

Wildlife Observation, Photography, Environmental Education, and Interpretation

REFUGE NAME:

James River National Wildlife Refuge

ESTABLISHMENT DATE:

March 27, 1991

ESTABLISHING AND ACQUISITION AUTHORITY(IES):

Endangered Species Act of 1973 (16 U.S.C. 1531-1543), as amended

REFUGE PURPOSE(S):

“...to conserve (A) fish or wildlife which are listed as endangered species or threatened species...or (B) plants...”

NATIONAL WILDLIFE REFUGE SYSTEM MISSION:

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.

DESCRIPTION OF USE:

(a) What is the use? Is the use a priority public use?

The uses are wildlife observation, photography, environmental education, and interpretation. These are four of the six priority public uses of the National Wildlife Refuge System (Refuge System) under the Refuge System Administration Act of 1966 (16 U.S.C. § 668dd-668ee), as amended by the Refuge System Improvement Act of 1997 (Pub.L. 105-57).

(b) Where would the use be conducted?

These four public uses are concentrated on approximately 240 acres, hereafter referred to as the designated public use area, of the 4,324-acre refuge (USFWS 2015). The public use area is situated between Powell Creek and State Route 639. The public use area includes upland pine-dominated and moist hardwood forests, as well as lower elevation floodplain forests, freshwater marshes, and shrub swamps along Powell Creek.

These four public uses are conducted on designated refuge roads and trails within the public use area. These areas include, but are not limited to the existing 0.5-mile of trail extending from the refuge’s information kiosk to along the west bank of Powell Creek. Prior authorization from the

Service is required for the hand-launching of canoes and kayaks on Powell Creek at the existing canoe/kayak launch.

As identified in the refuge's comprehensive conservation plan (USFWS 2015), the following public use facilities modifications will enhance wildlife observation, photography, environmental education, and interpretation opportunities on the refuge:

- Extend the existing 0.5-mile nature trail to become a 3-mile trail, including segments that are American's With Disabilities Act-accessible and a pedestrian walkway that doubles as an observation platform along steep valleys.
- Improvements to the existing canoe/kayak launch on Powell Creek.
- Improvements to the existing vehicular ingress and egress route(s) and parking.
- Enhancement to the dike at Powell Creek to accommodate nature trail user access.
- Improvements to the existing restroom facility and renovate the existing check station main room to serve as a visitor contact station.
- Upgrade the equipment shed to accommodate outdoor meeting space for partners promoting Service mission-related topics.
- Improvements to interpretive waysides and brochures.
- Construction of a 3-person wildlife observation/photography blind.

(c) When would the use be conducted?

Currently, these four public uses may occur in the designated public use areas year-round from sunrise to sunset. If and when needed, time-of-year restrictions will be imposed on a case-by-case basis to ensure compliance with purposes for which the refuge was established and to prevent conflicts with other refuge public uses (e.g., hunting) or management activities (e.g., pine thinning).

Service and partner-sponsored public use programs will be scheduled on a case-by-case basis.

(d) How would the use be conducted?

Currently, visitors enter the refuge at public entry points by car along State Routes 10 and 639. Visitors traveling by car may park vehicles at refuge parking areas.

Upon access request and permit approval, visitors are informed of the allowed uses and how they should be conducted. Directional and informational signage is used to inform visitors about where and how to conduct these uses on the refuge. The information kiosk near Route 639 identifies the roads and trails open for travel and list authorized public uses.

As stated in the refuge's approved comprehensive conservation plan (USFWS 2015):

- Once infrastructure to support increased refuge visitation is constructed, improved, or enhanced, visitors in groups of 10 or less will no longer be required to obtain a general special use permit in advance of participating in wildlife observation, photography, environmental education, or interpretation within the refuge’s designated public use area.
- Visitors traveling by car may park vehicles at designated refuge parking areas.
- The designated 3-mile trail will be described and interpreted in refuge brochures and on the refuge’s website. Parking areas and kiosks would be located at refuge trailheads.

Contingent on available staffing and funding, the comprehensive conservation plan also calls for expanding or enhancing these four priority public uses through a variety of methods including, but not limited to, the following:

- Develop the existing partnership with the National Park Service (NPS) for natural and cultural resource interpretation and protection along the Captain John Smith Chesapeake National Historic Trail.
- Coordinate with local schools and pursue partnerships (i.e., Prince George County Parks and Recreation Department) to establish regular visitation and introduce community youth to the natural resources within their county through environmental education and interpretive programs.
- Offer two interpretive boat tours annually, specifically to observe bald eagles.
- Create a program to showcase the refuge as a demonstration area for forest management.
- Expand existing partnership with Richmond Audubon Society and Virginia Master Naturalist groups to include seasonal public wildlife observation and nature photography tours.
- Explore environmental education opportunities at the refuge with the James River Association (JRA).

Individuals or Small Groups

Wildlife observation, photography, environmental education, and interpretive experiences occur on an individual or group basis. To accommodate other users and promote a positive wildlife observation experience, we encourage smaller group sizes (i.e., less than 10 members). The refuge will not require advanced notice to request a general special use permit (SUP) for individuals or groups of less than 10 members interested in using the designated public use areas for wildlife observation, photography, environmental education, or interpretation.

Large Groups

Groups larger than 10 persons must contact the refuge office no less than 5 business days prior to the date proposed for visiting the trail system so that the refuge can determine if the group can be accommodated. A general SUP may be required. The general SUP application will be mailed, emailed, or faxed to the applicant upon request. The Refuge Manager, or his designee, will evaluate the general SUP application and determine if a permit will be issued. If approved, the

applicant will be sent an approved general SUP and informed that the applicant must have a copy of the permit in his/her possession while visiting the refuge. If a permit application is denied, the applicant will be informed of the basis for permit denial.

A general SUP is not required for individuals participating in Service- or partner-sponsored programs that are advertised in local publications and on the refuge website (http://www.fws.gov/refuge/james_river). Participation instructions are included in these announcements.

Participation by visitors in partner-sponsored events or programs does not require a general SUP if the partner organization has been issued a general SUP for the event or program because program sponsors request a general SUP on behalf of program participants. A general SUP may be issued to an individual; a group (e.g., birding club, Virginia Master Naturalists); or a formally recognized Service partner organization or agency (e.g., Richmond Audubon Society, JRA, NPS) sponsoring a wildlife-dependent recreational use program. For example, the JRA is a formally recognized Service partner organization that has been granted a general special use permit to conduct an environmental education program for student groups at James River NWR on a recurring basis.

Refuge staff and partners communicate directly with visitors in advance of or during their visit. Maps, brochures, and trail information is provided to the participating visitor or made available by other means (e.g., trail kiosks, refuge website).

The James River Ecology School

In December 2007, the Service signed a 20-year Memorandum of Understanding (MOU) with the JRA to develop the James River Ecology School (the Ecology School) at Presquile NWR and James River NWR. The Ecology School programming is designed to provide meaningful outdoor experiences that connect people with nature, is focused on the Chesapeake Bay and James River watershed, and is consistent with Virginia Standards of Learning requirements. The bulk of visitors, students, and youth groups participating in the Ecology School will be visiting Presquile NWR, a 1,329-acre island refuge located a upriver from James River NWR; however, some Ecology School programming may occur at James River NWR.

Service and NPS Collaboration in the Chesapeake Bay Watershed

In October 2010, the Service and NPS signed a MOU regarding cooperation and collaboration on a variety of efforts within the Chesapeake Bay Watershed. Among these efforts is implementation of the NPS Captain John Smith Chesapeake National Historic Trail (NHT), America's first water-based national historic trail. The water trail, more than 3,000 miles long, follows the routes of Captain John Smith's exploration of the Chesapeake Bay and its tributaries in 1607-1609. Through recreational experiences on water and land, knowledge about American Indian societies and cultures of the 17th century is shared and the natural history of the Chesapeake Bay and tributaries are interpreted.

During 2011, the Service actively participated in the planning process for implementing the Captain John Smith Chesapeake NHT on the James River. Through continued collaboration, the Service and NPS will ensure that Captain John Smith Chesapeake NHT-related activities proposed to occur at James River NWR are implemented in a manner that is compatible with the purpose and intent of the refuge.

(e) Why is the use being proposed?

The Refuge System Improvement Act identifies these four uses as priority public uses that, if compatible, are to receive enhanced consideration over other general public uses. Offering all four of these priority public uses at James River NWR will facilitate public enjoyment of and advocacy for the refuge, the Refuge System, and the Service mission (USFWS 2015). Of these four uses, James River NWR was opened to environmental education in the early 1990s and no unacceptable impacts to the refuge have been observed to date. As stated in the refuge’s comprehensive conservation plan (USFWS 2015), we will enhance the existing wildlife observation, photography, environmental education, and interpretation programs on the refuge.

These uses will provide opportunities for visitors to observe and learn about wildlife and wild lands in both structured and unstructured environments, and observe wildlife in their natural habitats. These four priority uses provide visitors with opportunities to enjoy refuge resources and gain a better understanding and appreciation of fish and wildlife, wild lands ecology, the relationships of plant and animal populations in an ecosystem, and wildlife management. These activities will enhance public understanding of natural resource management programs and ecological concepts, enable the public to better understand the problems facing native wildlife and wild lands resources, help visitors better understand how they affect wildlife and other natural resources, and demonstrate the Service’s role in conservation and restoration.

Photographers will gain opportunities to photograph wildlife in its natural habitat. These opportunities will increase the publicity and advocacy of Service programs. Photography provides wholesome, safe, outdoor recreation in a scenic setting, and entices those who come strictly for recreational enjoyment to participate in the educational facets of our public use program and become advocates for the refuge and the Service.

Visitors need a way to access these priority uses. By allowing visitors to walk, hike, drive, paddle, and boat in designated areas of the refuge, we are providing access to these important priority public uses with minimal impacts to sensitive wildlife and habitat.

AVAILABILITY OF RESOURCES:

The financial and staff resources necessary to provide and administer these uses at their current levels are now available. We expect the existing financial resources to continue in the future, subject to availability of appropriated funds. Recommendations detailed in the comprehensive conservation plan (USFWS 2015) and associated step-down plans would identify strategies for implementation.

Current annual administrative costs associated with the existing refuge-supported operations for wildlife observation, photography, environmental education, and interpretation programming are small due to the limited scope of use. The largest costs would be associated with new trail construction, kiosks, and canoe/kayak launch. These capital costs are described in appendix D of the comprehensive conservation plan (USFWS 2015).

Staff time associated with administration and regulatory enforcement of this use is related to assessing the need for road and trail maintenance and repair, maintaining kiosks, maintaining gates, maintaining traffic counters and recording collected data, maintaining sign-posting of roads and trails, informing the public about new refuge uses, conducting visitor use surveys, analyzing

visitor use patterns, monitoring the effects of public uses on refuge resources and visitors, and providing information to the public about the use.

Funding for visitor improvements comes from a variety of sources including general management capability funds, visitor facility enhancement projects, grant funds, contributions, and special project funds. We will complete and maintain projects and facilities as funds become available, and use volunteers and partners to help in construction and maintenance when appropriate.

Once a visitor services plan is completed and support infrastructure erected, cost for administering the wildlife observation, photography, environmental education and interpretive program will be easier to assess.

ANTICIPATED IMPACTS OF THE USE:

The public use program on the refuge is affected by Service policy to ensure that the biological integrity, diversity, and environmental health (BIDEH) of the Refuge System are maintained for the benefit of present and future generations of Americans. The Service policy on BIDEH (601 FW 3) provides for the consideration and protection of the broad spectrum of fish, wildlife, and habitat resources found on national wildlife refuges and associated ecosystems. Adverse impacts to the refuge's BIDEH will be avoided or minimized when implementing public use programs by establishing stipulations to ensure compatibility.

Soils and Vegetation

In the short-term, minor impacts to forest and the freshwater marsh and shrub swamp vegetation would be primarily associated with the use of heavy equipment to remove trees for the construction of 2.5 miles of new trail segments, establishment of four parking areas, and installation of interpretive signage in the designated public use area (USFWS 2015). In the long-term, impacts on vegetation would decrease as the vegetation adjacent to these areas recovers from the temporary use and presence of equipment. Through site planning and interpretive messaging, we would minimize the potential for impacts to refuge vegetation beyond the designated public use area including parking lots and nature trail.

Refuge visitors will be concentrated within the designated public use area (i.e., trail network and lawn areas adjacent to buildings). As a result of their activities, visitors are likely to generate noise, trample vegetation, and occupy buildings with windows and lighting. Wildlife habitat in the vicinity may be impacted.

Visitor use in the uplands occurs in forested areas with leaf litter ground cover, which is able to withstand high foot-traffic. Increased public use activity on the refuge would result in negligible, direct, long-term impacts to soils adjacent to designed public use areas such as trails and parking areas. In steep areas and those adjacent to water and wetlands, best management practices will be utilized to minimize impacts. Boardwalks will be used in areas of potential erosion concerns and moist soil sites. We would minimize impacts by installing interpretive signs that require users to stay on the designated paths and trails and explain the reasons why.

Increased foot traffic and construction equipment are the primary sources for introduction of non-native, invasive plant species. Infrequent and short-duration foot traffic has been shown to result in substantial loss of plant cover and species diversity, in some cases as much as more frequent traffic over a longer period of time (Kuss and Hall 1991) and loss of organic soil (Cole and Marion

1988). Some salamander species, such as the eastern redback salamander (*Plethodon cinereus*), will not cross openings that are too wide, dry, graveled, or bare ground (Marsh et al. 2005).

Wildlife

Bald eagles, other raptors, ground nesting, and breeding and migratory songbirds use the forested habitat of the refuge for nesting, roosting, and foraging. Public access to trails, hunts, and education programs on the refuge would result in negligible short-term indirect impacts to nesting, foraging, or breeding birds. Pedestrian activity has been shown to be the most disturbing activity to nesting and foraging bald eagles (Grubb and King 1991). Noise and motion near nesting or roosting sites may cause wildlife to flush and expend energy otherwise needed for reproductive success or overwintering survival (Burger 1981, Klein 1989). Existing and proposed trails and public access points are located in discrete locations.

Human disturbance would potentially cause mammals to flee. Similar to birds, mammals can flee in response to human disturbance (Knight and Cole 1991). Females with young are more likely to flee from disturbance than those without young (Hammitt and Cole 1998). We would minimize impacts to mammals by requiring visitors to stay on trails (Miller et al. 2001) and to stay out of sensitive areas.

External lighting fixtures and light from internal sources can disorient birds and amphibians and fatally attract pollinators (Brown et al. 2007, Buchanan 2002, Frank 1988, Frank 2002). Night programming on the refuge will be rare and be sensitive to these concerns. Large glass windows that reflect habitat or look deceptively like open sky kill millions of birds each year in the United States, especially during night migration and near stopover sites (Brown et al. 2007). Refuge buildings are one-story in height and use non-reflective or patterned glass to reduce the chance of bird strikes.

Implementing the refuge's comprehensive conservation plan will have no effect on the listed species or their associated habitats on the refuge (USFWS 2015).

The bald eagle continues to be protected federally under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA). The BGEPA, originally passed in 1940, provides for the protection of the bald eagle and the golden eagle (as amended in 1962) by prohibiting the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit (16 U.S.C. 668(a); 50 CFR 22). Bald eagles (*Haliaeetus leucocephalus*) are known to nest, roost, and winter at James River NWR. Since the refuge was opened to any public use, we have imposed geographic and time-of-year restrictions on the public use activities to protect nesting bald eagles. We would continue to provide direct, moderate, long-term beneficial impacts to bald eagle nesting areas by managing visitor access in accordance with BGEPA requirements. Within 330 feet of known nesting sites, we would continue to limit access between December 15 and July 15 (VDGIF and USFWS 2000) to minimize disturbance during incubation and other nesting activities that could reduce recruitment rates. We would continue to manage public use activities in accordance with Federal laws and regulations.

Public Access and Use

Our increased and improved environmental education and interpretation of the refuge's birds and their habitat requirements would provide negligible, direct, long-term impacts by helping to increase public understanding of and appreciation for bald eagles, as well as waterfowl and

waterbirds. Providing up to two refuge-sponsored trips for approximately 60 people annually to observe bald eagles perching, foraging, and nesting on the refuge would also offer opportunities to observe and learn more about waterfowl and waterbirds in the vicinity.

Increased public access to trails for wildlife observation, photography, environmental education, and interpretation would result in negligible to minor, indirect, short-term impacts as knowledge and appreciation of mammalian species and their habitats is fostered.

With limited Service resources available for additional monitoring of birds and their habitats, partnerships would provide moderate, indirect, long-term impacts as it will help to supplement our information needs. University research partnerships and education programs would provide minor direct long-term impacts by helping to increase knowledge about and awareness of different bird groups using the refuge, including ground nesting birds, cavity nesting birds, raptors, neotropical migratory birds, waterfowl, marsh birds, and bald eagles.

PUBLIC REVIEW AND COMMENT:

As part of the comprehensive conservation planning process for James River NWR, this compatibility determination underwent extensive public review during a 39-day comment period with the release of the draft comprehensive conservation plan and environmental assessment. We announced the availability of the draft plan for public comment in the *Federal Register* on October 22, 2014 (79 FR 63161), as well as in media news releases, on the refuge's website, and in a newsletter that we distributed to nearly 500 parties on our planning mailing list. This level of public review fully complies with Service policy and NEPA. No change in this compatibility determination was warranted based on comments received.

DETERMINATION (CHECK ONE BELOW):

- Use is not compatible
- Use is compatible, with the following stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

James River NWR has developed a list of criteria for determining whether any given refuge location would be appropriate for wildlife observation, photography, environmental education, or interpretation. These criteria would apply to current and future programs, trails, and facilities, and are in addition to the MBTA and BGEPA. Criteria are as follows:

Locations for wildlife-dependent public uses should:

- Provide an opportunity to view a variety of habitats and wildlife.
- Be safe for the access proposed at current use levels and proposed future use levels.
- Require minimal annual maintenance to ensure safe access and prevent habitat degradation.
- Have a low potential for fragmenting habitat or disturbing wildlife populations.

- Occur where less than 50 percent of the trail system’s length occupies soil types rated as high or very high for compaction and/or erosiveness.
- Predominately occupy previously modified substrate (graveled, cultivated, or filled), such as old roads and former logging corridors.

Additional stipulations to ensure compatibility include:

- James River NWR regulations will be posted and enforced. Closed areas will be established as needed, posted, and enforced. Signs necessary for visitor information, directions, and safety will be kept current.
- Walking and hiking on designated trails solely for the purpose of wildlife observation, photography, environmental education, interpretation, and accessing to designated fishing locations is only compatible on designated trails.
- Biking on the refuge is only compatible when visitors are using Route 639 to arrive at or leave the information kiosk on Route 639. The area of compatible bike use is less than 400 linear feet.
- Driving on refuge roads within the public use area is only compatible along very limited designated routes.
- Prior to trail expansion and improvements to infrastructure to support increased visitation, refuge access permits will continue to be required in advance of visit.
- Access for canoes, kayaks, and non-trailerred, hand-launched boats with small electric motors to access Powell Creek from the refuge is only compatible when using designated public use facilities on the refuge (i.e., public canoe/kayak launch on Powell Creek).
- To promote public safety, accommodate other users, and reduce wildlife disturbance, groups of 10 or more persons must apply for and be issued a general SUP. Visitor group sizes and visitation frequency will be limited during sensitive time periods for wildlife or in sensitive locations (i.e., wetlands).
- Refuge- or partner-sponsored events and programming may require preregistration.
- No activities will be allowed that may adversely impact any federally threatened or endangered species. The known presence of a threatened or endangered species will preclude any new use of an area until the Refuge Manager determines otherwise.
- Public use areas and facilities will be maintained in good, working, and safe condition. Regularly used roads, trails, landings are largely distanced from sensitive habitats, migration corridors, and transition zones between adjacent habitats. If necessary, portions of trails may

be closed or traffic rerouted away from hibernacula, wetlands, nesting sites, seeps, ravines, and coves.

- We will evaluate sites and programs as needed to assess whether objectives are being met and to prevent site degradation. If evidence of unacceptable adverse impacts appears, the location(s) of activities will be rotated with secondary sites, curtailed, or discontinued.
- Best management practices will be used to avoid introductions of non-native, invasive plant species.
- The Service limits human disturbance of wildlife in the eagle concentration areas. Adherence to the guidelines and raising awareness about eagle protection and recovery on the James River are high priorities for this refuge.

JUSTIFICATION:

Wildlife observation, photography, environmental education, and interpretation are all priority public uses and are to receive enhanced consideration on refuges, according to the Refuge System Improvement Act. Providing increased wildlife-dependent recreational opportunities at James River NWR promotes visitor appreciation and support for the refuge, Refuge System, and Service; engages communities in local habitat conservation efforts in the lower James River and the Chesapeake Bay; and instills a sense of ownership and stewardship ethic in refuge visitors.

Wildlife observation, photography, environmental education, and interpretation, as described above, will not detract from the purpose and intent of the refuge. Stipulations described will ensure proper control over the use and provide management flexibility should detrimental impacts develop. Allowing this use furthers the mission of the Refuge System and Service by expanding opportunities for wildlife dependent uses when compatible and consistent with sound fish and wildlife management. We have determined that wildlife observation, photography, environmental education, and interpretation will not materially interfere with, or detract from, the fulfillment of the Refuge System mission or the purposes for which the refuge was established.

SIGNATURE:

Refuge Manager:



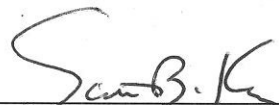
(Signature)

6/2/15

(Date)

CONCURRENCE:

Regional Chief:



(Signature)

6/3/2015

(Date)

MANDATORY 15 YEAR RE-EVALUATION DATE:

6/3/2030

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Appendix C



USFWS

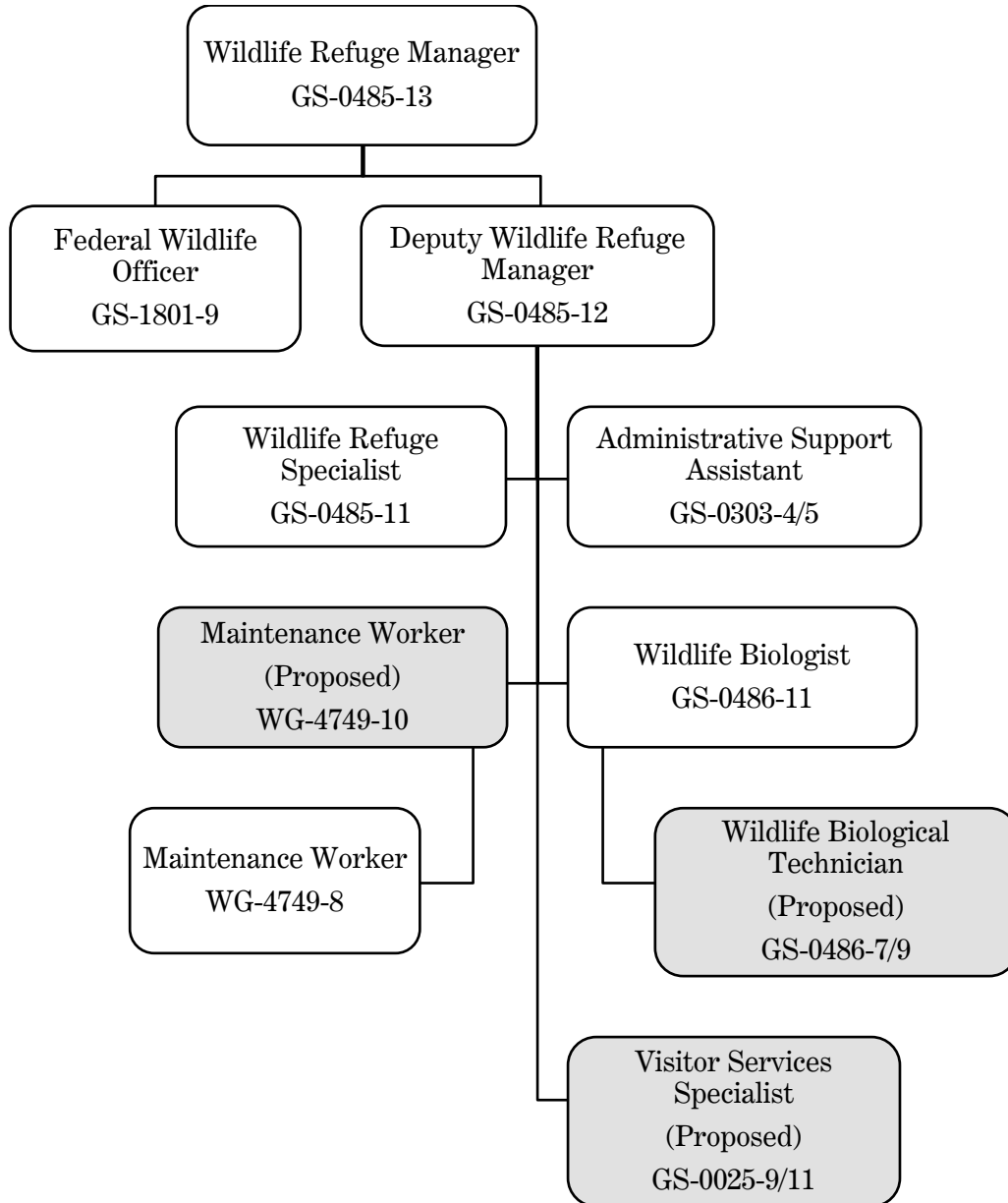
Eastern Virginia Rivers NWR Complex staff (2013)

Staffing Chart



U.S. Fish and Wildlife Service
Northeast Region
Regional Chief, National Wildlife Refuge System
Eastern Virginia Rivers National Wildlife Refuge Complex
 (James River / Plum Tree Island / Presquile / Rappahannock River Valley)

Staffing Chart



Appendix D



Cyrus Brame/USFWS

Prescribed burn underway

Refuge Operations Needs System (RONS) and Service Asset Maintenance Management System (SAMMS) Projects

Refuge Operations Needs and Service Asset Maintenance Management Systems

James River National Wildlife Refuge’s (NWR, the refuge) budget requests contained in the Refuge Operations Needs System (RONS) and Service Asset and Maintenance Management System (SAMMS) databases include a wide variety of new projects and maintenance needs. The RONS and SAMMS lists are regularly updated to include priority projects. Contact the refuge for the most current RONS and SAMMS lists.

Table D.1. Existing and Proposed Projects in the RONS Database for James River NWR.

Station Priority Rank ¹	Project Description	Estimated One-time Cost	Recurring Base Cost ²	Total First Year Need	FTE
EXISTING PROJECTS					
1	Maintain facilities and equipment at James River Refuge (maintenance Worker [WG-10])	-	\$88,133	\$88,133	1.0
2	Inventory and protect cultural resources	\$250,000	\$5,000	\$255,000	-
Totals (as of FY2010)		\$250,000	\$93,133	\$343,133	1.0
PROPOSED PROJECTS					
1	Provide enhanced nature-dependent opportunities for the visiting public (Visitor Services Specialist [GS-09/11])	-	\$75,376	\$75,376	1.0
2	Monitor and inventory biological health and impacts (Wildlife Biological Technician [GS-07/09])	-	\$62,297	\$62,297	1.0
Totals		-	\$137,673	\$137,673	2.0

¹This ranking does not necessarily represent the Eastern Rivers NWR Complex ranking. The refuge manager may adjust priorities based on annual funding levels and regional priorities.

²Unless otherwise noted, full performance salary in FY2014 dollars.

Table D.2. Existing and Proposed Projects in the SAMMS Database for James River NWR.

Project Number	Project Description	Estimated Cost
EXISTING PROJECTS		
2006503755	Repair James River Fire Lane Roads	\$86,200
104771	Rehabilitate Existing James River Hunter Check Station	\$70,000
Totals (as of FY2010)		\$156,200
PROPOSED PROJECTS		
	Improve and expand wildlife observation trail and public use structures (e.g., multi-purpose observation blind, elevated pedestrian walkway, canoe/kayak launch, and fishing platform)	\$103,750
	Improve public parking	\$98,000
	Develop refuge interpretive signs and displays along trails and in Visitor Contact Station	\$57,000
	Relocate maintenance complex	\$654,500
Totals		\$ 913,250

Appendix E



Cyrus Brance/USFWS

Sunrise on the James River

Consultation Documentation

- **Federal Consistency Determination**
- **State Historic Preservation Office Letter**
- **Intra-Service Section 7 Biological Evaluation Form**

FEDERAL CONSISTENCY DETERMINATION

Draft Comprehensive Conservation Plan and Environmental Assessment

for

**James River National Wildlife Refuge
Prince George County, Virginia
U.S. Fish and Wildlife Service
Department of the Interior**

This Federal Consistency Determination (FCD) provides the Commonwealth of Virginia with the U.S. Fish and Wildlife Service's (the Service, we, our) consistency determination under the Coastal Zone Management Act Section 307(c)(1) and Title 15 Code of Federal Regulations (CFR) Part 930, Subpart C, for implementing the Comprehensive Conservation Plan (CCP) for James River National Wildlife Refuge (NWR). The CCP would guide management of James River NWR over the next 15 years. The information in this FCD is provided pursuant to 15 CFR §930.39. The Service seeks concurrence from the Virginia Coastal Management Program (VCP) that alternative B (the Service-preferred alternative) as detailed in the draft CCP is consistent, to the maximum extent practicable, with the enforceable policies of the VCP.

To streamline the administrative requirements of the CCP development process and environmental review, the Service prepared a combined document that evaluates the potential environmental impacts from implementing a CCP. The draft CCP and environmental assessment (EA) was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended (42 USC §§ 4321-4347); the Council on Environmental Quality regulations for implementing NEPA (40 CFR §§ 1500-1508); and the Department of the Interior (516 DM 8) and Service (550 FW 3) policies. The draft CCP and EA also complies with Section 106 of the National Historic Preservation Act of 1966, as amended. Refer to section 1.3 of the draft CCP and EA for additional information regarding regulatory compliance.

Background

James River NWR is located in Prince George County, Virginia and is approximately 24 miles southeast of Richmond. The regional context of the project area is defined by the interactions of the nearby metropolitan area, the James River watershed, and the Chesapeake Bay Estuary (maps 1.1 through 1.3 in the draft CCP and EA). The refuge encompasses 4,324 acres of pine-dominated, moist hardwood, and floodplain forests; freshwater marsh and shrub swamp; aquatic habitats; erosional bluff habitats; and non-forested upland. The refuge is bounded to the north by the James River, to the west by Powell Creek, to the southeast by Flowerdew Hundred Creek, and to the south by Route 10.

Project Description

As detailed in chapter 3 of the draft CCP and EA, alternative B (the Service-preferred alternative) emphasizes the management of specific refuge habitats to support priority refuge species whose habitat needs benefit other species of conservation concern that are found around the refuge and in the larger landscape of the lower James River. The process we used to select priority refuge species whose habitat needs benefit other species of conservation concern is detailed in appendix A of the draft CCP and EA.

Under alternative B (the Service-preferred alternative), we would:

- Convert up to 2,651 of the refuge's pine-dominated forest habitat to mature pine savanna with open midstory and understory to increase resident brown-headed nuthatch populations and breeding populations of Chuck-will's-widow.
- Maintain 755 acres of moist hardwood forest to ensure its integrity is maintained or increased, as well as to protect year-round habitat for eastern box turtle and nesting habitat for breeding red-shouldered hawks and wood thrushes.
- Maintain 633 acres of floodplain forest to promote forest health and to protect nesting and roosting bald eagles, breeding prothonotary warblers, and resident spotted salamander populations.
- Support efforts of partners to improve 17 acres of aquatic habitat to benefit native species (e.g., Atlantic sturgeon, alewife, blueback herring) and protect this habitat from being degraded.
- Maintain and promote native vegetation on 3 miles of shoreline to help stabilize bluffs, reduce erosion, and benefit breeding bank swallows.
- Maintain and promote native species in 82 acres of freshwater marsh and shrub swamp and investigate the hydrology of this habitat to protect resident marsh wren populations and breeding least bitterns.
- Maintain 15 acres of non-forested upland managed for administrative purposes.
- Use more precise information about archaeological sites to protect known archaeological sites and better inform refuge management decisions.
- Provide high quality recreational hunting opportunities and complete all the administrative requirements to expand the existing deer hunt, add new hunts, and promote youth hunt involvement.
- Provide infrastructure within a designated area to support opportunities for visitors to participate in wildlife observation, photography, environmental education, and interpretation to improve the quality of visitor experiences.
- Open the refuge to year-round fishing at up to two designated locations to accommodate up to 1,460 anglers annually.
- Enhance existing partnerships and develop new partnerships with Federal, State, and local government agencies, non-government organizations, academic institutions, conservation organizations, and volunteers to fulfill mutual natural resource conservation mandates and help meet wildlife, habitat, and visitor services objectives.

We identified that coordination and consultation with various State agency offices responsible for enforcing the policies of the VCP is an important action to be implemented by the refuge as it implements the CCP. The following list identifies strategies that would subject to the VCP enforceable policies:

- Protect and maintain the characteristics on refuge lands that contributed to the area’s special designation as Summer and Winter Bald Eagle Concentration Areas, the Lower James River Important Bird Area, Anadromous Fish Use Area, as well as its contribution to other special area designations.
- Continue working toward stabilization and restoration of the refuge’s shoreline in partnership with others for the benefit of natural and cultural resources, as well as by designating two small areas along Powell Creek for recreational fishing (see appendix B).
- Participate in partnerships with communities and partners in the Chesapeake Bay watershed to implement the Strategy for Protecting and Restoring the Chesapeake Bay Watershed (Executive Order 13508) at the refuge, with an emphasis on land conservation, public access, and citizen stewardship.
- Implement the established partnership with the National Park Service (NPS) to promote the Captain John Smith Chesapeake National Historic Trail (NHT) and Chesapeake Bay Gateways and Watertrails Network at the refuge by enhancing place-based interpretation, providing public access, and fostering conservation and restoration of natural and cultural resources related to the Chesapeake Bay through programming, outreach, and citizen involvement.
- Restore native vegetation, with priority action given to the most degraded sites.
- Reduce the carbon footprint of facilities, vehicles, workforce, and operations by using energy efficient equipment, where feasible, and maintaining and constructing facilities using sustainable green building technologies (see appendix C of the draft CCP and EA).

The draft CCP and EA was developed with sufficient detail to account for the greatest potential impacts that could result from the proposed actions identified under both alternatives. However, additional NEPA analysis will be necessary for certain types of actions, even once we adopt a final CCP. Where decisions have not been made in the draft CCP and EA, but must be made later, we analyze the impacts of the possible range of alternatives in this document. During the planning process for those plans and actions, we will consult with the Virginia Department of Environmental Quality (VDEQ) to determine if additional FCDs are needed.

Examples of proposed actions that may require further analysis include:

- Developing a Land Protection Plan with appropriate NEPA documentation to meet habitat needs for trust species and to contribute to the network of conservation lands and wildlife resources in the regional landscape by expanding the refuge’s acquisition boundary.
- Improving or removing existing facilities and construction of new facilities.
- Expanding the existing hunt program and adding new hunting opportunities for adults and youth.
- Removing nuisance wildlife through public hunting or trapping permits, if deemed necessary.

Effect on Resources

Implementation of the preferred alternative would affect the natural and human environments, varying in duration, context, type, and intensity. Chapter 4 and the summary table comparison of consequences (table 4.3) of the draft CCP and EA details impacts in the local, regional, and national contexts, over the short- and long-term, and identifies the intensity of beneficial and adverse impacts that would directly, indirectly, and cumulatively result from implementation of alternative B.

In summary, implementation of alternative B would affect the land or water uses or natural resources of Virginia in the following manner:

Air Quality—Moderate, indirect, long-term benefits of air filtering and carbon sequestration would result from managing more than 4,000 acres of forested habitats to improve the health and vigor of trees. Negligible, direct, short-term impacts would result from more frequent use of fuel-burning equipment used for forest management. None of our actions would violate the U.S. Environmental Protection Agency (USEPA) standards, and all actions would be undertaken to ensure compliance with the Clean Air Act.

To reduce potential adverse impacts on local air quality, we would follow guidance provided State agencies regarding refuge activities that have the potential to adversely impact air quality in the vicinity, including the minimization of vehicle idling, use of precautionary measures to restrict emissions of volatile organic compounds and oxides of nitrogen, and minimization of fugitive dust.

Water Resources—Long-term, minor to moderate, direct and indirect beneficial impacts on water resources in the refuge vicinity would result from the continued protection of soils, wetlands, and waterways within the refuge boundary. Our increased efforts to inventory and monitor aquatic resources would inform specific refuge management decisions that have the potential to impact water resources in the refuge vicinity. Land-disturbing activities on the refuge, such as forest management and dike enhancement, have the potential to result in negligible to moderate, direct, short-term and indirect, long-term adverse impacts on local water quality.

To reduce potential adverse impacts on local hydrology and water quality, we would employ best management practices when conducting land-disturbing activities. As needed, we would consult with State offices regarding permitting applicability and requirements to ensure compliance with applicable Federal and State laws and regulations, as well as the Prince George County ordinance for the protection of Resource Management and Protection Areas.

Soils—Long-term, moderate, direct beneficial impacts on soils would result from maintaining the land cover with natural vegetation, minimizing soil disturbance to the maximum extent practicable, and allowing public use on a limited acreage and in designated areas. We would employ and maintain sediment and erosion control measures to minimize the potential for soils to migrate during land-disturbing activities (e.g., forest management, extending the nature trail). We would continue to maintain existing vegetation and employ erosion control measures as needed along the refuge's shoreline. We anticipate working with other Federal and State agencies to investigate options for reducing erosion of lands along the Powell Creek and the James River. In the long-term, increased refuge visitation in the designated public use area has the potential to result in negligible and direct adverse impact soils via compaction.

To reduce potential adverse impacts to soils, we would consult with State offices regarding permit applicability prior to conducting activities that have the potential to affect tidal wetlands, disturb land, or contaminate soils.

Forested Habitats—Long-term, minor to moderate, direct and indirect beneficial impacts on forested habitats would result from our transitioning of up to 2,651 acres of pine-dominated forest to pine savanna. We would thin the dense pine stands, conduct prescribed burns, control nonnative plants, and reduce the potential for pine beetle infestation. Over time, the mature pine savanna would increase. We would maintain the ecological integrity of the refuge's pine-dominated, moist hardwood, and floodplain forest habitats through inventory, monitoring, and active habitat management.

Improvement of existing and creation of new refuge infrastructure to support visitor use on the refuge would result in minor, direct, short-term and negligible, direct, long-term impacts in the pine-dominated, moist hardwood, and floodplain forests. Through site planning and interpretive messaging, we would minimize the potential for impacts to refuge vegetation beyond the designated public use area including parking lots and nature trail. Appropriate public uses would continue to be conducted in designated areas in accordance with refuge-specific stipulations to ensure compatibility with the refuge's purpose (see appendix B).

Non-forested Habitats—Long-term, moderate, direct beneficial impacts on freshwater wetland habitats and vegetation would result from our continued protection and minimal intervention efforts to protect the ecological integrity of the refuge's freshwater marsh and swamp forest, as well as adjacent aquatic habitats. We would establish a long-term monitoring effort to serve as an early detection and inform a rapid response in habitats due to invasive species, global climate change, or storm events. Enhancing the culvert along the dike would have minor, direct, long-term impacts to freshwater marsh and shrub swamp of the refuge because the natural hydrologic flow between Powell Creek and the freshwater marsh and shrub swamp along the southwestern portion of the refuge would be investigated. Continuing to implement best management practices for land disturbing and herbicide application activities would provide moderate, indirect, short- and long-term impacts to aquatic habitats because these practices would help to prevent habitat degradation. We would partner with other Federal and State agencies to conduct biological monitoring, as well as to improve interagency coordination on actions with the potential to adversely impact known populations of plant and animal populations associated with the freshwater wetland habitats within and surrounding the refuge. In the long-term, beneficial impacts would result from continued efforts to protect the refuge's shoreline and designating areas for appropriate and compatible public uses.

Since wetlands management and protection is a Federal trust responsibility and our highest priority for the refuge, we would take all necessary precautions to avoid adverse impacts to wetlands. However, we would continue to conduct actions that have the potential to negligibly and adversely impact freshwater wetland habitats and vegetation, such as trail construction. To reduce potential adverse impacts to wetlands and vegetation, we would consult with State offices regarding best management practices to be employed on a project-specific basis and acquire permits prior to conducting activities as warranted.

Birds—Long-term, moderate, direct beneficial impacts on birds would result from implementation of the CCP. Promoting the transition of up to 2,651 acres of pine-dominated forest to pine savanna, maintaining 775 acres of moist hardwood forest, and maintaining 633 acres of

floodplain forest would continue to provide important breeding and migratory stopover habitat for priority refuge resources of concern such as brown-headed nuthatch, Chuck-will's-widow, red-shouldered hawk, wood thrush, prothonotary warbler, and other forest breeding landbirds. We expect minimal disturbance to breeding and migrating birds from trail maintenance, invasive species control activities, mowing, and other management activities. A short-term, minor to moderate, adverse impact on ground or cavity nesting or songbird species would result from increased disturbance during the nesting season that would destroy nests or cause abandonment. Impacts would increase in alternative B because prescribed burning would not cease on April 15 but would continue as weather, soils, and resources dictate. Prescribed burns during the growing season (late spring through summer) are shown to increase the knock back of hardwood species and increase seeding and growth response in herbaceous vegetation. Although neotropical migratory birds would be impacted by removal of hardwoods, our moist hardwood and floodplain forest (which are more preferred habitat for neotropical migratory birds) would still provide stopover habitat for these species.

Maintenance and promotion of native species in 82 acres of freshwater marsh and shrub swamp, along with restoration of the natural hydrology along Powell Creek, would protect resident marsh wren populations and breeding least bitterns. We would continue to coordinate with State agencies by sharing information about wildlife populations and habitat management strategies, especially regarding protection of State endangered species. We would increase inventory and monitoring activities to collect information on priority refuge species and habitats. We would continue to support efforts by our partners to improve 17 acres of aquatic habitat to benefit native species (e.g., Atlantic sturgeon, alewife, blueback herring) and protect this habitat from being degraded.

Since some disturbance to breeding birds is likely from public use of the refuge, we would continue to allow appropriate and compatible public uses in designated areas and in accordance with stipulations to ensure compatibility (see appendix B). Birds that occupy the designated public use area of the refuge may be more likely affected by human activity and associated noise. We believe constructing a 3-mile trail, a wildlife observation platform, and fishing platform would have minor, indirect, short-term impacts to nesting bald eagles, raptors, ground and cavity nesters, and songbirds. Best management practices, the short duration, and limited area of the construction should limit effects on nesting species.

Fisheries—Long-term, moderate, indirect beneficial impacts on fisheries would result from our efforts to protect, maintain, and restore habitats for native wildlife; protect water quality minimizing erosion of the refuge's shoreline and sediment deposition loads in waterways; and improved interagency coordination and partnership support for fisheries monitoring and management. Investigation of the hydrology between wetlands in the southwestern portion of the refuge and Powell Creek will help us understand potential impacts on fisheries. Opening the refuge to recreational fishing, as well as kayaking and canoeing on Powell Creek, throughout the year from sunrise to sunset without a refuge-issued permit would increase public access to waterway and may result in negligible, indirect, short-term impacts on fisheries. Our continued efforts to minimize the existing issue of shoreline erosion would reduce the refuge's adverse impacts on adjacent waterways and fish habitat. These efforts to would contribute beneficially to fisheries adjacent to, and down river from, the refuge.

Mammals—Short- and long-term, minor, direct adverse impacts to mammals would result from noise disturbance and the reduction of food and cover caused by thinning the pine-dominated

forest. However, we expect impacts to mammal populations would be minimized because oaks are present in the neighboring mature moist hardwood and floodplain forest would continue to provide food resources. Long-term, moderate, direct beneficial impacts to larger mammals would result from continuing to protect the refuge's mature moist hardwood forest and floodplain forest. Expansion of a 3-mile trail, construction of a wildlife observation and photography blind and a fishing platform, improvement of the existing canoe/kayak launch, and increase in refuge visitation in the designated public use area would have negligible, indirect, long-term adverse impacts to mammals. We also emphasize interagency coordination to ensure that the refuge offers a quality hunting program.

Amphibians and Reptiles—Long-term, moderate, direct beneficial impacts to amphibian and reptile populations would result from thinning and prescribed burning in the pine-dominated forest. Thinning, prescribed burning, and ground disturbing activities in the pine-dominated forest would result in minor, direct, short term impacts to amphibians and reptiles because equipment would compact the soil while these activities were taking place. Long-term, moderate, direct beneficial impacts to amphibian and reptile populations would result from preserving the mature moist hardwood forest and floodplain forest. Invasive plant species control in mature moist hardwood forest, floodplain forest, and freshwater marsh and shrub swamp would have negligible, indirect, short- and long-term impacts to amphibians and reptiles because the natural hydrology of these habitats would be protected and native plant species, which are important food resources for amphibians and reptiles, would remain undisturbed. Expansion of a 2-mile trail, construction of a wildlife observation and photography blind and a fishing platform, improvement of the existing canoe/kayak launch, and increase in refuge visitation in the designated public use area would result in negligible, direct, short term impacts to amphibians and reptiles. Trampling and harassment by refuge visitors using the 3-mile trail and walkways to and from other public use areas would be the largest potential impact to amphibians and reptiles. We would require visitors to stay on the trail to minimize impacts and limit foot traffic to a designated area.

Invertebrates—Long-term, moderate, direct adverse impacts to invertebrates that inhabit the pine-dominated forest would result during the transition to pine savanna. Protection of the mature moist hardwood forest and floodplain forest would continue to provide minor to moderate, direct, long-term impacts to invertebrates. Limiting disturbance and management activities would increase the number of snags and woody debris available as the forests continue to age. Protection of freshwater marsh, shrub swamp, and aquatic habitats would have moderate, direct long-term impacts on invertebrate populations.

Public Uses and Access—Long-term, minor to moderate, direct beneficial impacts would result from expanding the refuge's deer hunting program, opening the refuge to new hunting opportunities, and promoting hunting opportunities for youth. Opening James River NWR to recreational fishing at two designated locations for up to 1,460 anglers annually would result in moderate, direct, long-term impacts to the recreational fishing community by increasing recreational fishing opportunities and access to fishing information along the Lower James River. We would coordinate closely with the Virginia Department of Game and Inland Fisheries (VDGIF) to keep informed about State fishing regulations, trends in fish populations, and disease outbreaks in fish to most effectively manage the fishing program at the refuge.

Until signage and visitor support facility improvements are completed, require participants to request a refuge-issued permit three business days in advance of proposed visit. Once completed, we would eliminate the need for visitors to obtain a permit in advance of their visit, which would

have moderate, direct, long-term impacts as it would allow for the public to visit the refuge at their convenience. Opening the refuge to less restrictive entry is one way that the refuge staff can help increase public access to wildlife observation, photography, environmental education, and interpretation opportunities and programs. Targeting urban audiences would attract new participants to the facilities associated with the public use program, especially in refuge- and partner-sponsored programs and events. We anticipate the impacts from promoting to an urban audience to be negligible, direct, and long-term. Through our partnerships, our potential to achieve the goal of inspiring appreciation and stewardship of the refuge in relation to the James River watershed, Chesapeake Bay Estuary, and the National Wildlife Refuge System (Refuge System) would increase. By telling a more complete story of the area's significance to Native Indians and early European settlers, our efforts would promote a deeper understanding and appreciation of America's diverse peoples and inspire refuge stewardship.

Consistency Determination

The VCP contains the following applicable enforceable policies. For each enforceable policy, specific actions to be implemented under alternative B are described.

Fisheries Management—Administered by Marine Resources Commission (MRC) and VDGIF, this program stresses the conservation and enhancement of shellfish and finfish resources and the promotion of commercial and recreational fisheries (Code of Virginia §28.2-200 through §28.2-713, §29.1-100 through §29.1-570, or §3.1-249.59 through §3.1-249.62).

We anticipate conducting additional investigation, assessment, and analysis of management alternatives to reduce adverse impacts to shellfish and finfish habitat currently resulting from refuge shoreline erosion and sediment deposition in the James River conservation and enhancement of shellfish and finfish resources. In an effort to limit any additional erosion of the refuge's banks, we would designate two areas for recreational fishing, and we may construct new facilities on the refuge to support this use.

Subaqueous Lands Management—Administered by MRC, this program establishes conditions for granting permits for encroachments in, on, or over State-owned submerged lands throughout the Commonwealth (Code of Virginia §28.2-1200 through §28.2-1213).

We anticipate conducting additional consultation with the MRC prior to implementing actions that would affect subaqueous lands or qualify as channel-ward encroachments on tidal waterways. Actions with the potential to adversely impact subaqueous lands are the potential to construct facilities near Powell Creek to support public uses (e.g., wildlife observation/waterfowl hunting blind, fishing platform); install new and maintain existing shoreline stabilization features; and/or alter existing or construct new water-based transportation facilities. We would consult with State agencies early in the project planning phase to ensure consistency with the enforceable policies of the VCP. Permitting and site plan approvals would be acquired prior to implementing construction activities with the potential to adversely impact subaqueous lands.

Wetlands Management—Administered by MRC and VDEQ, the wetlands management program preserves and protects tidal wetlands (Code of Virginia §28.2-1301 through §28.2-1320 or § 62.1-44.15.5).

The protection of wetlands is of high management priority for our agency and at this refuge. We strive to avoid adverse impacts on wetlands and surface waters. However,

where avoidance cannot be achieved, we strive to minimize adverse impacts by minimizing land disturbance and impervious cover.

As identified in our draft CCP and EA, we would establish a long-term monitoring program to inform management actions aimed to protect wetlands on the refuge and adjacent to the refuge. In the future, we anticipate consulting with the State for individual projects for which site-specific planning has not yet been completed. Future projects with the potential to impact wetlands and waterways include the proposed construction of facilities near Powell Creek to support public uses (e.g., wildlife observation/waterfowl hunting blind, fishing platform); installation of new and maintenance of existing shoreline stabilization features; and/or alteration of existing canoe/kayak launch. Early in the planning phase for each of these projects, we would consult with MRC and VDEQ to identify the most appropriate best management practices to be employed to ensure the protection of wetlands and surface waters, as well as identify permitting or plan approvals required prior to project implementation.

Dunes Management—Administered by MRC, the purpose of this program is to prevent the destruction and/or alteration of primary dunes (Code of Virginia §28.2-1400 through §28.2-1420).

None of the actions to be implemented under alternative B would alter dunes in Virginia because dunes do not occur on the refuge or in the refuge vicinity.

Non-point Source Pollution Control—Administered by the Virginia Department of Conservation and Recreation (DCR), the Virginia Erosion and Sediment Control Law and Regulations are intended to minimize non-point source pollution entering Virginia's waterways (Code of Virginia §10.1-560 et seq.).

As identified in our draft CCP and EA, we would manage nonnative plant species using herbicides. We would take all appropriate steps to minimize the potential to contaminate soils or cause runoff into the river when applying herbicide, including using the minimum effective dosage, using application methods that minimize non-target effects, applying during optimal growth stage for effectiveness, applying in optimal weather conditions, and adhering to licensing requirements and other Federal, State, and local regulations. We would minimize the potential for adverse impacts to the environment and humans by using only approved herbicides, developing and following a spill plan, and using the herbicide as instructed by the manufacturer and according to pesticide use plans approved by our regional contaminants coordinator.

Hazardous materials and wastes would be stored, transported, and disposed of in accordance with applicable laws and regulations. We would consult with VDEQ regarding identification of approved solid waste and hazardous waste disposal sites, as well as opportunities to reuse and recycle non-hazardous materials.

Early in the planning phase for facility maintenance and construction projects, we would consult with DCR to identify the most appropriate best management practices to limit potential for non-point source pollution generation, as well as identify permitting or plan approvals required prior to project implementation. Actions with the potential to disturb 2,500 square feet or more of land and/ or generate non-point source pollution include the maintenance of existing, or construction of new, shoreline stabilization features and water-based transportation facilities.

Point Source Pollution Control—Administered by the State Water Control Board, the National Pollutant Discharge Elimination System permit program regulates point source discharges to Virginia’s waterways (Code of Virginia §62.1-44.15).

None of the actions proposed in our draft CCP and EA would generate a new point source discharge, or alter of any existing point source discharge, into Virginia’s waterways. We would consult with VDEQ regarding future maintenance or construction projects to determine which actions would be considered a new point source discharge and proceed with permitting and project approvals as needed.

Shoreline Sanitation—Administered by the Department of Health (VDH), this program regulates the installation of septic tanks to protect public health and the environment (Code of Virginia §32.1-164 through §32.1-165).

We anticipate conducting regular maintenance on the existing septic system serving the refuge’s visitor contact station to ensure its proper functioning. We anticipate consulting with VDH regarding septic system maintenance, groundwater well operation, and potential upgrades to ensure protection of public health and the environment.

Air Pollution Control—Administered by the State Air Pollution Control Board, this program implements the Federal Clean Air Act through a legally enforceable State Implementation Plan (Code of Virginia §10.1-1300 through 10.1-1320).

As identified in our draft CCP and EA, none of our actions would violate USEPA standards for air quality. All actions would be undertaken to ensure compliance with the Clean Air Act. To reduce potential adverse impacts on local air quality, we would follow guidance provided the VDEQ regarding construction project design and implementation, including the minimization of vehicle idling, use of precautionary measures to restrict emissions of volatile organic compounds and oxides of nitrogen, and minimization of fugitive dust. On a project-specific basis, we would consult with State agencies regarding permit requirements for boilers or fuel-burning equipment that may be used during facility maintenance or construction activities. We would continue to coordinate with State offices regarding prescribed burning as needed.

Coastal Lands Management—Administered by the DCR’s Division of Stormwater Management, Local Implementation (DSM-LI) administers the coastal lands management enforceable policy of the VCP which is governed by the Chesapeake Bay Preservation Act and Chesapeake Bay Preservation Area Designation and Management Regulations (Code of Virginia §§ 10.1-2100 through 10.1-2114, the Chesapeake Bay Preservation Area Designation and Management Regulations, or 9 VAC10-20-10 et seq.).

Since the entire refuge is located within either the Chesapeake Bay Resource Protection Area (RPA) or the Resource Management Area (RMA), we would consult with State offices to ensure the protection of coastal lands. Actions to be undertaken within the RPA include maintenance and use of water-dependent features (e.g., maintenance of existing canoe/kayak launch and the dike, constructions of new facilities to support appropriate and compatible public uses). We would also conduct resource protection activities along the shoreline (e.g., nonnative plant management, planting of native trees and shrubs, documentation of archaeological resources). Actions that would occur within the RMA include conducting archaeological investigations, planting of native trees and shrubs,

maintenance of a 3-mile nature trail, maintenance and/or upgrade of the septic system and groundwater well serving the visitor contact station, and the concentration of visitors in designated public use areas. We would consult with DCR regarding best management practices, minimizing land disturbance and impervious cover, and the protection of native vegetation.

Although not required for the purposes of consistency, in accordance with 15 CFR §930.39(c), we considered the advisory policies of the VCP as well.

Geographical Areas of Particular Concern—Coastal natural resource areas (e.g., wetlands; aquatic spawning, nursery, and feeding grounds, significant wildlife habitat areas, public recreational areas, and underwater historic sites) are vital to estuarine and marine ecosystems and receive special attention from the Commonwealth because of their conservation, recreational, ecological, and aesthetic values. Coastal natural hazard areas are vulnerable to continuing and severe erosion and are susceptible to wind, tidal, and storm-related damage. Waterfront development areas are vital to the Commonwealth because of the limited number of areas suitable for waterfront activities.

The diversity of conservation, ecological, recreational, and aesthetic values associated with James River NWR are detailed in chapter 2 of the draft CCP and EA. As a unit of the Refuge System, the paramount purpose of this refuge is to serve as an inviolate sanctuary for migratory birds. We also support scientific research regarding the breeding of the federally endangered Atlantic sturgeon in the refuge vicinity. The refuge has been opened for six priority wildlife-dependent recreational uses, one general public use, and one specialized use; each of these uses has been found to be compatible with the refuge's purpose (see appendix B).

As discussed earlier in this FCD, we anticipate consulting with VDEQ regarding shoreline structures on the refuge in the future. We aim design and site facilities where the potential for property damage due to storms or shoreline erosion can be minimized.

Implementation of alternative B would have no direct impact on commercial ports, commercial fishing piers, or community waterfronts in the refuge vicinity.

Shorefront Access Planning and Protection—The Commonwealth values maintenance of shorefront access for public recreational uses, while protecting the historic features of waterfront properties.

Implementation of alternative B would have no direct impact on Virginia's 25 miles of public beaches.

Implementation of alternative B would be consistent, to the maximum extent practicable, with the 2007 Virginia Outdoors Plan. Our partnership efforts with the James River Association, NPS, and others exemplify our commitment to accommodate public uses of the refuge that are appropriate and compatible. We would increase the availability and quality of wildlife-dependent recreational uses on the refuge, as well as increase our outreach efforts through partners with shared conservation goals.

Implementation of alternative B would have direct impacts on recreational uses and values associated with James River NWR and the Captain John Smith Chesapeake NHT.

Through our continued coordination and collaboration, we would maintain and protect recreational values associated with the refuge and the Captain John Smith Chesapeake NHT while protecting natural and cultural resources for the enjoyment of future generations.

Implementation of alternative B would have no direct impact on waterfront recreational land acquisition opportunities in the Commonwealth.

As discussed earlier in this FCD, we anticipate consulting with VDEQ regarding water-based transportation facility improvements and shoreline structures on the refuge. Refuge facilities would be designed, constructed, and maintained to provide points of water access in support of refuge operations and visitor access when conducted in accordance with the stipulations identified for specific, appropriate, and compatible public uses (see appendix B).

As detailed in chapter 2 of the draft CCP and EA, the refuge has a long history of human settlement and development. We would use a proactive approach to interagency coordination for the protection of the refuge's cultural resources. Through our partnerships, we would promote cultural resource stewardship and appreciation both on and off the refuge in educational programs and interpretive media.

Finding

Based on this information, data, and analysis, the Service finds that alternative B (the Service-preferred alternative) of the draft CCP and EA for James River NWR is consistent, to the maximum extent practicable, with the enforceable policies of the VCP. Although not required for the purposes of consistency, we find that alternative B is in line with the VCP advisory policies when following them will not materially interfere with, or detract from, the fulfillment of the Refuge System mission or the purposes for which the refuge was established.

Concurrence Response

The entire draft CCP and EA were available on the refuge's website for a 39-day public review and comment period, from October 23, 2014 through November 30, 2014. We also mailed paper and CD-ROM copies of the draft CCP and EA, which included this FCD as appendix F, to VDEQ for their review on October 23, 2014. Pursuant to 15 CFR §930.41, the VCP had 60 days from the receipt of this FCD submission to respond to our consistency finding.

In a letter dated November 21, 2014, the VDEQ stated that it coordinated the review of this FCD with agencies administering the enforceable and advisory policies of the VCP. Additionally, VDEQ published a public notice of this proposed action its website from October 27, 2014 to November 13, 2014, in accordance with 15 CFR §930.2; no public comments were received in response to the notice. After review and compilation of agency responses, the VDEQ concurred with our consistency finding, provided all applicable permits and approvals are obtained. Details about applicable permits and approvals were provided in their letter, which is available for public review at the refuge upon request.



COMMONWEALTH of VIRGINIA

Department of Historic Resources

2801 Kensington Avenue, Richmond, Virginia 23221

Douglas W. Domenech
Secretary of Natural Resources

Kathleen S. Kilpatrick
Director

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November 14, 2014

Rebekah P. Martin
Deputy Refuge Manager
Eastern Virginia Rivers NWRC
P.O. Box 1030/336 Wilna Rd
Warsaw, VA 22572

Re: James River National Wildlife Refuge
Comprehensive Conservation Plan and Environmental Assessment
DHR File No. 2014-0790

Dear Ms. Martin:

Thank you for offering us the opportunity to comment on the draft Comprehensive Conservation Plan and Environmental Assessment (CCP/EA) for the James River National Wildlife Refuge. We fully support the Service's Preferred Alternative, Alternative B. We note that Alternative B will implement the recommendations made in the *Archaeological Overview Study for James River and Presquile National Wildlife Refuges* (Goode *et al.*, 2009), including conducting further archaeological investigations to locate and assess the condition of potential archaeological sites, which will help prevent adverse impacts from activities related to the pine-dominated forest transition, as well as protect those resources located in the other refuge habitats.

We appreciate the attention paid to the comments made on the internal draft CCP in our letter of July 16, 2014. We look forward to working with you and the Regional Historic Preservation Officer on cultural resource management issues as you implement the plan.

If you have any questions concerning our comments, or if we may provide any further assistance, please do not hesitate to contact me at (804) 482-6088; e-mail ethel.eaton@dhr.virginia.gov.

Sincerely,

A handwritten signature in black ink that reads 'Ethel R. Eaton'.

Ethel R. Eaton, Ph.D., Senior Policy Analyst
Review and Compliance Division

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INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

[Note: This form provides the outline of information needed for consultation. If additional space is needed, attach additional sheets, or set up this form to accommodate your responses.]

Originating Person: Meghan Powell

Telephone Number: 804-313-7729

Date: March 13, 2014

- I. Region:** Region 5 (Northeast)
- II. Service Activity (Program):** National Wildlife Refuge System
- III. Pertinent Species and Habitat:**
- A. Listed species and/or their critical habitat within the action area**
Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*)
 - B. Proposed species and/or proposed critical habitat within the action area**
None
 - C. Candidate species within the action area:**
None
- IV. Geographic area or station name and action:**
James River National Wildlife Refuge – Development of a Comprehensive Conservation Plan and Environment Assessment (CCP and EA)
- V. Location:**
Maps are found in chapters 1 through 3 of the draft CCP and EA
- A. Ecoregion Number and Name:**
 - B. County and State:** Prince George County, Virginia
 - C. Section, township, and range (or latitude and longitude):**
 - D. Distance (miles) and direction to nearest town:** The refuge is located 6 miles east of Hopewell, Virginia.
 - E. Species/habitat occurrence:** The Chesapeake Bay Distinct Population Segment of the Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) has been listed as endangered. The James River adjacent to the project area supports this species, as well as alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*).

In 2001, the VDCR Natural Heritage conducted targeted botanical surveys to look for any rare plant species at James River NWR (Belden et al. 2002). Surveyors targeted their search for 12 rare plant species. Although none were found to occur at James River during various surveys, surveyors noted that the refuge does have suitable habitat for the sensitive joint-vetch (federally threatened) and small whorled pogonia (federally endangered). The nearest known occurrences of sensitive joint-vetch are on the northern banks, across the James River from the refuge. The nearest known occurrence of small whorled pogonia is from wetlands between the York and Chickahominy Rivers.

For additional information and details, please refer to chapter 2, “Affected Environment” of the draft CCP and EA.

VI. Description of proposed action (attach additional pages as needed):

James River National Wildlife Refuge is in the process of preparing a CCP and EA that is vital for the management of the Refuge. The final CCP will provide strategic management direction over the next 15 years, by

- providing a clear statement of desired future conditions for habitat, wildlife, visitor services, and facilities;
- providing Refuge neighbors, visitors, and partners with a clear understanding of the reasons for management actions;
- ensuring Refuge management reflects the policies and goals of the System and legal mandates;
- ensuring the compatibility of current and future public uses;
- providing long-term continuity and direction for Refuge management; and
- providing direction for staffing, operations, maintenance, and developing budget requests.

Three alternatives analyzed by the Service are described in chapter 3, “Alternatives” of the draft CCP and EA.

Atlantic Sturgeon, Alewife, and Blueback Herring

The James River and its associated backwater habitats, including tidal creeks, are important spawning habitats for resident and migratory fish, such as alewife, American shad, freshwater mussels, and as foraging and resting habitat for migratory and overwintering waterfowl, water birds, and bald eagles. Over the life of the plan, the refuge would support efforts of partners to maintain or increase submerged aquatic vegetation in 17 acres of aquatic habitat for the benefit of native species (e.g., Atlantic sturgeon, alewife, blueback herring) and protect this habitat from being degraded.

The ability for USFWS to manage this habitat type is limited jurisdictionally. A variety of Federal and State agencies (including, but not limited to, the US Army Corps of Engineers (USACE), VDEQ, VMRC, and VDGIF) oversee activities tied to waterway bottoms, water quality management and navigation. Coordination with the appropriate agencies would be required for any action tied to this habitat type.

The 4,324-acre refuge would employ best management practices on refuge lands to minimize sedimentation to the James River. Additionally, existing wetlands and riparian buffer protection would continue within the refuge throughout the life of the plan. We would investigate ways to restore the hydrologic flow between the wetlands in the southwestern portion of the refuge and Powell Creek.

Sensitive Joint-Vetch and Small Whorled Pogonia

In cooperation with the VDCR Natural Heritage Program, the refuge would continue to survey for these species under all alternatives. If located, we would work with the respective species' Recovery Team and other experts to develop plans to protect them.

Information on the occurrence of listed species and their habitats is frequently updated; thus, refuge staff will continue to consult with the Service's Ecological Services Branch.

VII. Determination of effects:

A. Explanation of effects of the action on species and critical habitats in items III.A, B, and C (attach additional pages as needed):

Refer to chapter 4, "Environmental Consequences" of the draft CCP and EA for more information and details.

As explained above, we believe that implementation of the proposed alternative in the CCP will result in either completely beneficial effects to the listed species described above; or that any direct, indirect, or cumulative adverse effects that may result will be no more than negligible and indirect.

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

To ensure that habitat restoration activities and other management actions in listed species habitat will have no adverse effects, these actions will be performed outside listed species growing/breeding seasonal windows.

VIII. Effect determination and response requested: [* optional]

A. Listed species/critical habitat:

Determination

Response requested

No effect

Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*)

Concurrence

May affect, but is not likely to adversely affect species/adversely modify critical habitat


Species: None

Concurrence

May affect, and is likely to adversely affect species/adversely modify critical habitat

Species: None

Formal Consultation



Project Leader
Eastern VA Rivers NWR Complex

11/30/15

Date

IX. Reviewing ESO Evaluation:

A. Concurrence _____ Non-concurrence _____

B. Formal consultation required _____

C. Conference required _____

D. Remarks: NOAA fisheries has jurisdiction over the Atlantic sturgeon.
On January 22, 2015, NOAA fisheries stated that they have no objection to our determination of no effect on Atlantic sturgeon.

Supervisor
Virginia Field Office

Date

Appendix F



Cyrus Brame/USFWS

Bald eagle perched along the James River

Summary of Public Comments and Service Responses on the Draft Comprehensive Conservation Plan and Environmental Assessment for James River National Wildlife Refuge

Introduction

In October 2014, the U.S. Fish and Wildlife Service (Service, we, our) published the draft comprehensive conservation plan and environmental assessment (draft CCP and EA) for James River National Wildlife Refuge (James River NWR, the refuge). The draft CCP and EA outlined three alternatives for managing the refuge. Alternative B is identified as the “Service-preferred alternative.”

On October 22, 2014, the *Federal Register* published our notice of availability of the draft CCP and EA for a public review and comment period (79 FR 63161) and we distributed notification of its availability and public meetings via email and hardcopy newsletter to all parties on our mailing list, including media outlets. Our 39-day public comment period closed on November 30, 2014, but we accepted late comment submissions received through December 7, 2014. We received 48 correspondences, representing 126 individual comments. A total of 23 people attended two public meetings held on November 12, 2014. This document summarizes the substantive comments and provides our responses to them.

We have determined that no substantive modifications to the Service-preferred alternative (alternative B), as originally presented in the draft CCP and EA, are necessary. We made only non-substantive changes in the final CCP, which are:

- Minor corrections of fact that do not alter the conclusions drawn from their analysis.
- Minor updates of information to improve readability or clarity.
- Minor formatting and typographical errors that were brought to our attention.

We have determined that publishing a revised or amended draft CCP and EA is not warranted. We recommend alternative B for implementation as the final CCP and have submitted it to our Regional Director for approval.

In addition to our recommendation of alternative B, the Regional Director may also consider one of the following for the final CCP:

- One of the other alternatives analyzed in the draft CCP and EA.
- A combination of actions from among the alternatives analyzed in the draft CCP and EA.

The Regional Director will also determine whether a Finding of No Significant Impact (FONSI) is justified prior to finalizing the decision. The decision will be made after:

- Reviewing all the comments received on the draft CCP and EA and our responses to those comments.
- Affirming that the CCP actions:
 - ❖ Support the purpose and need for the CCP.
 - ❖ Support the purposes for which the refuge was established.
 - ❖ Help fulfill the mission of the National Wildlife Refuge System (Refuge System).
 - ❖ Comply with all legal and policy mandates.

- ❖ Best work toward achieving each refuge's vision and goals.

At the same time we release an approved final CCP, we will publish a notice of the availability in the *Federal Register*. That notice will complete the planning phase of the CCP process, and we can begin implementing the plan.

Summary of Comments Received and Service Responses by Subject

After the comment period ended on November 30, 2014, we compiled all of the comments we received, including all letters, emails, and comments recorded at public meetings. We received 48 correspondences, including the one correspondence received after the close of the public comment period (table F.1). We received a consolidated letter compiled by the Virginia Department of Environmental Quality that included comments from the following State agencies and county government offices:

- Virginia Department of Conservation and Recreation (VDCR)
- Virginia Department of Environmental Quality (VDEQ)
- Virginia Department of Forestry (VDOT)
- Virginia Department of Game and Inland Fisheries (VDGIF)
- Virginia Department of Historic Resources (VDHR)
- Virginia Marine Resources Commission (VMRC)
- Prince George County Board of Supervisors

We grouped similar comments together and organized them by subject heading. Directly beneath each subject heading, you will also see a list of unique correspondence numbers that correspond to the commenter's identity (table F.1). In the discussions below, we address and respond to every substantive comment we received. Substantive comments are those that suggest our analysis is flawed in a specific way. Substantive comments:

- Challenge the accuracy of information presented.
- Challenge the adequacy, methodology, or assumptions of the environmental or social analysis and supporting rationale.
- Present new information relevant to the analysis.
- Present reasonable alternatives, including mitigation, other than those presented in the document.

Our discussion does not include responses to any comments we determined to be non-substantive, including comments thanking us for hosting the public meetings, telling us that they thought the document was well written, or requesting copies of the draft CCP and EA.

In some instances, we refer to specific text in the draft CCP and EA and indicate how the final CCP was changed in response to comments. The full versions of both the draft CCP and EA and the final CCP are available online at:

http://www.fws.gov/refuge/James_River/what_we_do/conservation.html. For a CD-ROM or a print copy of either plan, please contact:

Andy Hofmann, Refuge Manager
Eastern Virginia Rivers National Wildlife Refuge Complex
336 Wilna Rd./P.O. Box 1030
Warsaw, VA 22572
Phone: 804/333-1470 extension 112
Email: Andy_Hofmann@fws.gov

Document Accessibility

Comment: The Service sent out its original announcement that the draft CCP and EA would be available for 30 days and would be available on the refuge's website

(http://www.fws.gov/refuge/James_River/what_we_do/conservation.html) on October 22, 2014.

However, the website link did not work on October 22, 2014. (*Correspondences #16, 17, and 19*)

Response: Unfortunately, we experienced technical difficulties with the refuge's website on October 22, 2014. We notified all parties who received our notice via email that technical difficulties had occurred and that the refuge's website would display the draft CCP and EA on October 23, 2014. The website and document were available for viewing and download at 12:01am on October 23, 2014. Although we could have closed the public comment period after 30 days (November 23, 2014), we accepted all comments received through December 7, 2014.

Planning Process

Comment: On behalf of the Prince George County Board of Supervisors, we received a request for "a formal (private) meeting" with the planning team to discuss the issue of the motorized boat ramp. (*Correspondence #25*)

Response: On January 26, 2015, we met with Prince George County Board of Supervisors to explain why a public motorized boat ramp at the refuge is not appropriate (as stated on page 3-8 of our draft CCP and EA) and discuss the potential to collaborate with other organizations to identify an alternative location on the James River.

Laws, Mandates, and Policies

Comment: Based on the review of the Federal Consistency Determination and the comments submitted by agencies administering the enforceable policies of the Virginia Coastal Zone Management Program (VCP), the Virginia Department of Environmental Quality (VDEQ) "concurs that the Plan is consistent with the VCP, provided all applicable permits and approvals are obtained. However, other state approvals which may apply to this action are not included in this FCD review. Therefore, the Service must also ensure that this action is carried out in

accordance with all applicable federal, state, and local laws and regulations.” (*Correspondence #52*)

Response: We appreciate the VDEQ’s coordination of the Commonwealth’s review of our proposal and their guidance to ensure the protection of coastal resources and uses. To ensure consistency with the enforceable policies of the VCP, we will continue to coordinate and consult with Federal, State, and local agencies to acquire all applicable permits and approvals prior to project implementation.

Refuge Step-down Plans

Comment: VDEQ noted that draft CCP and EA discussed only one aspect of hazardous waste management and provided contact information for State offices to assist us by addressing questions regarding compliance with solid and hazardous waste laws and regulations. (*Correspondence #52*)

Response: We appreciate these specific comments related to the protection of the natural and human environment. We will consult with the appropriate State agencies to ensure compliance with applicable Federal, State, and local laws regarding the creation, handling, storage, and transport of waste and hazardous materials.

Comment: VDEQ commented that the draft CCP and EA did not appear to address pollution prevention. (*Correspondence #52*)

Response: We appreciate these specific comments related to the protection of the natural and human environment. Pollution prevention is addressed throughout the draft CCP and EA, including sections 2.10.4 “Refuge Operations and Sustainable Practices,” section 3.3 “Actions Common to All Alternatives,” and section 4.20 “Energy Efficiency.” Where practicable, we adopt or change our practices to prevent or minimize pollution by eliminating the use of materials that produce hazardous waste or have an adverse effect on the environment (565 FW 1). We address specific pollution prevention measures in refuge step-down plans such as the Spill Prevention, Control, and Countermeasures Plan (2001). We will comply with applicable Federal, State, and local laws and regulations regarding planning and permitting requirements.

Comment: VDCR supports the updating and implementation of the refuge’s Spill Prevention, Control, and Countermeasures Plan (2001) and Forest Management Plan (2003). VDCR also supports the development and implementation of a refuge Habitat Management Plan, Inventory and Monitoring Plan, and an invasive species management plan. (*Correspondences #34 and 52*)

Response: We appreciate the VDCR’s support of our updating and implementing refuge step-down plans. We will comply with applicable Federal, State, and local laws and regulations regarding planning and permitting requirements.

Elements of Alternatives Considered but Dismissed

Comment: The refuge should consider adding a limited quail hunt once the pine-dominated forest has been successfully transitioned to a pine savanna that supports a population of quail to be hunted. (*Correspondence #27*)

Response: We appreciate this suggestion for offering a limited quail hunt once the pine savanna habitat can support sufficient quail to be hunted. We considered but dismissed the element of small game hunting at the refuge because the long hunt seasons for small game would interfere with other existing and planned hunting opportunities, limit other wildlife-dependent recreational opportunities, and require more staff time for administration than is available (as stated on page 3-7 of our draft CCP and EA). In addition, there would be conflicts with many of the habitat management strategies discussed in all alternatives in this plan, including prescribed fire and timber operations. We may consider offering a limited quail hunt in a subsequent CCP.

Comment: Include a public motorized boat ramp in alternative B because there used to be one at Blair's Wharf, Prince George County would like to increase tourism and economic benefits from this use, public access to the James River is limited between Hopewell and Surry County, and other refuges have public motorized boat ramps. (*Correspondences #24, 26, 31, and 52*)

Response: As stated on page 3-8 of our draft CCP and EA, we considered but dismissed developing a public motorized boat ramp at Blair's Wharf because construction and use of a public boat ramp, road, and parking for vehicles with boat trailers on the refuge would result in a marked increase of impervious surface on the refuge, increase stormwater runoff and pollutants into adjacent waterways, and promote the spread of invasive aquatic species. The noise generated by non-electric, two- and four-stroke engines would disturb nesting, foraging, and roosting bald eagles on the refuge, resulting in a direct conflict with the refuge's purpose. According to a 2013 VDGIF report, 14 Bald Eagle Concentration Areas and Roosts and 67 bald eagle nests occur within 3 miles of the refuge. Construction and use of a public motorized boat ramp at James River NWR would disturb nesting, foraging, and roosting bald eagles on the refuge and could cause them to move away from their river food sources, abandon nests, and expend energy reserves needed to provide for nestlings. This type of boating noise would also degrade opportunities to view a diversity of wildlife and substantially alter the peaceful, naturally quiet soundscape along the refuge's shoreline. In addition, we do not have the staffing and resources to construct and manage a boat ramp efficiently and safely. Therefore, we dismissed construction of a public boat ramp for motorized watercraft on the refuge from further analysis. Subsequently, we developed a finding of appropriateness for the construction and operation of a public motorized boat ramp on the refuge. The finding determines that a public motorized boat ramp is not appropriate on the refuge. Refer to appendix B of the final CCP for additional details.

The Service realizes the Prince George County Board of Supervisors is interested in establishing a County ramp to accommodate motorized boats near the refuge along the James

River. The Service is continuing dialogue with the County in an effort to assist in finding an appropriate location off of the refuge.

Comment: “I am an avid fisherman, and while not an expert on the James River, I do not see where it is possible to put a public boat ramp on the refuge property that lies along the James due to swampy areas, and also due to the roosting and nesting sites of the eagles.” (*Correspondence #43*)

Response: As stated on page 3-8 of our draft CCP and EA, we dismissed construction of a public boat ramp for motorized watercraft on the refuge from further analysis. Subsequently, we developed a finding of appropriateness for the construction and operation of a public motorized boat ramp on the refuge. The finding determines that a public motorized boat ramp is not appropriate on the refuge. Refer to appendix B of the final CCP for additional details.

Alternatives

Comment: We received many statements of support for or opposition to specific alternatives as presented in the draft CCP and EA. However, many of the comments received included this support or opposition without providing any additional information. Some commenters identified specific reasons for their support of or opposition to an alternative (in its entirety or in part), including:

- Alternative A
 - ❖ Support for relaxing the refuge’s permit requirement for wildlife observation, photography, environmental education, and interpretation; and current administration of the existing deer hunt program. (*Correspondences #20, 28, 30, 35, 48, and 51*)
 - ❖ Opposition to the existing forest management activities and the existing deer hunting opportunities. (*Correspondences #12 and 22*)
- Alternative B
 - ❖ Support for habitat improvements for bald eagles and cavity- and ground-nesting bird species; creation of pine savanna; conducting pine thinning and prescribed burns; controlling invasive plant infestations; conducting experimental longleaf pine restoration; maintaining healthy, balanced wildlife populations; investigation and protection of cultural resources; relaxing the refuge’s permit requirement for wildlife observation, photography, environmental education, and interpretation; increased public use opportunities by expanding the existing deer hunt, opening new hunting opportunities, promoting youth involvement in hunting and fishing, expanding the existing nature trail, improving existing canoe/kayak launch, increasing the number of interpretive program opportunities, interpreting cultural landscapes and resources; and expanding partnerships for public use and research purposes. (*Correspondences #10, 20, 27, 29, 35, 36, 37, 38, 39, 40, 41, 44, 45, 46, 49, 50, 51, and 52*)
 - ❖ Opposition to increased refuge visitation, expanding the existing deer hunting, opening the refuge to new hunting opportunities, and promoting youth hunting opportunities. (*Correspondences #12, 22, and 28*)
- Alternative C
 - ❖ Support for introduction of mixed hardwood habitat; maintaining healthy, balanced

wildlife populations; relaxing the refuge's permit requirement for wildlife observation, photography, environmental education, and interpretation; and increased public use opportunities, especially hunting opportunities for adults, youth, disabled, and veterans. (*Correspondences #1, 2, 3, 4, 7, 8, 10, 11, 13, 14, 15, 20, 21, 35, and 51*)

- ❖ Opposition to the loop road proposed for the main refuge area, expanding the existing deer hunting, opening the refuge to new hunting opportunities, and promoting youth hunting opportunities. (*Correspondences #12, 22, 28, 30, and 48*)

Response: Comments noted.

Comment: The Humane Society of the United States expressed concern about the use of lead ammunition used for hunting on the refuge and recommended that a lead-free ammunition requirement for hunting be included in each of the alternatives. (*Correspondence #47*)

Response: Lead in the environment is certainly a serious issue and one that we are concerned with as well. Alternative B, the Service's preferred alternative, includes investigating the required use of lead-free ammunition for deer and turkey hunting. Analyzing a lead-free ammunition requirement would include identifying the impacts of lead exposure from hunting activities on wildlife, as well as the impacts of ammunition restrictions on hunters. We have recommended alternative B from the draft CCP and EA for implementation.

Comment: "Plan A gets my support, but I would like the addition of oak and beech hardwoods growth." (*Correspondence #30*)

Response: Comment noted. Oak and beech hardwood growth will remain an integral part of the preferred alternative. We will continue to manage the moist hardwood habitat for oak and beech. Other refuge habitats also support healthy stands of oak and beech hardwood. Although additional planting of these species is not anticipated, the hundreds of mature trees found on the refuge continually provide seed stock.

Comment: "I would prefer to see the [refuge] to be left as is (Alt. A) but I know that won't happen so Alt. B is my choice. What I don't want to see is trees being cut down, too much hunting, atv use, roads built." (*Correspondence #48*)

Response: We appreciate support for our preferred alternative. Using our best professional judgment, we developed goals and objectives for Alternative B in the draft CCP and EA, and carried them forth in the CCP, that would conserve and protect natural resources. These goals and objectives were developed after consulting with wildlife experts in federal and state agencies, as well as researchers current in their field. Chapter 5 of the final CCP provides a summary of our coordination and consultation with others.

All alternatives in the draft CCP and EA include removing trees from the dense pine-dominated forest. Alternative B will convert the pine-dominated forest to a pine savanna to support cavity nesting and ground nesting bird species. We have recommended alternative

B from the draft CCP and EA for implementation, including all of the actions mentioned in these comments.

Public uses deemed appropriate and found compatible with the Refuge System mission and refuge's purpose will be conducted to ensure proper control over these public uses and provide management flexibility should detrimental impacts develop. Refer to appendix B of the final CCP for additional details regarding public uses on this refuge.

Comment: "If the outcome from Alt B does prove to be beneficial, then I would suggest another look/vote in 5 years or so to incorporate Alt C." (*Correspondence #41*)

Response: Implementation of monitoring and evaluation processes will be initiated upon approval of the plan. We aim to assess progress made toward achieving the refuge's purpose, vision, goals, and objectives. Through adaptive management, evaluation of monitoring and research results may indicate the need to modify refuge objectives or strategies. We will revise the CCP every 15 years thereafter, or earlier, if monitoring and evaluation determine that we need changes to achieve the refuge's purpose, vision, goals, or objectives (602 FW 3).

Comment: We received comments of general support for alternative B with modifications, such as more wildlife observation areas and expanding the nature trail considerably longer than 3 miles. (*Correspondences #43 and 46*)

Response: We appreciate support for our preferred alternative. Using our best professional judgment, we developed goals and objectives for Alternative B in the draft CCP and EA, and carried them forth in the CCP, that would conserve and protect natural resources. These goals and objectives were developed after consulting with wildlife experts in federal and state agencies, as well as other researchers current in their field. Chapter 5 of the final CCP provides a summary of our coordination and consultation with others.

Alternative B will convert the pine-dominated forest to a pine savanna to support cavity nesting and ground nesting bird species. Alternative B does not include the addition of oak and beech hardwoods growth in the pine savanna in order to provide an open, herbaceous understory. We have recommended alternative B from the draft CCP and EA for implementation, including all of the actions mentioned in these comments.

Public uses deemed appropriate and found compatible with the Refuge System mission and refuge's purpose will be conducted to ensure proper control over these public uses and provide management flexibility should detrimental impacts develop. We developed the 3-mile trail and associated public use facilities based on refuge management activities required to convert the pine-dominated forest to a pine savanna and the refuge's ability to support the uses with current and future resources. Refer to appendix B of the final CCP for additional details regarding public uses on this refuge.

Comment: “I looked for verbage about possible revenue generated by logging operations. I could not find it. However, if you need more public support from the people of Prince George County, I suggest the following:

- Give an estimate for how much money will be generated from sale of timber removed in lowering tree density for pine savanna. Publicize this if needed to gain public support.
- Use local vendors where possible, there are a lot of conservative people in Prince George County. If they are made aware of any economic impacts of the project, there will be more buy-in and acceptance.” (*Correspondence #50*)

Response: We appreciate support for our preferred alternative. The compatibility determination for commercial forest management for habitat management in appendix B of the final CCP describes how commercial loggers will be selected and how revenue generated by logging operations will be handled. To fund the pine thinning effort solely through station funds would otherwise not be possible. The commercial value of overstocked refuge pine forests presents an opportunity to use a contractor to conduct much needed forest management at no cost to the Service. As mentioned in your comment, this provides an economic stimulus to the community. Refer to appendix B for additional information regarding revenue generated by logging operations.

Comment: We received a comment stating opposition to trapping. (*Correspondence #12*)

Response: As stated on page 3-20 of our draft CCP and EA, we are not proposing to initiate a public or recreational trapping program on the refuge. Invasive wildlife species of potential management concern include feral hogs, nutria, and mute swans. However, none of these species has been detected on the refuge to date. We do not intend to initiate a public or recreational trapping program at this time. Trapping is considered a commercial activity and must meet a higher standard of compatibility than priority wildlife-dependent public recreational uses or other non-commercial uses. We will reconsider our position if future situations arise in which predation, habitat loss, or disease is severe, and we determine public trapping to be an effective, essential element in managing them. Until that is necessary, we will use trapping only on a case-by-case basis to help alleviate a particular problem. In this context, trapping will be considered a management or administrative activity and not subject to compatibility review.

Refuge Habitats and Vegetation

Comment: Keep the refuge natural by stopping management actions, such as thinning the pine-dominated forest, conducting prescribed burns, and spraying herbicides. Do not construct new roads. (*Correspondence #12*)

Response: The refuge’s pine-dominated forest is not a roadless, pristine forest community. The existing forest is the result of many years of management as a commercial timber plantation prior to refuge establishment. Over time, the pine forests have become too thick to benefit migratory birds, with more than 1,000 trees per acre. This thickness presents a

wildfire hazard and makes trees susceptible to disease infestation from pine bark beetles. Habitat management tools (such as thinning, prescribed burning, and using pesticides) enable us to develop habitat features that support the needs of wildlife. The 12.3 miles of existing unimproved, gravel and dirt refuge roads, 0.94 miles of well-maintained gravel State roads, and 3.6 miles of paved State roads serve as firebreaks that are effective measures to control prescribed burns and wildfires. We will continue to maintain and improve existing refuge roads as needed in support of refuge operations. No new refuge roads are proposed to be constructed.

Comment: “Why mow 12 acres. Limit it and let woodcock, quail, et al use it as a roost.”
(*Correspondence #27*)

Response: We recognize interest in offering habitat for American woodcock and quail. Neither American woodcock nor quail were identified as a priority species to be managed at James River NWR. We maintain the non-forested upland acres for administrative purposes. We regard these areas as incidental habitat of low quality because of small size and low-quality vegetation.

Comment: “In any beetle kill, consider replanting with longleaf. This will be the roost and nest trees in the future.” (*Correspondence #27*)

Response: We appreciate concerns regarding pine beetle infestations and future bald eagle habitat. In chapter 4, goal 1, objective 1.1 Pine-Dominated Forest, we identify a strategy to plant long-leaf pine seedlings and/or saplings in widened thinning corridors. This could also include planting long-leaf pine in areas cleared following a die-off of trees from a pine beetle infestation.

Comment: “I am in favor of thinning of the pines and the controlled burn program to bring in more wildlife and help the existing wildlife in the refuge.” (*Correspondence #43*)

Response: We appreciate support for our efforts to manage the pine-dominated forest.

Comment: “If burn units exceed 150 acres, you will wish to include ring-around of approximately 1-acre unburned areas within the burn.” (*Correspondence #27*)

Response: We appreciate the tactical suggestion to protect vegetation and wildlife species during prescribed burn operations. Even with our pine-dominated forest, there are pockets of vegetation that hold moisture and do not burn cleanly. In our Prescribed Fire Plans, our fire team considers conditions and tactics to promote the best results for refuge vegetation and wildlife species.

Species of Conservation Concern

Comment: Due to the potential for the refuge to support populations of natural heritage resources, the VDCR recommended conducting inventories on the refuge for various species of conservation concern in Virginia (i.e., barking treefrog, rare skipper, rare crustaceans, sensitive

joint-vetch, Parker's pipewort) and coordination with various regulatory authorities to ensure compliance with State and Federal laws. (*Correspondences #34 and 52*)

Response: We appreciate these specific comments related to the protection of the natural and human environment. We value our existing partnership with VDCR, Division of Natural Heritage and look forward to working together more in the future to protect the Commonwealth's natural heritage resources. We will consult with the appropriate agencies and offices to ensure compliance with applicable Federal, State, and local laws and regulations regarding surveys, planning, and permitting requirements.

Birds

Comment: Consider creating 1.5-acre logging decks, which would be used by woodcock. (*Correspondence #27*)

Response: We recognize interest in offering habitat for American woodcock. American woodcock was not identified as a priority species to be managed at James River NWR. While the logging decks will be maintained as openings, the habitat requirements for the American woodcock include a juxtaposition of open herbaceous grass near young hardwoods. The logging decks are surrounded by pine-dominated forest and will not offer high quality habitat for American woodcock. We aim to assess progress made toward achieving the refuge's purpose, vision, goals, and objectives. Through adaptive management, evaluation of monitoring and research results may indicate the need to modify refuge objectives or strategies. We will revise the CCP every 15 years thereafter, or earlier, if monitoring and evaluation determine that we need changes to achieve the refuge's purpose, vision, goals, or objectives (602 FW 3).

Comment: "Reducing pines from 1000 trees per acre (tpa) to 400 tpa will not produce eagle nest trees. You need to go down from there to 200 tpa at year 17-20 and then down to 70-80 tpa to get decent growth that will result in eagle nest trees." (*Correspondence #27*)

Response: We appreciate the support for protecting future bald eagle nest trees. In chapter 4, goal 1, objective 1.1 Pine-Dominated Forest, we identify the need to reduce the pine density to 80 to 100 tpa to achieve the mature pine savanna habitat. Over the next 10 years, however, we aim to achieve thinning to 200 tpa as we make progress toward the pine savanna habitat.

Comment: Reduce the frequency of wildlife surveys conducted by refuge staff to every 5 or 7 years instead of annually because "you are wasting taxpayer dollars an douging [*sic*] regular wildlife watchers [*sic*] for nothing." (*Correspondence #12*)

Response: Within 5 years of completing the refuge's Habitat Management Plan, we would complete the refuge's Inventory and Monitoring Plan (IMP). The IMP will outline and prioritize inventory and monitoring activities for the refuge based on the priorities detailed in the CCP. The IMP will also incorporate recommendations from the "Strategic Plan for Inventories and Monitoring on National Wildlife Refuge: Adapting to Environmental

Change” (USFWS 2010a) to ensure a coordinate approach to inventory and monitoring across refuges. Conducting wildlife surveys and research are essential to successful habitat and species management. We recognize that refuge staff time is limited and shared across refuges. Throughout the planning process, we recognized that our existing partnerships have more development potential and that we could pursue development of new partners to help us fulfill mutual natural resource conservation mandates and help meet wildlife, habitat, and visitor services objectives. For these reasons, we established a partnership goal for the refuge (goal 5). As a living laboratory, the refuge supports environmental research conducted by partner organizations and institutions recognized for their scientific excellence.

Archaeological Resources or Sites

Comment: We received comments expressing concern that increased public access to the refuge would increase the risk of looting archaeological sites and that the refuge should monitor sites to prevent such damage. (*Correspondences #32 and 49*)

Response: We appreciate concerns regarding potential impacts to archaeological sites at the refuge. In chapter 4, goal 3, objective 3.1 Cultural Resource Protection, we identify strategies to use precise information about archaeological sites to protect known archaeological sites and to better inform refuge management decisions. The strategies include establishing an archaeological site monitoring program that would establish a baseline assessment and monitor site conditions over time. We aim to assess progress made toward achieving the refuge’s purpose, vision, goals, and objectives. Through adaptive management, evaluation of monitoring and research results may indicate the need to modify refuge objectives or strategies. We will revise the CCP every 15 years thereafter, or earlier, if monitoring and evaluation determine that we need changes to achieve the refuge’s purpose, vision, goals, or objectives (602 FW 3).

Refuge Access

Comment: We received comments in support of maintaining limited public access, not providing new amenities for refuge visitors, and not expanding existing refuge trails during the life of this CCP. Two commenters suggested that we consider increasing public use in a future CCP, so as not to hinder habitat restoration efforts. (*Correspondences #20, 22, 28, 29, 30, 32, 48, and 49*)

Response: We appreciate concerns regarding increased public use opportunities. However, when managed responsibly, public uses can instill refuge visitors with a deeper appreciation for wildlife, their behavior, and their habitat needs. We believe that designating a total of 240 acres to support these wildlife dependent public uses would dovetail well with our habitat management actions in the pine-dominated forest. We aim to assess progress made toward achieving the refuge’s purpose, vision, goals, and objectives. Through adaptive management, evaluation of monitoring and research results may indicate the need to modify refuge objectives or strategies. We will revise the CCP every 15 years thereafter, or earlier, if monitoring and evaluation determine that we need changes to achieve the refuge’s purpose, vision, goals, or objectives (602 FW 3).

Comment: “I commend you for trying to improve the refuge and opening some of it to the public. I do feel it is imperative to balance the desires of the people of Prince George County with protection of the roosting and nesting sites of the eagles.” (*Correspondence #43*)

Response: We appreciate these statements of support and look forward to offering new opportunities for wildlife dependent recreation at the refuge while continuing to protect bald eagle habitat.

Public Hunting Opportunities

Comment: Use a lottery system for game hunting to control the number of hunters and harvest totals. Consider using the same rules as False Cape. (*Correspondences #5 and 6*)

Response: We appreciate the suggestion. We will make administrative changes to our hunt program to increase participation in each of the hunts offered. As we consider potential administrative changes, we will research new and improved methods for administering the hunt.

Comment: We received comments in support of promoting hunting opportunities for inner city youth, as well as for disabled, veterans, and other groups that “might not otherwise have access to quality outdoor experiences.” (*Correspondence #10*)

Response: We appreciate these statements of support and look forward to offering new opportunities for wildlife dependent recreation at the refuge. Because James River NWR is considered by the Service to be an urban refuge, we anticipate increased opportunities to provide wildlife dependent recreation activities to diverse audiences.

Comment: “I would like bow hunting to be done like gun hunting. Do away with the lottery.” (*Correspondence #20*)

Response: We will make administrative changes to our hunt program to increase participation in each of the hunts offered. The lottery system enables us to offer a 3-week archery hunt season and requires less staff time and resources than the administration of the gun hunts. Currently, we cannot administer the archery hunt using walk-in hunt registration on the morning of each hunt day because we do not have staff available. We will continue to utilize the lottery system for the archery hunt to provide quality hunt opportunities until further notice. Within 5 years of CCP approval, we will complete all administrative requirements for the proposed expanded hunt program once the CCP is approved and resources are available, including developing a separate NEPA document, compatibility determination, hunt plan, and further public involvement. We will reevaluate all aspects of hunt program administration during that planning process.

Comment: We received comments in support of our determination that deer hunting with pursuit dogs is not appropriate at the refuge because it is “very disruptive to the ecology” and “a threat to wildlife.” (*Correspondences #29, 32, and 49*)

Response: We appreciate these statements of support.

Comment: “A certain area that dogs could be used for deer hunting would be beneficial for the control of deer population. There is no record that anyone has harmed any of the Bald Eagles. We would hope that the ‘good neighbor’ policy would exist.” (*Correspondence #31*)

Response: We appreciate the diversity of opinions regarding hunting opportunities on refuges. We also recognize the interest in deer hunting with pursuit dogs. Our determination that deer hunting with pursuit dogs remains that it is not appropriate on the refuge. No unconfined domestic animals, including but not limited to dogs, are permitted to enter upon any national wildlife refuge or to roam at large upon such an area, except as specifically authorized under the provisions for refuge-specific regulations, field trials, or economic uses in Title 50 of the Code of Federal Regulations (50 CFR 26.34, 27.91, and 29.2, respectively). Resources needed to allow the use of pursuit dogs that adequately provides for public and employee sanitation and safety, without disturbing or harming wildlife species, would divert existing and future resources from accomplishing priority refuge tasks. It also presents unacceptable levels of risk from the potential negative impacts on sensitive habitats, migratory birds, and other wildlife species, and could present conflicts with other refuge users. Pursuit dogs could not be prevented from entering the closed areas of the refuge. Hunting from portable tree stands has long been recognized as an effective way of hunting white-tailed deer and is the recommended method to be used on James River NWR.

Comment: We received a comment opposed to turkey hunting. (*Correspondence #22*)

Response: We appreciate the diversity of opinions regarding hunting opportunities on refuges. Hunting was identified in the National Wildlife Refuge System Improvement Act of 1997 as one of the six priority wildlife-dependent public uses of national wildlife refuges. Each of the six priority public uses receives priority consideration in refuge planning and management.

VDGIF and the public requested we consider providing opportunities for turkey hunting at James River NWR. Turkey hunting is an extremely popular form of hunting in Virginia. During the 2011-2012 hunt season, turkey hunters accounted for 38 percent of all hunters in Virginia (VDGIF 2013). In 2011 to 2012, Virginia hunters were asked how important different forms of hunting were to them; spring turkey season ranked second and fall turkey season ranked third most important (VDGIF 2013). In addition, a Service-led visitor services review (USFWS 2010b) recommended that James River NWR explore possibility of fall turkey hunting opportunities that could couple with or compliment the deer hunt without additional staff involvement. We acknowledge that additional planning and analysis will be necessary to evaluate potential expansions of the refuge’s hunting program.

Comment: “I note your alleged ‘partnerships’ seem to be only with the National Rifle Association (NRA)” for hunting, and the partnership should be terminated. (*Correspondence #12*)

Response: The Service has a partnership with the NRA; the Memorandum of Understanding is available for review at: <http://www.fws.gov/refuges/youcanhelp/nraMOU.htm>. Terminating the Service’s partnership with the NRA is beyond the scope of the James River NWR CCP.

At James River NWR, we are partners with the VDGIF for hunt administration and deer management objectives (see pages 2-61 and 2-62 of the draft CCP and EA). The refuge is open to developing partnerships with organizations that promote the refuge mission and supports the purposes for which the refuge was established.

Public Wildlife Observation, Photography, Environmental Education, and Interpretation Opportunities

Comment: Create an environmental education center on the refuge that emphasizes why the refuge exists and why it is necessary to continue protecting the bald eagle. (*Correspondence #43*)

Response: We appreciate these statements of support for wildlife-dependent recreation and outreach efforts at the refuge. In chapter 4, goal 4, objective 4.1-Hunting and objective 4.2-Wildlife Observation, Photography, Environmental Education, and Interpretation identify strategies to refuge’s hunter contact station to become the refuge’s visitor contact station. We will utilize the renovated facility to provide visitors with information on the refuge, the history of the refuge’s establishment, and priority species being managed at the refuge including the bald eagle.

Staffing

Comment: Refuge staffing is insufficient to “keep out all the bad guys who bring in junk, and lead shot, etc.” (*Correspondence #12*)

Response: We appreciate this statement of concern. We will continue involving volunteers and partners to support the maintenance of a clean and safe environment at the refuge.

Partnerships

Comment: Various State government agencies and organizations expressed their interest in partnering to protect the refuge’s natural and cultural resources, as well as public use opportunities. (*Correspondences #38 and 52*)

Response: We appreciate these statements of support and look forward to building existing partnerships and developing new partnerships with other government agencies, non-government organizations, academic institutions, conservation organizations, and volunteers to fulfill mutual natural resource conservation mandates and help meet wildlife, habitat, and visitor services objectives.

Comment: Conduct professional archaeological research through universities. (*Correspondence #32*)

Response: We appreciate this comment and look forward to working closely with academic institutions for a variety of purposes, including expansion of professional knowledge and understanding of cultural resources, their contexts, and relevance.

Table F.1. Commenters on the Draft CCP and EA for James River NWR

Correspondence Number	Name / Affiliation
1	Steve Larus
2	John Kerins
3	Peter Kalis
4	Vincent Giannini
5	Emmett Simmons
6	Emmett Simmons
7	Tom Sutterfield
8	Patrick Rupertus
9	Alia Taylor
10	Randall Carroll
11	John Cheatham
12	Jean Public
13	Robert Pride
14	Patrick Heraghty
15	James Webb
16	Ron Carlton
17	David Byrd, U.S. Fish and Wildlife Service's Partners for Fish and Wildlife Program
18	Jeffrey Stoke, Prince George County Board of Supervisors
19	Charles Ellis, VDEQ
20	Todd Langley
21	Russell Friedline
22	Barbara Sachau
23	Mark Bittner
24	Jerry Skalsky
25	Percy Ashcraft, Prince George County Board of Supervisors
26	Jeffrey Stoke, Prince George County Board of Supervisors
27	Steve Capel, Young Forest Initiative under Wildlife Management Institute
28	Nelson Marks
29	Doris Gallup, Virginia Master Naturalists
30	Craig Marks
31	Henry Parker, Prince George County Board of Supervisors
32	Chris Stevenson, Virginia Commonwealth University
34	Alli Baird, VADCR- Division of Natural Heritage
38	Justin Doyle, James River Association
39	Deanna Beacham
40	Mary Morrison, National Park Service
41	Joey Nield
42	Mike Ostrander, Discover The James
43	Douglas Tuggle
44	Ethel Eaton, VDHR
45	Emily Myron, Chesapeake Conservancy
46	Molly Maddra
47	Sara Walker, Humane Society of the United States
48	Peggy Combs
49	Carol Figg Hopkins

Summary of Comments Received and Service Responses by Subject

Correspondence Number	Name / Affiliation
50	Linda Maddra, Virginia Master Naturalists
51	Charlie Eastep
52	Ellie Irons, VDEQ

Note: Due to a database error, records 33, 35, 36, and 37 did not have a comment letter entered. These records were blank and were subsequently removed from the database.

Appendix G



Laurel Parshall

Northern bobwhite

Finding of No Significant Impact (FONSI)

James River National Wildlife Refuge Comprehensive Conservation Plan

In October 2014, the U.S. Fish and Wildlife Service (Service, we, our) published the James River National Wildlife Refuge (NWR) draft comprehensive conservation plan and environmental assessment (CCP and EA), which is hereby incorporated by reference. Under the authority of the Endangered Species Act of 1973, James River NWR was established in 1991 is “...to conserve (A) fish or wildlife which are listed as endangered species or threatened species...or (B) plants” (ESA, 16 U.S.C. § 1534). It was the fourth refuge established specifically for the protection of bald eagles, which was a federally endangered species in 1991. The first tract acquired in March 1991 was 3,516 acres of a former pine plantation. With acquisition of additional tracts, the refuge has grown to 4,324 acres of pine-dominated, moist hardwood, and floodplain forests; freshwater marsh and shrub swamp; aquatic habitats; erosional bluffs; and non-forested upland. James River NWR is one of the four refuges that make up the Eastern Virginia Rivers NWR Complex.

The James River NWR draft CCP and EA details the three alternatives evaluated as potential management direction for the refuge over the next 15 years. It carefully considers impacts of each alternative on the environment and potential contribution to the mission of the National Wildlife Refuge System (Refuge System). The draft CCP and EA restates the refuge’s purposes, creates a vision for the next 15 years, and proposes five goals to be achieved through plan implementation. Chapter 2 of the draft CCP and EA characterizes the environment affected by the plan; chapter 3 details the respective goals, objectives, and strategies for each of three alternatives; and chapter 4 describes the consequences of implementing each alternative. The draft CCP includes appendixes that provide additional information in support of the environmental assessment and specific elements of alternative B, the Service-preferred alternative.

Alternative A. Current Management

This alternative satisfies the National Environmental Policy Act (NEPA) requirement of a “no action” alternative, which we define as “continuing current management.” It describes our existing management priorities and activities, and serves as a baseline for comparing and contrasting alternatives B and C.

It would maintain our present levels of approved refuge staffing and the biological and visitor programs now in place. We would continue to manage for and maintain the integrity of refuge forests, swamp, aquatic habitats, erosional bluff, and non-forested upland. We would continue to maintain the 2,653 acres of pine-dominated forest on the refuge using a regime of logging and prescribed fire to selectively reduce forest density, while still protecting large trees. The management focus would remain on protecting this habitat for nesting and roosting bald eagles, as well as other species that use this habitat, such as wild turkey, cavity-nesting bird species, various hawk species, and native mammals. The refuge would continue to provide an active visitor use program that supports public deer hunting and refuge-sponsored wildlife observation, photography, environmental education, and interpretation activities.

Alternative B. Manage Forest Health with Pine-dominated Component; New, Enhanced, and Focused Public Use Opportunities (Service-preferred Alternative)

This alternative is the Service-preferred alternative because it combines the actions we believe would most effectively achieve the refuge’s purposes, vision, and goals, and respond to the issues raised during the scoping period.

It emphasizes the management of specific refuge habitats to protect, enhance, and restore the ecological integrity of inner coastal plain forest and non-forest ecosystems of the lower James River in support of native wildlife and plant communities, including species of conservation concern, and to ensure those ecosystems are resilient in anticipation of climate change. In particular, it emphasizes continued habitat protection for the bald eagle while also promoting the transition of the existing pine-dominated forest to a mature pine savanna habitat with an open midstory and understory. Our management of this habitat would promote the growth of larger and healthier pine trees, and help establish and maintain this habitat at a high quality for the benefit of priority refuge species, such as the brown-headed nuthatch and Chuck-will's-widow.

We would continue to protect the biological integrity, diversity, and environmental health of the other refuge habitats at their current acreages and protect cultural resources throughout the refuge. Gradually, wildlife-dependent recreational opportunities on the refuge would expand and new opportunities would be offered. We would expand the existing public deer hunt and open the refuge to new hunting opportunities for adults and youth. We would designate a public use area for recreational fishing, wildlife observation, photography, environmental education, interpretation opportunities with an emphasis on urban population outreach and continued development of partnerships for resource management and public use.

Alternative C. Manage Forest Health with Hardwood Conversion Component; New and Expanded Public Use Opportunities

This alternative also emphasizes the protection, enhancement, and restoration of the ecological integrity of inner coastal plain forest and non-forest ecosystems of the lower James River. However, this alternative emphasizes promoting the transition of the existing pine-dominated forest towards an oak/hickory/pine forest using selective cut forestry and best management practices while still protecting select trees for bald eagle use. We would reduce the density of trees in the pine-dominated forest using selective cut forestry and associated best management practices to promote forest conversion using an incremental, gradual, and phased approach. Prescribed burning would promote dry hardwood species, and help establish and maintain this habitat at a high quality for the benefit of priority refuge species, such as black-and-white warblers and ovenbirds.

We would continue to protect the biological integrity, diversity, and environmental health of the other refuge habitats at their current acreages and protect of cultural resources throughout the refuge. As under alternative B, we would gradually expand the number and diversity of public use opportunities on the refuge to a broad range of audiences, and in some cases expand them further than under alternative B.

Selection of Management Alternative for the Final CCP

On October 22, 2014, the *Federal Register* published our notice of availability of the draft CCP and EA for a public review and comment period (79 FR 63161) and we distributed notification of its availability and public meetings via email and hardcopy newsletter to all parties on our mailing list, including media outlets. Our 39-day public comment period closed on November 30, 2014, but we accepted late comment submissions received through December 7, 2014. We received 48 correspondences, representing 126 individual comments. A total of 23 people attended two public meetings held on November 12, 2014. Appendix F in the final CCP includes a summary of those comments and our responses to them.

After reviewing the proposed management actions, and considering all substantive public comments and our responses to them, we have determined that the analysis in the EA is sufficient to support our findings. We are selecting alternative B, as presented in the draft CCP and EA with the following changes recommended by the planning team, to implement as the final CCP. We made only non-substantive changes in the final CCP, which are:

- Minor corrections of fact that do not alter the conclusions drawn from their analysis.
- Minor updates of information to improve readability or clarity.
- Minor formatting and typographical errors that were brought to our attention.

We conclude that alternative B, with the above changes, will:

1. Best fulfill the mission of the Refuge System;
2. Best achieve the refuge's purpose, vision, and goals;
3. Best maintain and, where appropriate, restore the refuge's ecological integrity;
4. Best address the major issues identified during the planning process; and
5. Be most consistent with the principles of sound fish and wildlife management.

Specifically, in comparison to the other two alternatives, alternative B provides the biggest increase in the diversity, integrity, and health of high-quality habitats through enhanced habitat management. It also provides the most reasonable and effective improvements to existing public use programs that are in demand, with minimal impacts to wildlife and habitats. It is reasonable, is feasible, and will result in the most efficient management of the refuge to best serve the American public.

We have reviewed the predicted beneficial and adverse impacts with alternative B that are presented in chapter 4 of the draft CCP and EA, and compared them to the other alternatives. We specifically reviewed the context and intensity of those predicted impacts over the short- and long-term, and considered the cumulative effects. Our assessment of the NEPA factors indicative of significant environmental effects (40 C.F.R. 1508.27) is summarized below.

Beneficial and adverse effects: Prior to this CCP, the refuge had clear management direction to protect and enhance habitat for bald eagles and few other forest species. In this CCP, we determined that we could support bald eagles in the long-term, as well as improve the habitat quality to support other native species of conservation concern. We will reduce the density of trees in the refuge's pine-dominated forest to promote growth of larger and healthier pine trees for the benefit of various priority refuge species such as the bald eagle, brown-headed nuthatch, and Chuck-will's-widow. Our protection of the biological integrity, diversity, and environmental health of the all refuge habitats will moderately benefit native plant and wildlife communities. Since our habitat and wildlife management actions would not result in widespread changes in abundance, distribution, or composition of local or regional populations or habitats to the extent that any species of conservation concern would be jeopardized or recovered, we do not anticipate any significant beneficial or adverse effect on the natural environment. We also would conduct additional planning and NEPA review as needed to avoid, minimize, or mitigate adverse effects on the natural or human environments.

Public health and safety: We expect the refuge's good safety record to continue under the final CCP. Public health and safety is a paramount consideration in designing and implementing all

activities on the refuge, whether those activities support habitat or visitor services programs. Adherence to spill prevention plans, pesticide use plans, best management practices, and the protective actions provided in the stipulations of the compatibility determinations for authorized public uses on the refuge, will be a priority. Given these considerations, there should be no significant impact on public health and safety from the implementation of the final CCP.

Unique characteristics of the area: We expect the unique and regionally significant character of the refuge to be maintained under implementation of the final CCP. The unique characteristics of the refuge include:

- The refuge is located within and adjacent to coastal counties with special preservation provisions to protect water quality in accordance with the Chesapeake Bay Preservation Act.
- The refuge is located within an Anadromous Fish Use Area.
- The refuge is located along a segment of the James River that is one of the best places in the Chesapeake Bay Estuary to find the federally endangered Atlantic sturgeon.
- The refuge is located within the summer and winter concentration areas for bald eagles along the James River watershed.
- It is located within the Lower James River Important Bird Area.
- It has a high potential for preserved significant archaeological resources that date from the Early Archaic period (8000 B.C. to 6500 B.C.) through the 20th century and could enhance our understanding of Virginia's human history.

We expect that the management actions outlined in the final CCP will continue to protect these unique characteristics. These actions include the following:

- Maintain and promote ecological integrity, diversity, and environmental health of refuge habitats for the benefit of priority refuge species.
- Allowing public access to designated public use areas.
- Work with partners to inventory, monitor, and protect habitats and species.
- Work with partners to protect, research, and interpret cultural resources and values.

Given these considerations, there should be no significant impact on the unique characteristics of the area due to implementation of the final CCP.

Highly controversial effects: We do not predict that any highly controversial effects would occur from implementing the final CCP. We have extensive experience protecting rare, threatened, and endangered species; conducting forest habitat management; controlling invasive plants and pests; controlling deer populations through hunting; and other activities to support wildlife-dependent recreational uses. The effects of these actions are widely known from our past management and monitoring. There is no scientific controversy over what these effects will be. Given these considerations, there is little risk of any unexpected, highly

controversial effects on the quality of the human environment.

Highly uncertain effects or unknown risks: We do not predict any highly uncertain effects or unknown risks with implementing the CCP. The management actions in the CCP are mostly refinements of existing management that we have used since the refuge was established. However, there is some uncertainty with regard to how climate change will impact refuge resources.

There are many predictions of climate change impacts, but all have a degree of uncertainty. Generally, on a broad scale, it is predicted that the greatest effects of climate change will be on regional air and water temperatures, precipitation patterns, storm intensity, and sea levels, although the degree to which those changes will occur varies among climate change models. Those broad-scale changes are anticipated to influence natural disturbance patterns and result in a decrease in freeze periods, decreased snow cover, increased storm intensities and frequencies, increased intensity and frequency of summer droughts, damaging ozone, and an increase in the spread of invasive species and disease. The resulting effects on wildlife and habitats are expected to be variable and species-specific. There are no site-specific models for the refuge.

We feel the final CCP adheres to the main guiding principal of the Service's climate change adaptation planning which is to establish baseline conditions and monitor changes to those conditions, through the inventory and monitoring strategies we have identified, and by maintaining or increasing the resiliency of the refuge's habitats and ecological processes through forest, aquatic, and shoreline restoration activities. We are also safeguarding against the uncertainty and unpredictability of future climate change effects by using an adaptive management approach.

Precedent for future actions with significant effects: The purpose of the CCP is to establish the precedent for managing the refuge for up to 15 years. The effects of that management are designed as gradual improvements over the existing conditions, not global changes. For example, strategies such as expanding environmental education and forest will be completed over several years. Therefore, we do not expect this precedent to cause any significant impact on the environment.

Despite the potential for some small amount of uncertainty from climate change impacts, we do not find a high degree of uncertainty or unknown risk that the final CCP will cause any significant direct, indirect, or cumulative impact on the environment. This conclusion is based on available data about the impacts of our current management actions, and our use of education, monitoring, expert consultations, outreach, and enforcement to help identify and address any unplanned effects.

Cumulatively significant impacts: We developed actions and strategies to support the purpose of the CCP, which is to develop a strategic management plan to best meet the refuge's purposes and goals, and the Refuge System mission for up to 15 years. The effects of management are designed as gradual improvements over the existing conditions, not global or expansive changes. For example, our invasive plant control efforts and continued work with partners to improve pine-dominated forest quality will contribute a relatively unnoticeable benefit toward improvement of the region's forest health. Given these considerations, we do not expect the actions in the final CCP to set a precedent for future actions that may cause any

significant impact on the environment.


Effects on scientific, cultural, or historical resources: Throughout development of the CCP, we informally consulted with the Service's Northeast Regional Office Historic Preservation Office and the Virginia State Historic Preservation Office. At their request, we incorporated all of the best management practices and recommendations provided to avoid or minimize the potential for land-disturbing activities to generate adverse effects on cultural resources that may be eligible for listing in the National Register. We would continue to consult with these offices and local government officials to identify concerns about potential undertakings early in the planning process. Therefore, we do not expect that implementing the CCP would cause any significant effect on scientific, cultural, or historical resources.

Effects on Endangered Species Act (ESA)-listed species and habitats: Although not legally required, we consulted the Service's Ecological Services Virginia Field Office under Section 7 of the ESA and the National Oceanic and Atmospheric Administration regarding the potential to affect the federally endangered Atlantic sturgeon in the James River. We concluded that the actions planned in the CCP will have no effect on Atlantic sturgeon (appendix E). Neither office objected to our conclusion.

Threat of violating any environmental law: Our habitat management actions are designed to benefit the environment. They will comply with all applicable laws, such as the Clean Water Act, Clean Air Act, ESA, and the NHPA. Appendix E includes documentation of our consultation with State government offices. Given these considerations, we do not anticipate a threat that the CCP will violate any environmental law or cause any significant impact on the environment.

Conclusion

Based on this review, we find that implementing alternative B will not have a significant impact on the quality of the human environment, in accordance with Section 102(2)(c) of NEPA. Therefore, we have concluded that this Finding of No Significant Impact is appropriate and an Environmental Impact Statement is not required.



Wendi Weber
Regional Director
U.S. Fish and Wildlife Service
Hadley, Massachusetts

11 JUNE 2015
Date

Acting

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