



U.S. Fish and Wildlife Service

Great Swamp National Wildlife Refuge

Hunting Plan

August 2021



Great Swamp National Wildlife Refuge – Credit: Richard Pope

Appendix A – Compatibility Determination
Appendix B – Environmental Assessment
Appendix C – Intra-Service Section 7 Analysis
Appendix D – Finding of No Significant Impact

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August 2021

U.S. Fish and Wildlife Service

Great Swamp National Wildlife Refuge
32 Pleasant Plains Road
Basking Ridge, NJ 07920

Submitted By:
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GREAT SWAMP NATIONAL WILDLIFE REFUGE HUNTING PLAN

I. Introduction

National wildlife refuges are guided by the mission and goals of the National Wildlife Refuge System (Refuge System), the purposes of an individual refuge, U.S. Fish and Wildlife Service (Service) policy, laws and international treaties. Relevant guidance includes the National Wildlife Refuge System Administration Act (NWRSA) of 1966, as amended by the Refuge System Improvement Act of 1997, Refuge Recreation Act of 1962, and selected portions of the Code of Federal Regulations (CFR) and Fish and Wildlife Service Manual.

Great Swamp National Wildlife Refuge (NWR) was established and lands acquired under authorities of the Migratory Bird Conservation Act of 1929 (16 U.S.C. 715-715r, 45 Stat. 1222), as amended; the National Wildlife Refuge Recreation Act (16 U.S.C. 460k-2), as amended; the Emergency Wetlands Resources Act of 1986 (16 U.S.C. 3901(b)); the Endangered Species Act of 1973 (16 U.S.C. 1534); and the Wilderness Act of 1964 (Public Law 88577; 16 U.S.C. 1131-1136).

The primary purposes of the refuge are:

- “...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” (Migratory Bird Conservation Act of 1929; 16 U.S.C. 715d)
- “... (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ...” (Refuge Recreation Act; 16 U.S.C. 460k-1) “the Secretary...may accept and use...real...property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors...” (Refuge Recreation Act; 16 U.S.C. 460k-2, as amended)
- “...for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions ...” (Emergency Wetlands Resources Act of 1986; 16 U.S.C. 3901(b));
- “... 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); and
- “...to secure for the American people of present and future generations the benefits of an enduring resource of wilderness... wilderness areas ... shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their

use and enjoyment as wilderness: ...” (Wilderness Act of 1964; Public Law 88577; 16 U.S.C. 1131-1136).

Great Swamp NWR encompasses 7,768 acres (see Map 1) and is 26 miles from New York City within the Townships of Chatham, Harding, and Long Hill of Morris County, New Jersey. Great Swamp NWR is north of Interstate 78 and east of Interstate 287. The refuge has an approved acquisition boundary that would allow for refuge expansion to a maximum of 9,429 acres.

The surrounding area is heavily suburbanized. As a result, the refuge has become an island of wildlife habitat in a sea of development. The refuge provides vital brooding, nesting, feeding, and resting habitat for a variety of migratory bird species including waterfowl. Although established primarily for migratory birds, the refuge’s mosaic of forested wetlands, emergent wetlands, and various successional stages of upland vegetation provides habitats for a variety of wildlife species. The refuge has five major impoundments totaling approximately 570 acres. These impoundments are managed for marsh habitat that contains wetland plants similar to natural marsh habitat in Northern New Jersey.

The mission of the Refuge System, as outlined by the NWRSA, as amended by the Refuge System Improvement Act (16 U.S.C. 668dd et seq.), is to:

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

The NWRSA mandates the Secretary of the Interior in administering the Refuge System to (16 U.S.C. 668dd(a)(4):

- Provide for the conservation of fish, wildlife, and plants, and their habitats within the Refuge System;
- Ensure that the biological integrity, diversity, and environmental health of the Refuge System are maintained for the benefit of present and future generations of Americans;
- Ensure that the mission of the Refuge System described at 16 U.S.C. 668dd(a)(2) and the purposes of each refuge are carried out;
- Ensure effective coordination, interaction, and cooperation with owners of land adjoining refuges and the fish and wildlife agency of the States in which the units of the Refuge System are located;
- Assist in the maintenance of adequate water quantity and water quality to fulfill the mission of the Refuge System and the purposes of each refuge;

- Recognize compatible wildlife-dependent recreational uses as the priority general public uses of the Refuge System through which the American public can develop an appreciation for fish and wildlife;
- Ensure that opportunities are provided within the Refuge System for compatible wildlife-dependent recreational uses; and
- Monitor the status and trends of fish, wildlife, and plants in each refuge.

Therefore, it is a priority of the Service to provide for wildlife-dependent recreation opportunities, including hunting and fishing, when those opportunities are compatible with the purposes for which the refuge was established and the mission of the Refuge System.

The refuge currently runs a managed firearm deer hunt over a 5-day period in November beginning with a 1-day youth hunt on a Saturday followed by a 4-day regular hunt the following Wednesday through Saturday. An annual deer firearm hunt has been conducted on the refuge since 1974 to maintain the refuge deer population at or below a level that does not negatively impact wildlife habitat while providing a safe, high quality outdoor experience for refuge hunters.

The Service proposes to expand hunting opportunities at Great Swamp NWR to better reach refuge management objectives and align with New Jersey Division of Fish and Wildlife (NJDFW) hunting programs. We propose the following changes to the existing hunting plan:

1. *Species changes*: Propose opening to wild turkey (spring and fall seasons), Canada goose (September season only), and coyote and fox (taken incidental only while deer or turkey hunting; no night hunting allowed). Propose adding archery white-tailed deer hunting and aligning current firearm hunt dates with the Statewide 6-day firearm season (and youth firearm day) on the refuge in accordance with NJDFW seasons and regulations.
2. *Method of take changes*: Propose reducing the use of all lead ammunition on the refuge by (1) allowing only non-toxic shot for wild turkey hunting and (2) encouraging the transition towards non-toxic ammunition for all other game species. The refuge proposes to align with method of take for species above consistent with NJDFW where possible.
3. *Days of the week changes*: None.
4. *Hunt Area changes*: Propose adding the Primrose Brook parcel of 100 acres, located within the Management Area of the refuge, into the hunting program.
5. *Permit fees*: Propose a simplified hunting permit requirement and reduction in permit fees.

II. Statement of Objectives

The objectives of a hunting program on Great Swamp NWR are to provide:

- Biological diversity by preserving the natural diversity and variety of biotic communities occurring on refuge lands through management of sustainable deer, turkey, and small game populations;
- Wildlife-dependent public recreation as mandated by and according to Service law and policy;
- Neighbors with considerate management of the refuge's wildlife populations to prevent property damages; and
- A quality recreational experience for hunters, especially youth and persons who qualify for State disabled hunting permits.

Hunting is necessary to fulfill the refuge's purposes. Additionally, each hunting opportunity is tied specifically to the following refuge management objectives:

- Deer population control helps maintain good health in the refuge deer herd and prevents ecosystem damage from over browsing and adverse impacts on other wildlife species.
- Managing abundant turkey populations helps preserve the forest floor community and reduces soil disturbance that causes the spread of invasive vegetation.
- Incidental take of coyote and fox helps reduce the predator population that prey on several endangered or threatened species including federally listed bog turtles, State-listed wood turtles, amphibians, and grassland and forest ground nesting birds. (Harding, 2001)
- Conducting a September Canada goose hunt in accordance with NJDFW would target populations of resident Canada geese. Resident geese who nest in the refuge's impoundments severely degrade habitat quality and food resources for migratory flocks of waterfowl passing through in the fall and spring.(Haramis, 2004; Perry 2004)

III. Description of Hunting Program

A. Areas to be Opened to Hunting

Hunting would be allowed on approximately 6,804 acres divided into two units: the Wilderness Area (3,397 acres) and Management Area (3,507 acres).

The Wilderness Area makes up most of the eastern side of the refuge and is comprised of bottomland red maple floodplain forest, small upland "islands" of American beech, chestnut oak-dominated hardwood forest, and a small amount of open water. The Management Area makes up

the western side and is characterized by stands of bottomland and upland forest types (i.e. pin oak, swamp white oak and mesic beech) interspersed amongst about 840 acres of scrub/shrub habitat, 460 acres of early successional fields, and five impoundments (570 acres). Black Brook, Great Brook, Loantaka Brook and Primrose Brook flow through the refuge and drain into the Passaic River that runs along portions of the western refuge boundary (USFWS 2009).

White-tailed deer, turkey, Canada goose, and incidental small game hunting would be permitted in the entirety of both the Wilderness Area and Management Area during their respective seasons, except in areas where no hunting is outlined. A permanent no-hunting area (962 acres) is maintained along the perimeter of the refuge.

B. Species to be Taken, Hunting Periods, Hunting Access

Hunting seasons will be set annually by the NJDFW and will be reiterated in the refuge's annual regulations which may contain further restrictions.

Big Game Hunting – We allow the hunting of white-tailed deer and wild turkey (spring and fall) on designated areas of the refuge in accordance with regulations and seasons set forth by the State and subject to the following condition: Non-toxic shot will be required for hunting turkey on the refuge.

Small Game Hunting – We allow incidental coyote and fox hunting on designated areas of the refuge in accordance with regulations and seasons set forth by the State and subject to the following condition: Species may be taken only as incidental to deer hunting or turkey per NJDFW regulations.

Migratory Bird Hunting – We allow hunting of Canada geese only during the New Jersey September Canada Goose season. No other migratory birds may be taken.

The Service will allow hunters access to all huntable portions of the refuge. The intention is to provide safe, quality hunting opportunities that consider the welfare of the refuge wildlife resources. Hunter parking lots and access points will be delineated on the annual refuge hunt maps.

The refuge will adopt youth hunts in accordance with the State's programs. Accommodations would provide opportunities for hunters with who qualify for State disabled hunting permits. Future plans would include establishing a disabled hunter only area to allow vehicle access

C. Hunter Permit Requirements

Hunters must obtain an annual Great Swamp NWR hunting permit in addition to all applicable State licenses and permits prior to hunting or scouting. Permits are available for purchase online at greatswamp.recaccess.com.

The refuge hunting permit costs \$30 (\$25 refuge fee, \$5 processing fee), be valid from January 1 to December 31, and will include spring and fall turkey*, archery deer, 6-day firearm deer hunt, and incidental coyote and fox hunting. Permits are valid for the entire refuge including both the

Wilderness Area and Management Area. A separate, limited number of September Canada Goose Permits will be available for \$5 (cost of processing fee). Youth permits for all of the above will remain free.

This proposed permit structure simplifies the current process and does not result in an increase in cost for the customer. Please note that turkey hunting will be established through a phased approach, by introducing mentored hunts only for the first 2 to 3 years after acceptance of this hunt package, with a future goal to have regular, public spring and fall turkey hunting opportunities.

Permit fees help defray costs of administering the hunt program. The permit system enables refuge management to limit area access or reduce numbers of permits available, if deemed necessary, due to user conflicts, habitat damage, or disturbance to wildlife. This is a condition that refuge neighbors and, both past and future land donors, have expressed appreciation of. Permits also ensure that hunters acknowledge the refuge rules and regulations. Hunt permits, which come with a hunter parking dashboard slip, also allow law enforcement the ability to confirm hunter use of designated parking areas.

D. Consultation and Coordination with the State

The refuge consulted with the State of New Jersey extensively while writing their hunting plan. NJDFW supported this expansion, which included new opportunities for small game, big game and migratory bird hunting. In addition, the refuge had a meeting with the State in January 2021 regarding the proposed changes. The State of New Jersey fully supported the refuge aligning with State hunting programs and regulations.

E. Law Enforcement

The enforcement of violations on national wildlife refuges is the responsibility of commissioned Federal Wildlife Officers (FWOs). The following methods will be used to control and enforce hunting regulations:

- Refuge boundaries will be clearly posted;
- The refuge will provide a brochure that shows hunt areas;
- Law enforcement officers will randomly check hunters for compliance with Federal and State Laws as well as refuge-specific regulations pertinent to hunting; and
- Information will be made available at the Great Swamp NWR visitor center and website.

Procedures for obtaining law enforcement assistance are based on legal jurisdiction, pending where the incident occurred.

F. Funding and Staffing Requirements

Costs associated with administering the hunt program total approximately \$25,000 (see Table 1). This amount is based on salaries for personnel, creation and distribution of hunting information, permit system administration, signage, and other miscellaneous expenses.

Table 1. Funding and Staffing Requirements for Refuge Hunt Program

Identifier	Cost
Staff (Admin Assistant, Refuge Specialist, Maintenance, Refuge Manager) Hunt	\$17,000
Maintain roads, parking lots, trails*	\$1,000
News releases, fact sheets, reports for Hunt Program	\$1,000
Maintain hunting signs	\$1,000
Law Enforcement	\$5,000
Total Annual Cost	\$25,000

**Refuge trails and roads are maintained for a variety of activities. Costs shown are a percentage of total costs for trail/road maintenance on the refuge, and reflective of the percentage of trail/road use for hunting. Volunteers account for some maintenance hours and help reduce cost of the program.*

IV. Conduct of the Hunting Program

A. Hunter Permit Application, Selection, and/or Registration Procedures

Hunters must obtain an annual Great Swamp NWR hunting permit prior to hunting or scouting. Permits can be purchased online at: <https://greatswamp.recaccess.com/> at any time during the hunting season. New season permits will go on sale on the first of the new calendar year.

Refuge-specific hunting regulations and current hunt maps are available to download or print from the permit website above. Hunters are required to acknowledge that they have reviewed the refuge regulations prior to purchasing a permit.

B. Refuge-Specific Hunting Regulations

To ensure compatibility with refuge purposes and the mission of the Refuge System, hunting must be conducted in accordance with State and Federal regulations, supplemented by refuge-specific regulations (50 CFR §32.49) and information sheets/brochures. The use of non-toxic ammunition is proposed for wild turkey hunting opportunities and will be required upon implementation of this plan in 2021. We will continue to encourage use of non-toxic ammunition for other hunts and will educate hunters about lead and potential impacts. Stipulations are detailed in the Hunting Compatibility Determination (CD) (Appendix A). The following hunting procedures apply at Great Swamp NWR:

- Hunters must obtain a refuge hunting permit. We require hunters to possess a signed refuge hunting permit at all times while scouting and hunting on the refuge.
- Hunters may enter the refuge 2 hours before legal shooting time and must leave no later

than 2 hours after legal shooting time. Hunting in accordance with State listed times within this timeframe.

- We require the use of non-toxic shot while turkey hunting on the refuge.
- We prohibit organized deer drives. We define a “deer drive” as an organized or planned effort to pursue, drive, chase, or otherwise frighten deer into moving in the direction of any person(s) who is part of the organized or planned hunt and known to be waiting for the deer.

C. Relevant State Regulation

Hunters are responsible for knowing and complying with all applicable New Jersey regulations including safety zones and other requirements of the State.

D. Other Refuge Rules and Regulations for Hunting

- Parking permits (included with hunting permit) must be clearly visible on vehicle dashboard.
- Scouting is permitted 2 weeks prior to any season opening. Firearms or archery equipment are prohibited while scouting. Hunter orange must be worn if the hunter is scouting during any firearms season.
- Only portable tree stands may be used. All stands must be removed by March 31.

V. Public Engagement

A. Outreach for Announcing and Publicizing the Hunting Program

The refuge maintains a mailing list for news release purposes to local newspapers, radio and websites. Special announcements and articles may be released in conjunction with hunting seasons. In addition, information about the hunt will be available at Great Swamp NWR headquarters or on the Great Swamp NWR website and social media.

B. Anticipated Public Reaction to the Hunting Program

As part of the 2014 Comprehensive Conservation Plan (CCP) process for Great Swamp NWR, the hunting CD underwent extensive public review during a 47-day public review and comment period on the draft CCP/EA. We announced the public review and comment period in the Federal Register and through local media announcements. For this Hunting Plan (with CD and EA), the refuge received no comments during a 90-day public comment period. No changes were made to the plan from draft to final.

Although hunters comprise a small fraction of refuge visitation, hunters and non-hunters may have conflicts over shared space, disturbance, and safety concerns. To mitigate potential

conflicts, the refuge will clearly advertise hunting seasons and regulations, encourage all visitors to wear hunter orange, and will clearly sign/post safety and hunting zones.

C. How Hunters Will Be Informed of Relevant Rules and Regulations

Refuge-specific hunting regulations and current hunt maps are available to download or print from the permit website at any time. Hunters are required to acknowledge that they have reviewed the refuge regulations prior to purchasing a permit. Requiring hunters to obtain a permit each year helps to ensure refuge rules and regulations are reviewed and abided by. Dates, forms, hunting unit directions, maps, applications, and permit requirements about the hunt will be available at the refuge website at: www.fws.gov/refuge/Great_Swamp. General information regarding hunting and other wildlife-dependent public uses can be obtained by calling (973) 425-1222 and at the Great Swamp NWR Visitor Center at:

32 Pleasant Plain Road
Basking Ridge, NJ 07920

VI. Compatibility Determination

Hunting and all associated program activities proposed in this plan are compatible with the purposes of the refuge. See attached Hunting CD (Appendix A).

VII. References

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- Rooney, T.P. 2001. Deer impacts on forest ecosystems: a North American perspective. *Forestry* 74:201-208.
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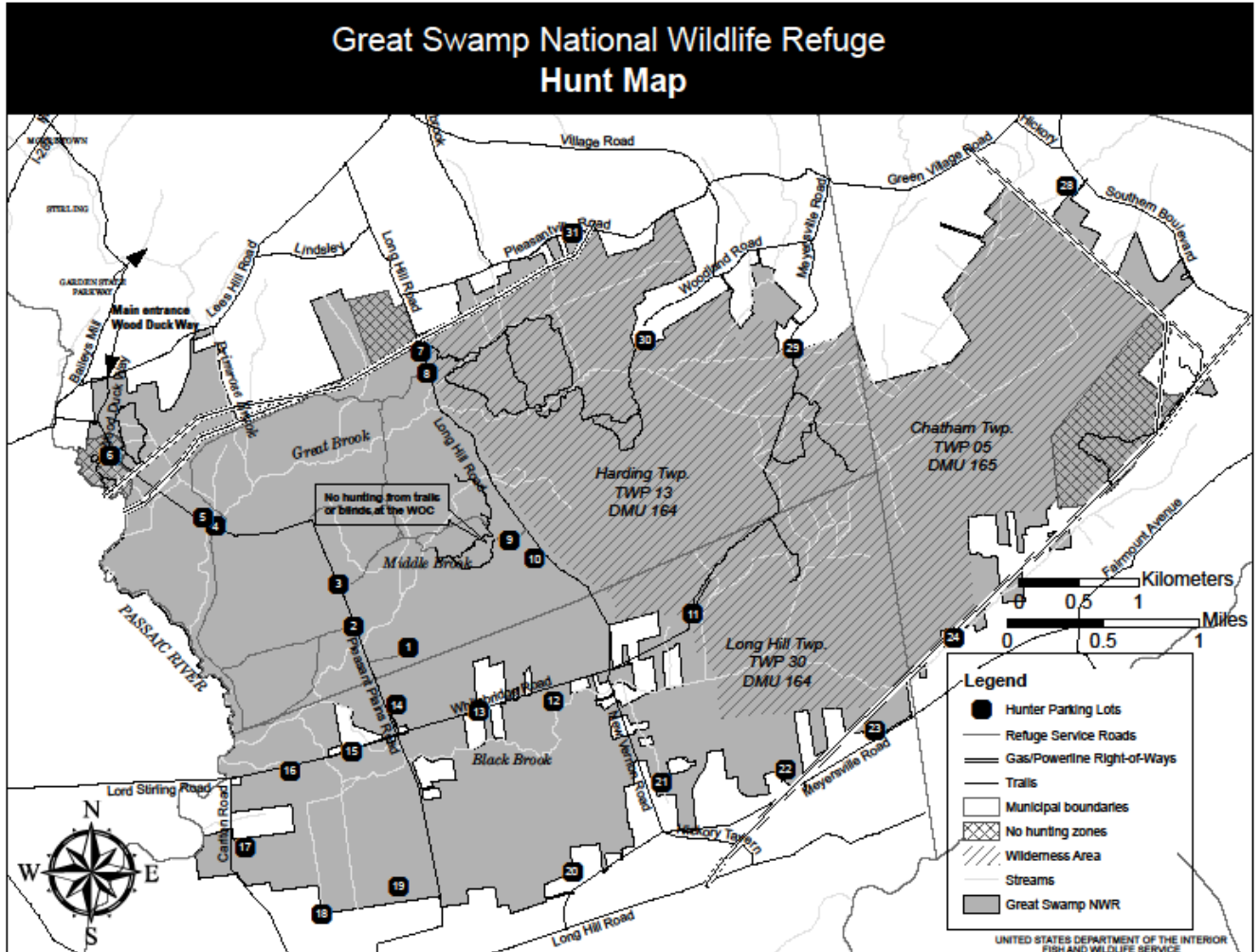
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USFWS. 2009. Great Swamp National Wildlife Refuge Habitat Management Plan, Final Draft, Great Swamp National Wildlife Refuge, Morris County, New Jersey. Department of the Interior, USFWS, Basking Ridge, NJ.

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VIII. Maps

Map 1. Map of Great Swamp NWR Hunting Areas



COMPATIBILITY DETERMINATION

USE: Hunting

REFUGE NAME: Great Swamp National Wildlife Refuge

DATE ESTABLISHED: November 3, 1960

ESTABLISHING and ACQUISITION AUTHORITIES:

- 1) Migratory Bird Conservation Act of 1929 (16 U.S.C. 715-715r, 45 Stat. 1222), as amended;
- 2) National Wildlife Refuge Recreation Act (16 U.S.C. 460k-2), as amended;
- 3) Emergency Wetlands Resources Act of 1986 (16 U.S.C. 3901(b));
- 4) Endangered Species Act of 1973 (16 U.S.C. 1534); and
- 5) Wilderness Act of 1964 (Public Law 88577; 16 U.S.C. 1131-1136).

REFUGE PURPOSE(S):

- “...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” (Migratory Bird Conservation Act of 1929; 16 U.S.C. 715d)
- “...for (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ...” (Refuge Recreation Act; 16 U.S.C. 460k-1) “the Secretary...may accept and use...real...property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors...” (Refuge Recreation Act; 16 U.S.C. 460k-2, as amended)
- “...for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions ...” (Emergency Wetlands Resources Act of 1986; 16 U.S.C. 3901(b));
- “... 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); and
- “...to secure for the American people of present and future generations the benefits of an enduring resource of wilderness... wilderness areas ... shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness: ...” (Wilderness Act of 1964; Public Law 88577; 16 U.S.C. 1131-1136).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION:

The mission of the National Wildlife Refuge System (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 of 1997, Public Law 105-57).

DESCRIPTION OF USE:

(a) What is the use? Is the use a priority public use?

The use is white-tailed deer, wild turkey, Canada goose, coyote and fox hunting. Hunting of coyote and fox would be incidental to deer and turkey hunting in accordance with New Jersey Division of Fish and Wildlife (NJDFW) regulations.

Hunting was identified as one of six priority public uses of the Refuge System by the National Wildlife Refuge System Administration Act (NWRSA) of 1966, as amended by the Refuge System Improvement Act of 1997 (Public Law 105-57), when found to be compatible.

(b) Where would the use be conducted?

There are three main areas on the refuge: the Management Area (3,407 acres), the Wilderness Area (3,397 acres) and the Closed Area (962 acres). Hunting would remain prohibited in the Closed Area due to a higher concentration of non-consumptive refuge users and suburban development (see Map 1 in the Hunting Plan).

In the Management Area and Wilderness areas, hunting would be permitted for white-tailed deer, wild turkey, Canada goose, coyote and fox.

(c) When would the use be conducted?

Hunting seasons are set annually by the NJDFW. Hunting will primarily occur from September through January, and April through May for spring turkey season. Regulations are published within the State’s Hunting and Trapping Digest. Night hunting would be prohibited. Access to the refuge would be allowed 2 hours before sunrise and 2 hours after sunset.

(d) How would the use be conducted?

We would continue to conduct the hunting program according to State and Federal regulations. Federal regulations in 50 CFR pertaining to the NWRS as well as existing refuge-specific regulations would apply.

However, the refuge manager may, upon annual review of the hunting program, take the necessary steps to impose further restrictions, recommend that the refuge be closed to hunting, or further liberalize hunting regulations up to the limits of State regulations. We would restrict hunting if it becomes inconsistent with other, higher priority refuge programs or endangers refuge resources or public safety.

Hunters must obtain an annual Great Swamp NWR hunting permit in addition to all applicable State licenses and permits prior to hunting or scouting. Permits are available for purchase online at greatswamp.recaccess.com.

The refuge hunting permit would cost \$30 (\$25 refuge fee, \$5 processing fee), be valid from January 1 to December 31, and would include spring and fall turkey*, archery deer, 6-day firearm deer hunt, and incidental coyote and fox hunting. Permits are valid for the entire refuge including both the Wilderness Area and Management Area. A separate, limited number of September Canada Goose Permits will be available for \$5 (cost of processing fee). Youth permits for all of the above will remain free.

Turkey hunting would be introduced in a phased approach through mentor-guided hunts only for the first 2 to 3 years for youth, persons who qualify for state disabled hunter permits, or beginner hunters. After the initial 2 to 3 years, the refuge would allow regular, public spring and fall turkey hunting opportunities. Refuge-specific hunting regulations and current hunt maps are available to download and/or print from the permit website above. Hunters are required to acknowledge that they have reviewed the refuge regulations prior to purchasing a permit. We propose to restrict the use of lead ammunition for turkey hunting on the refuge. It is well known that lead is a potent neurotoxin for wildlife. Reducing the use of lead ammunition at the refuge is consistent with the Federal lead shot restriction for hunting waterfowl that inhabit the same pond, marsh and open water habitats where hunting may occur. This action is intended to reduce the unintentional introduction of a known neurotoxin into habitats used by diving ducks, loons, eagles, and other wildlife species sensitive to the effects of lead. We will continue to encourage use of non-toxic ammunition for other hunts and will educate hunters about lead and potential impacts.

The Service will make a reasonable effort to allow hunters access to all huntable portions of the refuge. The intention is to provide safe, quality hunting opportunities that consider the welfare of the refuge wildlife resources. Hunter parking lots and access points will be delineated on the annual refuge hunt maps.

(e) Why is the use being proposed?

Hunting is a healthy and traditional recreational use of renewable natural resources deeply rooted in America's heritage, and it can be an important wildlife management tool. Hunting is one of the priority uses outlined in the Refuge System Improvement Act of 1997. The Service supports and encourages priority uses when they are appropriate and compatible on refuge lands. Hunting is used in some instances to manage wildlife populations. Expanding hunting access on the refuge provides an opportunity to motivate visitors to value, support, and contribute to the refuge and Refuge System, and become better environmental stewards.

Department of the Interior Secretarial Order 3356, signed in 2017, directs the Service to enhance and expand public access to lands and waters on refuges for hunting, fishing, and other forms of outdoor recreation. The proposed action would promote one of the priority public uses of the Refuge System, and providing opportunities for visitors to hunt would promote stewardship of our natural resources and increase public appreciation and support for the refuges. Finally, the proposed action would help to meet the statement of objectives detailed in the Hunting Plan.

AVAILABILITY OF RESOURCES:

Costs associated with administering the hunt program total approximately \$25,000. This amount is based on salaries for personnel, creation and distribution of hunting information, permit system administration, signage, and other miscellaneous expenses (see Table A-1).

Table A-1. Funding and Staffing Requirements

Identifier	Cost
Staff (Admin Assistant, Refuge Specialist, Maintenance, Refuge Manager) Hunt	\$17,000
Maintain roads, parking lots, trails*	\$1,000
News releases, fact sheets, reports for Hunt Program	\$1,000
Maintain hunting signs	\$1,000
Law Enforcement	\$5,000
Total Annual Cost	\$25,000

**Refuge trails and roads are maintained for a variety of activities. Costs shown are a percentage of total costs for trail/road maintenance on the refuge and are reflective of the percentage of trail/road use for hunting. Volunteers account for some maintenance hours and help to reduce overall cost of the program.*

ANTICIPATED IMPACTS OF THE USE:

We expect only minimal impacts from continuing to allow hunting on the refuge. This section predicts the foreseeable impacts of implementing the hunting program at the refuge. When detailed information may be deficient or unavailable, we base our comparisons on professional judgment and experience. We usually identify potential impacts within a long-range timeframe (i.e., 15 years); beyond that timeframe, they become more speculative.

The negative impacts of lead on wildlife are documented and clear (Golden et al. 2016 and Grade et al. 2019). To move towards reduction of this threat on the refuge, the requirement to use non-toxic ammunition is proposed for turkey hunting and will be required upon implementation of this plan in 2021. We will continue to encourage use of non-toxic ammunition for other hunts and will educate hunters about lead and potential impacts.

Please keep in mind the relatively small total land mass of the hunting area of the refuge in comparison with the entire Atlantic Flyway or the breeding ranges of the many birds and wildlife that use it. We recognize that the refuge is not isolated ecologically from the land around it; however, we may have overstated positive or negative impacts in that larger geographic context. Nevertheless, many of the actions we propose conform with the CCP and other regional landscape plans, and provide positive, incremental contributions to those larger landscape goals. A more detailed impact analysis is described in the Great Swamp NWR Hunting Plan Environmental Assessment (Appendix B).

White-tailed Deer

White-tailed deer hunting is managed on a Statewide basis in accordance with approved New Jersey State management plans. Impacts from hunting could result in direct mortality of individuals, changes in wildlife behavior, and changes in distribution patterns. White-tailed deer

hunting may have a small positive impact on refuge resources, as managing deer populations can prevent over-browsing, disease, and habitat damage. Deer densities are high in the area of the refuge and reducing densities of 12 to 15 deer per square mile would benefit natural resources and human health and safety (Tilghman 1989, DeCalesta 1994, DeNicola and Williams 2008, Kirkpatrick and LaBonte 2007). Hunting is the most feasible management tool available to control deer populations on the refuge. The State's white-tailed deer population is estimated to be over 125,000 individuals (NJDFW). New Jersey is divided into 70 Deer Management Zones (DMZ). Great Swamp NWR currently falls under DMZ 38 and is the only land unit in this DMZ. It is surrounded by DMZ 13, which includes portions of Morris, Somerset, and Union counties. For comparison, total number of deer harvests in DMZ 38 (the refuge) in 2017, 2018, and 2019 were 22, 44, and 50 individuals, respectively. The 2020 harvest from the refuge was 31 individuals. In DMZ 13, total number of deer harvest in 2017, 2018, and 2019 were 1,214, 1,047, and 1,143 individuals, respectively. Harvest data for DMZ 13 for 2020 was not yet available at the time of writing this plan. With the addition of archery seasons, the annual take of deer is not expected to change significantly and the addition of archery at the refuge is not expected to have any significant negative impacts to local or regional deer populations. We expect another 15 to 20 deer harvests per year. Hunting, in the context of an overabundant species like white-tailed deer, is an important population management tool that can reduce habitat degradation and competition, yielding healthier populations in the long-term.

Wild Turkey

Wild turkeys had disappeared from New Jersey by the mid-1800s due to habitat changes and over hunting for food. State biologists and the New Jersey chapter of the National Wild Turkey Federation, reintroduced wild turkeys in 1977 with 22 birds (NJDFW). In 1979, biologists began to live-trap and re-locate birds throughout the State to establish populations. By 1981, the population had grown to support a spring hunting season and in 1997, a fall hunt was also initiated (NJDFW). Today, the State's turkey population is estimated to be approximately 23,000 individuals with an annual harvest of approximately 3,000 birds (NJDFW). With 22 Turkey Hunting Areas throughout the State, the refuge would fall under Turkey Area 10. From 2015-2020, an average of 55 turkeys were harvested from Turkey Area 10. The hunter success ratio in New Jersey typically is about 16 percent. However, for a turkey population that is legally being hunted for the first time, harvest rates around 30 percent can be expected (T. McBride, NJDFW Turkey Project Leader, personal communication). Based on a 30 percent hunter success ratio, only 5 male turkeys would be anticipated to be harvested the first season. After the first season, hunter success ratios likely would drop to 16 percent. Turkey hunting would be introduced in the refuge in a phased approach, starting with mentored hunts only for the first 2 to 3 years. This would allow refuge management to assess feasibility and hunter interest prior to opening to a regular, public turkey hunt. Only non-toxic shot will be allowed for wild turkey hunting at the refuge.

Hunting could result in direct mortality of individuals, changes in wildlife behavior, and changes in distribution patterns. Turkey are an abundant species and opening the refuge to turkey hunting would decrease forest floor disturbance and manage the population. Disturbance to turkeys in hunting areas would occur during the hunting season, but the disturbance is considered negligible as flocks are prone to move regularly over large areas. The additional turkey hunting opportunities at the refuge would likely not have any significant impacts to local or regional turkey populations. Hunting may result in disturbance to non-target birds as well, altering their regular behavior. This

altered behavior may change foraging patterns (Skagen et al. 1991), increase distraction displays, or cause birds to leave or completely avoid the disturbed areas (Burger et al. 1995). Additionally, the higher level of vigilance required reduces the time available for foraging, which places increased stress on adults trying to find food and may affect their survival (Marcum 2005). However, we do not anticipate turkey hunter numbers to be in excess to have an adverse effect to non-target birds.

Coyote and Fox

Coyotes have been documented in all 21 counties of New Jersey. The coyote population appears to be increasing and is estimated at around 3,000 individuals (NJDFW). Fox is also a common and abundant species in New Jersey, documented throughout the State. The additional hunting opportunities could result in direct mortality of individuals, changes in wildlife behavior, and changes in distribution patterns.

However, since coyotes and foxes are most active at night when hunting is prohibited on the refuge and hunting these species must be incidental to white-tailed deer or turkey hunting, impacts would be limited. Although the refuge hunting program is anticipated to result in the direct mortality of individuals, this would not result in any long-term or significant negative impacts. Management of these mesocarnivores in the form of incidental take may decrease predation on species of concern including wood turtles and ground nesting bird species.

Canada Goose

NJDFW established the September Canada Goose season to help curb the growth of the resident population of Canada geese. This population of Canada geese do not seasonally migrate to breeding or wintering grounds and, therefore, occupy habitat year-round. The September season targets the resident population prior to the peak migratory season of the migrating population of Canada Geese and other waterfowl. Migratory birds are managed on a flyway basis and hunting regulations are established in each State based on flyway data. Hunting early season, resident geese on the refuge would reduce the number of geese utilizing important feeding and resting habitat year-round, thus preserving the resources for migratory birds that depend on quality habitat seasonally.

Canada goose hunting on the refuge would make the birds more skittish and prone to disturbance, reduce the amount of time they spend foraging and resting, and alter their habitat usage patterns (Raveling 1979, White-Robinson 1982, Madsen 1985, Bartelt 1987). Disturbance to non-target birds and resident wildlife would likely occur from hunting and associated hunter activity but would be short-term and temporary due to the limited Canada goose hunting season. Resident geese who nest in the refuge's impoundments severely degrade habitat quality and food resources for migratory flocks of waterfowl passing through in the fall and spring, so adding a goose hunt would have a slight beneficial impact. Overall, the positive and negative effects on migratory birds are expected to be minimal.

Wetlands and Water Resources

Hydrology impacts from hunting would be minimal and would primarily result from foot traffic both on- and off-trail. Unsurfaced trails are susceptible to a variety of impacts including vegetation loss and compositional changes, soil compaction, erosion and muddiness, exposure of plant roots,

trail widening, and the proliferation of visitor created side trails (Marion and Leung 2001). However, hunting is expected to have minimal adverse effects as hunters are generally dispersed, which reduces repeated erosive actions on soils.

Threatened and Endangered Species

Threatened and endangered species that may be found on the refuge include the Indiana bat, bog turtle, and the Northern long-eared bat. Each of these species are federally listed. The hunting program would have no significant impacts on threatened or endangered species. Rather, we expect to see a positive habitat response by reducing the deer herd. Overbrowsing by deer decreases native vegetation cover and often allows invasive plants to take hold, potentially degrading the habitat of the species above. Deer also browse on plants of conservation concern including swamp pink and northeastern bulrush.

Fall and winter represent periods of low or no activity for bog turtles, minimizing the likelihood that they would be encountered by hunters. Secondly, bog turtles are most often found in boggy, open habitats where there is little cover for wild game and which are difficult for people to walk through. Thus, it is likely that few hunters would venture into bog turtle habitat.

Indiana bats and Northern long-eared bats may be found within the refuge (during maternity season only). These species hibernate in caves and mines from October through April (the majority of the hunting season) and would not be impacted by hunting. They are unlikely to be disturbed by hunter activity during the September Canada goose season, deer season, or turkey season (spring and fall) as they are nocturnal species and would not be encountered during foraging flights. It is possible that hunters, especially spring turkey hunters, could be in the vicinity of roost trees later in the season. However, with low numbers of turkey hunters (30 to 50 hunters) spread out over 6,000 acres, the probability of a hunter discharging a firearm at or near a roost tree is low. Thus, hunting may affect, but is not likely to adversely affect, any threatened or endangered species on the refuge.

Vegetation and Soils

Negative impacts of recreational hunting include the temporary trampling of vegetation and soil erosion. Most hunting activities occur during the fall, but impacts would be minimal. Some hunt seasons extend into winter when plants are dormant and the ground is frozen or covered in snow. Hunters would have minimal impacts on plants during this period. Spring turkey hunters could trample some new growth, but the number of hunters afield per day would be limited during the spring turkey season, limited the impact on plants and soil. Additionally, hunter use during all seasons would be dispersed throughout the refuge, minimizing the impact to any one area. For these reasons, hunting is expected to have minimal adverse impacts on vegetation and soils.

Positive effects on the vegetation would result from a reduction in the white-tailed 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, Tilghman 1989, Cote et al. 2004, White 2012). An overabundance of deer can suppress native vegetation, facilitating the success of invasive species in forested habitats (Knight et al. 2009). Lessening the impact of excessive deer herbivory is a key forest management strategy (White 2012, Nuttle et al. 2013) and will likely become even more important as the climate warms (Galatowitsch et al. 2009).

Visitor Use

Great Swamp NWR is open to five priority wildlife-dependent recreational uses and some disturbance to other visitors is anticipated. Disturbance to other users could arise when hunters are travelling to or from hunting units, or from sounds during hunting hours. Hunting could be particularly disruptive to non-consumptive users, as hunting may cause wildlife to temporarily avoid areas adjacent to hunting units. Impacts to other users would be limited to the hunting season and are lessened by time and space zoning that minimizes interactions between hunters and other wildlife dependent users. All impacts to other users are expected to be short-term and minor.

PUBLIC REVIEW AND COMMENT:

This Compatibility Determination (CD) is part of the Great Swamp NWR Hunting Plan and the accompanying EA. The plan was coordinated with all interested and/or affected parties, including NJDFW staff. The public was notified of the availability of the Hunting Plan, EA, and accompanying CD on April 7, 2021. We offered a 90-day review and comment period to July 6, 2021. We informed the public through local venues, the refuge website, and social media. The refuge received no comments during a 90-day public comment period. No changes were made to the CD from draft to final.

DETERMINATION (CHECK ONE BELOW):

Use is not compatible

Use is compatible, with the following stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY:

To ensure compatibility with refuge purpose(s) and Refuge System mission, hunting can occur at Great Swamp NWR in accordance with State, Federal and refuge-specific regulations to ensure that wildlife and habitat management goals are achieved, and that the program is providing a safe, high quality hunting experience for participants. This hunting program will be monitored and potentially modified or eliminated if any the program’s components are found not compatible.

The following stipulations are necessary to ensure compatibility:

- Hunting for coyote and fox will be incidental while deer or turkey hunting only. No night hunting will be allowed.
- Hunters must obtain a refuge hunting permit. We require hunters to possess a signed refuge hunting permit at all times while scouting and hunting on the refuge.
- Hunters may enter the refuge 2 hours before legal shooting time and must leave no later than 2 hours after legal shooting time. Hunting is permitted from legal sunrise to legal sunset.
- We prohibit organized deer drives. We define a “deer drive” as an organized or planned effort to pursue, drive, chase, or otherwise frighten deer into moving in the direction of any person(s)

who is part of the organized or planned hunt and known to be waiting for the deer.

- We require the use of non-toxic shot for hunting wild turkey.

JUSTIFICATION:

Hunting is a priority wildlife-dependent use for the Refuge System through which the public can develop an appreciation for fish and wildlife. Service policy is to provide expanded opportunities for wildlife-dependent uses when compatible and consistent with sound fish and wildlife management and ensure that they receive enhanced attention during planning and management.

Hunting satisfies a recreational need, but hunting on refuges is also an important, proactive management tool that can prevent overpopulation and the deterioration of habitat. Disturbance to other species would occur, but this disturbance is generally short-term. Suitable habitat exists on refuge lands to support hunting as proposed.

This activity would not conflict with any of the other priority public uses or adversely impact biological resources. Therefore, through this CD process, we have determined that hunting on the refuge, in accordance with the stipulations provided above, is a compatible use that would not materially interfere with, or detract from, the fulfillment of the Refuge System mission or the purpose(s) of the refuge.

SIGNATURE:

Refuge Manager

(Signature)

(Date)

CONCURRENCE:

Regional Chief

(Signature)

(Date)

MANDATORY 15 YEAR RE-EVALUATION DATE:

(Date)

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Environmental Assessment for Hunting at Great Swamp National Wildlife Refuge

This Environmental Assessment (EA) is being prepared to evaluate the effects associated with this proposed action and to comply with the National Environmental Policy Act (NEPA) in accordance with Council on Environmental Quality regulations (40 CFR 1500-1509) and Department of the Interior (43 CFR 46; 516 DM 8) and U.S. Fish and Wildlife Service (550 FW 3) regulations and policies. NEPA requires examination of the effects of proposed actions on the natural and human environment. A list of laws and executive orders evaluated through this EA is included at the end of this document.

Proposed Action

The U.S. Fish and Wildlife Service (Service) is proposing to open or expand opportunities for big game, upland game, and migratory game bird hunting on the 7,768-acre Great Swamp National Wildlife Refuge (NWR, refuge) in Morris County, New Jersey, in accordance with the refuge's Comprehensive Conservation Plan (CCP).

This proposed action is often iterative and evolves over time during the process as the agency refines its proposal and learns more from the public, tribes, and other agencies. Therefore, the final proposed action may be different from the original. The final decision on the proposed action will be made at the conclusion of the public comment period for the EA.

Background

National wildlife refuges are guided by the mission and goals of the National Wildlife Refuge System (Refuge System), the purposes of an individual refuge, Service policy, and laws and international treaties. Relevant guidance includes the National Wildlife Refuge System Administration Act (NWRSA) of 1966, as amended by the Refuge System Improvement Act of 1997, Refuge Recreation Act of 1962, and selected portions of the Code of Federal Regulations (CFR) and Fish and Wildlife Service Manual (FWS).

The refuge was established pursuant to the Migratory Bird Conservation Act of 1929 (16 U.S.C. 715-715r, 45 Stat. 1222), the National Wildlife Refuge Recreation Act (16 U.S.C. 460k-2), the Emergency Wetlands Resources Act of 1986 (16 U.S.C. 3901(b)), the Endangered Species Act of 1973 (16 U.S.C. 1534), and the Wilderness Act of 1964 (Public Law 88577; 16 U.S.C. 1131-1136).

The primary purposes of the refuge are

- "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (Migratory Bird Conservation Act of 1929; 16 U.S.C. 715d)
- "...for (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ..." (Refuge Recreation Act; 16 U.S.C. 460k-1) "the Secretary...may accept and use...real...property. Such acceptance may be accomplished under the terms and

conditions of restrictive covenants imposed by donors...” (Refuge Recreation Act; 16 U.S.C. 460k-2, as amended)

- “...for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions ...” (Emergency Wetlands Resources Act of 1986; 16 U.S.C. 3901(b));
- “... 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); and
- “...to secure for the American people of present and future generations the benefits of an enduring resource of wilderness... wilderness areas ... shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness: ...” (Wilderness Act of 1964; Public Law 88577; 16 U.S.C. 1131-1136).

The mission of the Refuge System, as outlined by the NWRSA, as amended by the National Wildlife Refuge System Improvement Act (16 U.S.C. 668dd et seq.), 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”

Additionally, the NWRSA mandates the Secretary of the Interior in administering the Refuge System (16 U.S.C. 668dd(a)(4)) to

- Provide for the conservation of fish, wildlife, and plants, and their habitats within the Refuge System;
- Ensure that the biological integrity, diversity, and environmental health of the Refuge System are maintained for the benefit of present and future generations of Americans;
- Ensure that the mission of the Refuge System described at 16 U.S.C. 668dd(a)(2) and the purposes of each refuge are carried out;
- Ensure effective coordination, interaction, and cooperation with owners of land adjoining refuges and the fish and wildlife agency of the states in which the units of the Refuge System are located;

- Assist in the maintenance of adequate water quantity and water quality to fulfill the mission of the Refuge System and the purposes of each refuge;
- Recognize compatible wildlife-dependent recreational uses as the priority general public uses of the Refuge System through which the American public can develop an appreciation for fish and wildlife;
- Ensure that opportunities are provided within the Refuge System for compatible wildlife-dependent recreational uses; and
- Monitor the status and trends of fish, wildlife, and plants in each refuge.

Purpose and Need for the Proposed Action

Hunting is identified as a priority public use legislatively mandated by the NWRSA of 1966, as amended by the Refuge System Improvement Act of 1997 (Public Law 105-57) and reinforced as a priority use by Department of the Interior Secretarial Order 3356 (September 15, 2017). The need for action revolves around hunting as a priority public use and the requirement to facilitate such activity compatible with the purpose of the refuge and consistent with State of New Jersey regulations.

Hunting is a healthy, traditional, recreational use of renewable natural resources deeply rooted in America's heritage, and can be an important wildlife management tool. National wildlife refuges, including Great Swamp NWR, conduct hunting programs within the framework of Federal, State, and refuge regulations. Hunters on the refuge are expected to be ethical and respectful of other users, wildlife species, and the environment while on refuge lands.

The purpose of the proposed action is to provide compatible wildlife-dependent recreational opportunities on Great Swamp NWR. The need of the proposed action is to meet the Service's priorities and mandates as outlined by the NWRSA to "recognize compatible wildlife-dependent recreational uses as the priority general uses of the Refuge System" and "ensure that opportunities are provided within the Refuge System for compatible wildlife-dependent recreational uses" (16 U.S.C. 668dd(a)(4)). Furthermore, the proposed action should bring the refuge more into compliance with current day management objectives noted in the refuge CCP to provide for and where possible, expand, opportunities for big game hunting, small game hunting, and migratory game bird hunting.

Department of the Interior Secretarial Order 3356 directs the Service to enhance and expand public access to lands and waters on national wildlife refuges for hunting and other forms of outdoor recreation. The proposed action will also promote one of the priority public uses of the Refuge System, and providing opportunities for visitors to hunt and fish can promote stewardship of our natural resources and increase public appreciation and support for the refuge.

The EA serves as the NEPA document which analyzes the impacts on environmental, cultural, and historical resources of providing additional hunting opportunities on the refuge.

Alternatives

Alternative A – No Action Alternative

The No Action Alternative would continue the refuge's current hunting program. The refuge hunt program currently allows for white-tailed deer hunting on designated areas of the refuge. Hunting is currently permitted on 6,804 acres of the refuge, with a 5-day firearm deer management hunt. Turkey hunting will remain closed on the refuge. Primrose Brook parcel (100 acres) would remain closed to all hunting.

Alternative B – Proposed Action Alternative

The refuge has prepared a Hunting Plan, which is presented in this document as the Proposed Action Alternative. Under this alternative, white-tailed deer hunting would be expanded to include additional season dates and methods of take. Hunting would be permitted for wild turkey (spring and fall), coyote, fox, and Canada goose. We will allow incidental coyote and fox hunting on designated areas of the refuge in accordance with regulations and seasons set forth by the State and subject to specific conditions. We will allow hunting of Canada geese only during the New Jersey September Canada Goose season. No other migratory birds may be taken. Hunting would be permitted in the Management Area (3,407 acres plus addition of the Primrose Brook parcels totaling 100 acres) and the Wilderness Area (3,397) for all species with specific regulations and season restrictions. Hunting would be prohibited in the Closed Area (962 acres). Archery deer hunting season dates would follow those of the adjacent New Jersey Deer Management Zone 13 (Zone 13). The firearm deer hunt dates would also align with Zone 13's youth firearm hunt followed by the 6-day firearm season for greater consistency.

Measures to Avoid Conflicts

- The refuge would clearly post information on the hunting season at the refuge headquarters, on the website, and on signs throughout the refuge.
- The refuge would encourage all users to wear blaze orange during the firearms hunting season to minimize potential safety issues.
- Maps will be provided for hunters to include hunt boundaries, buildings, trails, and parking areas to ensure hunters are aware of safety zone requirements.
- Coyote and fox may be taken only as incidental to deer hunting or turkey per NJDFW regulations, and no night hunting is permitted.
- We require the use of non-toxic shot when hunting wild turkey.

Alternative(s) Considered, But Dismissed From Further Consideration

In developing hunting plans for refuges, we regularly receive comments and requests from some members of the public to eliminate hunting. An alternative that would close the refuge to all hunting was therefore considered but dismissed from detailed analysis. A "No Hunting Alternative" would not accomplish the purposes we seek to accomplish by the adoption of this hunting plan, as described in the "purpose and need" section of this EA. Closing the refuge to

hunting would conflict with the Refuge System Improvement Act, which provides that hunting is an appropriate and priority use of the Refuge System, shall receive priority consideration in refuge planning and management, mandates that hunting opportunities should be facilitated when feasible, and directs the Service to administer the Refuge System so as to “provide increased opportunities for families to experience compatible wildlife-dependent recreation, particularly opportunities for parents and their children to safely engage in traditional outdoor activities, such as fishing and hunting.” Furthermore, Department of the Interior Secretarial Order 3356, signed in 2017, directs the Service to enhance and expand public access to lands and waters on national wildlife refuges for hunting, fishing, recreational shooting, and other forms of outdoor recreation. An alternative that failed to provide any opportunity to participate in hunting activities, where such activities are compatible with the purposes of the Refuge System, would also fail to meet the goals of the Refuge System.

Refuge staff have worked closely with stakeholders and with NJDFW to develop the current proposed hunting plan. There are no unresolved conflicts about the proposed action with respect to alternative uses of available resources. Additionally, the proposed action builds on an existing hunt program, and includes the addition of seasons and areas developed, in part, from an initial scoping process of the refuge’s Comprehensive Conservation Plans (CCP). Therefore, the Service does not need to consider additional alternatives (43 CFR 46.310).

Affected Environment and Environmental Consequences

This section is organized by affected resource categories and for each affected resource discusses both (1) the existing environmental and socioeconomic baseline in the action area for each resource and (2) the effects and impacts of the proposed action and any alternatives on each resource. The effects and impacts of the proposed action considered here are changes to the human environment, whether adverse or beneficial, that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives. This EA focuses on the written analyses of the environmental consequences on a resource only when the impacts on that resource could be more than negligible and therefore considered an “affected resource.” Resources that will not be more than negligibly impacted by the action may be dismissed from further analyses (see Table B-1). We determine significance by considering the degree of effects to that environment, and connected actions are used to assist in determining significance.

Great Swamp NWR encompasses 7,768 acres and is located 26 miles from New York City within the Townships of Chatham, Harding, and Long Hill of Morris County in north-central New Jersey (see Map 1 of the Hunting Plan). Great Swamp NWR is situated north of Interstate 78 and east of Interstate 287. The refuge has an approved acquisition boundary that would allow for refuge expansion to a maximum of 9,429 acres. The surrounding area is heavily suburbanized, and as a result, the refuge has become an island of wildlife habitat in a sea of development. The refuge provides vital brooding, nesting, feeding, and resting habitat for a variety of migratory bird species, including waterfowl. Although established primarily for migratory birds, the refuge’s mosaic of forested wetlands, emergent wetlands, and various successional stages of upland vegetation provides habitats for a diversity of wildlife species. Habitat types on the refuge include bottomland forest, upland forest, non-forested wetlands,

grassland, and shrub/scrub wetlands. The refuge also has five major impoundments, totaling approximately 570 acres.

As stated above, this section predicts the foreseeable impacts of implementing the hunting program in each of the alternatives. When detailed information may be deficient or unavailable, we base our comparisons on professional judgment and experience. We usually identify potential impacts within a long-range timeframe (i.e., 15 years); beyond that timeframe, they become more speculative.

Please keep in mind the relatively small total land mass of the hunting area of the refuge in comparison with the entire Atlantic Flyway or the breeding ranges of the many birds and wildlife that use it. We recognize that the refuge is not isolated ecologically from the land around it; however, we may have overstated positive or negative impacts in that larger geographic context. Nevertheless, many of the actions we propose conform with the CCP and other regional landscape plans, and provide positive, incremental contributions to those larger landscape goals.

TABLE B-1. POTENTIAL FOR ADVERSE IMPACTS FROM PROPOSED ACTION AND ALTERNATIVES

Resources	Not Applicable: Resource does not exist in project area	No/Negligible Impacts: Exists but no or negligible impacts	Greater than Negligible Impacts: Impacts analyzed in this EA
Species to Be Hunted/Fished	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Non-Target Wildlife and Aquatic Species	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Threatened and Endangered Species	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Habitat and Vegetation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Geology and Soils	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Air Quality	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water Quality	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Floodplains	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wilderness	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Visitor Use and Experience	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cultural Resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Refuge Management and Operations	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Socioeconomics and Environmental Justice	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Big Game (white-tailed deer and wild turkey)

Affected Resource Description

White-tailed Deer

White-tailed deer hunting is managed on a state-wide basis in accordance with approved New Jersey State management plans. Impacts from hunting could result in direct mortality of individuals, changes in wildlife behavior, and changes in distribution patterns. White-tailed deer hunting may have a small positive impact on refuge resources, as managing deer populations can prevent over-browsing, disease, and habitat damage. Deer densities are high in the area of the refuge and reducing densities of 12 to 15 deer per square mile would benefit natural resources and human health and safety (Tilghman 1989, DeCalesta 1994, DeNicola and Williams 2008, Kirkpatrick and LaBonte 2007). Hunting is the most feasible management tool available to control deer populations on the refuge. The State's white-tailed deer population is estimated to be over 125,000 individuals (NJDFW). New Jersey is divided into seventy (70) Deer Management Zones (DMZ). Great Swamp NWR currently falls under DMZ 38 and is the only land unit in this DMZ. It is surrounded by DMZ 13 which includes portions of Morris, Somerset, and Union counties. For comparison, total number of deer harvests in DMZ 38 (the refuge) in 2017, 2018, and 2019 were 22, 44, and 50 individuals, respectively. The 2020 harvest from the refuge was 31 individuals. In DMZ 13, total number of deer harvest in 2017, 2018, and 2019 were 1,214, 1,047, and 1,143 individuals, respectively. Harvest data for DMZ 13 for 2020 was not yet available at the time of writing this plan.

With the addition of archery seasons, the annual take of deer is not expected to change significantly and the addition of archery at the refuge is not expected to have any significant negative impacts to local or regional deer populations. We expect another 15-20 deer harvests per year. Hunting, in the context of an overabundant species like white-tailed deer, is an important population management tool that can reduce habitat degradation and competition, yielding healthier populations in the long-term.

Wild Turkey

Wild turkeys had disappeared from New Jersey by the mid-1800's due to habitat changes and over hunting for food. State biologists and the New Jersey chapter of the National Wild Turkey Federation, reintroduced wild turkeys in 1977 with 22 birds (NJDFW). In 1979, biologists began to live-trap and re-locate birds throughout the state to establish populations. By 1981, the population had grown to support a spring hunting season and in 1997, a fall hunt was also initiated (NJDFW). Today, the State's turkey population is estimated to be approximately 23,000 individuals with an annual harvest of approximately 3,000 birds (NJDFW). With 22 Turkey Hunting Areas throughout the state, the refuge would fall under Turkey Area 10. From 2015-2020, an average of 55 turkeys were harvested from Turkey Area 10. The hunter success ratio in New Jersey typically is about 16 percent. However, for a turkey population that is legally being hunted for the first time, harvest rates around 30 percent can be expected (T. McBride, NJDFW Turkey Project Leader, Personal Communication). Based on a 30 percent hunter success ratio, only five male turkeys would be anticipated to be harvested the first season. After the first season, hunter success ratios likely would drop to 16 percent. Turkey hunting would be introduced in the refuge in a phased approach, starting with mentored hunts only for the first 2-3 years. This would allow refuge management to assess feasibility and hunter interest prior to opening to a regular, public turkey hunt.

Hunting could result in direct mortality of individuals, changes in wildlife behavior, and changes in distribution patterns. Turkey are an abundant species and opening the refuge to turkey hunting would decrease forest floor disturbance and manage the population. Disturbance to turkeys in hunting areas would occur during the hunting season, but the disturbance is considered negligible as flocks are prone to move regularly over large areas. The additional turkey hunting opportunities at the refuge would likely not have any significant impacts to local or regional turkey populations. Hunting may result in disturbance to non-target birds as well, altering their regular behavior. This altered behavior may change foraging patterns (Skagen et al. 1991), increase distraction displays, or cause birds to leave or completely avoid the disturbed areas (Burger et al. 1995). Additionally, the higher level of vigilance required reduces the time available for foraging, which places increased stress on adults trying to find food and may affect their survival (Marcum 2005). However, we do not anticipate turkey hunter numbers to be in excess to have an adverse effect to non-target birds.

Anticipated Impacts

No Action Alternative

Under the No Action Alternative, white-tailed deer hunting would be permitted at Great Swamp NWR during the 5-day firearm deer management hunt. Current levels of harvest, which are on average about 30 deer per year, would be expected as no new opportunities would be provided and public interest in big game hunting would likely remain the same. Impacts to white-tailed deer populations would also remain consistent and could include temporary and localized disturbance, changes in behavior, direct injury or mortality of individuals, and changes in population dynamics. Under this alternative, neither turkey hunting, September Canada goose, nor incidental coyote or fox take would be permitted as no new opportunities would be provided.

Proposed Action Alternative

Big Game – (White-tailed Deer and Wild Turkey)

Under the Proposed Action Alternative, expanded opportunities would be provided for white-tailed deer, and wild turkey (spring and fall) hunting. Great Swamp NWR expects approximately 50 additional hunters annually. White-tailed deer hunting would continue to be permitted on 6,804 acres of the refuge as well as 100 acres of the new Primrose Brook parcel, and with expanded seasons and methods of take. Turkey hunting would open on 6,904 acres of the refuge for the first time. Impacts to white-tailed deer populations would remain relatively consistent. The expanded hunting seasons may attract a small number of new hunters, but no noticeable impacts on refuge populations are expected. Impacts to white-tailed deer populations expected under the No Action Alternative would apply.

Impacts to wild turkey populations would expand under this alternative. Opening the refuge to turkey hunting for the first time, the Proposed Action is anticipated to result in injury or mortality of individuals and other associated impacts. Those impacts may include disturbance to turkey flocks, changes in species distribution across the refuge, avoidance of some areas, changes in population dynamics, and changes in wildlife behavior.

Studies examining the direct effects of hunting on turkey behavior and movement are limited. One study conducted in Louisiana tracked the movements of wild turkey during the hunting

season and found that distances traveled by wild turkeys were only 8 percent greater during hunting days than non-hunting days (Gross et al. 2015). Although hunting made it more likely for a turkey to change their movement patterns, a small-scale increase in range may not be biologically significant. Like all hunts, spring turkey hunting would be conducted within State and refuge-specific regulations. While the refuge does expect to observe some localized impacts, the hunting program would not result in major negative changes to the turkey population Statewide or regional turkey populations.

Upland Game (coyote and fox)

Affected Resource Description

Coyotes have been documented in all 21 counties of New Jersey. The coyote population appears to be increasing and is estimated at around 3,000 individuals. The NJDFW estimates that approximately 11,207 foxes and 88 coyotes were harvested during the 2017-2018 hunting season across New Jersey. NJDFW will adjust seasons and limits to maintain healthy populations.

Anticipated Impacts

No Action Alternative

Under the No Action Alternative, no impacts are expected for upland game species as no opportunities would be provided. Hunting would be closed for these species.

Proposed Action Alternative

Under the Proposed Action Alternative, expanded impacts would be expected for all upland game species. Upland game hunting would be a new opportunity at Great Swamp NWR. Upland game hunting would be incidental to the white-tailed deer and turkey hunt only, which limits the number of hunters pursuing upland game species. Potential impacts from this new use could include greater disturbance to habitat and landscape, changes in wildlife behavior, changes in species distribution, and temporary reductions to local populations. Injury and mortality of individuals is an anticipated impact of the hunt program. All impacts to these species would be localized to the refuge area and are not expected to result in long-term negative impacts. In the case of nocturnal species, impacts would be lessened as hunting is only permitted during the daytime. For all species, impacts from hunting will be lessened as hunting is spread out over a large geographic area, preventing concentrated impacts in any one area. It is anticipated that harvest of some coyotes and fox will alleviate predation from these species on species of conservation concern such as bog turtles, wood turtles, and ground nesting birds.

Migratory Birds (including Canada goose)

Affected Resource Description

Waterfowl seasons and bag limits are set by States within a framework set by the Service and based on surveys, harvest data, and habitat data. Populations of these species have remained relatively stable. The NJDFW estimates 26,600 Canada geese were harvested during the 2016-2017 hunting season across New Jersey.

Historically, the principal cause of lead poisoning in waterfowl was the collection of high densities of lead shot in wetland sediments associated with migratory bird hunting activities (Kendall et al. 1996). In 1991, as a result of high bird mortality, the Service instituted a nationwide ban on the use of lead shot for hunting waterfowl and coots (50 CFR 20). The

Service requires any new shot types for waterfowl and coot hunting to undergo rigorous testing in a three-tier approval process that involves an ecological risk assessment and an evaluation of the candidate shot's physical and chemical characteristics, short- and long-term impacts on reproduction in waterfowl, and potential toxic impacts on invertebrates (50 CFR 20.134). Because of this rigorous testing, the shot toxicity issue of the past is substantially less of an ecological concern. However, there remains a concern about the bioavailability of spent lead ammunition (bullets) and sinkers on the environment, endangered and threatened species, birds, mammals, and humans or other fish and wildlife susceptible to biomagnification.

Anticipated Impacts

No Action Alternative

Under the No Action Alternative, no impacts are expected for Canada geese as no opportunities would be provided. Hunting would be closed for all species.

Proposed Action Alternative

Under the Proposed Action Alternative, Canada goose hunting would be permitted on 6,904 acres of Great Swamp NWR. Waterfowl management is on a Flyway basis; regulations are based on surveys and monitoring, data analyses, and rule making. Each year, the Service prescribes frameworks for migratory bird hunting dates and times, the allowable harvest, and the allowable number of birds in a hunter's possession. This framework allows State selections of seasons and limits for recreation and sustenance and permits harvests at levels compatible with population status and habitat conditions. Harvest limits and hunting seasons are also set for these species to maintain sustainable populations. NJDFW established the September Canada Goose season to help curb the growth of the resident population of Canada geese. This population of Canada geese do not seasonally migrate to breeding or wintering grounds and, therefore, occupy habitat year-round. The September season targets the resident population prior to the peak migratory season of the migrating population of Canada Geese and other waterfowl. Hunting early season, resident geese on the refuge would reduce the number of geese utilizing important feeding and resting habitat year-round, thus preserving the resources for migratory birds that depend on quality habitat seasonally.

Hunting on the refuge would likely result in a minimal increase in migratory bird hunting Statewide, resulting in additional mortality of individuals. As Great Swamp NWR provides important resting and feeding habitat for migratory birds, opening hunting of this species may result in changes to wildlife behavior. Impacts to migratory birds from hunting at the refuges would not result in significant changes on a Statewide, regional, or flyway level, but localized impacts are expected. Impacts would be limited as the refuge is only open to a limited season. Great Swamp NWR will limit number of goose permits to 5 hunters annually. Compared to the annual harvest of migratory birds in the State and Atlantic Flyway, hunting on the refuge would not have a significant negative impact on migratory bird populations.

Lead is a known metabolic poison that can negatively influence biological processes in wildlife. Federal restrictions require hunters to use only approved non-toxic shot for hunting waterfowl nationwide.

Non-target Wildlife and Aquatic Species

Affected Resource Description

Great Swamp NWR provides important habitat for resident and migratory wildlife in a densely populated and developed area. More than 240 species of birds have been recorded throughout the year at Great Swamp NWR. Waterfowl species commonly found on the refuge include the mallard, American black duck, green-winged teal, American wigeon, Northern pintail, gadwall, blue-winged teal, Canada goose, ring-necked duck, and bufflehead. Land birds commonly found on the refuge include wood thrush, scarlet tanager, rose-breasted grosbeak, black-billed cuckoo, yellow-billed cuckoo, blue-winged warbler, yellow-breasted chat, Acadian flycatcher, Eastern wood pewee, willow flycatcher, field sparrow, and Eastern towhee. Raptors found on the refuge include the red-shouldered hawk, Cooper's hawk, barred owl, and broad-winged hawk. Water birds found on the refuge include the great blue heron, American bittern, least bittern, green heron, night heron, cattle egret, snowy egret, king rail, Virginia rail, and common moorhen. The killdeer, spotted sandpiper, common snipe, and American woodcock are also found on the refuge.

Mammals commonly found on the refuge include the white-tailed deer, raccoon, Virginia opossum, striped skunk, masked shrew, grey squirrel, smoky shrew and star-nosed mole. Additional species found on the refuge include the woodchuck, Southern flying squirrel, beaver, white-footed mouse, meadow vole, woodland vole, muskrat, meadow jumping mouse, and woodland jumping mouse. Predators found on the refuge include river otter, mink, long-tailed weasel, coyote, gray fox, red fox, and the occasional black bear.

The refuge is also home to a diversity of reptiles and amphibians. Common species of frogs found on the refuge include the Northern cricket frog, Northern gray tree frog, Northern spring peeper, green frog, and bull frog. The most common salamander found on the refuge is the red-backed salamander. Turtles found on the refuge include the bog turtle, wood turtle, box turtle, and spotted turtle. Common snakes include the Northern water snake, brown snake, Northern black racer, Eastern milk snake, and common garter snake.

Fish found on and around the refuge include chain pickerel, largemouth bass, black crappie, yellow perch, shiners, and blacknose dace.

Anticipated Impacts

No Action Alternative

Under the No Action Alternative, white-tailed deer hunting at Great Swamp NWR creates some minor disturbances to non-target wildlife. Disturbance may include impacts to habitat from hunters walking off-trail, avoidance of areas while hunting is underway, or heightened stress during the hunting season. All impacts to non-target wildlife are indirect, localized, and confined to the hunting season.

Proposed Action Alternative

Some disturbance of non-target wildlife species and impacts on vegetation may occur. While not the target of the hunting program, other resident and migratory wildlife species may experience disturbance, habitat damage, behavior changes, or injury as a result of the proposed action. Species may avoid certain areas of the refuge where hunting pressure is high. This could pose challenges for certain species considering the limited habitat availability in areas surrounding the

refuge. However, these impacts should be minimal, as the refuge would limit hunting seasons and provide “no hunting areas” that would disperse the impacts. Hunting would only be permitted for a limited Canada goose hunt, spring and fall turkey season, and during certain portions of the State deer season. Hunting is not permitted at night. Impacts to resident and migratory wildlife populations would have minor, localized impacts that are not expected to affect Statewide or regional populations.

Threatened and Endangered Species and Other Special Status Species

Affected Resource Description

Threatened and endangered species that may be found on the refuge include the Indiana bat, bog turtle, and the Northern long-eared bat. Each of these species are federally listed.

Nationwide, there is concern about the bioavailability of spent lead ammunition (bullets) and sinkers on the environment, endangered and threatened species, birds (especially raptors), mammals, and other fish and wildlife susceptible to biomagnification. Lead shot and bullet fragments found in animal carcasses and gut piles are the most likely source of lead exposure (Kelly et al. 2011). Many hunters do not realize that the carcass or gut pile they leave in the field usually contains lead bullet fragments. Research continues on the effects of lead ammunition and the fragments it can deposit in killed game. Avian predators and scavengers can be susceptible to lead poisoning when they ingest lead fragments or pellets in the tissues of animals killed or wounded by lead ammunition. Lead poison may weaken raptors and increase mortality rate by leaving them unable to hunt or more susceptible to vehicles or power line accidents (Kramer and Redig 1997). In a study of bald eagles and golden eagles admitted to the Raptor Rehabilitation Program at the College of Veterinary Medicine of Washington State University from 1991 to 2008, it was found that 48 percent of bald eagles and 62 percent of golden eagles tested had blood lead levels considered toxic by current standards. Of the bald and golden eagles with toxic lead levels, 91 percent of bald eagles and 58 percent of golden eagles were admitted to the rehabilitation facility after the end of the general deer and elk hunting seasons in December (Stauber 2010). Non-toxic shot would be required for turkey hunting on the refuge and hunters would be encouraged to use non-toxic ammunition while hunting other game.

Anticipated Impacts

No Action Alternative

Hunting is likely to have minimal impacts on these species given the time of year the activities take place and where the use occurs on the refuge. Present activities do not have adverse impacts on any threatened or endangered species.

Proposed Action Alternative

The proposed alternative would have no significant impacts on threatened or endangered species. Rather, we expect the reduction of deer resulting from increase hunting opportunities to benefit most species as foraging pressure is lifted.

Fall and winter represent periods of low or no activity for bog turtles, minimizing the likelihood that they would be encountered by hunters. Secondly, bog turtles are most often found in boggy, open habitats where there is little cover for wild game and which are difficult for people to walk through. Thus, it is likely that few hunters would venture into bog turtle habitat. Thirdly, the

prohibition against the use of dogs for anything other than waterfowl and woodcock hunting significantly limits the potential for dog-turtle interactions in these habitats.

Indiana bats and Northern long-eared bats may be found within the refuge (during maternity season only). These species hibernate in caves and mines from October through April (the majority of the hunting season) and would not be impacted by hunting. They are unlikely to be disturbed by hunter activity during the September Canada goose season or archery deer season, as they are nocturnal species and would not be encountered during foraging flights. It is possible that hunters, especially spring turkey hunters, could be in the vicinity of bat roost trees later in the season. However, with low numbers of turkey hunters (30 to 50 hunters) spread out over 6,000 acres, the probability of a hunter discharging a firearm at or near a bat roost tree is low.

Nationwide, there is concern about the bioavailability of spent lead ammunition (bullets) and sinkers on the environment, endangered and threatened species, birds (especially raptors), mammals, and other fish and wildlife susceptible to biomagnification. Lead shot and bullet fragments found in animal carcasses and gut piles are the most likely source of lead exposure (Kelly et al. 2011). Many hunters do not realize that the carcass or gut pile they leave in the field usually contains lead bullet fragments. Research continues on the effects of lead ammunition and the fragments it can deposit in killed game. Avian predators and scavengers can be susceptible to lead poisoning when they ingest lead fragments or pellets in the tissues of animals killed or wounded by lead ammunition. Lead poison may weaken raptors and increase mortality rate by leaving them unable to hunt or more susceptible to vehicles or power line accidents (Kramer and Redig 1997). In a study of bald eagles and golden eagles admitted to the Raptor Rehabilitation Program at the College of Veterinary Medicine of Washington State University from 1991 to 2008, it was found that 48 percent of bald eagles and 62 percent of golden eagles tested had blood lead levels considered toxic by current standards. Of the bald and golden eagles with toxic lead levels, 91 percent of bald eagles and 58 percent of golden eagles were admitted to the rehabilitation facility after the end of the general deer and elk hunting seasons in December (Stauber 2010). We will continue to encourage use of non-toxic ammunition, and will educate hunters about lead and impacts. Thus, there are no anticipated adverse impacts to any of the above listed species.

Lead shot can be used on parts of the refuge during the deer hunting seasons as detailed in the Hunting Plan, in accordance with State and refuge-specific regulations. Turkey may only be hunted with non-toxic shot on the refuge. The amount of lead introduced to the environment as a result of refuge hunting activities, however, is negligible. The above listed species could not be exposed to lead shot, as they are not present on the refuge during the hunting seasons. Thus, there are no anticipated significant adverse impacts to any of the above listed species

Vegetation and Soils

Affected Resource Description

Habitat types on the refuge include bottomland forest, upland forest, non-forested wetlands, grassland, and shrub/scrub wetlands. The refuge has five major impoundments, totaling approximately 570 acres. Bottomland forest is the most common vegetation cover on the refuge. Dominant tree types on the refuge include green ash, red maple, pin oak, white oak, red oak, and American beech. Other plant species common on the refuge include buttonbush, shadbush,

swamp rose, dogwoods, sedges, pondweeds, seedbox, smartweeds, millets, wool grass, cattail, bulrush, purple loosestrife, and common reed grass.

The refuge is comprised of 28 soil units of 16 soil series. Soils on the refuge primarily consist of silt loam, sandy loam, and muck. Geologically, the refuge is located in the Piedmont Province. The Piedmont Province is generally characterized by gently rolling plains with elevations typically ranging between 200 to 400 feet above Mean Sea Level (MSL). These elevated plains are separated by a series of erodible ridges. It is predominantly comprised of mildly folded and faulted sedimentary rocks of Late Triassic and Early Jurassic age (230 to 190 million years old). Climate change refers to the increasing changes in the measures of climate over a long period of time - including precipitation, temperature, and wind patterns (USGS 2019). There is no definitive information on how exactly changes in climate will impact species populations.

Potential negative impacts resulting from a changing climate in New Jersey could include rising temperatures, changing precipitation patterns, increased storm frequency, sea level rise, and saltwater intrusion. The New Jersey State's 2020 report on Climate Change determined that temperatures are rising more rapidly in New Jersey than in other areas of the Northeast, that annual precipitation in the State could increase by up to 11 percent by 2050, and that there will be observable changes in precipitation, flooding, crop yield, water supply and air quality. The State has developed mitigation measures to ensure climate resilience and avoid these harsh outcomes.

Anticipated Impacts

No Action Alternative

Under the current management, the refuge is only open to white-tailed deer hunting. During hunting and scouting, white-tailed deer hunters walk off trail, damaging vegetation and creating new pathways in the process. Minor vegetation trampling is the most likely impact of the hunting program; however, this impact is diminished as most plants are senescing or entering dormancy during the hunting season. No impacts from the current deer hunt program have been observed under this alternative, as no additional opportunities are provided.

Proposed Action Alternative

With the expanded hunting program, the impacts on vegetation are expected to increase. The number of acres open to hunting would not expand, but new species would be added. With the expanded opportunity, the refuge expects more users to utilize the hunting areas at once. This may result in more concentrated impacts including the creation of new trails, greater vegetation damage, and additional soil compaction and/or erosion. Considering the seasons in which hunting would occur, impacts to vegetation would be minimized as plants will be senescing or entering dormancy. During spring turkey season, we do not expect the use to be so overwhelming that vegetation would be affected. Overall, only minor localized impacts are expected.

Water Quality

Affected Resource Description

Water resources on the refuge include five impoundments, the Passaic River, the Black Brook, the Great Brook, the Loantaka Brook, and the Primrose Brook. Upstream development within the Great Swamp Watershed has negatively influenced water quality in some of these streams,

resulting in varying water quality throughout the refuge. Hydrologic changes resulting from development include elevated silt loads, higher floods, faster peak flows, and more pollution. According to a Water Quality Monitoring Report on the watershed produced by Princeton Hydro, the Loantaka Brook, Great Brook, and Black Brook generally failed to meet the State's water quality standards under both base flow and storm flow conditions (N.J.A.C. 7:9B). However, the Upper Passaic River and Primrose streams typically met or exceeded the State's water quality standards under both base flow and storm flow conditions.

Anticipated Impacts

No Action Alternative

Under the current management, impacts from the hunting program are minor. Impacts include light erosion, changes to drainage patterns, and potential damage to riparian areas. Only localized negligible impacts have been observed under this alternative.

Proposed Action Alternative

Under the Proposed Action Alternative, changes to water quality are expected to be minor. Access to hunting would be by foot only and no additional areas would open to hunting. Opening to Canada goose hunting has the potential to increase impacts to wetland areas, but impacts are expected to be minor. With more hunters traversing the landscape, impacts including erosion, changes to drainage patterns, and wetland habitat damage may increase slightly. Overall, impacts are not expected to impact the overall water quality in the Passaic River Watershed.

Wilderness

Affected Resource Description

The eastern portion of the refuge, comprised of 3,660 acres, was designated as a Wilderness Area in 1968. The Wilderness Area has been less disturbed than other areas of the refuge. The Wilderness Area primarily consists of bottomland forests and has vegetation patterns consistent with the influence of postglacial deposits that characterize the geologic history of the region. The Wilderness Area includes 8.5 miles of foot trails, information kiosks, numerous signs, and other refuge resources.

Anticipated Impacts

No Action Alternative

There have been no adverse impacts observed under the current refuge hunt program in the Wilderness Area.

Proposed Action Alternative

Additional impacts from expanded hunting opportunities in the Wilderness Area are expected to be negligible. Impacts described in previous sections on environment, wildlife, and other related topics apply here as well.

Visitor Use and Experience

Affected Resource Description

In 2017, Great Swamp NWR had a total of 208,795 recreational visits. Of this total, only 290 visits were for hunting. This accounts for less than 1 percent of the refuge's overall visitation. The 2017 total indicates an overall increase of visitation at the refuge over a 5-year period, with

the 2012 total at approximately 168,000 total visits. The refuge is open to five out of six priority public uses of the Refuge System, including wildlife observation, environmental education, interpretation, and wildlife photography, and hunting.

Anticipated Impacts

No Action Alternative

Compared to the overall visitation at the refuge, hunting accounts for a very small percentage of refuge users. Under this alternative, some visitor use conflicts are observed, both between different hunters and between different user groups. Hunters are permitted to use a large portion of the refuge, but the majority of conflict occurs in shared areas including parking lots and trails. Visitor use conflicts involving hunters are limited to the hunting and scouting seasons and therefore do not represent a significant impact to refuge visitation over the course of the year.

Proposed Action Alternative

Under the Proposed Action Alternative, the number of hunters using the refuge is expected to increase slightly. With an increase to the number of hunters using the refuge, an increase to visitor use conflicts is expected. Visitor use conflicts arise over disturbance, the dispersal of users throughout the refuge, safety concerns, and personal disagreements. Impacts may occur over a slightly longer time period with the expanded hunt seasons. While these conflicts are expected to increase slightly, they would not have a significant impact on refuge visitation throughout the year. Visitor use conflicts would remain limited to the hunting season. If deemed necessary, the refuge would mitigate visitor use conflicts through time and space zoning, safety regulations, and clearly posted information on the hunting program. There is potential for hunters to interact with other visitors such as hikers. The refuge could explore hosting talks with hunters on how to effectively interact with visitors who may not agree with hunting practices.

Cultural Resources

Affected Resource Description

A 2010 report by JMA identified 123 cultural resources within the refuge's approved acquisition boundary. Of these resources, 32 resources are considered prehistoric sites, 57 are from the historic era (1750 to mid-1900s), 3 have prehistoric and historic components, and 31 are standing structures. Not all of these structures are within parcels currently owned by the Service. To date, no sites within the acquisition boundary are listed on the National Register of Historic Places or the New Jersey Register of Historic Places, although two sites have been characterized as eligible for listing on the National Register.

Analysis of artifacts recovered within and around Great Swamp NWR demonstrates that prehistoric use by people likely began in the Paleo-Indian Period and continued through the Woodland Period (the last prehistoric period). Most of the artifacts recovered are flakes (i.e., knives and points) along with other artifacts including pottery and steatite bowls. Because of the agricultural history of the area, it is not surprising that all of the known prehistoric sites have experienced some level of disturbance, primarily from plowing. Native peoples in the area belonged to the Lenape (or Delaware people), an association of tribal groups connected by shared culture and language. European contact in the area of the refuge is believed to have occurred around 1600, but there is no evidence of European settlement in the Great Swamp area prior to 1708.

Anticipated Impacts

No Action Alternative

No adverse impacts would occur under this alternative.

Proposed Action Alternative

Hunting, regardless of method or target, is a consumptive activity that does not pose any threat to prehistoric or historic properties on or near the refuge. No impacts to cultural resources are anticipated above what may be caused by any refuge visitor. Although hunters would be able to access parts of the refuges that are closed to other visitors, this access alone is not expected to increase vandalism or disturbance to cultural resources by individuals while they are hunting, nor is it likely that hunters would be more likely to engage in vandalism or disturbance than any other refuge visitor.

Refuge Management and Operations

Affected Resource Description

Great Swamp NWR is administered as part of the Lenape NWR Complex which manages four refuges in three states (Great Swamp (NJ), Wallkill River (NJ), Cherry Valley (PA), and Shawangunk Grasslands (NY) NWRs). Complex staff consist of a Refuge Manager, Deputy Refuge Manager, Wildlife Biologist, Visitor Services Manager, Contaminants Biologist, two Wildlife Refuge Specialists, Engineering Equipment Operator, Maintenance Mechanic, Administrative Support Assistant, Administrative Officer, and Refuge Law Enforcement Officer. The refuge also has numerous volunteers, with 11,683 hours of volunteer time utilized in 2014 alone.

Infrastructure at Great Swamp NWR includes refuge headquarters, the Wildlife Observation Center, the Helen C. Fenske Visitor Center, 5 Impoundment Areas, an overlook observation area, and maintenance storage facilities,. The refuge also includes paved and gravel roads, trails, boardwalks, bridges, observation blinds, kiosks, interpretive signs, restrooms, and ample parking.

Anticipated Impacts

No Action Alternative

Under the current hunting program, refuge hunting permits are administered by the refuge's administrative assistant (based out of Wallkill River NWR) and the Visitor Services Manager through online permit vendor RecAccess. Maintenance staff maintain the hunting parking lots and the refuge Law Enforcement Officer patrols or is on-call during the 5-day deer firearm hunt. Refuge hunt permits are slightly burdensome under current structure, with hunters required to purchase separate permits for the Management Area or the Wilderness Area, with several different permit categories for adults, disabled hunters, senior hunters, and youth. Overall, the administrative burden of this hunt is minor.

Hunters currently use refuge infrastructure, such as public parking areas, hunter parking areas, and refuge trails, to gain access to refuge lands. There are no adverse impacts to refuge facilities observed under this alternative. There would be no changes to refuge facilities or infrastructure under this alternative.

Proposed Action Alternative

Administration of the hunting program would remain largely the same. However, a reduction in

permits down to one Great Swamp NWR Hunt Permit and supplemental September Canada Goose Permit would make the administrative burden of hunt permit sales easier to manage, and result in a savings for the hunter and refuge, in personnel costs for time. The amount of maintenance required for parking lots is expected to be the same. Need for law enforcement presence may increase slightly as additional seasons will be open, however, at other refuges in the Complex that follow a similar hunting season program, coverage has shown to be adequate.

Hunters would continue to use existing refuge infrastructure (parking areas, trails, roadways) to access hunting areas. It is anticipated that there would be 10 to 20 additional hunters per year. While more visitors are expected to use the refuge under this alternative, no observable impacts to infrastructure or facilities are anticipated. No changes to facilities or infrastructure are planned under this alternative.

Socioeconomics and Environmental Justice

Affected Resource Description

From 2017 to 2018, the median household income in Morris County, New Jersey declined from \$114,732 to \$112,228. This represents a 2.13 percent decrease. The economy in Morris County employs 261,000 people. The most common occupations in Morris County include management, office and administrative support, and sales.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires all Federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities.

Anticipated Impacts

No Action Alternative

The current hunting program has a minor, long-term beneficial impact to the local economy. We average around 100 hunters a year, but each of those visits represents only a minor contribution to the economy. The majority of refuge visitors are not residents of the local area; therefore, many visitors spend money on gasoline, equipment, food, and lodging in the area surrounding the refuge. While positive, the contributions to the local economy can be considered negligible.

Proposed Action Alternative

While hunting visitation may increase due to increased opportunities, hunting only accounts for a fraction of expenditures related to the refuge. Expanding hunting programs at Great Swamp NWR would likely enrich the local economy by attracting additional refuge visitors to the area, but the additional economic impact is expected to be negligible under this action.

The Service has identified no minority or low-income communities within the impact area. Minority or low income communities would not be disproportionately affected by any impacts from this proposed action or any of the alternatives.

Monitoring

Many game species populations are monitored by the State through field surveys and game harvest reports, which provide an additional means for monitoring populations. Refuge hunters are required to indicate they were hunting on federal land per State game-check procedures. The State has determined that populations of game species are at levels acceptable to support hunting and these assessments are reviewed and adjusted periodically. The refuge will be adaptive towards harvest management under the hunt program to ensure species and habitat health. Refuge-specific hunting regulations may be altered to achieve species-specific harvest objectives in the future.

Summary of Analysis

The purpose of this EA is to briefly provide sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI).

Alternative A – No Action Alternative

There would be no additional costs to the refuge under this alternative. There would be no change to the current public use and wildlife management programs on the refuge. The refuge would not increase its impact on the economy and would not provide new hunting and access opportunities. This alternative has the least direct impacts of physical and biological resources. In addition, this alternative would reduce not meet mandates under the NWRSA and Secretarial Order 3356.

Alternative B – Proposed Action Alternative

This alternative is the Service's proposed action because it offers the best opportunity for public hunting that would result in a minimal impact on physical and biological resources, while meeting the Service's mandates under the NWRSA and Secretarial Order 3356. The Service believes that hunting on the refuge would not have a significant impact on local or regional wildlife populations because the percentage likely to be harvested on the refuge, though possibly additive to existing hunting takes, would be a tiny fraction of the estimated populations. Additional hunting would not add more than slightly to the impacts to wildlife from hunting at the local or regional levels, and would only result in minor, negative impacts to wildlife populations.

List of Sources, Agencies and Persons Consulted

NJDFW

List of Preparers

Laura Howard, Visitor Services Assistant
Chelsea Utter, Wildlife Refuge Specialist
Tom Bonetti, Regional Hunting and Fishing Coordinator
Stacey Lowe, Regional Hunting and Fishing Chief

State Coordination

Refuges, including Great Swamp NWR, conduct hunting programs within the framework of State and Federal regulations. The proposed hunting program has been reviewed and is supported

by the NJDEP. Additionally, the refuge coordinates with the NJDEP annually and strives to maintain consistent regulations and programs.

Tribal Consultation

Refuge staff will coordinate with federally recognized Tribal governments in areas of mutual interest, including hunting opportunities. Various tribes will be contacted once this hunting plan goes out to public comment. Haudenosaunee Tribes, Algonkian Tribes and Delaware Tribes may be contacted.

Public Outreach

The public will be notified of the availability of the Great Swamp NWR Hunting Plan, EA, and CD for review, and these will have a 30-day public comment period. We will inform the public through local venues, the refuge website, and social media. Comments received from the public will be considered, and modifications may be incorporated into the final plan and decision documents.

Determination

This section will be filled out upon completion of any public comment period and at the time of finalization of the Environmental Assessment.

- The Service’s action will not result in a significant impact on the quality of the human environment. See the attached “**Finding of No Significant Impact**”.

- The Service’s action **may significantly affect** the quality of the human environment and the Service will prepare an Environmental Impact Statement.

Preparer Signature:  Date: 8/13/2021

Name/Title/Organization: Thomas Bonetti, Hunting and Fishing Coordinator

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OTHER APPLICABLE STATUTES, EXECUTIVE ORDERS AND REGULATIONS

Cultural Resources

- American Indian Religious Freedom Act, as amended, 42 U.S.C. 1996–1996a; 43 CFR Part 7.
- Antiquities Act of 1906, 16 U.S.C. 431-433; 43 CFR Part 3.
- Archaeological Resources Protection Act of 1979, 16 U.S.C. 470aa – 470mm; 18 CFR Part 1312; 32 CFR Part 229; 36 CFR Part 296; 43 CFR Part 7.
- National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470-470x-6; 36 CFR Parts 60, 63, 78, 79, 800, 801, and 810.
- Paleontological Resources Protection Act, 16 U.S.C. 470aaa – 470aaa-11.
- Native American Graves Protection and Repatriation Act, 25 U.S.C. 3001-3013; 43 CFR
- Executive Order 11593 – Protection and Enhancement of the Cultural Environment, 36 Fed. Reg. 8921 (1971).

Fish and Wildlife

- Bald and Golden Eagle Protection Act, as amended, 16 U.S.C. 668-668c, 50 CFR 22.
- Endangered Species Act of 1973, as amended, 16 U.S.C. 1531-1544; 36 CFR Part 13; 50 CFR Parts 10, 17, 23, 81, 217, 222, 225, 402, and 450.
- Fish and Wildlife Act of 1956, 16 U.S.C. 742 a-m.
- Lacey Act, as amended, 16 U.S.C. 3371 et seq.; 15 CFR Parts 10, 11, 12, 14, 300, and 904.
- Migratory Bird Treaty Act, as amended, 16 U.S.C. 703-712; 50 CFR Parts 10, 12, 20, and 21.
- Executive Order 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds, 66 Fed. Reg. 3853 (2001).

Natural Resources

- Clean Air Act, as amended, 42 U.S.C. 7401-7671q; 40 CFR Parts 23, 50, 51, 52, 58, 60, 61, 82, and 93; 48 CFR Part 23.
- Wilderness Act, 16 U.S.C. 1131 et seq.
- Wild and Scenic Rivers Act, 16 U.S.C. 1271 et seq.
- Executive Order 13112 – Invasive Species, 64 Fed. Reg. 6183 (1999).

Water Resources

- Coastal Zone Management Act of 1972, 16 U.S.C. 1451 et seq.; 15 CFR Parts 923, 930, 933.
- Federal Water Pollution Control Act of 1972 (commonly referred to as Clean Water Act), 33 U.S.C. 1251 et seq.; 33 CFR Parts 320-330; 40 CFR Parts 110, 112, 116, 117, 230-232, 323, and 328.
- Rivers and Harbors Act of 1899, as amended, 33 U.S.C. 401 et seq.; 33 CFR Parts 114, 115, 116, 321, 322, and 333. Safe Drinking Water Act of 1974, 42 U.S.C. 300f et seq.; 40 CFR Parts 141-148.c
- Executive Order 11988 – Floodplain Management, 42 Fed. Reg. 26951 (1977).
- Executive Order 11990 – Protection of Wetlands, 42 Fed. Reg. 26961 (1977).

INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

Project Name: GSNWR Hunt Plan **Originating Person:** Chelsea Utter
Township: Chatham, Harding, and Long **Telephone Number:** 973-702-7266 x 18
County: Morris County **Date:** 12/30/2020
Consultation code: 2021-I-0620

Distance to nearest town: 7 miles south of Morristown, NJ

I. Region: 5

II. Service Activity (Program)

National Wildlife Refuge System, Great Swamp NWR, Basking Ridge, NJ

III. Pertinent Species and Habitat:

A. Listed species and/or their critical habitat within the action area:

Bog Turtle (*Clemmys [Glyptemys] muhlenbergii*)

Indiana Bat (*Myotis sodalis*)

Northern long-eared bat (*Myotis septentrionalis*)

B. Proposed species and/or proposed critical habitat within the action area: None

C. Candidate species within the action area:

Monarch butterfly (*Danaus plexippus*)

D. Include species/habitat occurrences on a map.

The New Jersey Field Office has specific locations of T&E species. Bog turtles occur in appropriate habitats, which are not typically suitable for hunting. Indiana and northern long-eared bats occur throughout the summer but are not present during the winter and fall hunting seasons. The monarch butterfly may occur wherever milkweed and nectar plants exist at Great Swamp NWR.

Great Swamp NWR uses IPaC to identify threatened and endangered species, including for purposes of this Biological Evaluation. This is done because the IPaC database is the better of the Service's databases for the refuge and may contain the best available information on species presence. Nevertheless, in order to ensure a thorough review, this Biological Evaluation considers all threatened and endangered species identified by both the IPaC and ECOS databases. Note, however, that these databases are updated regularly, approximately every 90 days, and, thus, it is possible that the specific threatened and endangered species identified as present on or near the refuge may change between the finalization of this Biological Evaluation and its publication and/or between finalization and your reading this document.

Staff present on the refuge and conducting this evaluation may have the best available information about the presence of fish and wildlife species. Thus, where species are identified by either database, but the refuge has information that the species is not actually present within the "action area," we have explained that as the basis for our determination that any hunting and fishing activities will likely have no effect on the species.

IV. Description of proposed action (attach additional pages as needed):

Great Swamp NWR proposes to expand hunting opportunities from its current hunting program. A 5-day firearm deer hunt already occurs on the refuge. Expansion would include allowing archery deer hunting consistent with New Jersey Division of Fish and Wildlife (NJDFW) seasons and regulations. Also proposed, consistent with State regulations, is opening to spring and fall wild turkey, early-season Canada goose, and coyote/fox hunting* (*incidental to deer or turkey seasons only per NJDFW regulations).

V. 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):

The proposed alternative will have no significant adverse effects on threatened or endangered species. Rather, we expect the reduction of deer resulting from a hunt to benefit most species as foraging pressure is lifted. We also expect harvesting of coyote and fox to reduce mortality of ground nesting birds and reptiles, such as wood turtles and bog turtles.

Fall and winter represent periods of low or no activity for bog turtles, minimizing the likelihood that they would be encountered by hunters. Secondly, bog turtles are most often found in boggy, open habitats where there is little cover for wild game and which are difficult for people to walk through. Thus, it is likely that few hunters will venture into bog turtle habitat. The greatest threats to bog turtles are the loss, degradation, and fragmentation of its habitat from wetland alteration, development, pollution, invasive species, and natural vegetation succession. The few potential disturbances of hunting, such as foot traffic of hunters or gun noise, would be a temporary inconvenience and likely not rise to the level of take. Because hunters would likely not hunt in their habitat and bog turtles are inactive during the hunting seasons, it is unlikely that lead ammunition would affect bog turtles. The small, semi-aquatic species consumes a varied diet including insects, snails, worms, seeds, and carrion. These eating behaviors likely preclude lead impacts, as the soils on the refuge do not have high concentrations of lead, and unlikely to have increases based on the amount of hunting allowed and the fact that all or most hunting is on other portions of the refuge.

Indiana bats and Northern long eared bats may be found within the refuge (maternity season only). These species hibernate in caves and mines from October through April (the majority of the hunting season) and would not be impacted by hunting during this time. They are unlikely to be disturbed by hunter activity during the September Canada goose season or during the archery-deer season, as they are a nocturnal species and hunting is restricted to daylight hours. Potential disturbances from expanded hunting, such as an increase in gun noise or additional portable tree stands, would likely not rise to the level of take. Furthermore, there is no likelihood there would be disturbance to bats from hunting when bats are not active. Tree climbing and placing portable tree stands, or noise from firearms, could flush roosting bats from the trees, but it is more likely that the bats would remain in the tree than be flushed, and instances of flushing

are unlikely to result in bat mortality. There is no hunting near any cave or mine where bats could hibernate (i.e., hibernaculum), and hunting programs would not result in any tree cutting or other habitat alteration.

Lead can be used on the refuge for hunting as detailed in the Hunting Plan. The amount of lead introduced to the environment as a result of hunting activities will be negligible, given the amount of hunter participation on the refuge and restriction on lead ammunition for all migratory game bird hunting. Lead shot and bullet fragments found in animal carcasses and gut piles are the most likely source of lead exposure. Many hunters do not realize that the carcass or gut pile they leave in the field usually contains lead bullet fragments. Research continues on the effects of lead ammunition and the fragments it can deposit in killed game. Avian predators and scavengers can be susceptible to lead poisoning when they ingest lead fragments or pellets in the tissues of animals killed or wounded by lead ammunition. Lead poison may weaken raptors and increase mortality rate by leaving them unable to hunt, or more susceptible to vehicles or power line accidents. The bioaccumulation of lead is a potential concern, but it does not present a significant issue for hunting on this refuge as the refuge strongly encourages use of non-toxic alternatives and will educate hunters, anglers and the public to the potential adverse impacts of lead. Some hunters will choose non-lead methods of take such as archery. Moreover, the scarce amount of lead introduced on this refuge is not likely to adversely affect the listed species because those species will not be present or active in the refuge hunting areas during the hunting seasons and hours. Furthermore, these species are not scavengers, and therefore will not be impacted by lead fragments in gut piles left after hunting seasons.

As the foraging ecology of the bats (i.e., eating flying insects) is known, the only way the species would be exposed to lead from hunting is through bioaccumulation from herbivorous insects. Such prey (and only some of their prey are herbivorous) could eat plants that have taken up lead from the soil, but it is unlikely because plants only uptake lead when it is in soil in highly concentrated levels and the proposed hunting expansions would not introduce enough lead for that possibility. Current and proposed levels of hunting, along with non-lead alternative education, would not result in lead levels toxic to any threatened or endangered species that occur on the refuge.

The monarch butterfly caterpillars are likely to be present at Great Swamp NWR during the spring and summer months on milkweed plants. Caterpillars and their milkweed host plants could be trampled by hunters while walking off-trail; however, the likelihood of this occurring is largely discountable because the density of hunters across the Refuge will remain low. Adult monarch butterflies are not vulnerable to trampling and are not expected to be effected by the proposed hunting expansion.

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

Federal and State regulations specifically prohibit the harassment and/or take of listed species. The refuge will require hunters to purchase an annual refuge hunting permit in order for management to assess use and compatibility. At any point, the refuge manager may modify number of permits available, hunt areas, hunting seasons, and/or regulations if necessary to protect threatened and endangered species.

VI. Effect determination and response requested: [* = optional]

A. Listed species/designated critical habitat:

<u>Determination</u>	<u>Response requested</u>
no effect/no adverse modification (_____)	____Concurrence
may affect, but is not likely to adversely affect species/ adversely modify critical habitat (species: <u>bog turtle, Indiana bat, northern long-eared bat</u>)	<u>X</u> Concurrence
may affect, and is likely to adversely affect species/adversely modify critical habitat (species: _____)	____ Formal Consultation

B. Candidate species

No effect (Species: <u>Monarch butterfly</u>)	<u>X</u> *Concurrence
is likely to jeopardize (Species: _____)	____ Conference

Chelsea Utter

Project Biologist (Requestor)

7/23/2021

Date

VII. Reviewing ESFO Evaluation:

A. Concurrence X Nonconcurrency _____

B. Formal consultation required _____

C. Conference required _____

D. Informal conference required _____

E. Remarks (attach additional pages as needed):

Alicia Protus

Endangered Species Biologist (Reviewer),
New Jersey Field Office

8/12/2021

Date

RONALD
POPOWSKI

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8/12/21

Supervisor, New Jersey Field Office

Date

FINDING OF NO SIGNIFICANT IMPACT
ENVIRONMENTAL ASSESSMENT
for HUNTING
Great Swamp National Wildlife Refuge

The U.S. Fish and Wildlife Service (Service) is proposing to open or expand opportunities for big game, upland game, and migratory game bird hunting on the 7,768-acre Great Swamp National Wildlife Refuge (NWR, refuge) in Morris County, New Jersey, in accordance with the refuge's Comprehensive Conservation Plan (CCP).

Selected Action

Proposed Action Alternative

Under this alternative, white-tailed deer hunting would be expanded to include additional season dates and methods of take. Hunting would be permitted for wild turkey (spring and fall), coyote, fox, and Canada goose. We will allow incidental coyote and fox hunting on designated areas of the refuge in accordance with regulations and seasons set forth by the State and subject to specific conditions. We will allow hunting of Canada geese only during the New Jersey September Canada Goose season. No other migratory birds may be taken.

There are three main areas on the refuge: the Management Area (3,407 acres), the Wilderness Area (3,397 acres) and the Closed Area (962 acres). Hunting would remain prohibited in the Closed Area due to a higher concentration of non-consumptive refuge users and suburban development (see Map 1 in the Hunting Plan).

In the Management Area and Wilderness areas, hunting would be permitted for white-tailed deer, wild turkey, Canada goose, coyote and fox. Archery deer hunting season dates would follow those of the adjacent New Jersey Deer Management Zone 13 (Zone 13). The firearm deer hunt dates would also align with Zone 13's youth firearm hunt followed by the 6-day firearm season for greater consistency.

Hunting seasons are set annually by the New Jersey Division of Fish and Wildlife (NJDFW). Hunting will primarily occur from September through January, and April through May for spring turkey season. Regulations are published within the State's Hunting and Trapping Digest. Night hunting would be prohibited. Access to the refuge would be allowed 2 hours before sunrise and 2 hours after sunset.

We would continue to conduct hunting according to State and Federal regulations. Hunters would also have to comply with additional refuge-specific regulations, including but not limited to those contained in the Code of Federal Regulations (50 CFR §32.49), which are revised or updated annually as needed. However, the refuge manager may, upon annual review of the hunting program, take the necessary steps to impose further restrictions, recommend that the refuge be closed to hunting, or further liberalize hunting regulations up to the limits of the State. We would restrict hunting if it became incompatible with other priority refuge programs or endangered

refuge resources or public safety.

Hunters must obtain an annual Great Swamp NWR hunting permit in addition to all applicable State licenses and permits prior to hunting or scouting. The refuge hunting permit costs \$30 (\$25 refuge fee, \$5 processing fee), will be valid from January 1 to December 31, and will include spring and fall turkey, archery deer, 6-day firearm deer hunt, and incidental coyote and fox hunting. Permits are valid for the entire refuge including both the Wilderness Area and Management Area. A separate, limited number of September Canada Goose Permits will be available for \$5 (cost of processing fee). Youth permits for all of the above will remain free. This proposed permit structure simplifies the current process and does not result in an increase in cost for the customer.

Refuge staff have worked closely with stakeholders and State agency staff to develop this plan, and ensure safe and enjoyable recreational hunting opportunities. There are no unresolved conflicts about the proposed action with respect to alternative uses of available resources, because the changes proposed by this action are not expected to have harmful impacts to the ecological, aesthetic, historic, cultural, economic, social, or health aspects of the refuge and surrounding communities. Additionally, the proposed action builds on an existing hunt program, and includes measures to better meet goals and objectives developed, in part, from the refuge's Comprehensive Conservation Plan (CCP). Therefore, the Service does not need to consider additional alternatives (43 CFR 46.310(b)).

This alternative was selected over other alternative because: (1) it helps fulfill the statement of objectives detailed in the Hunting Plan; (2) it would result in a minimal impact on physical and biological resources; and (3) it meets the Service's mandates under the National Wildlife Refuge System Administration Act (NWRSA) of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, and Department of the Interior Secretarial Order 3356. The Service believes that expanding hunting opportunities on Great Swamp NWR will not have a significant impact to wildlife, other uses, or refuge administration. This alternative will best meet the purpose and need, refuge objectives, and Service mandates.

Department of the Interior Secretarial Order 3347 – "Conservation Stewardship and Outdoor Recreation," signed March 2, 2017, and Secretarial Order 3356 – "Hunting, Fishing, Recreational Shooting, and Wildlife Conservation Opportunities and Coordination with States, Tribes, and Territories," signed September 15, 2017, includes direction to Department of the Interior agencies to "increase outdoor recreation opportunities for all Americans, including opportunities to hunt and fish; and improve the management of game species and their habitats for this generation and beyond." The selected alternative will also promote one of the priority public uses of the National Wildlife Refuge System (Refuge System), and providing opportunities for visitors to hunt will promote stewardship of our natural resources and increase public appreciation and support for the refuges.

Other Alternatives Considered and Analyzed

No Action Alternative

The No Action Alternative would continue the refuge’s current hunting program. The refuge hunt program currently allows for white-tailed deer hunting on designated areas of the refuge. Hunting is currently permitted on 6,804 acres of the refuge, with a 5-day firearm deer management hunt. Turkey hunting will remain closed on the refuge. Primrose Brook parcel (100 acres) would remain closed to all hunting. New hunting opportunities would not be created under this alternative, including new access sites to refuge lands for other users. This alternative has the least short-term impacts to physical and biological resources; however, long-term impacts on habitat quality could be adverse with greater deer browsing. In addition, it would not fulfill the Service’s mandate under the NWRSA and Secretarial Order 3356 as well as the proposed action.

Summary of Effects of Selected Action

An Environmental Assessment (EA) was prepared in compliance with the National Environmental Policy Act of 1969, as amended (NEPA) to provide a decision-making framework that: (1) explored a reasonable range of alternatives to meet project objectives; (2) evaluated potential issues and impacts to the refuge, resources and values; and (3) identified mitigation measures to lessen the degree or extent of these impacts. The EA evaluated the effects associated with expansion of hunting opportunities at Great Swamp NWR, as well as the effects of a no-action alternative. It is incorporated as part of this finding.

Implementation of the agency’s decision would be expected to result in the following environmental, social, and economic impacts:

Affected Environment	Potential Impacts of the Selected Action
Big game (i.e., white-tailed deer, wild turkey)	Minor, short-term adverse impacts to species. The expanded deer hunting seasons may attract a small number of new hunters, but no noticeable impacts on refuge deer populations are expected. Opening the refuge to turkey hunting for the first time, impacts may include disturbance to turkey flocks, changes in species distribution across the refuge, avoidance of some areas, changes in population dynamics, and changes in wildlife behavior. For a turkey population that is legally being hunted for the first time, harvest rates around 30 percent can be expected; thus, only five male turkeys would be anticipated to be harvested the first season. After the first season, hunter success ratios likely would drop to 16 percent. Turkey hunting would be introduced in the refuge in a phased approach, starting with mentored hunts only for the first 2 to 3 years. This would allow refuge management to assess feasibility and hunter interest prior to opening to a regular, public turkey hunt.

Affected Environment	Potential Impacts of the Selected Action
Upland game	<p>Minor, short-term adverse impacts species. Upland game hunting would be incidental to the white-tailed deer and turkey hunt only, which limits the number of hunters pursuing upland game species. Potential impacts could include greater disturbance to habitat and landscape, changes in wildlife behavior, changes in species distribution, and temporary reductions to local populations. Injury and mortality of individuals is an anticipated impact of the hunt program. All impacts would be localized to the refuge area and are not expected to result in long-term negative impacts. In the case of nocturnal species, impacts would be lessened as hunting is only permitted during the daytime. For all species, impacts will be lessened as hunting is spread out over a large geographic area, preventing concentrated impacts in any one area. Harvest of some coyotes and fox will alleviate predation from these species on species of conservation concern such as bog turtles, wood turtles, and ground nesting birds.</p>
Migratory birds/waterfowl (i.e., Canada goose)	<p>Minor, short-term adverse impacts species. Impacts to migratory birds from hunting at the refuge would not result in significant changes on a Statewide, regional, or flyway level, but some localized impacts can be expected. Impacts would be limited as the refuge is only open to a limited season. Great Swamp NWR will limit the number of goose permits to five hunters annually. Compared to the annual harvest of migratory birds in the State and Atlantic Flyway, hunting on the refuge would not have a significant impact on migratory bird populations. The refuge also requires use of non-toxic ammunition when hunting migratory game birds to minimize risk of lead poisoning to waterfowl and other wildlife; therefore, there would likely be no adverse impacts.</p>
Non-target species	<p>Minor, short-term adverse impacts (disturbance) may occur. The refuge would limit hunting seasons and provide “no hunting areas” that would disperse impacts. Hunting only permitted for a limited Canada goose hunt, spring and fall turkey season, and certain portions of the State deer season. Hunting is not permitted at night. Impacts to resident and migratory wildlife populations would have minor, localized impacts that are not expected to affect Statewide or regional populations.</p>

Affected Environment	Potential Impacts of the Selected Action
Threatened and Endangered Species	<p>For more detail, see the completed Intra-Service Section 7 Biological Evaluation (Appendix C) for species including bog turtles and two bat species. Fall and winter represent periods of low or no activity for bog turtles, minimizing the likelihood that they would be encountered by hunters. Secondly, bog turtles are most often found in boggy, open habitats where there is little cover for wild game and which are difficult for people to walk through. Thus, it is likely that few hunters will venture into bog turtle habitat.</p> <p>Indiana bats and Northern long-eared bats may be found within the refuge (maternity season only). These species hibernate in caves and mines from October through April (the majority of the hunting season) and would not be impacted by hunting. They are unlikely to be disturbed by hunter activity during September Canada goose season or archery-deer season, as they are nocturnal species. Any disturbances would likely not rise to the level of take.</p>
Vegetation and Soils	<p>Negligible to minor, short-term impacts to vegetation. Hunting could negatively affect vegetation by trampling or creating footpaths. The number of acres open to hunting would not expand, but new species would be added. With the expanded opportunity, more users can result in more concentrated impacts, including the creation of new trails, greater vegetation damage, and additional soil compaction and/or erosion. Considering the seasons in which hunting would occur, impacts to vegetation would be minimized as plants will be senescing or entering dormancy. During spring turkey season, we do not expect the use to be so overwhelming that vegetation would be affected. Overall, only minor localized impacts are expected.</p>
Water Quality	<p>Negligible to minor, short-term impacts. Access to hunting would be by foot only and no additional areas would open to hunting. Opening to Canada goose hunting has the potential to increase impacts to wetland areas, but impacts are expected to be minor. With more hunters traversing the landscape, impacts including erosion, changes to drainage patterns, and wetland habitat damage may increase slightly. Overall, impacts are not expected to impact the overall water quality in the Passaic River Watershed.</p>

Affected Environment	Potential Impacts of the Selected Action
Wilderness	No adverse impacts. Similar to impacts described above for vegetation and wildlife.
Visitor Use and Experience	Minor, short-term adverse impacts to other public uses. The number of hunters using the refuge is expected to increase slightly. If deemed necessary, the refuge would mitigate visitor use conflicts through time and space zoning, safety regulations, and clearly posted information on the hunting program. There is potential for hunters to interact with other visitors such as hikers. The refuge could explore hosting talks with hunters on how to more effectively interact with visitors who may not agree with hunting practices.
Cultural Resources	No adverse impacts. Hunting, regardless of method or target, is a consumptive activity that does not pose any threat to prehistoric or historic properties on or near the refuge. No impacts to cultural resources are anticipated above what may be caused by any refuge visitor.
Refuge Management and Operations	Minor, short-term and minor, long-term impacts to refuge management and operations. A reduction in permits down to one Great Swamp NWR Hunt Permit and supplemental September Canada Goose Permit would make the administrative burden of hunt permit sales easier to manage, and result in a savings for the hunter and refuge, in personnel costs for time.
Socioeconomics and Environmental Justice	Negligible, short-term and long-term benefits. While hunting visitation may increase due to increased opportunities, hunting accounts for a fraction of expenditures related to the refuge. The Service identified no minority or low-income communities within the impact area. Minority or low-income communities would not be disproportionately affected by any impacts from this proposed action.

While refuges, by their nature, are unique areas protected for conservation of fish, wildlife and habitat, the selected action will not have a significant impact on refuge resources and uses for several reasons:

1. In the context of local and State hunting programs, the selected action will only result in a tiny fraction of the estimated populations and harvest. The Service works closely with the

Appendix D – Finding of No Significant Impact

States to ensure that additional species harvested on a refuge are within the limits set by each state to ensure healthy populations of the species for present and future generations of Americans.

2. The Refuge System uses an adaptive management approach to all wildlife management on refuges, monitoring and re-evaluating hunting opportunities on an annual basis to ensure that the program continues to contribute to the biodiversity and ecosystem health of the refuge, and that impacts from these opportunities do not add up to significant impacts in combination with the environmental trends and planned actions on and near the refuge.
3. The adverse effects of the selected action on air, water, soil, habitat, wildlife, aesthetic/visual resources, and wilderness values are expected to be non-existent, minor and/or short-term. The benefits to long-term ecosystem health from the selected action, in conjunction with other existing refuge programs, will far outweigh any of the short-term adverse impacts discussed in the EA and document. The action will result in beneficial impacts to the human environment, including the biodiversity and ecological integrity of the refuge, as well as the wildlife-dependent recreational opportunities and socioeconomics of the local economy, with only negligible adverse impacts to the human environment as discussed above.
4. The refuge-specific regulations detailed in 50 CFR are measures that will reduce or avoid impacts. Hunting regulations will be enforced by Federal and State law enforcement officers. Providing information through various forums will ensure the public is aware of applicable laws and policies.
5. The selected action, along with the proposed mitigation measures, will ensure that there is low danger to the health and safety of refuge staff, visitors, and hunters themselves.
6. The action is not in an ecologically sensitive area.
7. The action is not likely to adversely affect any threatened or endangered species; and will have no effect to federally designated critical habitat.
8. The action will not impact cultural or historical resources.
9. The action will not impact wilderness areas.
10. There is no scientific controversy over the impacts of this action, and the impacts of the proposed action are relatively certain.
11. The proposal is not expected to have any significant adverse effects on wetlands and floodplains, pursuant to Executive Orders 11990 and 11988 because hunters must use established access points that will not be located near sensitive habitats.

Additionally, the following stipulations are necessary to ensure compatibility:

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- Hunting for coyote and fox will be incidental while deer or turkey hunting only. No night hunting will be allowed.
- Hunters must obtain a refuge hunting permit. We require hunters to possess a signed refuge hunting permit at all times while scouting and hunting on the refuge.
- Hunters may enter the refuge 2 hours before legal shooting time and must leave no later than 2 hours after legal shooting time. Hunting is permitted from legal sunrise to legal sunset.
- We prohibit organized deer drives. We define a “deer drive” as an organized or planned effort to pursue, drive, chase, or otherwise frighten deer into moving in the direction of any person(s) who is part of the organized or planned hunt and known to be waiting for the deer.

Furthermore, the refuge would clearly post information on the hunting season at the refuge headquarters, on the website, and on signs throughout the refuge. Maps will be provided for hunters to include hunt boundaries, buildings, trails, and parking areas to ensure hunters are aware of safety zone requirements. We would encourage all users to wear blaze orange during the firearms hunting season to minimize potential safety issues.

These measures to mitigate and/or minimize adverse impacts have been incorporated into the proposal. The proposal is compatible with the purpose of the refuge and the mission of the Refuge System (see the Compatibility Determination, Appendix A, in the Hunting Plan). Furthermore, the action is consistent with applicable laws and policies regarding the establishment of hunting on national wildlife refuges.

Public Review

The plan has been thoroughly coordinated with all interested and/or affected parties. Refuge staff coordinated with State agency staff in preparation of the Hunting Plan, Compatibility Determination, and EA, and incorporated their comments into the documents.

Public notification and review included a 90-day comment period, from April 7 to July 6, 2021. We informed the public through local venues, the refuge website and social media. No comments were received. No significant modifications were incorporated into the final plan and decision documents.

Determination

Based upon a review and evaluation of the information contained in the EA, as well as other documents and actions of record affiliated with this proposal, the Service has determined that the proposal to expand hunting opportunities at Great Swamp NWR does not constitute a major Federal action significantly affecting the quality of the human environment under the meaning of section 102(2)(c) of NEPA. As such, an environmental impact statement is not required. An EA has been prepared in support of this finding (Appendix B) and is available upon request to Great Swamp NWR.

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The Service has decided to select the proposed action as described in the EA, and implement the Hunting Plan for Great Swamp NWR upon publication of the final 2021-2022 Station-Specific Hunting and Sport Fishing Regulations. This action is compatible with the purpose of the refuge and the mission of the Refuge System, and consistent with applicable laws and policies. See attached Compatibility Determination (Appendix A).

Regional Chief
National Wildlife Refuge System

Date