Patuxent Research Refuge

Hunting Plan

September 2022

U.S. FISH & WILDLIFE SERVICE

NATIONAL WILDLIFE REFUGE SYSTEM

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

Patuxent Research Refuge
Hunting Plan

U.S. Fish and Wildlife Service

Patuxent Research Refuge
12100 Beech Forest Road, Suite 138
Laurel, Maryland 20708

Submitted By:
Project Leader

JENNIFER GREINER Digitally signed by JENNIFER GREINER Date: 2022.09.01 11:32:27 -04'00' — Sept. 1, 2022

Signature — Date

Concurrence:
Refuge Supervisor

ANNE SITTAUER Digitally signed by ANNE SITTAUER Date: 2022.09.02 11:37:22 -04'00' — 9/2/2022

Signature — Date

Approved:
Regional Chief (Acting),
National Wildlife Refuge System

HOLLY GABORIAULT Digitally signed by HOLLY GABORIAULT Date: 2022.09.02 11:52:56 -04'00' — 9/2/22

Signature — Date

Table of Contents

PATUXENT RESEARCH 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, and laws and international treaties. Relevant guidance includes the National Wildlife Refuge System Administration Act (NWRSAA) 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.

Patuxent Research Refuge (PRR, refuge) was established on December 16, 1936, pursuant to Executive Order 7514 by President Franklin D. Roosevelt "to effectuate further the purposes of the Migratory Bird Conservation Act" and to serve "as a wildlife experiment and research refuge." Dedicated on June 3, 1939, Secretary of Agriculture Henry A. Wallace stated that, "The chief purpose of this refuge is to assist in the restoration of wildlife—one of our greatest natural resources."

The refuge is unique within the Refuge System by having both a research and wildlife conservation mission and by being co-located with the U.S. Geological Survey (USGS) to comprise the Patuxent Wildlife Research Center (PWRC). The PWRC purpose is to develop the scientific information needed to provide the biological foundation for effective conservation and management of the nation's biological resources and to conduct priority research for Department of the Interior agencies and other Federal and State partners. The Service's Division of Migratory Bird Management also has offices located at the refuge.

The refuge has grown from 2,679 acres in 1936 to 12,841 acres today. The most consequential growth in the refuge land holdings occurred in 1991, when 8,100 acres in Anne Arundel County transferred from Fort Meade to PRR, which at the time was 4,700 acres. This transferred property is now called the "North Tract." The North Tract is bounded on the north by Maryland Routes 198 and 32 and Tipton Airport, on the west by the Baltimore-Washington Parkway, on the east by AMTRAK train lines, and on the south by the Patuxent River. Historically, the land was cleared for agriculture and then used by the military for extensive small arms, artillery, and tank training. Most of the land has regenerated to form large stands of forest (approximately 6,400 acres) that lie contiguous with the Central Tract, but many open grassland areas remain as remnants of old firing ranges, paratrooper training sites, and related administrative areas. One of the largest sycamores and black gum trees in Maryland and a natural stand of white pine occur on the North Tract. Oak hybridization, sandy soils, sphagnum bog plant communities, oxbow wetlands from the Little Patuxent River, a 5 and a half-mile transmission power line right-of-way managed for shrub habitat, remnant unexploded ordnance, and gunnery ranges used by Federal agencies for law enforcement and security training are among the many management challenges of this tract.

The Central Tract consists of 2,670 acres located in Prince George's and Anne Arundel Counties. This tract is bordered on the north by the Patuxent River and on the south by Maryland 197. This

tract contains numerous buildings related to refuge administration, USGS offices and laboratories, 14 man-made impoundments managed for waterfowl, large pen complexes for environmental contaminant studies, residential buildings, and a 3 and a half-mile transmission power line right-of-way. Surrounding the open areas of mixed use are approximately 1,500 acres of hardwood floodplain forest or upland mixed forest.

The South Tract, located in Prince George's County, consists of 2,200 acres and is bordered by the inactive Sandy Hill Landfill, the Beltsville Agriculture Research Center (BARC), and several residential areas. The South Tract contains the National Wildlife Visitor Center, Cash Lake, a prominent seasonal fishing area, and Lake Redington that is favored by water birds. Further to the south are former crop fields adjacent to those of University of Maryland and BARC, forming some of the most important early succession habitat on the refuge.

The mission of the Refuge System, as outlined by the NWRSAA, as amended by the 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."

The NWRSAA 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, when those opportunities are compatible with the purposes for which the refuge was established and the mission of the Refuge System.

Several recent changes were made to the refuge hunting program in 2018 including greater alignment with State of Maryland regulations and offering a mentored hunt program. We opened additional acreage on the North and South tracts to the hunting program, opened to sea duck, light goose and dark goose as huntable species, and opened to a primitive firearm hunt season. In summary, the following additional changes are proposed as part of this new plan:

New proposed changes include:

- Aligning with State regulations for mourning dove hunting;
- Permitting use of dogs for waterfowl, rabbit, and mourning dove hunting;
- Expanding spring turkey hunting on 1,812 acres to include the South Tract and Schafer Farm;
- Expanding rabbit, gray squirrel, mourning dove and woodchuck hunting on the South Tract (1,336 acres) and Schafer Farm unit (476 acres);
- Aligning with the State for all deer hunting days and seasons (including those at the South tract);
- Facilitating additional mentored hunts where possible; and
- Use of non-lead ammunition is currently required for upland game, turkey, migratory bird and waterfowl hunting at Patuxent. Hunters are encouraged to voluntarily use non-lead ammunition when hunting deer. By fall of 2026, we will propose to phase out use of lead ammunition for all hunting that occurs on the refuge.

II. Statement of Objectives

The objectives for the hunting program at PRR are to provide the public with high quality wildlife-dependent recreational opportunities that align with refuge purposes and management objectives. The Service has long recognized that hunting is an integral part of a comprehensive wildlife management program and that positive benefits can be attributed to a well-managed hunt. As such, hunting is considered one of the six priority public uses of the refuge system. Hunting is recognized as an acceptable, traditional form of wildlife-dependent recreation that can be and is sometimes used as a tool to effectively manage wildlife population levels.

Hunting is consistent with the refuge's 2013 Comprehensive Conservation Plan (CCP), which stated as Goal 6 to "provide high quality hunting and fishing experiences for hunters and anglers." Objective 6.1 further clarified to "provide robust and diverse, quality hunting

opportunities to hunters of all ages while promoting hunter and visitor safety and wildlife health and accommodating other public use opportunities." We provide hunting opportunities on the assumption that, when properly regulated, it will also serve as a viable management tool for controlling populations and protecting habitat, although for some species there are inherent difficulties in achieving such an objective.

III. Description of Hunting Program

A. Areas to be Opened to Hunting

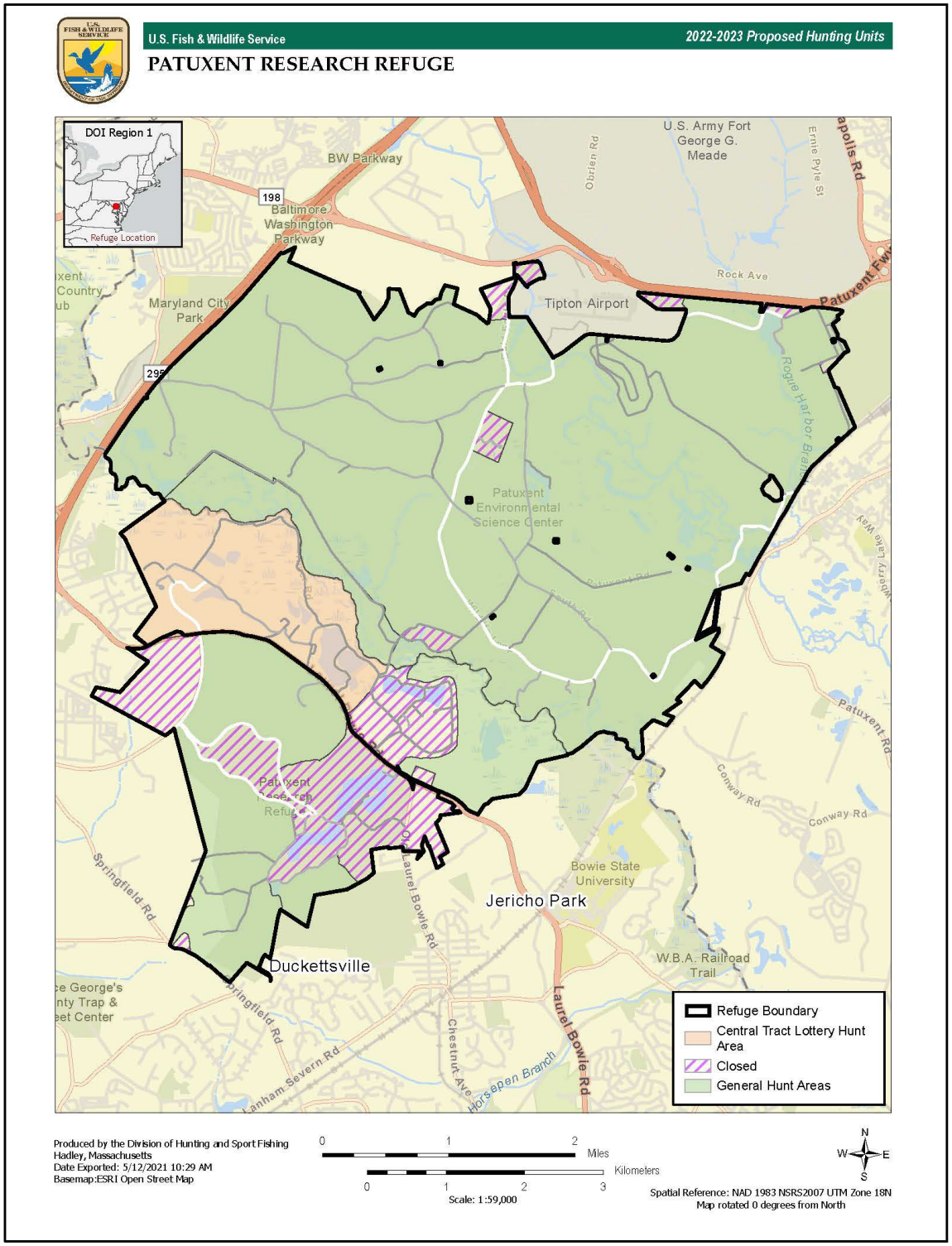
Hunting will be allowed on approximately 11,083 acres divided into three tracts with multiple hunting units/zones within each tract.

The North Tract consists of 7,954 acres available for hunting from September to May in accordance with Maryland Department of Natural Resources (MDDNR). The North Tract is made up of 20 hunting units/zones. White-tailed deer, migratory birds (ducks, sea ducks, light geese, dark geese), mourning dove, and upland game (rabbit, woodchuck, gray squirrel) hunting will be permitted during their respective State seasons except in areas closed to hunting where range activities prohibit it or if the refuge hunt season has ended earlier than the State season.

The Central Tract consists of 1,793 acres available for hunting in November and December in accordance with MD DNR. The Central Tract is made up of the refuge headquarters hunt area (1,048 acres), Schafer Farm Hunt Area (467 acres) and the Millrace Hunt Area (278 acres). White-tailed deer hunting will be permitted in the refuge headquarters hunt area and Millrace Hunt area via special lottery hunts only. Schafer Farm Hunt area will be open for white-tailed deer, turkey, mourning dove, and upland game (rabbit, woodchuck, gray squirrel) hunting during their respective seasons, except in areas closed to hunting or where the refuge hunt season has ended earlier than the State season.

The South Tract consists of 1,336 acres available for hunting from September to May in accordance with MDDNR. The South Tract is made up of the four South Tract units A, B, C, and D (1,336 acres). White-tailed deer, turkey, mourning dove, and upland game (rabbit, woodchuck, gray squirrel) hunting will be permitted during their respective seasons, except in areas closed to hunting or where the refuge hunt season has ended. See Figure 2 in Section VIII. Hunt Maps.

Figure 1. Map of Patuxent Research Refuge hunt units.



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

Hunting seasons will be set annually by the MDDNR and will be updated in the refuge's annual guidelines which may contain refuge regulations that further restrict season dates or harvest limits.

- MIGRATORY BIRD HUNTING (waterfowl): We allow the hunting of ducks, sea ducks, light geese, dark geese (e.g., Canada geese) in designated areas of the refuge in accordance with regulations and seasons set forth by the State. Use of non-lead ammunition is required.

- OTHER MIGRATORY BIRD HUNTING (mourning dove): We allow the hunting of mourning dove in designated areas of the refuge in accordance with regulations and seasons set forth by the State. Use of non-lead ammunition is required.

- UPLAND GAME HUNTING: We allow the hunting of rabbit, woodchuck and gray squirrel in designated areas of the refuge in accordance with regulations and seasons set forth by the State from September 1 to January 31 only. Upland hunting for these species is closed on the refuge the remainder of the Maryland State season. Use of non-lead ammunition is required.

- BIG GAME HUNTING: We allow the hunting of white-tailed deer and wild turkey (winter and spring) on designated areas of the refuge in accordance with regulations and seasons set forth by the State. Upon implementation of this plan, non-lead ammunition will be required for turkey hunting on the refuge. Use of non-lead ammunition for deer hunting will initially be voluntary but will proposed for requirement by 2026.

Hunting Access: Hunters must check in at the Hunter Control Station (HCS) Monday through Saturday (closed Sundays and all Federal holidays) beginning at 5:00 AM during the hunting season (September 1 to January 31). The refuge follows all State regulations for legal shooting hours.

C. Hunter Permit Requirements (if applicable)

Hunters will be required to have a State permit as well as a refuge-specific permit provided by the Meade Natural Heritage Association (MNHA). Hunting permits (PRR Hunt Cards) are purchased in person through the MNHA in partnership with PRR through a cooperative agreement. Permits will be sold at the Service HCS on Bald Eagle Drive, located on the refuge's North Tract starting in August on Saturdays from 9:00 AM to 3:00 PM. Permits will be sold daily from September 3 through January 31, except on Sundays and Federal holidays. See "Hunter Permit Application and/or Registration Procedures" in Section IV (A).

D. Consultation and Coordination with the State

The refuge consulted with State partners (MDDNR) extensively while writing this hunting plan. The refuge held conference calls and virtual meetings with the MDDNR Deer Project Leader in

January and February 2021 regarding the proposed changes. The refuge also consulted with MDDNR's Upland Game Bird Project Leader, Waterfowl Project Leader, Game Bird Section Leader and the South Region Manager in April 2021 and June 2021. In addition, the refuge discussed proposed changes in further detail during a virtual coordination meeting with the MDDNR staff on July 28, 2021. The MDDNR fully supported the proposed changes and increasing the refuge's alignment with State hunting programs and regulations where possible.

E. Law Enforcement

Enforcement of refuge violations normally associated with management of a NWR is the responsibility of commissioned Federal Wildlife Officers (FWO), other officers, Special Agents, and State game wardens who often assist PRR's full-time FWO.

The following methods are used to communicate and enforce hunting regulations:

- Refuge and hunt area boundaries will be clearly posted;
- The refuge will provide hunting guidelines that detail all refuge procedures and rules;
- The HCS will have maps of all hunting areas, hunting guideline booklets and additional information as needed, and;
- Information will be made available at the PRR's visitor center, North Tract Hunter Contact Station, and on the refuge's website.

F. Funding and Staffing Requirements

The hunt program is operated through a partnership with MNHA, and some of the annual administrative costs for the refuge hunting program are shared between the Service and MNHA.

During the hunting season, considerable staff time is spent on the annual planning and writing of the hunt regulations, preparing printed materials such as maps and hunt regulations, posting hunt area boundaries, prepping roads, preparing for parking and access, providing orientation, entering and analyzing harvest data, coordination meetings with range partners, law enforcement activities, hiring and training hunt control station managers, maintaining or updating the hunter and harvest databases, and coordinating the lottery hunts. Refuge dollars spent on hunt related activities in 2020-2021 were approximately $22,500. Supplies such as Carsonite signs, posts, and laminate material for signage cost the refuge about $2,500 annually. Gravel hunt road repairs and upkeep cost approximately $20,000 per year. The refuge is fortunate to have volunteers from MNHA to assist with hunt check station duties on hunt days, maintain the hunt check station and related outbuildings and premises, sell the permits, assist with publications or advertising, oversee hunter qualifications, and many other services all of which amount to a considerable cost savings to the refuge.

The fees charged for hunting permits and memberships fund administrative costs for the services MNHA provides to the hunt program, such as payroll for three hunt control station managers,

employment insurance, waste management, Hunters for the Hungry carcass processing, utilities for the check station and grounds, and communications by web and mail. The fees were increased in September 2017 (hunt permits cost $70.00 for adults, $35.00 for youth and seniors).

Since the fall of 2017, MNHA has covered all salaries for hunt control station managers, averaging between $3,200 and $3,600 per month. Payroll expenses are estimated to total about $20,000 during the 7-month hunt season (MNHA Treasurer's Report, April 2021).

IV. Conduct of the Hunting Program

A. Hunter Permit Application, Selection, and/or Registration Procedures (if applicable)

Due to the complexities of ongoing activities and other uses at the refuge, it is mandatory for hunters to check in and out every visit.

Hunters are required to purchase a PRR Hunting permit. To purchase a permit and hunt specific species, hunters are required to complete a NWRS Hunt Application (FWS Form 3-2439, OMB 1018-0140), and Statement of Hunter Ethics (FWS Form 3-2516). They must also present the following documents:

1. Current Maryland Hunting License;

2. Hunting stamps as required by the State of Maryland and Federal regulations; and

3. Hunters with a disability participating in the lottery hunt for turkey must present a Federal or Maryland State documentation of disabled eligibility when purchasing a permit for this hunt.

The use of a permit system allows the refuge to minimize habitat disturbance and to provide a high quality, safe hunt experience. Permits are sold for a fee to defray the costs of operation, with special discounts for senior and youth hunters. The schedule of fees is posted at various locations (HCS, Hunter Info hotline, and on the refuge website). The permit system enables the refuge to control the number of hunters on the refuge at any given time. Hunters are assigned to use specific hunting areas for North and South Tracts, and a lottery hunt is offered for the Central Tract units for special hunts.

Special Hunt Programs:

Mentored Hunts
In collaboration with multiple partners, the refuge will seek to provide mentored hunting opportunities for groups that are traditionally underrepresented in hunting. More information on mentored hunt opportunities will be made available on the refuge website, at the refuge Visitor Center, at the North Tract HCS, and the Visitor Contact Station.

Spring Turkey Lottery Hunts
Applications for the spring turkey hunt will be submitted to the refuge by January 31. Separate lottery hunts will be available for youth, disabled, and other hunters. Saturdays are reserved for

youth hunts where three youth hunters will be drawn per hunt date. Mondays are for disabled and all other hunters. Two disabled and four other hunters will be drawn per hunt date.

Hunters can only submit their names into one of the following categories:

1. Youth Hunters: Individuals that possess a refuge youth hunting permit.

2. Disabled Hunters: Individuals with a physical or intellectual impairment, as defined by the Americans with Disabilities Act, that have met the requirements to hunt on the refuge may enter the lottery for the zone(s) reserved for hunters with disabilities. The refuge requires hunters with disabilities to provide National Park Service (NPS) Form 10-597 when submitting for lottery.

3. Other Hunters: Individuals who do not qualify as a Youth or Disabled hunter.

Selected hunters will be notified through the mail with an official refuge letter indicating their status as being drawn for the hunt.

Central Tract and M-R Lottery Hunts

1. This is a deer management hunt, and the lesser firearm rule does not apply. Muzzleloaders are not permitted for the lottery hunts.

2. There are two separate lottery hunts: November TBD and December TBD.

3. Signup occurs for the lottery hunts at the HCS at least 2 weeks prior to the hunting date.

4. Hunters may place their names in each lottery (shotgun and archery) one time per hunt. If drawn for both, the hunter must choose one; the other will be assigned to an alternate.

5. Selection for participation in the Central Tract and M-R lottery hunts will be by lottery. There are 3 archery and 39 shotgun slots. Nine of the shotgun slots are in the M-R area and are not assigned to a specific site. Two shotgun sites are reserved for disabled hunters.

6. The use of a tree stand, a minimum of 10 feet off the ground, and a full-body harness is mandatory, except for the two disabled shotgun sites when used by a disabled hunter.

7. Lists of selected hunters and check-in times will be posted at the HCS at least 1 week prior to the scheduled hunt.

8. Selected hunters must check in by the time specified on the letter of notification. After the specified time, any available hunting slots will be issued to alternate

hunters, prior to standby hunters, by random drawing. Drawings will be performed at the HCS.

9. Access for all lottery-selected hunters for Central Tract and M-R will be via Gate 1 on American Holly Drive, opposite the intersection of MD Route 197 and Powder Mill Road.

10. All selected hunters are required to attend a pre-hunt orientation provided by refuge staff on Central Tract prior to going afield.

11. Shotgun stand sites 1 to 30 and archery stand sites 31 to 33 are marked with a reflective band on the assigned tree. Zones of fire are marked with arrows. All weapon firing must be within the zone of fire. Only shotguns with slugs may be used at sites 1 to 30 and in M-R 1 to 9. Only archery equipment may be used at sites 31 to 33. Zones of fire are marked at each tree stand location with arrows on stakes in that ground that show the safe line of fire for each stand location. The zones of fire are used on the Central Tract due to the close proximity of refuge roads, research structures, office buildings, residences and the main public road Route 197.

Hunters must leave the field by 12:00 PM. on the morning hunt or by 1 hour after sunset on the evening hunt. Check-in for the morning hunt is 5:00 AM. at the HCS, and 11:00 AM. check in for the evening hunt. The refuge adheres to all legal shooting hours set forth by State regulation for the Lottery Hunts.

B. Refuge-Specific Hunting Regulations

Relevant refuge-specific regulations are annually listed in 50 CFR 32.39. These guidelines may be modified as conditions change or if refuge expansion continues/occurs.

Hunters are encouraged to voluntarily use non-lead ammunition when hunting big game. By 2026, we will eliminate all lead ammunition on PRR for deer hunting.

C. Relevant State Regulations

The refuge conducts its hunting program within the framework of State and Federal regulations. Hunting at the refuge is at least as restrictive as the State of Maryland and, in some cases, more restrictive. Additionally, the refuge coordinates with the State as needed to maintain regulations and programs that are consistent with the State's management programs. Relevant refuge-specific regulations are annually listed in 50 CFR 32.39.

D. Other Refuge Rules and Regulations for Hunting

- Hunters are required to check in and out at the HCS every time they enter or exit the refuge, change hunting methods of harvest, or change hunting areas including North Tract, Central Tract and M-R Lottery Hunts, and Schafer Farm hunting areas.

- Hunters will be restricted to the selected area and specified method of harvest until they check out at the HCS. Upon checking into an area, the hunter must report directly to the area they are checked into. Hunters leaving their designated hunt zone for any reason must proceed directly to the HCS to check out. Hunters must check back in when returning. No hunting spots will be reserved.

- Hunters may check into the South Tract for hunting via calling into the HCS. The hunter must provide vehicle description and license plate number to the HCS Manager. Hunters must physically check out at the HCS if a deer is harvested. If no deer are harvested, the hunter may check out via calling the HCS manager. Hunters are required to check in and out every time they enter or exit the South Tract, change areas on the South Tract, or change hunting methods of harvest.

V. Public Engagement

A. Outreach for Announcing and Publicizing the Hunting Program

The refuge maintains the hunting program information on its website and MNHA website both of which are updated as needed. The refuge has a Hunt Outreach Plan that maintains mailing lists schedules of communication events for news release purposes to local papers and providing postings to community activity boards/calendars. Information may also be released in the form of special announcements, social media posts and articles in conjunction with hunting seasons when needed. In addition, information about all of the hunts will be available at NWVC, HCS, North Tract Visitor Contact Station and the Service's Find Your Hunt website at: https://www.fws.gov/refuges/hunting/map/

B. Anticipated Public Reaction to the Hunting Program

Overall, hunting has been allowed on PRR for over 20 years and little negative reaction is expected for most of the proposed changes put forth in this plan. There may be some concerns about the lack of furbearer hunting opportunities, as additional opportunities for furbearer hunting were considered but not added at this time. We will consider the addition of these opportunities in the future.

The refuge anticipates some public concern about obtaining non-lead ammunition given the phasing out of lead use on the refuge. It is for this reason that the proposed requirement to use non-lead ammunition will not be put into place until fall 2026, providing hunters and anglers time to transition their supplies.

A total of four comment letters were submitted that offered input to the refuge. Any comments and our responses can be found in the Finding of No Significant Impact (Appendix D).

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

Hunters are required to pick up the refuge hunting guidelines when they pick up their hunting permit. General information regarding hunting and other wildlife-dependent public uses can be

obtained by calling (301) 497-5770. Dates, forms, hunting unit directions, maps, applications, and permit requirements about the hunts will be available on the station website at: *https://www.fws.gov/refuge/patuxent-research/visit-us/activities/hunting* and at the NWVC – 10901 Scarlet Tanager Loop Laurel, MD 20708, North Tract Contact Station - 230 Bald Eagle Drive Laurel, MD 20708 and the Hunt Control Station located on the North Tract.

VI. Compatibility Determination

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

VII. References

U.S. Fish and Wildlife Service. September 2013. Patuxent Research Refuge Comprehensive Conservation Plan.

VIII. Hunt Maps

Figure 2. Map of North Tract Hunt Area on Patuxent Research Refuge

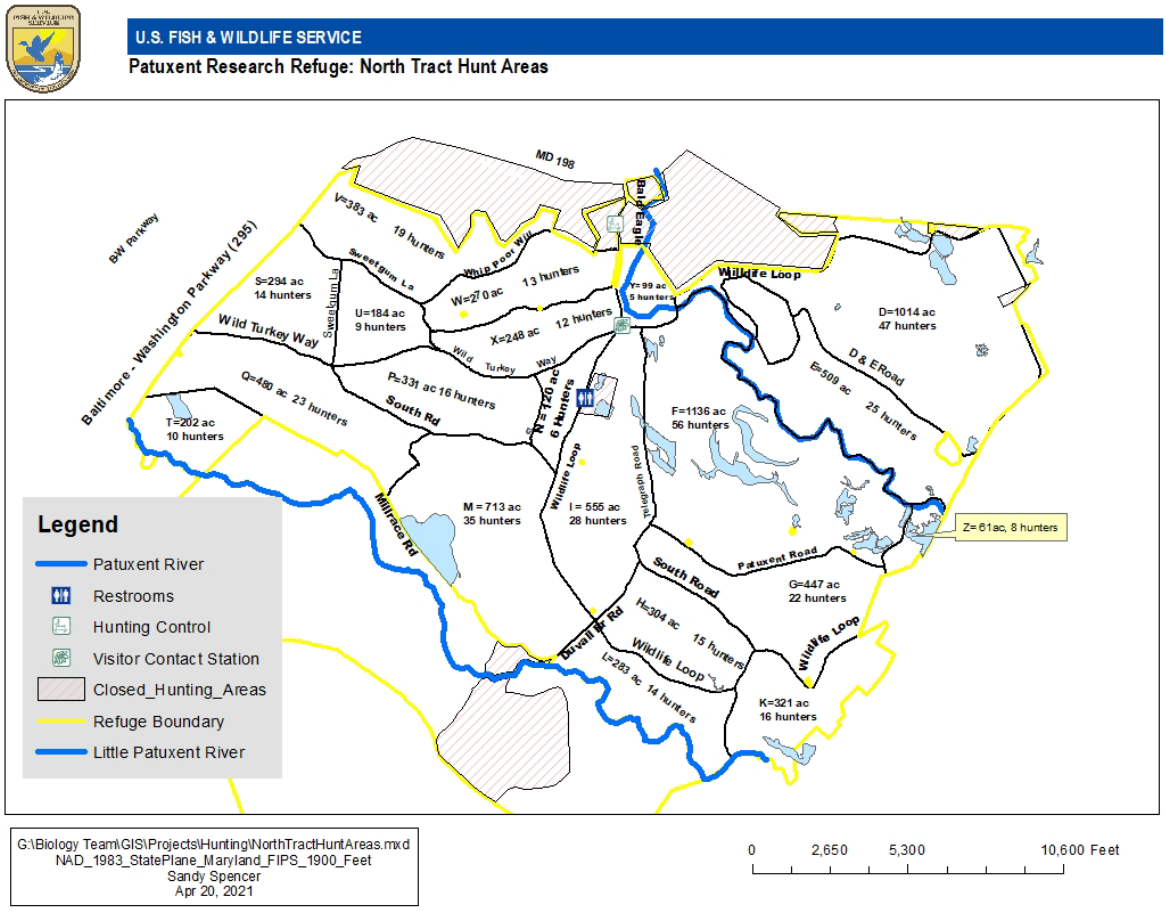


Figure 3. Map of Central Tract Controlled Deer Hunt Sites on Patuxent Research Refuge

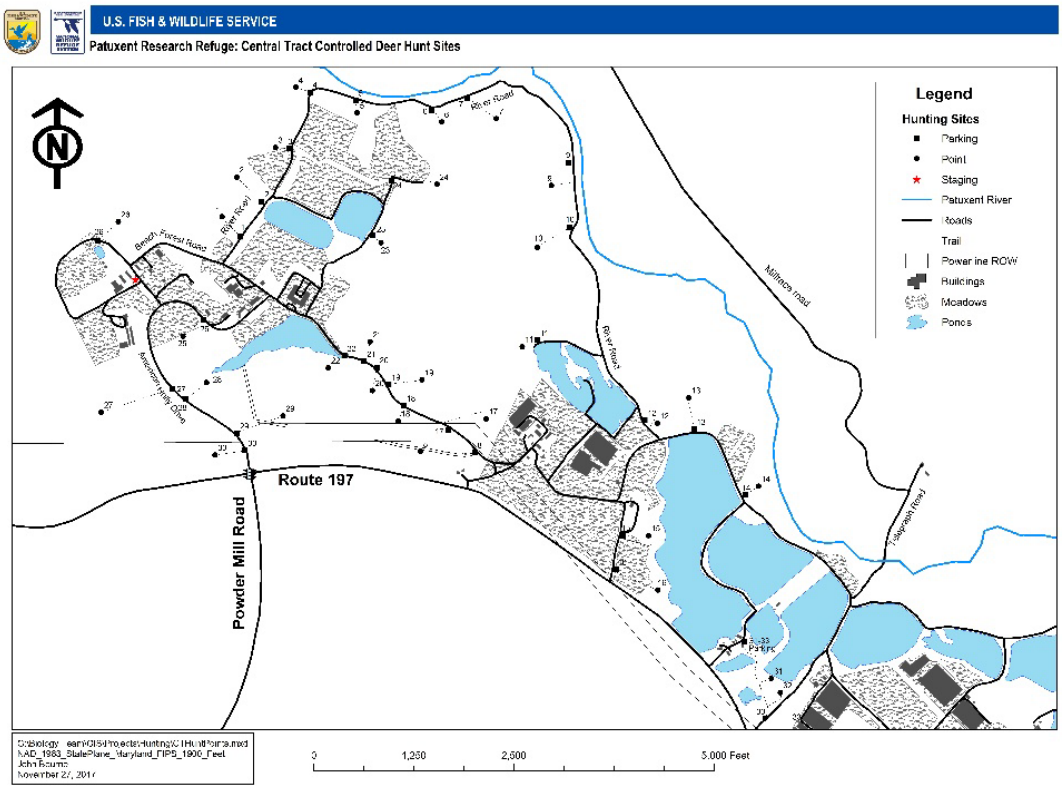


Figure 4. Map of Millrace Hunt Area on Patuxent Research Refuge

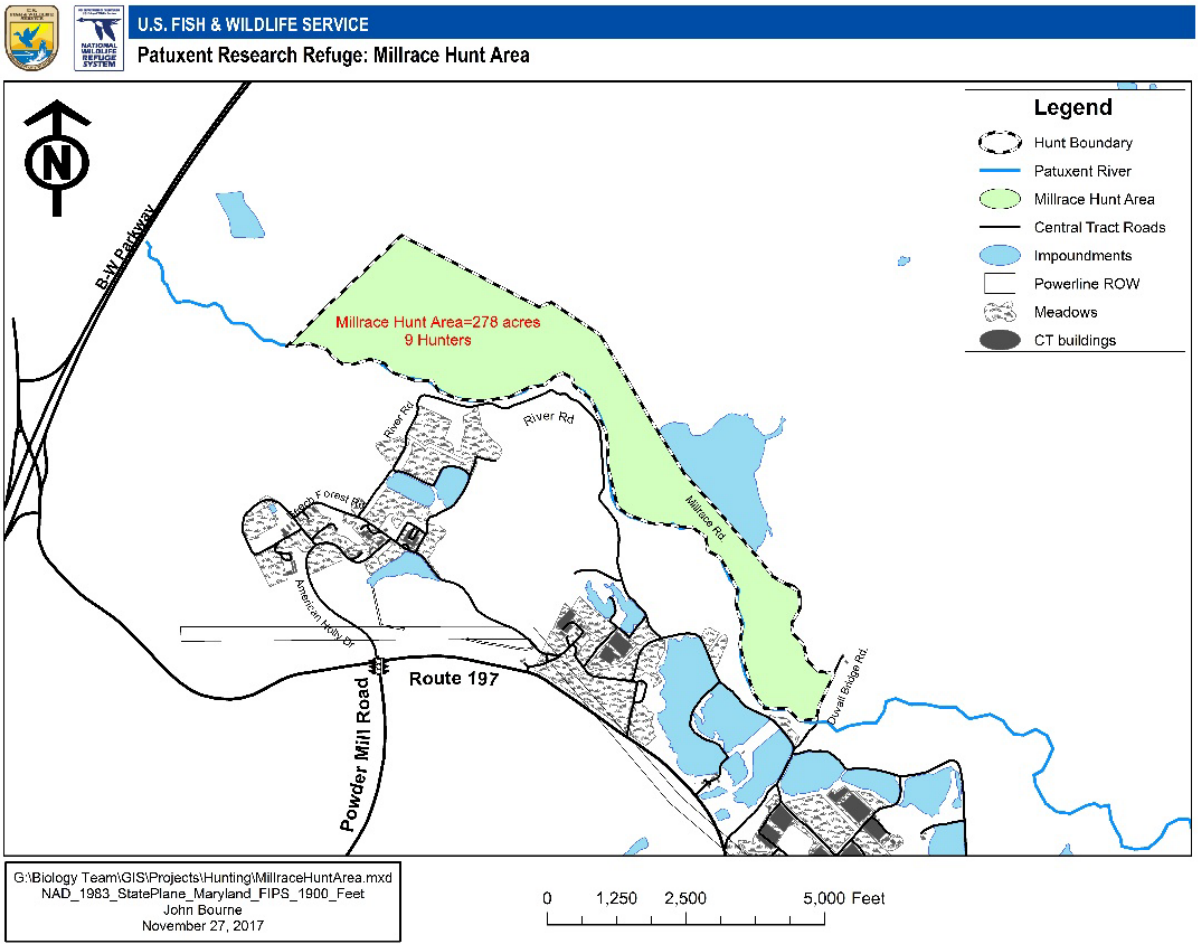


Figure 5. Map of Schafer Farm Hunt Unit on Patuxent Research Refuge

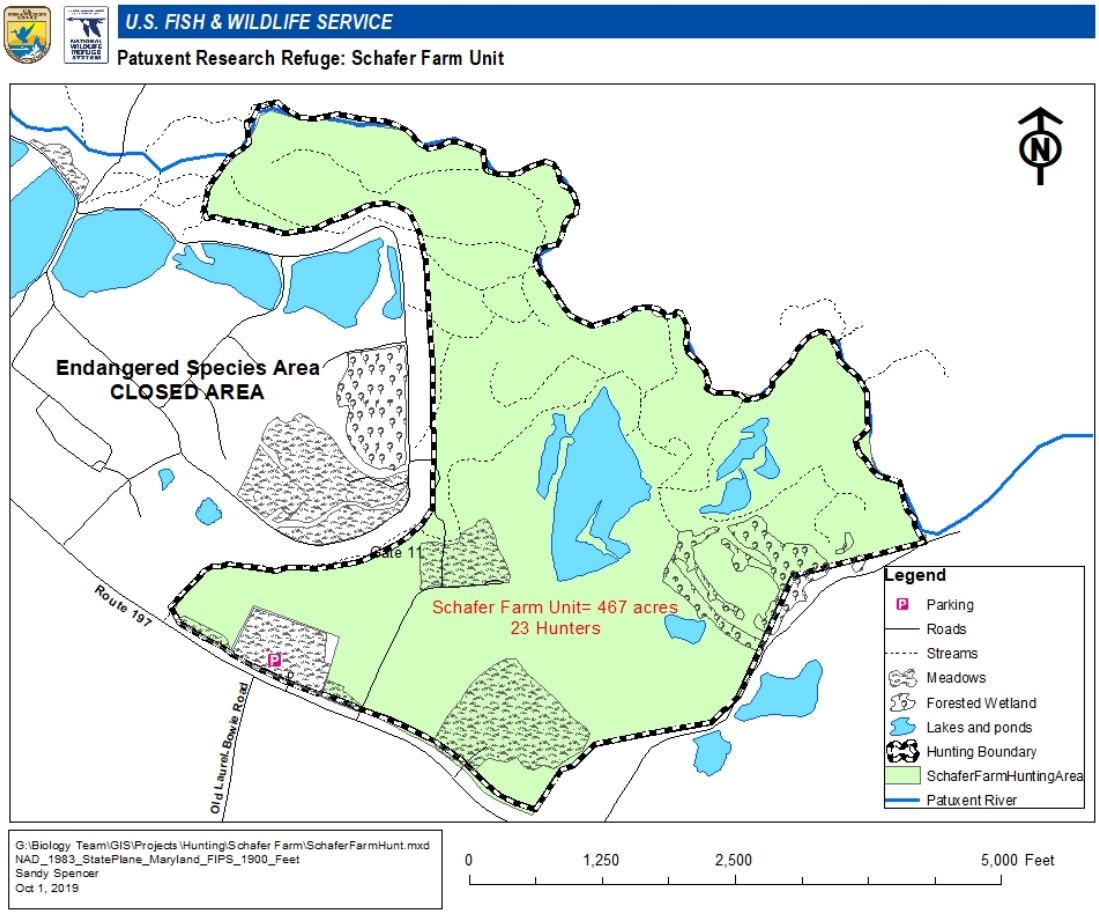
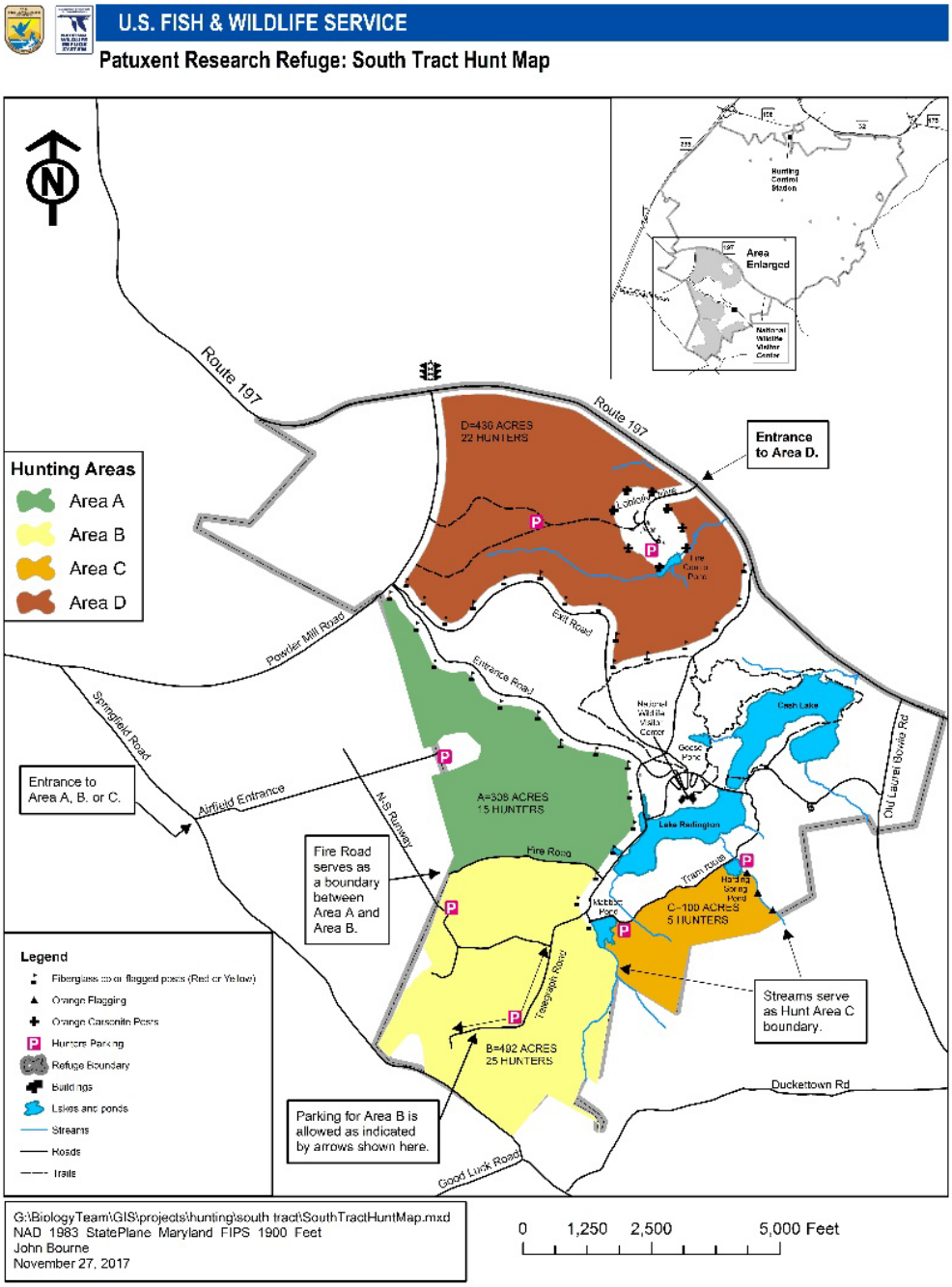


Figure 6. Map of South Tract Hunt Unit on Patuxent Research Refuge



COMPATIBILITY DETERMINATION

USE: Hunting

REFUGE NAME: Patuxent Research Refuge

DATE ESTABLISHED: December 16, 1936

ESTABLISHING and ACQUISITION AUTHORITY(IES):

- Executive Order 7514, dated December 16, 1936;
- Executive Order 11724, dated June 27, 1973;
- Migratory Bird Conservation Act of 1929 (16 U.S.C. 715d);
- Endangered Species Act (16 U.S.C. 1534);
- An Act Authorizing the Transfer of Certain Real Property for Wildlife or other purposes (16 U.S.C. 667b, dated May 19, 1948);
- Defense Appropriation Act – including transfer of the North Tract from Fort Meade (Public Law 101-519 Sec. 126, 104 Stat. 2247, dated November 5, 1990).

REFUGE PURPOSE(S):

- "...as a wildlife experiment and research refuge" – Executive Order 7514, dated December 16, 1936.

- "…recreation, conservation, wildlife preservation, and related scientific and educational activities" – Executive Order 11724, dated June 27, 1973.

- "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" – 16 U.S.C. 715d, dated February 18, 1929 (Migratory Bird Conservation Act).

- "...to conserve fish, wildlife and plants, including those which are listed as endangered species or threatened species" – 16 U.S.C. 1534, dated December 28, 1973 (Endangered Species Act).

- "...particular value in carrying out the national migratory bird management program." – 16 U.S.C. 667b, dated May 19, 1948 (An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes).

- "...the Secretary of the Interior shall administer the property transferred pursuant to subsection (a) consistent with wildlife conservation purposes and shall provide for the continued use of the property by Federal agencies to the extent such agencies are using it on the date of the enactment of this Act." – Public Law 101-519 Sec. 216, 104 Stat. 2247, dated November 5, 1990 (Defense Appropriation Act – including transfer of the North Tract from Fort Meade).

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 public hunting of big game (white-tailed deer and wild turkey), upland game (gray squirrel, woodchuck and eastern cottontail rabbit), and migratory birds (mourning dove, ducks, sea ducks, light geese, and dark geese) on Patuxent Research Refuge (PRR, refuge). Hunting was identified as one of six priority public uses of the Refuge System by the National Wildlife Refuge System Administration Act (NWRSAA) 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?
Hunting will be conducted on approximately 11,083 acres divided into three tracts with multiple hunting units/zones within each tract.

North Tract consists of 7,954 acres open for hunting from September to May in accordance with Maryland Division of Natural Resources (MDDNR) regulations. The North Tract is made up of 20 hunting areas.

Central Tract, partially separated from the North Tract by Patuxent River to its north and from South Tract by Route 197 to its south, is largely fenced in and consists of three separate hunt areas totaling 1,793 acres. The Central Tract Lottery Hunt Area provides approximately 1,048 acres of deer habitat, but hunters are required to use stands at 33 designated points because of all the offices, residences, and U.S. Geological Surveys (USGS) operations facilities (excluded from hunt acreage) on this Tract. Central Tract's Schafer Farm Hunt Area (467 acres) is available for hunting from September to May in accordance with MDDNR regulations. Central Tract's M to R area (278 acres) is available for turkey hunting in April and May and deer hunting via lottery in November and December.

South Tract consists of four areas available for hunting from September to May in accordance with MDDNR. Areas A, B, C, and D total 1,336 acres. One of the mentored hunts will be held in December on the South Tract Area D (Loblolly Area) for deer. See Figures 1 to 6 in the Hunting Plan for maps of the hunt units and zones.

(c) When would the use be conducted?
Public hunting is conducted in accordance with the State of Maryland's big game, upland game, and migratory game bird hunting seasons and in accordance with Federal and refuge-specific regulations (50 CFR 32.39). Hunting generally occurs from September 1 through February 5, except for spring turkey season. The spring turkey season is in April and May.

Hunting is conducted in accordance with state regulations and legal shooting times during daylight hours. Public hunting access is from 5:00 AM to 1 hour after sunset, Monday through Saturday. Hunting is not allowed on Sundays or Federal holidays.

(d) How would the use be conducted?
Public hunting is conducted in accordance with State and Federal regulations. The hunt program is operated through partnership with the MNHA, a cooperating association. The refuge manager may, upon review of the hunting program, impose further restrictions on hunting activity, open or close certain seasons or areas or amend the conduct of the hunt if hunting becomes inconsistent with other higher priority refuge programs or endangers refuge resources or public safety.

After purchasing a hunting permit from MNHA, hunters check in at the Hunting Control Station (HCS) on the North Tract and select an open zone for hunting. All harvested animals are checked through HCS, and biological data is recorded. All hunters must check out through HCS when they are finished hunting for the day.

A lottery-style spring turkey hunt will be held mid-April through May. Two special out-of-season deer shotgun and archery harvest authorizations are obtained from the Maryland DNR annually for controlled hunts on the Central Tract that take place in November and December to maintain deer populations at or below carrying capacity and to protect habitat and wildlife health. In collaboration with multiple partners, the refuge will host mentored hunts where possible. Mentored hunts will target providing opportunities for underrepresented groups of hunters (women, minorities, veterans, youth, and disabled hunters) with a goal of contributing to recruitment, retention, and reactivation of hunters (State of MD R3 efforts).

More information on mentored hunts being offered each year will be made available on the refuge website, at the refuge Visitor Center, at the North Tract Hunter Control Station, and at the Visitor Contact Station.

The use of non-lead ammunition for deer hunting will initially be voluntary and will be required after a 4-year proposed phase-in period beginning in fall 2026. This proposed phase-in period will allow hunters time to adapt to the new regulations without diminishing hunting opportunities on the refuge. The refuge staff will provide information to assist in this transition that benefits wildlife.

The hunting program will be reviewed annually or as needed, in consultation with MDDNR, to assess its effectiveness and ensure wildlife populations and habitat quality are managed appropriately. In addition, refuge-specific regulations listed under “Stipulations Necessary to Ensure Compatibility” will apply.

North Tract: Some hunting areas may be closed due to active firing ranges on the refuge. Big game (white-tailed deer and wild turkey), upland game (rabbit, woodchuck, gray squirrel), and migratory game bird (mourning dove and waterfowl, including ducks, sea ducks, light geese, and dark geese like Canada goose) hunting will be permitted during their respective State seasons, except in areas closed to hunting, or when the refuge hunt season has ended.

Shotgun, muzzleloader, archery, and primitive seasons are allowed for deer hunting. Upland game (gray squirrel, woodchuck, and eastern cottontail rabbit), migratory game bird (mourning dove, ducks, sea ducks, light geese, and dark geese), and wild turkey seasons will be permitted during their respective seasons, except in areas where no hunting is outlined, or refuge hunt season has ended. Open meadow, river, water impoundments, and hunting blinds are available for waterfowl hunters during the respective waterfowl seasons.

Central Tract: Deer hunting occurs in the refuge headquarters area and M through R areas. These hunts occur by lottery in November and December, and are for shotgun and archery only during special, controlled harvest dates. Use of designated tree stand sites is mandatory for the refuge headquarters area lottery hunts.

On Schafer Farm shotgun, muzzleloader, archery, and primitive seasons are allowed for deer hunting. Upland game (gray squirrel, woodchuck, and Eastern cottontail rabbit), migratory game bird (mourning dove), and wild turkey seasons will be permitted on Schafer Farm during their respective seasons except in areas where no hunting is outlined, or refuge hunt season has ended.

South Tract: Shotgun, muzzleloader, archery, and primitive seasons are allowed for deer hunting. Upland game (gray squirrel, woodchuck and, eastern cottontail rabbit), migratory game bird (mourning dove, ducks, sea ducks, light geese, and dark geese like Canada goose), and wild turkey seasons will be permitted during their respective seasons, except in areas where no hunting is outlined, or refuge hunt season has ended.

The Service will make a reasonable effort to allow hunters access to all portions of the refuge. The intention is to provide safe, quality hunting opportunities that consider the welfare of the refuge wildlife resources. Access points are delineated on the annual refuge hunt maps available at check in.

(e) Why is the use being proposed?
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. Public hunting on the refuge accommodates one of the priority public uses of the Refuge System. Hunting is used to assist in managing wildlife populations for the protection of wildlife habitat and health and, in some instances, to protect habitat for research. Hunting is critical to regulating and maintaining populations of deer at the carrying capacity of the habitat, thus reducing excessive damage to vegetation caused by over-browsing, maintaining understory habitat for other species, and maintaining habitat integrity for current and future wildlife related research.

Furthermore, 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, fishing, recreational shooting, and other forms of outdoor recreation. The proposed action would promote one of the priority public uses of the Refuge System. Providing opportunities for visitors to hunt would promote stewardship of our natural resources and increase public appreciation and support for the refuge.

AVAILABILITY OF RESOURCES:

Public hunting occurs over a 7-month period and requires considerable staff time. Annual administrative costs for the refuge hunting program are shared between the Service and MNHA. During the hunting season, staff time is spent on the annual planning and writing of the hunt regulations, preparing printed materials such as maps and hunt regulations, posting hunt area boundaries, prepping roads, preparing for parking and access, providing orientation, entering and analyzing harvest data, coordination meetings with range partners, law enforcement activities, hiring and training hunt control station managers, maintaining or updating the hunter and harvest databases, and coordinating the lottery hunts. Expenditures on hunt-related activities in 2020-2021 season were approximately $22,500. Supplies such as Carsonite signs, posts, and laminate material for signage cost the refuge about $2,500 annually. Gravel hunt road repairs and upkeep cost approximately $20,000 per year. The refuge is fortunate to have volunteers from MNHA to assist with hunt check station duties on hunt days, maintain the hunt check station and related outbuildings and premises, sell the permits, assist with publications or advertising, oversee hunter qualifications, and many other services all of which amount to a considerable cost savings to the refuge.

Table A-1. Funding and Staffing Requirements

Identifier	Cost
Staff time to implement hunt program (Maintenance Workers, Biologist, Park Rangers, and Refuge Managers)	$12,000
Maintain roads, parking lots, trails*	$20,000
Maintain hunting signs	$2,500
Total Annual Cost	**$34,500**

**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 costs of the program.*

The fees charged for hunting permits and memberships help fund administrative costs for the services MNHA provides to the hunt program, such as payroll for three hunt control station managers, employment insurance, waste management, Hunters for the Hungry carcass processing, utilities for the check station and grounds, and communications by web and mail. The fees were increased in September 2017 – hunt permits cost $70.00 for adults, $35.00 for youth and seniors.

ANTICIPATED IMPACTS OF THE USE:

The overall impacts of this use are fully reviewed and discussed in the Patuxent Research Refuge Hunting Plan (Appendix B - Environmental Assessment).

White-tailed Deer
White-tailed deer is the most intensely hunted of all game species offered at the refuge, and likely will remain so. For PRR to meet the State's preferred density, the deer population would

need to be limited to about 374 deer for the refuge's suitable deer habitat of 11,981 acres (18.72 square miles). Based on harvest data from 2009 to 2016, the deer population ranged from 278 to 794, and density ranged from 22.1 to 63.2. There could be temporary, localized population reductions for white-tailed deer. We estimate that with 5,000 to 6,000 hunt visits, an average annual harvest of more than 200 deer is expected.

Non-lead ammunition is required for all hunting on the refuge with the exception for deer. The voluntary use of non-lead ammunition for hunting deer will initially be encouraged, and by 2026 will propose to be required for use after a 4-year phase-in period. This proposed phase-in period will allow hunters time to adapt to the new regulations without diminishing deer hunting opportunities on the refuge. The refuge staff will provide information to assist in a valuable transition period that benefits fish, wildlife, and people. The transition to non-lead ammunition is not expected to impact harvest of big game species.

Wild Turkey
The MDDNR conducts an annual observation survey during the months of July and August of wild turkey reproductive success (Long 2017). Overall, estimated production has declined in the past 2 years with a reproductive index of 1.9 poults per hen in 2020 compared to 2.8 in 2019, and 2.7 on average over the last 15 years. The harvest rate of wild turkey on the refuge over the past decade has been low, ranging from a total of 20 harvested in 2021 and the lowest in 2008 of 4 turkeys. With a restriction on the number of turkey hunt dates offered, a lower hunter density, and a reduced bag limit of 1 turkey per year, we anticipate that the refuge turkey population will not be negatively impacted and should remain viable and resilient for the foreseeable future.

Upland and Small Game
Squirrel harvests over the past 20 years since 2000 ranged from 196 in 2001 to a low 14 in 2006. However, 14 out of 20 harvests during the period remained above 60. While no formal surveys have been conducted to assess current Eastern gray squirrel population abundance on refuge lands, we assume that, given the supportive habitat and their reproductive potential, expected hunting pressure is insufficient to have a significant adverse impact on the population.

Rabbit hunting has not received high participation on the refuge in the past due to scattered habitat and a prior refuge regulation that did not allow for the use of dogs while hunting. In most years, fewer than 10 rabbits were harvested each year. We anticipate a slight increase in rabbit hunting and harvest with allowing the use of dogs for this activity. Woodchuck hunting has received very little or no participation since it was opened. We anticipate fewer than 10 harvested each year, and this will likely result in a negligible impact on the local populations. The refuge is primarily forested, and most rabbits and woodchuck occur on the Central Tract where hunting is more restricted due to office complexes, residences, and USGS captive species research pens. This will limit the overall harvest of these species due to where they are found on the refuge.

Migratory Game Birds
Waterfowl on the refuge are present in numbers sufficient to allow hunting while not compromising other refuge objectives. Waterfowl hunts have been conducted on the North Tract since prior to transfer to the Service in 1991-1992. The PRR hunt season for waterfowl opens in alignment with the State's season and closes after the second State special hunt waterfowl day

(usually the first weekend in February). Migratory game bird hunting is suspended on the refuge during the firearms season and early deer muzzleloader season except in a few locations. The refuge adheres to State and Federal regulations with respect to daily bag limits.

The number of individuals harvested on the refuge, though additive to local, regional, and Atlantic Flyway harvest, is negligible to their populations. As migratory game bird species populations continue to be monitored, future harvests will be adjusted as needed under the existing processes. Canada goose is the most numerous waterfowl species harvested on the refuge, followed by wood duck and mallard partly due to establishing and growing resident populations. The number of geese harvested in each year is too low relative to the average population on the refuge or in the State to have a significant impact. Other waterfowl species harvested on the refuge but often in very small numbers annually (some less than 1 bird) include hooded merganser, American black duck, American green-winged teal, bufflehead, ring-necked duck, ruddy duck, lesser scaup, Atlantic brant, gadwall, Northern shoveler, and redhead.

Canada geese, mallard, wood duck, and mourning dove harvests are expected to slightly increase with the addition of allowing the use of dogs and expansion of hunting areas (i.e., South Tract and Schafer Farm).

Non-target Species

Non-target wildlife includes any forest-dependent species of the Mid-Atlantic portion of the Eastern biome. PRR provides habitat for at least 38 mammal species, 55 amphibians and reptiles, 25 orders of insects, 248 bird species, and 55 species of fish. A comprehensive list of species known to occur at PRR can be obtained from the refuge's 2013 Comprehensive Conservation Plan (CCP).

Impacts expected to result from fall and winter hunting on the refuge include trampling of vegetation, flushing of wildlife, spread of invasives via clothing, footwear, and tires, and road mortality from vehicles on back roads. In general, the presence of humans will disturb most animals, which typically results in short-term adverse impacts without long-term effects on individuals and populations. Because of the low density and dispersed nature of people hunting on the refuges, chronic adverse impacts on wildlife populations from hunting-related disturbances would be negligible in most instances.

Flushing of Eastern red bats roosting in leaf litter during winter may occur, especially where dogs are permitted for hunting. Trampling of vegetation or flushing breeding birds may be moderately higher risk during the spring turkey season (April to May). The refuge has an extensive road system maintained primarily for hunting. Although vehicles are only allowed on paved or gravel roads and no off-road vehicles are allowed, there remains risk to wildlife crossing roads in late spring or early fall during hunting or scouting, and extensive graveling, paving, or daylighting of roads may cause isolation of populations of environmentally sensitive amphibians such as salamanders that cannot cross such substrates.

The best available science indicates that lead ammunition may have negative impacts on wildlife and human health, and the environment (Golden et al. 2016). To move towards reduction and future elimination of this threat on the refuge, we will be eliminating the use of lead ammunition

over a 4-year period to educate and work with hunters on the use of non-lead alternatives. The proposed phased transition to lead-free ammunition for all hunting will minimize the inadvertent exposure and subsequent lethal or sub-lethal impacts to bald and golden eagles, as well as other scavenging species. Eagles and other 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 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 will continue 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 poisoning may weaken raptors by reducing their strength and coordination, leading to muscle and weight loss, reducing motor skill function, and making them lethargic, which may make them more susceptible to disease, vehicle strikes, or power line accidents and increases mortality rates by leaving them unable to hunt (Golden et al. 2016; Kelly and Kelly 2005; Kramer and Redig 1997; O'Halloran et al. 1989). The bioaccumulation of lead is a potential concern, but it does not likely present a significant issue on this refuge, as: 1) non-lead shot is currently required for hunting waterfowl; 2) we are proposing a 4-year phase out to the use of lead ammunition and tackle for all species by 2026; 3) the refuge strongly encourages use of non-lead alternatives for hunting big game and coyote for the next 4 years; 4) we will educate hunters, anglers, and the public to the potential adverse impacts of lead; and 5) the updated hunting and fishing activities are not likely to introduce substantially more lead into the environment over existing amounts with the current or proposed programs. Some hunters will also choose non-lead methods of take such as archery.

Habitat and Vegetation

About 10,000 acres of the total 12,841 acres are forested. Refuge forests contribute to one of the largest blocks of contiguous forested habitat in the Baltimore-Washington region of Maryland. Other habitat types include grasslands/old fields, emergent freshwater marshes, shrub and early succession forest communities, and constructed impoundments. Plant species assembled from historical data and recent updates provides 985 total plant species including 554 herbs/forbs, 209 graminoids, 165 trees/shrubs, 65 sedges, and 39 vines (Harms 2019; Hotchkiss and Stewart 1979; Perry and Bond 2011).

Negative impacts of recreational hunting could include the temporary trampling of vegetation and light soil erosion. Most hunting activities occur during the fall and winter, when plants become dormant, and the ground is often frozen and/or covered in snow. Hunters would have minimal impacts on plants during this period. Additionally, hunter use during all seasons will be dispersed throughout the refuge, minimizing the impact to any one area.

Controlling the deer population is a strategy that directly supports the goals and objectives for floodplain and upland forest habitats in the refuge CCP (USFWS 2013*a*).

Threatened and Endangered Species

The refuge provides habitat for forest-dependent threatened or endangered species such as the Northern long-eared bat (*Myotis septentrionalis*, federally threatened). The Patuxent and Little

Patuxent Rivers which flow through the refuge support at least three mussel species and may support the federally threatened yellow lance (*Elliptio lanceolata*), which requires healthy and intact floodplain forest for stream and river water quality.

The NLEB may occur in some hunting zones but are not likely to experience any disturbance even if bats and hunters may briefly overlap in time and space. This species is not known to winter in this region; it is only present in spring and summer (April – September). The only overlap with hunting that may occur is with the May turkey hunting and/or September bow season. With a restriction on the number of turkey hunt dates offered, a lower hunter density, and a reduced bag limit of 1 turkey per year, we anticipate that turkey hunting will occur in locations that are very unlikely to overlap with the presence of bats, and any potential disturbance effects from turkey hunting are extremely unlikely to occur and are therefore considered discountable.

Bats are typically nocturnal and inactive during most hunting seasons and times, and not present for most of the hunting seasons; therefore, disturbance would be highly unlikely. The species roosts in spring and summer in exfoliating bark of snags, downed logs or dense leaf clumps in trees. During the fall hunting season, gunshots could result in flushing of bats from roosting trees; however, bats are more likely to remain in the trees during daylight hours. Such disturbances are temporary and last only for the duration of the noise, not fundamentally unlike other temporary disturbances that bats may naturally experience without long-term effects, and therefore any potential effects are expected to be insignificant. Other possible disturbances include hunters climbing and placing portable tree stands on trees. However, hunters typically select live trees for safety reasons while bats are most often in dead or dying trees with large slabs of peeling bark. Further, hunting activities would not result in any roost tree destruction as no tree cutting or other habitat alteration is permitted on the refuge.

Because the potential for overlap in time or space between hunters and bats is very low; because the expected impacts to roosting bats, even if there is overlap, are insignificant; and because the potential for lead impacts are discountable, the proposed hunting activities are not likely to adversely affect the NLEB.

Hunters are most likely to use tracts through forested parts of the refuge, where monarchs and their nectaring plants generally do not occur. Furthermore, given that only light foot travel from hunters accessing the area is expected to occur on these acres, we anticipate that any potential damage to nectaring plants from foot traffic disturbance will be extremely unlikely, and therefore considered discountable. While hunters are walking through habitat used by monarchs, there could be some impacts including flushing while resting or feeding. This disturbance is minimal as the monarchs easily move to another spot when disturbed. Furthermore, hunting does not result in the removal of vegetation, including nectaring sources or milkweed, and so it would have negligible impacts to habitat resources important for monarchs. Noise disturbance from discharging of a firearm while hunting may startle the species resulting in change in flight pattern or a startle response in caterpillars, but this impact will not result in long-term negative impacts and is considered discountable as this type of noise is not frequent enough to result in habituation to noise that could cause butterfly to not respond to natural threats like parasitism (Taylor and Yack, 2019).

Hunting activities are not likely to adversely affect yellow lance or other mussel species because they are an aquatic species living in flowing waters, largely isolated from hunting activity. Therefore, the proposed activities are not likely to overlap in space with the yellow lance mussel, so any potential effects from disturbance are extremely unlikely, and therefore considered discountable.

Due to the inaccessibility of hunters to the lone suitable habitat of beetles, and because the species likely isn't even present on the refuge, the proposed hunting activities are not likely to adversely affect Puritan tiger beetles.

There have been many botany forays throughout the refuge's 85-year history, and to date swamp pink and sensitive joint vetch have not been found. There are no known occurrences of swamp pink or sensitive joint vetch, and any impacts from hunting or the associated use of lead ammunition would be considered discountable because they are extremely unlikely to occur. Therefore, the proposed activities are not likely to adversely affect either species.

The bioaccumulation of lead is a potential concern, but it does not likely present a significant issue on this refuge as: 1) non-lead shot is currently required for hunting waterfowl; 2) we plan to require the use of non-lead ammunition on the refuge at the beginning of the fall 2026-2027 hunting season; 3) the refuge strongly encourages use of non-lead alternatives for hunting big game for the next 4 years; 4) we will educate hunters and the public to the potential adverse impacts of lead; and 5) the updated hunting activities are not likely to introduce substantially more lead into the environment over existing amounts with the current or proposed programs. Some hunters will also choose non-lead methods of take such as archery.

For more detail, see the completed Intra-Service Section 7 Evaluation (Appendix C). Species evaluated are: Northern long-eared bat, yellow lance mussel, Puritan tiger beetle, sensitive joint vetch, swamp pink, and monarch butterfly. Hunting activities may affect, but are not likely to adversely affect, any threatened or endangered species at PRR. However, if there is a potential for hunting activities to have a negative impact on such species, or a new species of concern is identified on refuge lands, we will reevaluate our programs and implement program changes as necessary.

Other Species of Concern

Other species of concern include the bald eagle, spotted turtle (at-risk species), and the monarch butterfly (candidate species for listing). Deer hunting occurs from September through the end of January, with the most participation from October through early December when eagles are not nesting. The refuge only has one known bald eagle nest; however, it does support a small group of foraging eagles during the hunting season. To avoid flushing during nest building or adults incubating, the road nearest to the nest is closed from December 1 to July 1. Fall mowing for waterfowl hunt preparation or roadside mowing destroys host plants and nectar plants for the migrating monarch butterfly. These minor impacts are primarily from September to mid-November, when monarchs have passed, and plants have senesced.

Spotted turtles usually prefer shallow water habitats, such as swamps, ponds, bogs, marshy wetlands, creeks (including tidal ones) or ephemeral pools, but at times may be found in forested

areas some distance from water. Depending upon population location, seasonal activity begins in the late winter to early spring, and turtles are most active during the day. The greatest threats to spotted turtles are the loss, degradation and fragmentation of habitat from wetland alteration, development, pollution, invasive species, and natural vegetational succession. The few potential disturbances of hunting, such as foot traffic of hunters or gun noise, would be a temporary inconvenience and likely only result in negligible impacts to the population. If there is a potential for hunting activities to have a negative impact on such species, or a new species of concern is identified on refuge lands, we will reevaluate our programs and implement program changes as necessary.

Visitor Use
PRR is open to all six of the priority public uses that are outlined in the Refuge System Improvement Act of 1997, which include hunting, fishing, wildlife photography, wildlife observation, environmental education, and interpretation. In 2020, 248,448 people visited the refuge and 5,826 of those visits were for hunting.

Hunting, especially for species like waterfowl and deer, is a traditional activity during the fall in Maryland. As such, few conflicts among user groups have involved hunters or hunting on the refuge. The small number of hunter complaints or conflicts each year usually involve other hunters. Refuge visitors using trails (birdwatching, walking, photography) are the most affected by hunting activities. In order to address safety concerns of non-hunting visitors and trail use, the refuge staff has increased outreach and clearly posted trail signs and designated safety zones on the refuge. The number of hunters and the amount of time spent hunting is expected to slightly increase due to expanded refuge hunting opportunities on the South Tract and Schafer Farm areas of the refuge. It is likely that 40 to 50 additional hunters will use the South Tract and Schafer Farm areas for hunting. Novice deer hunters and their mentors may increase hunting pressure during the mentored deer hunt on the South Tract (Loblolly Area), but the only anticipated conflicts will likely be from other hunters.

The refuge takes several measures to avoid public use conflicts and to ensure public and hunter safety while accommodating multiple user groups. For example, zones are closed to all other uses during the morning or afternoon turkey hunt dates; during deer firearms season, all public use is confined to roads or no-hunt zones; and all visitors to the North Tract are required to check in at the Hunter Contact Station at the beginning of their visit, which affords an opportunity to inform them of hunt safety restrictions. Hunters are assigned to areas, stands or zones in the field at check in at the Hunt Control Station and required to wear hunter fluorescent orange/pink according to refuge hunt regulations.

With few exceptions, hunting is not allowed on or across any road (paved, gravel, dirt, opened and/or closed), within 50 yards of any road, within 150 yards of any building or shed, and within 25 yards of any designated “No Hunting” or “Safety Zone” area. The 50-yard buffers around public roads or public use wildlife viewing areas are marked to aid hunters in avoiding these areas. On the Central Tract, hunters are required to use 10-foot-high stands at designated points which have directional markers to control direction of fire. Hunting units can be opened or closed to accommodate any special needs.

While non-lead ammunition has become essentially equivalent in price to lead ammunition, certain types of non-lead ammunition can cost more than certain types of lead ammunition. However, the price of non-lead ammunition is the same or less than that of premium lead ammunition. In order to prevent the negative impacts of this switch, the refuge has begun and will continue specific outreach about the requirement to these groups and has put in place measures to mitigate the economic input beyond the phased implementation in fall 2026, which already affords hunters time to gradually transition their supplies of ammunition. The Service will continue educating hunters on the use of non-lead ammunition during the proposed phased in time period, provide resources on companies that produce non-lead ammunition for purchase and work with partner organizations on non-lead ammunition giveaways or exchanges if possible.

Further details pertaining to hunting safety are published in the refuge's annual hunt regulations booklet. Assessed and adjusted annually, these measures enable staff to ensure separation of conflicting uses so that hunting will have little interference and direct impact on other ongoing public use activities.

PUBLIC REVIEW AND COMMENT:

This Compatibility Determination (CD) is part of the Patuxent Research Refuge Hunting Plan and the accompanying NEPA compliance. The plan was coordinated with all interested and/or affected parties, including State partners. We released the draft plan, CD and EA for public review and comment from May 3 through August 8, 2022, a total of 97 days. We will inform the public through local venues, the refuge website, and social media. A total of four comment letters were submitted that offered input to the refuge. Any comments and our responses can be found in the Finding of No Significant Impact (Appendix D).

DETERMINATION (CHECK ONE BELOW):

_____ Use is not compatible

___X__ 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 PRR in accordance with State and Federal regulations and special refuge-specific restrictions (50 CFR 32.39) to ensure that wildlife and habitat management goals are achieved, and that the program provides a safe, high quality hunting experience for participants. This hunting program will be monitored and potentially modified or eliminated if any of the program's components are found not compatible. The following stipulations are necessary to ensure compatibility:

- We allow the hunting of rabbit, woodchuck, and gray squirrel in designated areas of the refuge in accordance with regulations and seasons set forth by the State from September 1 to January 31 only. Upland hunting for these species is closed on the refuge the remainder of the Maryland State season.

- Hunters are required to check in and out at the HCS every time they enter or exit the refuge, change hunting methods of harvest, or change hunting areas including North Tract, Central Tract and M-R Lottery Hunts, and Schafer Farm hunting areas.

- Non-lead ammunition is required for hunting upland game, migratory birds, and turkey. By fall 2026, we will propose to require the use of non-lead ammunition for hunting deer.

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 national wildlife refuges can be an important, proactive management action 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.

Hunting will not materially interfere with or detract from the research purpose of the refuge, because wildlife research can occur throughout the year, while hunting is limited to hunting seasons. In addition, there are certain days of the week and areas of the refuge that are not open to hunting where research can occur. These uses will not materially interfere with or detract from the two purposes related to wildlife conservation because hunting seasons reduce deer populations to levels that reduce the intensity of grazing which provides improved wildlife habitat, a healthier deer population, and increased plant diversity. The other target species also are hunted at levels to protect their regional populations. Hunting will occur on a portion of the refuge; as a result, some habitat will not be impacted at all. Hunting will not materially interfere with or detract from the two refuge purposes related to migratory bird conservation because bag limits and seasons for waterfowl hunting are set at a flyway scale such that these limits will not impact regional populations. In addition, deer hunting will reduce the size of the deer population, which will improve forest interior habitat quality for migratory land birds.

Since the land transfer of the North Tract from the Department of Defense to the Service in 1991, public hunting has been a wildlife-dependent priority public recreational use that is consistent with the purposes for which the refuge was established, the Service policy on hunting, the Improvement Act, and the broad management objectives of the Refuge System. The former U.S. Army/Fort Meade land (North Tract) has had a successful history of public hunting for over 30 years. At the time of transfer, hunting was continued as a public use that the military had previously allowed for the public.

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

SIGNATURE:
Refuge Manager

JENNIFER GREINER
Digitally signed by JENNIFER GREINER
Date: 2022.09.01 11:34:33 -04'00'

(Signature)

September 1, 2022
(Date)

CONCURRENCE:
Regional Chief (Acting)

HOLLY GABORIAULT
Digitally signed by HOLLY GABORIAULT
Date: 2022.09.02 12:17:50 -04'00'

(Signature)

9/2/22
(Date)

MANDATORY 15 YEAR RE-EVALUATION DATE: _____
(Date)

LITERATURE CITED:

Golden, N.H., S.E. Werner, and M.J. Coffey. 2016. A Review and Assessment of Spent Lead Ammunition and its Exposure and Effects to Scavenging Birds in the United States. P.de. Voogt (ed.), Reviews of Environmental Contamination and Toxicology 237:123-191.

Harms, William. 2019. Native Plant Inventory data. Refuge files.

Hotchkiss, N. and R.E. Stewart. 1979. Vegetation and vertebrates of the Patuxent Wildlife Research Center: outline of ecology and annotated lists (reprint with new supplements of vegetation of the Patuxent Research Refuge, MD). U.S. Department of the Interior, U.S. Fish and Wildlife Service, Laurel, MD.

Kelly A. and S. Kelly. 2005. Are mute swans with elevated blood lead levels more likely to collide with overhead power lines? Waterbirds 28: 331-334.

Kramer, J.L. and P.T. Redig. 1997. Sixteen years of lead poisoning in eagles, 1980-95: An epizootiologic view. Journal of Raptor Research. 31(4): 327-332.

Long, R. 2017. Maryland Department of Natural Resources. Personal communication. 16 November 2017.

O'Halloran, J., A.A. Myers, and P.F. Duggan. 1989. Some sub-lethal effects of lead on mute swan (*Cygnus olor*). Journal of Zoology 218: 627-632.

Perry, M.C. and C.S Bond. 2011. The herbaceous and woody plants of Patuxent Research Refuge. PRR, Laurel, MD 47 pp.

United States Fish and Wildlife Service. September 2013. Patuxent Research Refuge Comprehensive Conservation Plan. https://ecos.fws.gov/ServCat/Reference/Profile/43798

Environmental Assessment for Hunting
Patuxent Research Refuge

This Environmental Assessment (EA) evaluates the potential effects associated with the proposed action and complies 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 expand hunting access and opportunities for wild turkey, rabbit, gray squirrel, woodchuck, mourning dove, and white-tailed deer, and to provide mentored deer hunting opportunities during the Maryland deer hunting seasons at Patuxent Research Refuge (PRR, refuge) in accordance with the refuge's 2013 Comprehensive Conservation Plan (CCP) and 2021 Hunting Plan. PRR proposes to expand hunting on refuge-owned lands when found to be compatible and consistent with Federal, State and refuge-specific hunting guidelines.

As part of a next year's proposed rule, Patuxent Research Refuge will propose a non-lead requirement, which will take effect on September 1, 2026. The EA analyzes the impacts of lead ammunition; based on the breadth of comments received on the plan to require non-lead ammunition by 2026, the Service intends to complete additional analysis and provide another opportunity to comment during a next year's annual rulemaking.

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 (NWRSAA) 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.

PRR was established pursuant to Executive Order 7514, dated December 16, 1936. The primary purpose of the refuge is "To effectuate further the purposes of the Migratory Bird Conservation Act" and to serve "as a wildlife experiment and research refuge." Dedicated on June 3, 1939, Secretary of Agriculture Henry A. Wallace stated, "The chief purpose of this refuge is to assist in the restoration of wildlife – one of our greatest natural resources." The PRR mission is "To help protect and conserve the Nation's wildlife and habitat through research on critical environmental problems and issues."

The refuge has grown from 2,679 acres in 1936 to 12,841 acres today. The most consequential growth in the refuge land holdings occurred in 1991, when 8,100 acres in Anne Arundel County transferred from Fort Meade to PRR, which at the time was 4,700 acres. This transferred property is now called the North Tract.

The North Tract is bounded on the north by MD Routes 198 and 32 and Tipton Airport, on the west by the Baltimore-Washington Parkway, on the east by AMTRAK train lines, and on the south by the Patuxent River. Historically, the land was cleared for agriculture and then used by the military for extensive small arms, artillery, and tank training. Most of the land has regenerated to form large stands of forest (approximately 6,400 acres), that lie contiguous with the Central Tract, but many open grassland areas remain, as remnants of old firing ranges, paratrooper training sites, and related administrative areas. Oak hybridization, sandy soils, sphagnum bog plant communities, oxbow wetlands from the Little Patuxent River, a 5.5-mile transmission power line right-of-way managed for shrub habitat, remnant unexploded ordnance, and gunnery ranges used by Federal agencies for law enforcement and security training are among the many interesting characteristics of this tract.

The Central Tract consists of 2,670 acres located in Prince George's and Anne Arundel Counties and is bordered on the north by the Patuxent River and on the south by MD 197. It contains a 3-mile transmission right-of-way maintained in shrub community, many waterfowl impoundments, and most of the refuge's buildings.

The South Tract, located in Prince George's County, consists of 2,200 acres and is bordered by MD Route 197, the Beltsville Agriculture Research Center (BARC), and several residential areas. Further to the south are former crop fields adjacent to those of University of Maryland and BARC, forming one of largest grassland habitats of the refuge. The South Tract also contains some of the best oak/blueberry dominated forest on the refuge.

Although parts of refuge lands had been hunted when under different ownerships, the transfer of the North Tract from Fort Meade to the Service precipitated the hunt EA and opening process in 1991 for a hunt program offered and managed by the Service (rather than Fort Meade). The PRR hunting program is designed to provide compatible public hunting opportunities that support refuge objectives, while minimizing conflicts with non-hunting user groups. Hunting is consistent with the refuge's 2013 CCP, which stated as Goal 6: "Provide high-quality hunting and fishing experiences for hunters and anglers." Objective 6.1 further clarified to "provide robust and diverse, quality hunting opportunities to hunters of all ages while promoting hunter and visitor safety and wildlife health, and accommodating other public use opportunities."

The mission of the Refuge System, as outlined by the NWRSAA, as amended by the 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 NWRSAA 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.

This plan sets forth the guidance on the expansion and continued implementation of the hunting program at PRR.

Purpose and Need for the Action

Hunting is identified as one of the priority public uses legislatively mandated by the NWRSAA 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 use and the requirement to allow hunting that is compatible with the purpose of the refuge and consistent with State regulations. Additionally, hunting is a 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 PRR, 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 this proposed action is to provide compatible wildlife-dependent recreational opportunities on PRR. The need for the proposed action is to meet the Service's priorities and mandates as outlined by the NWRSAA 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)). Expanding hunting access and opportunities on the refuge provides an opportunity to motivate visitors to value, support, and contribute to the refuge, and the Refuge System and become better environmental stewards.

Department of the Interior Secretarial Order 3356 directs the Service to enhance and expand public access to lands and waters on refuges for hunting, fishing, recreational shooting, and other forms of outdoor recreation. The proposed action will also promote priority public uses of the Refuge System and will promote stewardship of our natural resources and increase public appreciation and support for the refuge by providing opportunities for visitors to hunt. To address the needs stated above, the proposed action will bring the refuge into greater compliance with the management guidance detailed in the orders, policy, and Federal law 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). Finally, the proposed action will help to meet the statement of objectives detailed in the Hunting Plan.

Alternatives

ALTERNATIVE A – NO ACTION ALTERNATIVE

Alternative A is the current management of the hunting program. This alternative is referred to as the "No Action Alternative" for NEPA purposes. The No Action Alternative would continue to provide hunting opportunities for waterfowl (ducks, light geese, dark geese), migratory birds (mourning dove), white-tailed deer, upland game (rabbit, gray squirrel, woodchuck), and wild turkey on designated areas of the refuge. No expansion or reduction of hunting programs would occur, and the programs would be conducted as they are currently.

ALTERNATIVE B – PROPOSED ACTION ALTERNATIVE

The refuge has prepared a Hunting Plan, which is presented in this document as the Proposed Action Alternative, or Alternative B. Under this alternative, the Service proposes to continue white-tailed deer hunting on 11,083 acres and increase the number of days for deer hunting on South Tract and Schafer Farm. We propose to expand 1,803 acres currently open to deer only to allow for turkey, mourning dove, woodchuck, and rabbit. The refuge additionally proposes to maintain wild turkey, rabbit, gray squirrel, woodchuck, mourning dove, and waterfowl hunting on 7,954 acres. The refuge also proposes allowing the use of dogs for waterfowl, rabbit, and mourning dove hunting.

All refuge lands opened to hunting under this proposed action will follow Federal and State regulations and will be subject to additional refuge-specific regulations (50 CFR 32.39). A complete and descriptive account of this alternative can be found under Sections III and IV of the Hunting Plan.

In addition to the existing hunting program, the refuge proposes to expand access and hunting opportunities on the South Tract and Schafer Farm Hunt Area by adding hunting of migratory birds (mourning dove), upland game (rabbit, gray squirrel, woodchuck), and wild turkey during the applicable Maryland hunting seasons from September through May, depending on the species being hunted. Hunting will be conducted during daylight hours and will not be permitted from May 25 until September 1.

The refuge will also add mentored deer hunts on the North Tract, South Tract and Schafer Farm during the Maryland deer hunting seasons of archery, muzzleloader, and firearms. There are no

proposed changes for the Central Tract or North Tract.

Non-lead ammunition is required for all upland game, migratory bird, and turkey hunting (everything except for deer). The use of non-lead ammunition for hunting deer will initially be voluntary and will transition to be required for use after a proposed 4-year phase-in period is completed in 2026. This proposed phase-in period will allow hunters time to adapt to the new regulations without diminishing deer hunting opportunities on the refuges.

Nationwide, there is concern about the bioavailability of spent lead ammunition (bullets) 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 prevalent 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 on the effects of lead ammunition and the fragments it can deposit in killed game continues to be conducted. 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 (the result of lead's brittle quality causing fragmentation upon impact) or pellets in the tissues of animals killed or wounded by lead ammunition (Cade 2007; Church et al. 2006; Craig et al. 1990; Cruz-Martinez et al. 2015; Finkelstein et al. 2012; Herring et al. 2016; Hunt et al. 2006; Pattee et al. 1981; Pauli and Buskirk 2007; Platt 1976; Redig et al. 1980; Rideout et al. 2012; Stroud and Hunt 2009; Warner et al. 2014). Lead poisoning may weaken raptors by reducing their strength and coordination, increasing muscle and weight loss, reducing motor skill function and making them lethargic, which may make them s more susceptible to disease, vehicle strikes or power line accidents and increases mortality rates by leaving them unable to hunt (Golden et al. 2016; Kelly and Kelly 2005; Kramer and Redig 1997; O'Halloran et al. 1989). Furthermore, nestlings of raptors have impaired survival and growth when parents bring food that is embedded with lead fragments (Hoffman 1985*a*, 1985*b*; Pattee 1984). Recent modeling has even indicated that lead poisoning suppresses population growth in eagles (Slabe et al. 2022). The extent to which elevated levels of lead have been documented in raptors admitted for rehabilitation can be found in a study of bald eagles and golden eagles in the Raptor Rehabilitation Program at the College of Veterinary Medicine at Washington State University from 1991 to 2008, where 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 et al. 2010). The proposed requirement of non-lead ammunition on the refuge starting Fall 2026 will help address concerns about the bioavailability of lead on the refuge.

The refuge staff will provide information to assist in a valuable transition period that benefits fish, wildlife, and people.

The refuge manager, upon annual review of the hunting program, however, may 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 will restrict hunting if it becomes inconsistent with other, higher priority refuge programs or endangers refuge resources of public safety.

Measures to Avoid Conflicts:

Hunting is a well-established activity at PRR. The greatest numbers of hunters are anticipated in October, November, and December and, thus, would not be disturbing to most wildlife during breeding seasons, except for nesting bald eagles. To avoid conflicts with other biological resources on the refuge, and other refuge uses, the refuge ends hunting of upland game species on January 31 to allow the visitors to use the North Tract and South Tract during the spring and summer. To avoid conflicts and safety issues with ongoing research, residential, office, and maintenance areas on the Central Tract, the refuge operates lottery hunts for assigned stands. To minimize conflicts with other refuge users in the spring, the refuge runs a limited lottery hunt for the spring turkey season.

Other Alternatives Considered but Eliminated from Further Analysis:

In developing hunting plans for national wildlife 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 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 the Maryland Department of Natural Resources (MDDNR) 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 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 (1) the existing environmental and socioeconomic baseline in the action area for each resource, and (2) the direct, indirect, and cumulative 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. Cumulative impacts are defined as the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. This EA focuses on 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." Any resources that would not be more than negligibly impacted by the action may be dismissed from further analyses.

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.

For more information regarding and the general characteristics of the refuge's environment, please see Chapter 4 of the refuge's CCP, which can be found at: https://ecos.fws.gov/ServCat/Reference/Profile/43798.

Table B-1 identifies those resources that either do not exist within the project area or would either not be affected or only negligibly affected by the proposed action. As such, these resources are not further analyzed in this EA.

Table B-1 Potential for Adverse Impacts from Proposed Action and Alternatives

Resources	Not Applicable: Resource does not exist or not affected	No/Negligible Impacts: Exists but no or negligible impacts	Greater than Negligible Impacts: Impacts analyzed in this EA
Species to Be Hunted/Fished	☐	☐	☒
Non-Target Wildlife and Aquatic Species	☐	☐	☒
Threatened and Endangered Species and Other Special Status Species	☐	☐	☒
Habitat and Vegetation (including vegetation of special management concern)	☐	☐	☒
Geology and Soils	☐	☒	☐
Air Quality	☐	☒	☐
Water Quality	☐	☒	☐
Floodplains	☒	☐	☐
Wilderness	☒	☐	☐
Visitor Use and Experience	☐	☐	☒
Cultural Resources	☐	☐	☒
Refuge Management and Operations	☐	☐	☒
Socioeconomics and Environmental Justice	☐	☐	☒

BIG GAME – WHITE-TAILED DEER

Description of Affected Resource

White-tailed deer are the most intensely hunted of all game species offered at the refuge, and likely will remain so. In Region B (Central, Southern and Eastern Maryland) of the State, where habitat quality is considered good, the population was estimated at about 205,000 deer in 1998. The population increased slightly, to approximately 238,000 deer in 2002, before the implementation of liberal antlerless seasons and bag limits reduced the population to an estimated low of 170,000 deer in 2013 (Eyler 2013). Since 2013, the Region B deer population has remained stable up to 2018 (MDDNR 2020).

As for the PRR population, annual analyses of average deer weights of all age classes and sexes on the North Tract (where deer are most intensely hunted) suggests a healthy population existing within, and occasionally exceeding, the refuge's carrying capacity. We also annually calculate deer density on the refuge to gauge how closely it tracks Maryland's recommended density of 20 deer per square mile. For PRR to meet this recommended density, the deer population would need to be limited to about 374 deer for the refuge's suitable deer habitat of 11,981 acres (18.72 square miles).

Based on harvest data from 2009 to 2016, the deer population ranged from 278 to 794, and density ranged from 22.1 to 63.2 per square mile. There is an inherent bias in using harvest data, as it is based on number of bucks harvested; this is the State's methodology and is a viable index over time. We conducted camera trapping for two years (2012-2013) to obtain an independent doe to buck ratio and found no significant difference in abundance and density in relation to the state estimates.

Table B-2 White-tailed deer harvest over 5-year period from 2016-2021 on PRR

Year	Total Harvest	Bucks	Does
2016-2017	207	103	104
2017-2018	168	76	92
2018-2019	151	73	78
2019-2020	221	114	107
2020-2021	94	46	48

Impacts on Affected Resource

ALTERNATIVE A – NO ACTION ALTERNATIVE

White-tailed deer hunting would continue to be permitted in designated areas of the refuge. There could be temporary, localized population reductions (i.e., less than 200 per year) for white-tailed deer. Current levels of harvest would be expected under this alternative as no new opportunities would be provided. Table B-3 provides anticipated impacts to species hunted as a result of these proposed actions. We estimate a stable number of hunt visits (5,000 to 6,000 visits) and total harvest of fewer than 200 deer under this alternative.

The current hunting program on refuge lands and waters carries the potential for adverse health impacts to huntable wildlife species from discarded lead in the environment and the potential for adverse human health impacts from lead in game meat. There is potential for the presence of discarded lead in the environment to have adverse impacts on wild game species in addition to the inherent impacts of intentional harvest from hunting. Some wild game species are susceptible to direct ingestion of lead and/or bioaccumulation of lead from their food sources. These types of species that are susceptible to these circumstances are discussed in detail in the non-target wildlife and aquatic species section but are applicable to similar species that are hunted including predators and big game.

ALTERNATIVE B – PROPOSED ACTION ALTERNATIVE

The refuge will expand white-tailed deer hunting on the refuge's South Tract and Schafer Farm portion of the Central Tract to match the same dates of opportunity with the North Tract. We assume a few (i.e., less than 20) additional deer would be harvested as a result, but overall local impacts are expected to be minimal. Deer hunting in the South Tract and Schafer Farm area of the refuge may result in slightly more hunters traversing the habitat and hunter conflicts. Non-lead ammunition will be required for all hunting except for deer. The use of non-lead ammunition for hunting deer will initially be voluntary and will transition to be required for use after a 4-year proposed phase-in period is completed in 2026.

Additional disturbance, displacement, and harvest of deer may result in temporary and localized population reductions, but no measurable population impacts are expected. We estimate a stable or slightly increased number of hunt visits (5,000 to 6,000 visits) and total harvest of fewer than 200 deer under this alternative.

Table B-3 Impacts by Alternative on Species Hunted

Hunted Species	**Alternative A Estimated Take**	**Alternative B Estimated Take**
White-tailed Deer	<200	May increase harvest
Wild Turkey	<20	May increase harvest
Gray Squirrel	80-100	May increase harvest
Eastern Cottontail	0	No significant change expected
Woodchuck	0	No significant change expected
Canada Goose	<50	May increase harvest
Mallard	<40	May increase harvest
Wood Duck	40-50	May increase above sustainable levels, needs monitoring
Mourning Dove	<25	No change expected

Refuges, including PRR, conduct the refuge hunting program within the framework of State and Federal regulations. MDDNR sets hunting frameworks based on species' populations and monitored harvests. The proposed refuge hunting regulations will be the same as, or more restrictive than, hunting regulations throughout the State. By maintaining hunting regulations that are the same as or more restrictive than the State, the refuge can ensure that they are maintaining seasons that are supportive of management on a more regional basis. Such an approach also provides consistency with large-scale population status and objectives.

FOREST GAME/UPLAND GAME – ***Wild Turkey, Gray Squirrel, Woodchuck, and Eastern Cottontail Rabbit***

Description of Affected Resource

Wild Turkey (Meleagris gallopavo)

According to a former refuge biologist, H. Obrecht, turkeys began to reappear at PRR in the 1990s. These birds were from a flock that were released on Meyer's Station in 1989 by MD DNR (Huettner 2003). Volunteers from the Central Maryland Chapter of the National Wild Turkey Federation conducted weekly spring turkey surveys from 1994 until about 2009 on the refuge's North Tract. In 1994, 129 turkeys were documented. From 1997 to 2000, totals were 109, 116, 67, and 92, respectively.

Two of the most important environmental trends that may affect this resource are accelerated habitat fragmentation and increased coyote population. Fragmentation facilitates predation on turkey nests, yearlings, and sitting hens and may eventually be a cause of concern for turkey populations within the Baltimore-Washington metropolis. Raccoons have long been the most common predator of turkey but increasing populations of coyotes may become a factor in the future (Hughs et al. 2005). However, forest fragmentation on the refuge itself has been relatively

stable or declined since the North Tract was transferred to the Service in 1991. The refuge has also incorporated plans for reforesting and increasing the acreage of forest interior to promote healthy, regenerating, oak-dominated upland forest.

Gray Squirrel (Sciurus carolinensis)
Eastern gray squirrel is ubiquitous on refuge lands and the surrounding urban landscape. Females begin reproducing in their second year, each litter averaging 2.5 young. Because of their high reproductive potential, the population can explode into the thousands within a short span (Benson 2013).

Eastern Cottontail Rabbit (Silvilagus floridanus)
Eastern cottontail is the most widely distributed of any species in the *Silvilagus* family ranging from lower Canada and Maine south to Florida and Mexico and west to the Rocky Mountains. Cottontails use a wide range of disturbed, transitional, or successional habitats. They favor habitats that provide grasses and weedy forbs with ready access to escape cover such as thickets and brush.

Where soil fertility is high, environmental conditions mild, and food is abundant, reproductive rate tends to increase in this already fecund species. The average litter size in western Maryland is 4.50 but can produce up to 7 litters each year with 3 to 4 being typical (Chapman and Feldhamer 1982). Only about 20 to 25 percent of the young survive a full year, and annual mortality of the entire population, including adults is about 85 percent due to predation, weather, disease, parasites, and social behavior to suppress numbers (Tjaden and Kays 2002). Local abundance also fluctuates relative to local land uses, where forestation or intense land uses may cause a recession.

The refuge has no data on current or past rabbit densities on the refuge. In the relatively agricultural landscape of St. Clements Island, Maryland for example, peak densities were documented at 10.2 per hectare (4.12 per acre) (Chapman and Feldhamer 1982). Per refuge staff observations, cottontail rabbits appear to be more numerous in the dense, well-landscaped neighborhoods than on the refuge.

Woodchuck/Groundhog (*Marmota monax*)
The refuge provides an open season on woodchuck/groundhog generally following the state season. However, no take for this species has been documented. Groundhogs are seldom seen in the scattered fields or shrubby open lands dotted across a primarily forested or floodplain landscape, therefore generally not conveniently available to hunters. There appears to be a lack of interest for this species in the local hunting community. Most groundhog sightings on the refuge are seen around lawns and buildings, such as at the Central Tract's office and facilities complex, Endangered Species Area or the South Tract Visitor Center (fewer).

Other Furbearer Species
The refuge does not currently offer seasons for other furbearer species such as bear, fox, raccoon, opossum, skunk, weasel, coyote, or bobcat.

Impacts on Affected Resource

ALTERNATIVE A – NO ACTION ALTERNATIVE

Under this alternative, we do not expect harvest trends to appreciably change. The harvest rate of wild turkey over the past decade has been low, with 20 taken in 2021 representing the highest amount in one season, and the lowest of 4 turkeys in 2008. With a limited number of turkey hunt dates offered (about 14 to 16 days in the season), low hunter density (nine zones, one hunter per zone), and a bag limit of one turkey per year, we anticipate that the refuge turkey population will not be negatively impacted by continuing low levels of hunting pressure and should remain viable and resilient for the foreseeable future.

Squirrel harvests since 2000 ranged from 196 in 2001 to a low 14 in 2006. However, 14 out of 20 harvests during the period remained above 60. While no formal surveys have been conducted to assess current Eastern gray squirrel population abundance on refuge lands, we assume that, given the supportive habitat and their reproductive potential, past and expected hunting pressure is insufficient to have a negative impact on the population.

Rabbits are not a popularly hunted species at PRR, likely due to scattered habitat in small parcels, and a refuge regulation that does not allow hunting with dogs. In a typical year, less than 5 rabbits are harvested. We expect that this will remain the case for the foreseeable future since the refuge is primarily a forest and most rabbits occur on the Central Tract where hunting is more restricted due to office complexes, residences, and US Geological Survey (USGS) captive species research pens.

ALTERNATIVE B – PROPOSED ACTION ALTERNATIVE

The refuge seeks to provide limited opportunities for turkey hunting on the South Tract; to open South Tract and the Schafer Farm portion of Central Tract to rabbit, woodchuck and squirrel hunting; and to allow dogs for rabbit hunting. We expect these changes to result in a slight increase in turkey and squirrel harvest but do not expect significant changes. No rabbits have been harvested on the refuge since 2004, and harvest of woodchuck have never been reported. We expect that this will remain the case for the foreseeable future since the refuge is primarily a forest, and most rabbits and woodchuck occur on the Central Tract where hunting is more restricted due to office complexes, residences, and USGS captive species research pens. See Table B-3, which provides anticipated impacts to species hunted as a result of these proposed actions.

MIGRATORY GAME BIRD – ***Waterfowl, Mourning Dove***

Description of Affected Resource

Waterfowl

The refuge is located on the western edge of the Atlantic Flyway, where the migration pattern is more of a broad front type that is characteristic of the Piedmont. The scattered inland water bodies and narrow rivers support smaller migrating or wintering flocks, not the massive flocks of thousands characteristic of the Eastern Coastal Plain and lower tidal portions of the estuaries. As a result, the refuge plays a comparatively reduced role in contributing to migratory waterfowl species at the flyway level.

Waterfowl hunts have been conducted on the North Tract since prior to transfer to the Service in 1991-1992. Refuge hunt season for waterfowl begins with the State's season, but ends earlier than the State, which continues well into March. Migratory game bird hunting is suspended on the refuge during firearms season and early deer muzzleloader season except in a few locations. The refuge adheres to State and Federal regulations with respect to daily bag limits.

Our information on refuge waterfowl numbers is derived from weekly waterbird surveys and spring productivity surveys, both of which had been conducted every year from 1997 to 2017. Counts were conducted according to Integrated Waterbird Monitoring and Management (IWMM) protocol (Loges et al. 2014). We are indebted to volunteer Frank McGilvray for this information (2014).

Canada Goose (Branta canadensis)
The early season goose hunt is primarily a management hunt to help control the proliferation of resident Canada geese. Waterfowl productivity surveys on the refuge revealed record highs in the late 1990s where 270 pairs were observed and a record low of 107 pairs observed in 2015. The peak fledgling success was in 2004 when 275 goslings reached flight age, and the record low was 40 in 2008. Weekly waterfowl surveys of the species from 2011 to 2013 ranged from 24,000 observations (averaging 480 birds) in 2011 to 14,000 observations (averaging 280 birds) in 2013. The Migratory Bird Harvest Information Program for 2018 and 2019 reported 90,855 and 45,452 Canada Geese harvested in Maryland respectively (Raftovich et al. 2020).

Mallard (Anas platyrhynchos)
The mallard breeds primarily in Canada, and winters primarily from West Virginia and Virginia south. Maryland is part of the species' northeast year-round range including breeders. The pair count during productivity surveys continued to increase from a low of 13 in 2012, to 27 in 2017. The peak was 63 in 1998 and 1999. Only two broods were seen, which reflects the average from 2007 to 2015. The waterbird surveys show that the species continues to thrive here with observation counts ranging from 1864 (2011) to 2090 (2014), whereas harvests during the same period ranged from 9 (2012) to 50 (2013).

Wood Duck (Aix sponsa)
The wood duck nestbox program (now discontinued) provided some of the best information on the species, in addition to that provided by waterbird survey counts. Over the past 20 years, the refuge had maintained as many as 132 wood duck nest boxes on various impoundments or other water bodies on the refuge, largely through the volunteer efforts of Frank McGilvray, a former Service waterfowl biologist. Productivity counts conducted annually from 1997 to 2017 showed a range of pairs observed from 55 in 2000 to 82 in 2005. As boxes aged or became unusable, they were removed from service. Waterbird counts provide an index for population abundance on the refuge. From 2010 to 2015, the counts ranged from 260 birds in 2012 to 516 in 2010, averaging 339 over the 6-year period. Harvest rates during the same period ranged from 12 in 2013 to 65 in 2011.

Wood duck is a popular species among waterfowl hunters. Given the sizeable quantity of floodplain habitat on the refuge (about 2,000 acres) to support natural nesting substrates and food resources for wood duck, and the inaccessibility of some sites, we hope hunting pressure is not

substantial. The wood duck harvest in Maryland for 2018 and 2019 was 10,142 and 8,001 respectively (Raftovich et al. 2020). We rely on guidance from MDDNR on bag limits to ensure harvest rates remain within sustainable limits.

Mourning Dove
PRR is located in the Eastern Management Unit for mourning doves. Mourning doves are found throughout the refuge foraging in patchy open areas along the refuge's many roads bordered by forests. Migratory Bird Harvest Information Program estimates for mourning dove total harvest in Maryland was 51,500 ± 34 percent in 2018 and 66,200 ± 27 percent in 2019 (Raftovich et al. 2020).

Impacts on Affected Resource
ALTERNATIVE A – NO ACTION ALTERNATIVE
Under this alternative, we do not expect current harvest trends to change. No new opportunities would be provided, so impacts would remain unchanged. The number of individuals harvested on the refuge, though additive to local, regional, and Atlantic Flyway harvest, is negligible to their populations. As migratory game bird species populations continue to be monitored, future harvests will be adjusted as needed under the existing processes. Canada goose is the most numerous waterfowl species harvested on the refuge, partly due to establishing and growing resident populations, followed by wood duck and mallard. The number of geese harvested each year is too low relative to the average population on the refuge or the state to have a significant impact. Other game includes hooded merganser, American black duck, American green-winged teal, bufflehead, ring-necked duck, ruddy duck, lesser scaup, Atlantic brant, gadwall, Northern shoveler, and redhead, though these are harvested in far fewer numbers, often only one bird per year.

Mourning dove harvest at PRR in the past 10 years has steeply declined. From 2011 to 2020 harvests were: 59, 65, 26, 3, 4, 22, 12, 2, 6, and 5 respectively. We do not monitor refuge populations of this species but follow state guidelines on bag limits and seasons.

ALTERNATIVE B – PROPOSED ACTION ALTERNATIVE
Canada geese, mallard, wood duck, and mourning dove harvests are expected to slightly increase with the addition of allowing the use of dogs and expansion of hunting areas (i.e., South Tract and Schafer farm). Environmental trends surrounding the refuge may have some bearing on the refuge's population of geese and, to a certain extent, ducks. Canada geese are a highly mobile group attracted to short-grass lawns near manmade ponds, such as found in new residential developments, commercial parks, shopping centers, golf courses, and stormwater management areas. We expect local development trends would favor the increase of the resident goose populations, which may shift to the refuge when seeking additional forage grounds. Likewise, mourning doves thrive in semi-open or edge habitats where trees and open ground are juxtaposed.

The Service believes that due to the time of year in which it is allowed, hunting on the refuge will not add significantly to the cumulative impacts of migratory bird management on local, regional, or Atlantic Flyway populations because the percentage likely to be taken on the complex, though possibly additive to existing hunting takes, would be a tiny fraction of the

estimated populations. In addition, overall populations will continue to be monitored and future harvests will be adjusted as needed under the existing flyway and State regulatory processes. Several points support this conclusion: (1) the proportion of the national waterfowl harvest that occurs on refuges is only 6 percent (USFWS 2013*b*); (2) there are no populations that exist wholly and exclusively on refuges; (3) annual hunting regulations within the United States are established at levels consistent with the current population status; (4) refuges cannot permit more liberal seasons than provided for in Federal frameworks; and (5) refuges purchased with funds derived from the Federal Duck Stamp must limit hunting to 40 percent of the available area. As a result, changes or additions to hunting on the refuge will have minor impacts on wildlife species in Maryland. Although the Proposed Action Alternative will increase hunting opportunities compared to the No Action Alternative A, the slight increase in hunter activity will not rise to a significant cumulative impact locally, regionally, or nationally.

NON-TARGET WILDLIFE AND AQUATIC SPECIES

Description of Affected Resource

Non-target wildlife includes any forest-dependent species of the Mid-Atlantic portion of the Eastern biome. The refuge provides habitat for at least 38 mammal species, 55 amphibians and reptiles, 25 orders of insects, 248 bird species, and 55 species of fish. A comprehensive list of species known to occur at PRR can be obtained from the refuge's CCP. The same environmental trends for landscapes surrounding the refuge as described in the accounts of species to be hunted above will also apply to non-target wildlife and aquatic species. They share the same habitats, are not spatially exclusive, and therefore are not discussed separately.

The best available science indicates that lead ammunition and tackle may have negative impacts on wildlife. This broad potential for adverse impacts to non-target wildlife and aquatic species and the overall environment is not inherent to the activities of hunting and fishing, but specifically to the use of lead ammunition and tackle. Those potentially adverse impacts can be prevented by requiring non-lead ammunition and tackle for hunting and fishing activities. Currently there are manufacturers that offer non-lead ammunition and fishing tackle, and some states have either implemented restrictions on the use of lead or offer incentives to use non-lead ammunition or fishing tackle (Arizona Game and Fish Department 2018; Center for Biological Diversity 2007; USFWS 1999; Washington Department of Fish and Wildlife 2022). In areas where non-lead ammunition and tackle are used, there have been declines in adverse effects to wildlife (Anderson et al. 2000; Kelly et al. 2011; Lewis et al. 2021; Samuel and Bowers 2000; Sieg et al. 2009).

Impacts on Affected Resource

ALTERNATIVE A – NO ACTION ALTERNATIVE

No expansion or reduction of the hunting program would occur, and the program would be conducted as it is currently. Some wildlife may be disturbed, distressed, or displaced as hunters walk, fire shots, and access specific areas on the refuge. Disturbances to birds, except waterfowl in hunted areas, are expected to be minimal, since most migrating and breeding activities occur from April to August when no hunting occurs on the refuge. Short-term disruptions to other species like bats, turtles, frogs, and some mammals are expected to be minor, due to bouts of inactivity or hibernation during this time. There could be temporary, localized disturbance to

fish, mussels, and other aquatic species during waterfowl hunting but no significant impacts are expected for any non-target refuge wildlife species.

In comparison, we expect long-term negative impacts on birds from not managing the deer. Ungulate populations generally overshoot the ultimate carrying capacity of the habitat before equilibrium is reached (McCullough 1982). White-tailed deer are more prone to cause habitat alteration during this process than many other species due to their high reproductive potential (McCullough 1982, 1997), with substantial impact on the vegetation. Intense grazing on woody plants limits regeneration of the key tree species which provide habitat and food for caterpillars, the most important source of protein for numerous species of breeding forest birds (Tallamy 2007).

ALTERNATIVE B – PROPOSED ACTION ALTERNATIVE

The expanded hunting program is expected to slightly increase impacts to refuge wildlife overall, but no significant impacts are anticipated. Impacts described above likely would still apply and are expected to slightly increase with more hunt opportunities expanded to South Tract and Schafer Farm. Impacts expected resulting from fall and winter hunting on the refuge include trampling of vegetation, flushing of wildlife, spread of invasive species via clothing, footwear, and tires, and road mortality from vehicles on back roads.

Flushing of Eastern red bats roosting in leaf litter during winter may occur, especially where dogs are permitted for hunting. Trampling of vegetation or flushing breeding birds may be moderately higher risk during the spring turkey season (April to May). The refuge has an extensive road system maintained primarily for hunting. Although vehicles are only allowed on paved or gravel roads, and no “off-road” vehicles are allowed, there remains risk to wildlife crossing roads in late spring or early fall hunting or scouting, and extensive graveling, paving, or daylighting of roads may cause isolation of populations of environmentally sensitive amphibians such as salamanders that cannot cross such substrates.

The best available science indicates that lead ammunition may have negative impacts on wildlife and human health, and the environment (Golden et al. 2016). To move towards reduction and future elimination of this threat on the refuge, we will be eliminating the use of lead ammunition over a 4-year period to educate and work with hunters on the use of non-lead alternatives. The proposed phased transition to lead-free ammunition for all hunting will minimize the inadvertent exposure and subsequent lethal or sub-lethal impacts to bald and golden eagles, as well as other scavenging species. Eagles and other 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 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 will continue 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 poisoning may weaken raptors by reducing their strength and coordination, leading to muscle and weight loss, reducing motor skill function, and making them lethargic, which may make them more susceptible to disease, vehicle strikes, or

power line accidents and increases mortality rates by leaving them unable to hunt (Golden et al. 2016; Kelly and Kelly 2005; Kramer and Redig 1997; O'Halloran et al. 1989). The bioaccumulation of lead is a potential concern, but it does not likely present a significant issue on this refuge, as: 1) non-lead shot is currently required for hunting waterfowl; 2) we are proposing a 4-year phase out to the use of lead ammunition and tackle for all species by 2026; 3) the refuge strongly encourages use of non-lead alternatives for hunting big game and coyote for the next 4 years; 4) we will educate hunters, anglers, and the public to the potential adverse impacts of lead; and 5) the updated hunting and fishing activities are not likely to introduce substantially more lead into the environment over existing amounts with the current or proposed programs. Some hunters will also choose non-lead methods of take such as archery.

Harvest restrictions through implementing reduced bag limits are the refuge's primary method of ensuring against over-harvesting of small or vulnerable populations. The Refuge Manager has the authority to place further restrictions on bag limits as necessary beyond those set by the state for the best management practices of the species involved.

THREATENED, ENDANGERED, AND OTHER SPECIAL STATUS SPECIES

Description of Affected Resource

The refuge provides habitat for forest-dependent threatened species, endangered species or species of special concern such as the bald eagle (*Hiliaeetus leucocephalus*), Northern long-eared bat (*Myotis septentrionalis,* federally threatened), spotted turtle (*Clemys guttata*, at-risk species), and monarch butterfly (*Danaus plexippus*, candidate species for listing). The Patuxent and Little Patuxent Rivers which flow through the refuge support at least three mussel species and may support the federally threatened yellow lance (*Elliptio lanceolata*), which requires healthy and intact floodplain forest for stream and river water quality.

Northern long-eared bats use mines and caves in the winter to hibernate and use forests to forage and roost throughout the rest of the year. Northern long-eared bats may occur in some areas in the hunting zones. The species is most sensitive to disturbance during hibernation and when raising young, activities that are not known to occur on the refuge. Any incidental disturbance to non-breeding individuals would likely have a negligible impact on the species.

Spotted turtles usually prefer shallow water habitats, such as swamps, ponds, bogs, marshy wetlands, creeks (including tidal ones) or ephemeral pools, but at times may be found in forested areas some distance from water. Depending upon population location, seasonal activity begins in the late winter to early spring, and turtles are most active during the day. Mating typically occurs in spring (March through May) and eggs are laid on land from late May through early July, depending on the population location. It has been subject to illegal poaching in portions of its range and has suffered substantial population declines and widespread habitat destruction.

Forest interior birds, rare plants, rare odonatan, and State Species of Greatest Conservation Need are among the species groups or taxa for which the refuge provides quality habitat. Puritan tiger beetle has not been observed on this refuge despite decades of coleoptera searches in the most likely habitat, along Little Patuxent River. The puritan tiger beetle is found in sandy-clay, earthen shoreline bluffs, typically with sparse to no vegetation and narrow, sandy beaches along

the cliff bases. The refuge has one bluff area along the Little Patuxent River, composed of red clay along an inaccessible section of the river. Hunting will likely have no impact on this species should it occur here.

There have been many botany forays throughout the refuge's 85-year history, and to date swamp pink and sensitive joint vetch have not been found. Swamp pink is found in perennially saturated, spring-fed, nutrient- poor, shrub swamps and forested wetlands, of which the refuge has many. Sensitive joint vetch inhabits the intertidal zone of fresh to slightly salty (brackish) tidal river segments. This far upstream of the Patuxent River experiences very little tidal impact, and its riparian zones within the refuge are heavily forested, too shady for this species. Given the scarcity or unlikely presence of swamp pink and sensitive joint vetch, no impact from hunting is anticipated. A more complete list of these species may be found in Appendix C.

Impacts on Affected Resource

ALTERNATIVE A – NO ACTION ALTERNATIVE

All refuge hunting would continue with no expansion or reduction in species or areas hunted. Deer hunting occurs from September through the end of January, with the most participation from October through early December, when eagles are not nesting. The refuge only has one known bald eagle nest; however, it does support a small group of foraging eagles during hunt season. To avoid flushing nest building or incubating adults, the road nearest the nest is closed from December 1 to July 1. Under this alternative, we anticipate a similar level of negligible impacts to these species.

ALTERNATIVE B – PROPOSED ACTION ALTERNATIVE

Northern long-eared bat

Northern long-eared bats (NLEB) primarily use mines and caves in the winter to hibernate and use upland forests to forage and roost throughout the rest of the year. The species is most sensitive to disturbance during hibernation and when raising young, which are activities that are not known to occur on the refuge. There are no caves or mines found on refuge property, while the refuge does have forested areas.

The NLEB may occur in some hunting zones but are not likely to experience any disturbance \even if bats and hunters may briefly overlap in time and space. This species is not known to winter in this region; it is only present in spring and summer (April – September). The only overlap with hunting that may occur is with the May turkey hunting and/or September bow season. With a restriction on the number of turkey hunt dates offered, a lower hunter density, and a reduced bag limit of 1 turkey per year, we anticipate that turkey hunting will occur in locations that are very unlikely to overlap with the presence of bats, and any potential disturbance effects from turkey hunting are extremely unlikely to occur and are therefore considered discountable.

Bats are typically nocturnal and inactive during most hunting seasons and times, and not present for most of the hunting seasons; therefore, disturbance would be highly unlikely. The species roosts in spring and summer in exfoliating bark of snags, downed logs or dense leaf clumps in trees. During the fall hunting season, gunshots could result in flushing of bats from roosting trees; however, bats are more likely to remain in the trees during daylight hours. Such disturbances are temporary and last only for the duration of the noise, not fundamentally unlike

other temporary disturbances that bats may naturally experience without long-term effects, and therefore any potential effects are expected to be insignificant. Other possible disturbances include hunters climbing and placing portable tree stands on trees. However, hunters typically select live trees for safety reasons while bats are most often in dead or dying trees with large slabs of peeling bark. Further, hunting activities would not result in any roost tree destruction as no tree cutting or other habitat alteration is permitted on the refuge.

The potential for lead impacts through bioaccumulation is discountable due to Northern long-eared bats' diet and foraging habits. Lead bullet fragments would have to break down in the soil in order to be taken up by plants near the area in which the fragments fall on or penetrate the soil surface. Typically, however, plants do not take heavy metals up until they have reached critical thresholds in the soil (Sharma and Dubey 2005). If lead is taken up by plants, it is mainly through the root system and partly, in minor amounts through the leaves. Inside the plants lead accumulates primarily in the root, but a part of it is translocated to the aerial portions. Larvae of certain herbivorous insect species could ingest some of the lead when they eat the exposed plants. Some of the insects could then be consumed by bats. Northern long-eared bats' diet is insects such as moths, flies, leafhoppers, caddisflies and beetles, only some of which are herbivorous. In addition, bats are transitory in nature and will not consume their entire diets on the refuge area. Considering the chain of events that are necessary for exposure and the small amount of lead that would contribute to lead concentrations in refuge soils, it is unlikely that bats that occur on refuges will consume lead derived from ammunition fired by hunters on the refuge.

Because the potential for overlap in time or space between hunters and bats is very low; because the expected impacts to roosting bats, even if there is overlap, are insignificant; and because the potential for lead impacts are discountable, the proposed hunting activities are not likely to adversely affect the NLEB.

Monarch butterfly

Monarch butterflies migrate through the refuge, passing through Patuxent as late as November. There are several hundred acres of meadow/grassland habitat with host and nectar plants. Most nectar sources have senesced by the start of the fall hunting season.

Hunters are most likely to use tracts through forested parts of the refuge, where monarchs and their nectaring plants generally do not occur. Furthermore, given that only light foot travel from hunters accessing the area is expected to occur on these acres, we anticipate that any potential damage to nectaring plants from foot traffic disturbance will be extremely unlikely, and therefore considered discountable. While hunters are walking through habitat used by monarchs, there could be some impacts including flushing while resting or feeding. This disturbance is minimal as the monarchs easily move to another spot when disturbed. Furthermore, hunting does not result in the removal of vegetation, including nectaring sources or milkweed, and so it would have negligible impacts to habitat resources important for monarchs. Noise disturbance from discharging of a firearm while hunting may startle the species resulting in change in flight pattern or a startle response in caterpillars, but this impact will not result in long-term negative impacts and is considered discountable as this type of noise is not frequent enough to result in habituation to noise that could cause butterfly to not respond to natural threats like parasitism (Taylor and Yack, 2019).

The potential for lead impacts to monarchs is discountable due to their diets. Adult monarch butterflies feed on nectar. Nectar typically carries less lead contaminants than other parts of the plant if lead is absorbed through the plant. Larvae consume the leaves and stems of milkweeds, where higher concentrations of lead could be present, if lead is absorbed through the plant. Lead absorption by plants typically occurs first through roots and only makes its way into other plant parts if concentrations are high enough. This means that, as with bats, bioaccumulation through the plant to the monarch butterfly or larvae could potentially occur. However, as with bats, it relies on the very unlikely occurrence that lead concentrations in the soil from hunting activities reach high enough levels for uptake by plants, and in this case, it would further require uptake by milkweed and the specific plants that monarchs rely on for nectar sources. Overall, lead is strongly adsorbed onto soil particles and is not readily translocated to above-ground portions of plants (McLaughlin 2002).

Given that hunters are not likely to overlap with areas where monarch and their plants are known to occur; that any potential disturbance from noise is expected to be insignificant; and because that bioaccumulation through plants into caterpillars or butterflies is discountable, the proposed activities are not likely to jeopardize the monarch butterfly.

Yellow lance mussel

This species may be present in the Patuxent River or Little Patuxent River, but to date has not been observed. Other mussel species however do occur in abundance. Hunting activities are not likely to adversely affect yellow lance or other mussel species because they are an aquatic species living in flowing waters, largely isolated from hunting activity. Therefore, the proposed activities are not likely to overlap in space with the yellow lance mussel, so any potential effects from disturbance are extremely unlikely, and therefore considered discountable.

Specific to potential impacts from continued use of lead ammunition for deer hunting, during the interim period before the planned non-lead requirement would take effect, there is a chance that lead could enter the water where mussels live. Typically, lead is not soluble in water unless the conditions are right, such as the body of water is more acidic than typical of freshwater. Even if the small amount of lead added to the refuge from hunting deer in the interim reaches the rivers, it is not likely to accumulate in the water column of the flowing rivers and affect filter feeders like mussels.

Before the non-lead requirement is planned to take effect in 2026, we expect the effects from authorized lead use from ammunition to be discountable and insignificant due to the small amounts of lead that are expected to enter the environment, and the specific circumstances that would need to occur for lead to have a measurable effect on the species (e.g., acidity and lead at high enough concentrations).

Because yellow lance mussels may not even be present on the refuge and because any potential lead added to the environment before the planned non-lead requirement takes effect are highly unlikely to occur, the proposed activities are not likely to adversely affect yellow lance mussels.

Puritan tiger beetle

This species has not been known to occur on this refuge despite decades of searches in the most likely habitat, along Little Patuxent River. The puritan tiger beetle is found on or near earthen shoreline bluffs, typically with sparse to no vegetation and narrow, sandy beaches along the cliff bases. The refuge has one bluff area along the Little Patuxent River, composed of red clay along an inaccessible section of the river. The immature stages of crickets and tenebroid beetles are capable of uptaking lead into the exoskeleton from their prey items (e.g., other insects and crustaceans), and it may also be possible for tiger beetles. However, hunting activities at Patuxent do not overlap in space with the possible habitat of Puritan tiger beetles, with hunters possibly atop the cliff and beetles on or below the cliff. Considering the chain of events that are necessary for exposure and the small amount of lead that would contribute to lead concentrations in refuge soils, it seems likely that beetles, if they were to would occur on the refuge, would not consume lead derived from ammunition fired by deer hunters on the refuge. Therefore, it is unlikely that the small amount of lead added to the refuge from hunting deer before the planned non-lead requirement takes effect would adversely impact the Puritan tiger beetle.

Due to the inaccessibility of hunters to the lone suitable habitat of beetles, and because the species likely isn't even present on the refuge, the proposed hunting activities are not likely to adversely affect Puritan tiger beetles.

Swamp pink and sensitive joint vetch

There have been many botany forays throughout the refuge's 85-year history, and to date swamp pink and sensitive joint vetch have not been found. Swamp pink is found in perennially saturated, spring-fed, nutrient- poor, shrub swamps and forested wetlands, of which the refuge has many. Sensitive joint vetch inhabits the intertidal zone of fresh to slightly salty (brackish) tidal river segments. The refuge is far enough upstream of the Patuxent River that it experiences very little tidal impact, and its riparian zones within the refuge are heavily forested, making them too shady for this species. Swamp pink leaves lay on the ground through winter (often covered with leaf litter) with a rosette visible in the middle; that rosette blooms in March through May. Even if the plant species were to occur on the refuge, any potential effects to the species from trampling would be considered extremely unlikely, and therefore discountable, because for the spring turkey hunt (Mid-April to May), the hunters do not walk through habitat where swamp pink could occur. Furthermore, the refuge is proposing to offer a limited turkey hunt, where only 3 to 5 hunters are selected to hunt each day.

Sharma and Dubey (2005) found that excess lead in plants causes a variety of toxic symptoms including stunted growth, chlorosis, blackening of root systems, inhibited photosynthesis, disrupted mineral nutrition and water balance, and altered plant hormones. Rattner et al. (2008) found that migration of lead from soil to roots and other parts of plants generally is considered to be minimal (Sorvari et al. 2006). Studies have documented elevated lead levels in plants in the vicinity of shooting ranges (Peterson et al. 1993, Mellor and McCartney 1994, Rooney et al. 1999, Hui 2002), but as proposed in this plan, hunters will not be concentrated or reach the numbers expected at a shooting range. As previously explained, hunters would be dissipated throughout the refuge and are unlikely to be in the area where these species could be found. Also, the migration of lead from soil to roots and other parts of the plant is expected to be minimal, so the use of lead for certain activities before the planned non-lead requirement would take effect in 2026 is not likely to adversely impact these species.

There are no known occurrences of swamp pink or sensitive joint vetch, and any impacts from hunting or the associated use of lead ammunition would be considered discountable because they are extremely unlikely to occur. Therefore, the proposed activities are not likely to adversely affect either species.

All Species

The best available science indicates that lead ammunition and tackle may have negative impacts on wildlife and the environment (Golden et al. 2016). Animals can be poisoned by lead in a variety of ways, including "ingestion of bullet fragments and shot pellets left in animal carcasses, spent ammunition left in the field, lost fishing tackle, lead-based paints, large-scale mining, and lead smelting activities. Despite a large body of scientific literature on exposure to lead and its toxicological effects, controversy still exists regarding its impacts at a population level" (Haig et al. 2014). The use of non-lead ammunition will initially be voluntary, and we plan to require non-lead ammunition and tackle, for all activities starting at the beginning of the fall 2026-2027 hunting season (after a 4-year phase-in period). This planned phase-in period will ensure continuity of visitor opportunities as hunters understand the changes and become more familiar with the availability and use of non-lead alternatives. We will educate hunters about the impacts of lead and strongly encourage non-lead ammunition alternatives for the next 4 years.

The bioaccumulation of lead is a potential concern, but it does not likely present a significant issue on this refuge as: 1) non-lead shot is currently required for hunting waterfowl; 2) we plan to require the use of non-lead ammunition on the refuge at the beginning of the fall 2026-2027 hunting season; 3) the refuge strongly encourages use of non-lead alternatives for hunting big game for the next 4 years; 4) we will educate hunters and the public to the potential adverse impacts of lead; and 5) the updated hunting activities are not likely to introduce substantially more lead into the environment over existing amounts with the current or proposed programs. Some hunters will also choose non-lead methods of take such as archery.

We understand that reinitiation of consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law), and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

HABITAT AND VEGETATION

Description of Affected Resource

About 10,000 acres of the total 12,841 acres are in forest of some type. Refuge forests contribute to one of the largest blocks of contiguous forested habitat in the Baltimore-Washington region of Maryland. Upland mixed deciduous and floodplain bottomlands are the dominant forest types. Dominant species include a variety of oaks, poplar, pines, red maple, American beech, cherry, hickories, sweetgum, river birch, sycamore, black gum, American elm, sweetbay magnolia, and American hornbeam. Other habitat types include grasslands/old fields, emergent freshwater

marshes, shrub and early succession forest communities, and constructed impoundments. Plant species assembled from historical data and recent updates provides 985 total plant species including 554 herbs/forbs, 209 graminoids, 165 trees/shrubs, 65 sedges, and 39 vines (Harms 2019; Hotchkiss and Stewart 1979; Perry and Bond 2011).

Impacts on Affected Resource

ALTERNATIVE A – NO ACTION ALTERNATIVE

The current management will not change the overall composition of the refuge vegetation and habitats. The largest impacts of current management on refuge vegetation and habitats are the control of the primary herbivore, deer, and the spread of invasive plants seeds sources by attachment to footwear, clothing, and tires. Hunters tend to park in improved lots and disperse across large areas in low density, resulting in minimal trampling of vegetation. Clearing or pruning of vegetation and use of screw-in steps or spikes for tree stands is prohibited. As currently implemented, very little damage to habitat and vegetation by hunters occur.

ALTERNATIVE B – PROPOSED ACTION ALTERNATIVE

Negative impacts of recreational hunting could include the temporary trampling of vegetation and light soil erosion. Most hunting activities occur during the fall and winter, when plants become dormant, and the ground is often frozen and/or covered in snow. Hunters would have minimal impacts on plants during this period. Additionally, hunter use during all seasons will be dispersed throughout the refuge, minimizing the impact to any one area.

The proposed management will not change the overall composition of the refuge vegetation and habitats. It is expected to further aid in keeping deer within MDDNR's recommended density for the central region's carrying capacity of 20 deer per square mile. Controlling the deer population is a strategy that directly supports the goals and objectives for floodplain and upland forest habitats in the refuge CCP (USFWS 2013*a*).

VISITOR USE AND EXPERIENCE

Description of Affected Resource

PRR is open to all six of the priority public uses that are outlined in the Refuge System Improvement Act of 1997, which include hunting, fishing, wildlife photography, wildlife observation, environmental education, and interpretation. Based on the 2017 Banking on Nature Report, less than 1 percent of refuge visits were for hunting, 31 percent of refuge visits were for fishing, and 69 percent of refuge visits were for non-consumptive uses (USFWS 2017). Hunting is a traditional and popular outdoor activity that is permitted on portions of the refuge in accordance with State and Federal seasons and regulations. In 2020, 248,448 people visited the refuge and 5,826 of those visits were related to the refuge hunt program.

The refuge facilitates a variety of programs and walks, done by refuge staff, refuge volunteers, and Friends of Patuxent members. Activities include an Urban Refuge Day celebration, monthly bird walks, owl prowls, book walks, and others. Trails on the refuge also create opportunities for the public to enjoy and appreciate the refuge's abundant natural resources (USFWS 2007).

Impacts on Affected Resource

ALTERNATIVE A – NO ACTION ALTERNATIVE

Currently, refuge lands open to hunting generally follow Federal and State seasons and regulations, with some refuge-specific restrictions. Hunting, especially for species like waterfowl and deer, is a traditional activity during the fall in Maryland. As such, few conflicts among user groups have involved hunters or hunting on the refuge. The small number of hunter complaints or conflicts each year usually involve other hunters. Refuge visitors using trails (birdwatching, walking, photography) are the most affected by hunting activities. In order to address safety concerns of non-hunting visitors and trail users, the refuge staff has increased outreach and clearly posted trail signs and designated safety zones on the refuge. Additionally, the North Tract and South Tract trails are closed during the deer firearm season to reduce conflict between recreational users.

ALTERNATIVE B – PROPOSED ACTION ALTERNATIVE

This alternative would not change any of the impacts to the non-hunting public. The opportunities for recreational hunting will continue to be available to hunters, including some additional opportunities, and therefore meet the demand. Hunting on the refuge contributes to the State's wildlife management objectives, the management objectives of the refuge, and allows a traditional use to continue. The number of hunters and the amount of time spent hunting is expected to slightly increase due to expanded refuge hunting opportunities on the South Tract and Schafer Farm areas of the refuge. It is likely that 40 to 50 additional hunters will use the South Tract and Schafer Farm areas for hunting. Novice deer hunters and their mentors may increase hunting pressure during the mentored deer hunt on the South Tract (Loblolly Area), but the only anticipated conflicts will likely be from other hunters.

Increased hunter presence and use during the regular refuge hunting timeframe (September to the end of January) is not expected to greatly increase the number of conflicts among user groups. Most hunter-to-hunter conflicts are expected to be minor and can be managed by refuge staff or law enforcement. Conflicts that arise with other user groups are expected to be minor, and may be managed through outreach, trail closures, and signage. If conflicts do arise, mitigation efforts will be designed and implemented to lessen impacts to other wildlife-dependent user groups. Additionally, the North Tract and South Tract trails are closed during the deer firearm season to reduce conflict between recreational users.

Time and space zoning (e.g., establishment of separate use areas, use periods, and restriction on the number of users) is an effective tool in eliminating conflicts between user groups. Timing, duration, number of hunters, and method of take restrictions have been proposed to reduce conflicts among different user groups.

CULTURAL RESOURCES

Description of Affected Resource

A total of 41 archaeological sites registered with the Maryland Historical Trust and Service are present within the refuge. Prehistoric archaeological resources date from the Early Archaic through Late Woodland periods. Native American archaeological resources dating to other time periods (e.g., Pre-Clovis, Paleo-Indian, Contact periods) may exist within the refuge. Historic sites include occupations dating from the 17th century to the 20th century (Richard Grubb and

Associates 2011). The prehistoric archaeological resources within the refuge reflect over 9,000 years of occupation. A diversity of artifacts and sites has been documented. Most of the historic archaeological resources within the PRR are detailed in Pousson (1987) for the Central and South Tracts and within Joseph et al. (1991) for the North Tract.

Three National Register eligible historic districts are identified within the refuge:

- Duvall Mill Historic District, which includes resources significant to the history of Prince George's County and not associated with the development of the refuge.

- Patuxent Research Refuge Historic District, which includes resources significant to the development of the refuge.

- South Tract Forest Service Historic District, which includes resources significant to the development of the Forest Service research area within the Beltsville Agricultural Research Center.

Several cemeteries are located within the North Tract (Hileman 1988). A history of the Patuxent forks region notes that there were two cemeteries (possibly a family cemetery and a separate slave cemetery) on both the Anderson and Mullikan farms (Dulaney 1948). The North Tract includes 10 Fort Meade inholdings that are historic cemeteries. These have headstones dating back to the 1700s, with some as recent as 1969 (Hileman 1988). They include graves and headstones of former landowners and their extended families. Four of the 10 cemeteries were part of the former Fort Meade lands transferred to the refuge in 1991 and 1992. These are the John Penn Cemetery and three others that are unknown or unmarked. The refuge performs minimal custodial work at the John Penn site.

Impacts on Affected Resource

ALTERNATIVE A – NO ACTION ALTERNATIVE

No adverse impacts occur under this alternative. Hunting, regardless of method or target species, 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.

ALTERNATIVE B – PROPOSED ACTION ALTERNATIVE

No additional adverse impacts would occur under this alternative.

REFUGE MANAGEMENT AND OPERATIONS

Description of Affected Resource

There are 12 permanent full-time employee positions that oversee the refuge. At the North Tract, infrastructure includes a refuge Hunt Control Station, visitor contact station, impoundments, overlook observation area, environmental education (EE) building and two shop areas. The

refuge also includes paved and gravel roads, trails, boardwalks, kiosks, interpretive signs, restrooms, and ample parking. The roads and trails support multiple uses by hikers, bikers and horseback riders.

The Central Tract contains numerous buildings related to refuge administration, USGS offices and laboratories, 14 man-made impoundments managed for waterfowl, large pen complexes for environmental contaminant studies, residential buildings, and a 3-mile transmission power line right-of-way.

At the South Tract, infrastructure includes the National Wildlife Visitor Center, Cash Lake, a prominent seasonal fishing area, and a tram shop. This portion of the refuge also includes paved and gravel roads, trails, boardwalks, kiosks, interpretive signs, restrooms, and ample parking. In the fall of 2021, the refuge will be installing a new outdoor comfort station on the National Wildlife Visitor Center grounds.

Impacts on Affected Resource

ALTERNATIVE A – NO ACTION ALTERNATIVE

Annual administrative costs for the refuge hunting program are shared between the Service and the MNHA. A large but necessary expense that falls upon the Service is staff time, especially that of law enforcement officers. During the hunting season, considerable staff time is spent on law enforcement activities, hiring and training hunt control station managers, maintaining or updating the hunter and harvest databases, and coordinating the lottery hunt. Other costs include staff time for annual planning and writing of the hunt regulations, preparing printed materials such as maps and hunt regulations, posting hunt area boundaries, prepping roads, preparing for parking and access, providing orientation, entering and analyzing harvest data, and coordination meetings.

Supplies such as Carsonite signs, posts, and laminate material for signage annually cost the refuge about $2,500. Gravel road repairs and upkeep totals approximately $20,000 per year, and printing hunting regulations costs MNHA about $5,200 per year.

Table B-4. Funding and Staffing Requirements

Identifier	Cost
Staff time to implement hunt program (Maintenance Workers, Biologist, Park Rangers, and Refuge Managers)	$12,000
Maintain roads, parking lots, trails*	$20,000
Maintain hunting signs	$2,500
Total Annual Cost	**$34,500**

**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 costs of the program.*

The refuge and facility management staff coordinate the budget each year to ensure funds are available. Hunters use refuge infrastructure, such as parking areas and refuge trails, to gain access to refuge lands. There would be no new adverse impacts to refuge facilities or staff time observed under this alternative.

ALTERNATIVE B – PROPOSED ACTION ALTERNATIVE

Annual administrative costs for the refuge hunting program will not be adversely impacted by this proposed action. The expansion of hunting opportunities will not have an observable impact to infrastructure or facilities. For the proposed action, hunters would continue to use existing refuge infrastructure (parking areas, trails, roadways, etc.) to access hunting areas. It is anticipated that there will be up 60 additional hunters per year at Schafer Farm and the South Tract with the new opportunities. We expect a slight increase of staff time with the addition of spring turkey hunting on the South Tract, which could see up to 24 additional turkey hunters per year. While more visitors are expected to use the refuge under this alternative, no observable impacts to infrastructure or facilities would be anticipated.

SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

Description of Affected Resource

The refuge is located in Anne Arundel and Prince George's Counties in Maryland. As of May 1, 2021, the populations of Anne Arundel and Prince George's Counties are estimated at 586,656 and 911,986. There was a 5.62 percent change in population from 2010 to 2021 for Prince George's County. This increase can still be attributed to the county's close proximity to the Washington, DC and Baltimore, Maryland metro areas. The two counties' combined population has been steadily growing since 1940 (Vanasse Hangen Brustlin, Inc. 2010). Prince George's is the second most populous county in Maryland and Anne Arundel County is the sixth largest (USCB 2020; USFWS 2021).

As of April 2021, the median household income in Anne Arundel County is $94,502. The ACS 1-year data shows the median family income for Prince George's County was $100,654 in 2019. Compared to the median Maryland family income, Prince George's County median family income is $5,025 lower. In South Laurel 4.75 percent of families are below poverty level, in Laurel 5.8 percent of families are below poverty level, and in Bowie 1.4 percent of families are below the poverty level (USCB 2020; USFWS 2021).

The populations surrounding the refuge are overwhelmingly made up of minorities, from 86.22 percent in South Laurel, MD to 78.77 percent in Laurel, MD, and 68.91 percent in Bowie, Maryland (which are the three cities in closest proximity to the refuge).

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.

Impacts on Affected Resource

ALTERNATIVE A – NO ACTION ALTERNATIVE

Population growth will continue to place stress upon the ecosystems of Maryland and the Patuxent River Watershed, both through direct loss of remaining habitats and indirect loss through fragmentation and degradation of the region's remaining parcels of wildlife habitat and demands on water. Management can do nothing to stem this trend, but refuges and other tracts of

habitats will become even more important as repositories of biodiversity.

There is a possibility of human health impacts from the current hunting program allowing and continuing to allow the use of certain types of lead ammunition for the harvest of certain species. However, minority and/or low-income communities are not disproportionately at risk or impacted. The Service has found these impacts negligible for all opportunities in the current hunting programs, but there is strong scientific evidence of impacts to human health from consuming animals hunted with lead ammunition.

ALTERNATIVE B – 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 PRR would likely enrich the local economy by attracting additional refuge visitors to the area, but the additional economic impact would likely be negligible under this action. The refuge is working towards lessening the financial impact on families by not charging the refuge permit fee to new hunters selected for the mentored deer hunts. The changes to the hunting program would have a minor, long-term beneficial impact to the local economy.

The refuge proposes to phase out use of lead ammunition on PRR by 2026. Although non-lead ammunition is currently more expensive than lead ammunition, we expect that as technology advances, the quality and supply of alternative ammunition will increase, and the cost will decrease. For some calibers and gauges even the difference between cheaper lead ammunition and nonlead ammunition can be less than $10 per box (State of California, 2022). The minor economic burden involved in transitioning between ammunition could be more impactful to low-income hunters. In order to prevent the negative impacts of this switch, the refuge has begun and will continue specific outreach about the requirement to these groups and has put in place measures to mitigate the economic input beyond the proposed phase implementation, which already affords hunters time to gradually transition their supplies of ammunition. In order to mitigate economic impacts to hunters who previously used lead ammunition, in addition to proposing the requirement in phases, the Service will continue educating hunters on the use of non-lead ammunition during the phased in time period, provide resources on companies that produce non-lead ammunition for purchase and work with partner organizations on non-lead ammunition giveaways or exchanges if possible. With these mitigation measures, minority and/or low-income communities are not disproportionately impacted from this alternative.

The Proposed Action Alternative would have a positive, but negligible, effect on human health. It would eliminate the risk of human health impacts that would follow if the Service continued to allow the use of certain lead ammunition for certain species on current and future Service lands and waters within the authorized boundary of the refuge. The Service has found these impacts negligible for all opportunities in the current hunting programs, which makes the benefit negligible, but there is strong scientific evidence of impacts to human health from consuming animals hunted with lead ammunition or tackle use for fishing such as higher blood lead levels (Fisher et al. 2006; Frank et al. 2019; Grade et al. 2019; Iqbal et al. 2009; Sahmel et al. 2015; Tsuji et al. 2008).

While the populations surrounding the refuge are overwhelmingly made up of minorities, we expect no disproportionate effects or impacts to these communities from this proposed action or any of the alternatives. The refuge will reach out to underserved communities to generate awareness of hunting opportunities and to engage these communities through the proposed action.

Monitoring
Many game species populations are monitored by MDDNR through field surveys and game harvest reports, which provide an additional means for monitoring populations. Refuge hunters will be required to check in and submit harvest reports before leaving hunt areas. The State has determined that populations of game species are at levels acceptable to support hunting and these assessments are reviewed and adjusted periodically.

We will continue to base the annual level of harvest on observed population size and habitat conditions. If results of monitoring programs indicate that resident fish and wildlife populations are unable to withstand any of the proposed harvest management strategies, the regulations will be adapted accordingly until the population can withstand the harvest pressure.
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).

<u>ALTERNATIVE A – NO ACTION ALTERNATIVE</u>
There would be no additional costs to the refuge and no change to the current public use and wildlife management programs on the refuge under this alternative. The refuge would not increase its impact on the economy and would not provide new hunting and access opportunities. While this alternative has the least direct impacts of physical and biological resources, it would not meet mandates under the NWRSAA and Secretarial Order 3356.

This action is not likely to adversely affect endangered or threatened species or their critical habitat. Effects on other wildlife and habitat would be negligible, although there may be some negative effects as the potential of lead being present and bioavailable for wildlife and aquatic species to consume would continue to occur under this alternative, even if that lead entering the environment from hunting and activities is estimated to be small. The refuge would still be able to manage for species of concern and meet the refuge purpose to manage for migratory birds. Water quality and soil impacts are likely negligible from continued use of lead ammunition, as the addition of lead from these activities are small and will not reach levels of contaminating these resources as levels that may affect human and wildlife health. There will be no impacts to special designations of the refuge. There would be no effect to cultural resources and impacts to the socioeconomics of the area are negligible.

This alternative helps meet the purpose and needs of the Service as described above, because it

provides additional wildlife-dependent recreation opportunities on the refuge meeting the Service's priorities and mandates. However, it continues to pose a threat to human health and the environment by continuing to allow the use of lead ammunition. There would be no new authorizations under this alternative, but the nature of discarded lead means that continuing to allow the use of lead ammunition on Service lands and waters would mean adding newly deposited lead to the current amount of lead in the environment on Service lands and waters. This would mean the risk of adverse impacts from lead available in the environment would continue and even increase for natural resources and for human health under the No Action Alternative, as described throughout this document.

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 NWRSAA and Secretarial Order 3356. The Service believes that hunting on the refuge would not have a significant impact on local, regional, or Atlantic flyway migratory bird populations because the percentage likely to be harvested on the refuge, though possibly additive to existing hunting takes, would be a small fraction of the estimated populations. In addition, overall populations will continue to be monitored and future harvests will be adjusted as needed under the existing flyway and State regulatory processes.

Economic impacts to hunters due to proposed required use of non-lead ammunition will be mitigated by a phased in approach and outreach programs. Additional hunting would not add more than slightly to the cumulative impacts stemming from hunting at the local, regional, or flyway levels, and would only result in minor, negative impacts to migratory bird or other species populations. This alternative best meets the purpose and need stated earlier.

List of Sources, Agencies and Persons Consulted

Karina Stonesifer	Associate Director, Game Management
Bill Harvey	Game Bird Project Leader
Harry Spiker	Game Mammal Project
Brian Eyler	Deer Project Leader
Josh Tabora	Furbearer Biologist
Jonathan McKnight	Associate Director, Natural Heritage Program
Nick Sagwitz	Southern Region Manager
Chris Markin	R3 Coordinator
Amy Wood	Cultural Resources
Tim Binzen	Tribal Liaison

List of Preparers

Jennifer Greiner, Refuge Manager, Patuxent Research Refuge
Sandy Spencer, Wildlife Biologist, Patuxent Research Refuge
Tarik Adams, Deputy Refuge Manager, Patuxent Research Refuge
Laura Howard, Visitor Services Assistant, Regional Office
Wilson Darbin, Visitor Services Assistant, Regional Office
Stacey Lowe, Hunting and Fishing Chief, Regional Office
Tom Bonetti, Hunting and Fishing Coordinator, Regional Office

Laura Kelly, Intern, Regional Office (Cover Graphics)
John Saluke, Visitor Services Assistant, Regional Office

State Coordination
National wildlife refuges, including PRR, conduct hunting programs within the framework of State and Federal regulations. The refuge has developed this hunting plan based upon formal coordination with the MDDNR (meeting held July 28, 2021) and with input from the MNHA as well as intervening informal discussions.

Refuge staff will continue to annually consult and coordinate with MDDNR and Chesapeake Marshlands National Wildlife Refuge Complex to maintain consistent regulations and programs, monitor populations of hunt species, and set harvest goals. We will work to ensure safe and enjoyable recreational hunting opportunities by working together with law enforcement officers from both agencies to conduct patrols, safeguard hunters and visitors, and protect both game and nongame species.

Tribal Consultation
The refuge does not have any federally recognized resident Tribal Nations or federally recognized interested Tribal Nations to notify of our intent to expand the hunting program.

Public Outreach
The public will be notified of the availability of the Patuxent Research Refuge Hunting Plan, EA and Compatibility Determination for review and will include no less than a 60-day 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 the public comment period and at the time of finalization of the Environmental Assessment.

_X_ 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: THOMAS BONETTI Digitally signed by THOMAS BONETTI Date: 2022.09.01 11:49:34 -04'00' Date: 9/1/2022

Name/Title/Organization: Thomas Bonetti, Hunt/Fish Coordinator
NWRS, Region 5, Hadley, MA

References

Anderson, W.L, S.P. Havera, and B.W. Zercher. 2000. Ingestion of lead and nontoxic shotgun pellets by ducks in the Mississippi flyway. The Journal of Wildlife Management 64(3): 848-857.

Arizona Game and Fish Department. 2018. Gearing up for the hunt? Don't forget the non-lead ammo. https://www.azgfd.com/gearing-up-for-a-hunt-dont-forget-the-non-lead-ammo/. Accessed: February 2, 2022.

Benson, Etienne. 2013. The Urbanization of the Eastern Gray Squirrel in the United States, *Journal of American History*, Volume 100, Issue 3, December 2013, Pages 691–710, https://doi.org/10.1093/jahist/jat353

Cade, T.J. 2007. Exposure of California condors to lead from spent ammunition. Journal of Wildlife Management 71(1): 2125-2133. doi:10.2193/2007-084.

Center for Biological Diversity. 2007. Schwarzenegger approves historic condor protection bill. https://www.biologicaldiversity.org/swcbd/PRESS/condor-lead-10-13-2007.html. Accessed: February 2, 2022.

Chapman, J.A. and G.A. Feldhamer. (eds). 1982. Wild Mammals of North America: Biology, Management, and Economics. Johns Hopkins University Press, Baltimore, Maryland.

Church, M.E., R. Gwiazda, R.W. Risebrough, K. Sorenson, C.P. Chamberlain, S. Farry, W. Heinrich, B.A. Rideout, and D.R. Smith. 2006. Ammunition is the primary source of lead accumulated by California condors re-introduced to the wild. Environmental Science and Technology 40: 6143-6150.

Craig, T.H., J.W. Connelly, E.H. Craig, and T.L. Parker. 1990. Lead concentrations in golden and bald eagles. Wilson Bulletin 102: 130-133.

Cruz-Martinez, Luis, Marrett D. Grund, and Patrick T Redig. 2015. Quantitative Assessment of Bullet Fragments in Viscera of Sheep Carcasses as surrogates for White-Tailed Deer. Human–Wildlife Interactions: Vol. 9: Iss. 2, Article 10. DOI: https://doi.org/10.26077/rxm7-x083 Available at: https://digitalcommons.usu.edu/hwi/vol9/iss2/10

Demayo, A., M.C. Taylor, K.W. Taylor, and P.V. Hodson. 1982. Toxic effects of lead and lead compounds on human health, aquatic life, wildlife plants, and livestock. CRC Crit. Rev. Environ. Control 12:257-305.

Dulaney, C.A. 1948. The Andersons from the Great Fork of the Patuxent. Self-published, Odenton, MD.

Eyler, B. 2013. MD DNR. Personal communication 27 July 2013.

Eisler, Ronald. 2000. Handbook of Chemical Risk Assessment—Health Hazards to Humans, Plants, and Animals. Vol 1, Metals. US Geological Survey, Patuxent Wildlife Research Center, Laurel, Md.

Finkelstein, M.E., D.F. Doak, D. George, J. Burnett, J. Brandt, M. Church, J, Grantham, and D.R. Smith. 2012. Lead poisoning and the deceptive recovery of the critically endangered California condor. Proceedings of the National Academy of Sciences 109(28): 11449-11454.

Fisher, I.J., D.J. Pain, and V.G. Thomas. 2006. A review of lead poisoning from ammunition sources in terrestrial birds. Biological Conservation 131: 421-432.

Frank, J.J., A.G. Poulakos, R. Tornero-Velez, and J. Xue. 2019. Systematic review and meta-analyses of lead (Pb) concentrations in environmental media (soil, dust, water, food, and air) reported in the United States from 1996 to 2016. Science of the Total Environment 694: 133489. https://www.sciencedirect.com/science/article/pii/S0048969719334096 Accessed April 14, 2022.

Golden, N.H., S.E. Werner, and M.J. Coffey. 2016. A Review and Assessment of Spent Lead Ammunition and its Exposure and Effects to Scavenging Birds in the United States. P.de. Voogt (ed.), Reviews of Environmental Contamination and Toxicology 237:123-191.

Grade, T., P. Campbell, T. Cooley, M. Kneeland, E. Leslie, B. MacDonald, J. Melotti, J. Okoniewski, E. J. Parmley, C. Perry, H. Vogel, and M. Pokras. 2019. Lead poisoning from ingestion of fishing gear: A review. Ambio 48, 1023–1038. https://doi.org/10.1007/s13280-019-01179-w

Holl, W. and R. Hamp 1972. 1975. Lead and plants. Residue Rev. 54:79-111.

Harms, William. 2019. Native Plant Inventory data. Refuge files.

Herring, G., C.A. Eagles-Smith, and M.T. Wagner. 2016. Ground Squirrel Shooting and Potential Lead Exposure in Breeding Avian Scavengers. PLOS ONE 11 (12): e0167926. https://doi.org/10.1371/journal.pone.0167926

Hileman, C. 1988. Census of cemeteries located on Fort George G. Meade Military Reservation July 1, 1988. On file at the Fort Meade Historical Museum.

Hoffman, D.J., J.C. Franson, O.H. Pattee, C.M. Bunck, and A. Allen. 1985a. Survival, growth, and accumulation of ingested lead in nestling American kestrels (*Falco sparverius*). Archives of Environmental Contamination and Toxicology 14: 89-94.

Hoffman, D.J., J.C. Franson, O.H. Pattee, C.M. Bunck, and H.C. Murray. 1985b. Biochemical and hematological effects of lead ingestion in nestling American kestrels *(Falco sparverius)*. Comparative Biochemistry and Physiology – Part C 80: 431-439.

Hotchkiss, N., and R.E. Stewart. 1979. Vegetation and vertebrates of the Patuxent Wildlife Research Center: outline of ecology and annotated lists (reprint with new supplements of vegetation of the Patuxent Research Refuge, MD). U.S. Department of the Interior, U.S. Fish and Wildlife Service, Laurel, MD.

Huettner, S. 2003. Pax Youth Turkey Hunt. Fishing and Hunting Journal. June 2003. P.10.

Hughs, T., J. Kennamer, J. Tapley, and Chad Lehman. 2005. The impacts of predation on wild turkeys. Proceedings of the National Wild Turkey Federation 9:117-126.

Hunt, W.G., W. Burnham, C.N. Parish, K.K. Burnham, B. Mutch, and J.L. Oaks. 2006. Bullet fragments in deer remains: Implications for lead exposure in avian scavengers. Wildlife Society Bulletin 34: 167-170.

Iqbal S., W. Blumenthal, C. Kennedy, F.Y. Yip, S. Pickard, W.D. Flanders, K. Loringer, K. Kruger, K.L. Caldwell, M. Jean Brown. 2009. Hunting with lead: association between blood lead levels and wild game consumption. Environmental Research 109(8):952-9. doi: 10.1016/j.envres.2009.08.007.

Joseph, J.W., M.B. Reed, and L.E. Abbott. 1991. Cultural resources overview of Fort George G. Meade, Arundel County, MD. Dated April 1991. On file at the Maryland Historical Trust, Crownsville, MD.

Kelly A., and S. Kelly. 2005. Are mute swans with elevated blood lead levels more likely to collide with overhead power lines? Waterbirds 28: 331-334.

Kelly, T.R., P.H. Bloom, S.G. Torres, Y.Z. Hernandez, R.H. Poppenga, W.M. Boyce, and C.K. Johnson. 2011. Impact of the California lead ammunition ban on reducing lead exposure in golden eagles and turkey vultures. PLoS ONE. 6(4): e17656. doi:10.1371/journal.pone.0017656.

Kramer, J.L., and P.T. Redig. 1997. Sixteen years of lead poisoning in eagles, 1980-95: An epizootiologic view. Journal of Raptor Research. 31(4): 327-332.

Lewis, N.L., T.C. Nichols, C. Lilley, D.E. Roscoe, and J. Lovy. 2021. Blood lead declines in wintering American black ducks in New Jersey following the lead shot ban. Journal of Fish and Wildlife Managements 12(1): 174-182.

Loges, B.W., B.G. Tavernia, A.M. Wilson, J.D. Stanton, J.H. Herner-Thogmartin, J. Casey, J.M. Coluccy, J.L. Coppen, M. Hanan, P.J. Heglund, S.K. Jacobi, T. Jones, M.G. Knutson, K.E. Koch, E.V. Lonsdorf, H.P. Laskowski, S.K. Lor, J.E. Lyons, M.E. Seamans, W. Stanton, B. Winn, and L.C. Ziemba. 2014. National protocol framework for the inventory and monitoring of nonbreeding waterbirds and their habitats, an Integrated Waterbird Management and Monitoring Initiative (IWMM) approach. Natural Resources Program Center, Fort Collins, CO. https://iwmmprogram.org/wp-

content/uploads/2021/08/IWMM_NationalProtocolFramework_V2.1.pdf

Maryland Department of Natural Resources. 2020. White-tailed deer management plan 2020-2034. https://dnr.maryland.gov/wildlife/Documents/2020-2034MarylandWTDeerPlan.pdf Accessed May 9, 2021.

McCullough, D.R. 1982. The theory and management of Odocoileus populations. in Biology and Management of the Cervidae. Wemmer, C. (ed.) 1987; 535-549. Res. Symposium National Zoological Park.

McCullough, D.R. 1997. Irruptive behavior in ungulates. Pages 69-93 in W.J. McShea, H.B. Underwood, and J.H. Rappole, eds., The Science of Overabundance: Deer Ecology and Population Management. Smithsonian Institution Press, Washington, DC.

McGilvray, F. 2014. Summary of 2014 Waterfowl Production.

Nas F.S. and Ali M. The effect of lead on plants in terms of growing and biochemical parameters: a review. MOJ Eco Environ Sci. 2018;3(4):265-268. DOI: 10.15406/mojes.2018.03.00098.

O'Halloran, J., A.A. Myers, and P.F. Duggan. 1989. Some sub-lethal effects of lead on mute swan (*Cygnus olor*). Journal of Zoology 218: 627-632.

Pattee, O.H. 1984. Eggshell thickness and reproduction in American kestrels exposed to chronic dietary lead. Archives of Environmental Contamination Toxicology 13, 29-34. https://link.springer.com/content/pdf/10.1007/BF01055643.pdf

Pattee, Oliver H., Stanley N. Wiemeyer, Bernie M. Mulhern, Louis Sileo, and James W. Carpenter. 1981. Experimental Lead-Shot Poisoning in Bald Eagles. The Journal of Wildlife Management, 45(3), 806–810. https://doi.org/10.2307/3808728

Pauli, Jonathan N., and Steven W. Buskirk. "Recreational Shooting of Prairie Dogs: A Portal for Lead Entering Wildlife Food Chains." *The Journal of Wildlife Management*, vol. 71, no. 1, 2007, pp. 103–08. *JSTOR*, http://www.jstor.org/stable/4495149. Accessed 15 Aug. 2022.

Perry, M.C., and C.S. Bond. 2011. The herbaceous and woody plants of Patuxent Research Refuge. PRR, Laurel, MD 47 pp.

Platt, J.B. 1976. Bald eagles wintering in a Utah desert. American Birds 30: 783-788.

Pousson, J.F. 1987. Archaeological overview and assessment Patuxent Wildlife Research Center, Laurel, Maryland. U.S. Department of Interior, National Park Service, Denver Service Center, Applied Archaeology Center.

Raftovich, R.V., K.K. Fleming, S.C. Chandler, and C.M. Cain. 2020. Migratory bird hunting

activity and harvest during the 2018-19 and 2019-20 hunting seasons. U.S. Fish and Wildlife Service, Laurel, MD, USA.

Redig, P.T., C.M. Stowe, D.M. Barnes, and T.D. Arent. 1980. Lead toxicosis in raptors. Journ. Amer.Vet. Med. Assoc. 177:941.

Richard Grubb and Associates, Inc. 2011. Archaeological overview and assessment of the Patuxent Research Refuge Prince George's and Anne Arundel Counties, MD. Cultural Resources Review.

Rideout, B.A., I. Stalis, R. Papendick, A. Pessier, B. Puschener, M.E. Finkelstein, D.R. Smith, M. Johnson, M. Mace, R. Stroud, J. Brandt, J. Burnett, C. Parish, J. Petterson, C. Witte, C. Stringfield, K. Orr, J. Zuba, M. Wallace, and J. Grantham. Patterns off mortality in free-ranging California condors (*Gymnogyps californianus*). Journal of Wildlife Diseases 48(1): 95-112.

Sahmel, J., E.I. Hsu, H.J. Avens, E. Beckett, and K.D. Devlin. 2015. Estimation of hand-to-mouth transfer efficiency of lead. Annals of Work Exposures and Health 59: 210–220.

Samuel, M.D., and E.F. Bowers. 2000. Lead exposure in American black ducks after implementation of non-toxic shot. Journal of Wildlife Management 64: 947-953.

Sieg, R., K.A. Sullivan, and C.N. Parish. 2009. Voluntary lead reduction efforts with the northern Arizona range of the California condor. In: R.T Watson, M. Fuller. M. Pokras, W.G. Hunt (Eds.). Ingestion of Lead from Spent Ammunition: Implications for Wildlife and Humans. The Peregrine Fund, Boise, Idaho, USA, pp. 341-349.

Slabe, V.A., J.T. Anderson, B.A. Milsap, J.L. Cooper, A.L. Harmata. M. Resatni, R.H. Crandall, B. Bodenstein, P.H. Bloom, T. Booms, J. Buchweitz, R. Culver, K. Dickerson, R. Domenech, E. Dominguez-Villegas, D. Driscoll, B.W. Smith, M.L. Lockhart, D. McRuer, T.A. Miller, P.A. Ortiz, K. Rogers, M. Schwartz, N. Turley, B. Woodbridge, M.E. Finkelstein, C.A. Triana, C.R. DeSorbo, and T.E. Katner. 2022. Demographic implications of lead poisoning for eagles across North America. Science. 375: 779-782.

State of California. 2022. Nonlead Ammunition in California. Accessed April 14, 2022. Available from: https://wildlife.ca.gov/Hunting/Nonlead-Ammunition#250462358-ive-heard-nonlead-costs-twice-as-much-where-can-i-find-a-good-deal-on-ammo

Stauber, Erik, Nickol Finch, Patricia A. Talcott, and John M. Gay. 2010. "Lead poisoning of bald (*Haliaeetus leucocephalus*) and golden (*Aquila chrysaetos*) eagles in the US inland Pacific Northwest region—An 18-year retrospective study: 1991–2008." *Journal of Avian Medicine and Surgery* 24.4 (2010): 279-287.

Stroud, R.K., and W.G. Hunt. 2009. Gunshot wounds: A source of lead in the environments. In: R.T. Watson, M. Fuller. M. Pokras, W.G. Hunt (Eds.). Ingestion of Lead from Spent Ammunition: Implications for Wildlife and Humans. The Peregrine Fund, Boise, Idaho,

USA. pp. 119-125.

Tallamy, D. 2007. Bringing Nature Home. Timber Press. Portland, London. 288 pp.

Tjaden, R.L., and J. Kays. 2002. Wildlife Management: Cottontail Rabbit. University of Maryland, Maryland Cooperative Extension Service, Publication #601.

Turner, R.S., A.H. Johnson, and D. Wang. 1985. Biogeochemistry of lead in McDonalds Branch watershed, New Jersey Pine Barrens, Jour. Environ. Qual. 14:305-314.

Tsuji, L.J., B.C. Wainman, I.D. Martin, C. Sutherland, J.P. Weber, P. Dumas, and E. Nieboer. 2008. The identification of lead ammunition as a source of lead exposure in First Nations: the use of lead isotope ratios. Science of the Total Environment. 393 (2–3), 291–298.

United States Census Bureau (USCB). 2020. 2020 United States Census data. Accessed May 1, 2021.

United States Fish and Wildlife Service (USFWS) Socioeconomic Profiles. 2021. Available online at https://headwaterseconomics.org/tools/usfws-indicators/ Accessed April 2021.

United States Fish and Wildlife Service (USFWS). 2017. Banking on Nature 2017: the economic benefit to local communities of National Wildlife Refuge visitation. U.S. Department of the Interior, U.S. Fish and Wildlife, Division of Economics, Washington, DC.

United States Fish and Wildlife Service (USFWS). September 2013*a*. Patuxent Research Refuge Comprehensive Conservation Plan. https://ecos.fws.gov/ServCat/Reference/Profile/43798

United States Fish and Wildlife Service (USFWS). 2013*b*. Issuance of Annual Regulations Permitting the Hunting of Migratory Birds, Final Supplemental Environmental Impact Statement. USFWS, Division of Migratory Birds and Management, Laurel, MD. 418pp.

United States Fish and Wildlife Service (USFWS). 2007. Banking on Nature 2006: the economic benefit to local communities of National Wildlife Refuge visitation. U.S. Department of the Interior, U.S. Fish and Wildlife, Division of Economics, Washington, DC.

United States Fish and Wildlife Service (USFWS). 1999. Establishing “lead free fishing area” and the prohibition of the use of certain fishing sinkers and jigs made with lead on specific units of the National Wildlife Refuge system. Federal Register 64:17992.

Vanasse Hangen Brustlin, Inc. 2010.

Warner, S.E., E.E. Britton, D.N. Becker, and M.J. Coffey. 2014. Bald eagle lead exposure in the Upper Midwest. *Journal of Fish and Wildlife Management*, 5(2), 208-216.

Washington Department of Fish and Wildlife. 2022. Non-toxic shot requirements. https://wdfw.wa.gov/hunting/regulations/migratory-waterfowl-upland-game/non-toxic-

shot. Accessed: February 2, 2022.

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 Part 10.
- Executive Order 11593 – Protection and Enhancement of the Cultural Environment, 36 Fed. Reg. 8921 (1971).
- Executive Order 13007 – Indian Sacred Sites, 61 Fed. Reg. 26771 (1996).

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, 450.
- Fish and Wildlife Act of 1956, 16 U.S.C. 742a-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.
- Wild and Scenic Rivers Act, 16 U.S.C. 1271 et seq.
- Executive Order 13112 – Invasive Species, 64 Fed. Reg. 6183 (1999).

SPECIES OF CONSERVATION CONCERN ON PATUXENT RESEARCH REFUGE

Scientific Name	Common Name	State Status (Fed status)
Turtles and Amphibians		
Clemmys guttata	Spotted turtle	*(At-Risk, petitioned for listing)*
Terepene carolina carolina	Eastern box turtle	
Lithobates sylvatica	Wood frog	
Scaphiopus holbrookii	Eastern spadefoot toad	
Abystoma maculatum	Spotted salamander	
Abystoma opacum	Marbled salamander	
Mammals		
Myotis septentrionalis	Northern long-eared bat	*(Threatened)*
Forest Interior and Shrubland Birds		
Hylocichla mustelina	Wood thrush	
Geothlypis formosa	Kentucky warbler	
Protonotaria citrea	Prothonotary warbler	
Helmitheros vermivorum	Worm eating warbler	
Seiurus aurocapilla	Ovenbird	
Setophaga discolor	Prairie Warbler	
Icteria virens	Yellow-breasted chat	
Toxostoma rufum	Brown thrasher	
Caprimulgus vociferous	Whip-poor will	
Piranga olivacea	Scarlet tanager	
Dragonflies/Damselflies		
Stylurus laurae	Laura's Clubtail	*Rare*
Libellula flavida	Yellow-sided Skimmer	*Rare*
Nannothemis bella	Elfin Skimmer	*Endangered*
Somatochloa provocans	Treetop Emerald	*Endangered*
Epitheca costalis	Slender Baskettail	*Highly Rare*
Celithemis martha	Martha's Pennant	*Highly Rare*
Gomphaeschna antilope	Taper-tailed Darner	*Rare*
Nehalennia gracilis	Sphagnum Sprite	*Rare*
Nehalennia integricollis	Southern Sprite	*Highly Rare*
Helocordulia selysii	Selys' Sundragon	*Threatened*
Gomphus rogersi	Sable Clubtail	*In Need of Conservation*
Butterflies/Skippers		
Callophrys augustinus	Brown elfin butterfly	*G5 Secure*
Danaus plexippus	Monarch butterfly	(*Candidate species 2021)*
Fish and Mussels		
Lethenteron appendix	American Brook Lamprey	*Threatened*

Etheostoma vitreum	Glassy Darter	*Threatened*
Ameiurus catus	White Catfish	*Uncertain*
Elliptio producta	Atlantic Spike	*In Need of Conservation*
Elliptio lanceolata	Yellow lance	*Threatened()*

Plants (non-tree)

Gratiola viscidula	Short's Hedge-hyssop	*Endangered*

INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

Originating Person: Sandy Spencer
Telephone Number: 301 497 5587 **Email:** sandy_spencer@fws.gov
Date: May 2022

Project Name: Patuxent Research Refuge Hunting Plan

I. Service Program:

_____ Ecological Services
__X_ National Wildlife Refuge System
_____ Federal Aid
_____ Clean Vessel Act
_____ Coastal Wetlands
_____ Endangered Species Section 6
_____ Partners for Fish and Wildlife
_____ Sport Fish Restoration
_____ Wildlife Restoration

II. State/Agency: National Wildlife Refuge System

III. Station Name: Patuxent Research Refuge

IV. Description of Proposed Action (attach additional pages as needed):

- Aligning with State regulations for mourning dove hunting;
- Permitting use of dogs for waterfowl, rabbit, and mourning dove hunting;
- Expanding spring turkey hunting on 1,812 acres to include the South Tract and Schafer Farm;
- Expanding rabbit, gray squirrel, mourning dove and woodchuck hunting on the South Tract (1,336 acres) and Schafer Farm unit (476 acres);
- Aligning with the State for all deer hunting days/seasons (including those at the South tract);
- Hunting seasons are conducted from September through January, with a limited spring turkey hunt mid-April to May.
- Facilitating additional mentored hunts where possible; and
- Use of non-lead ammunition is currently required for upland game, turkey, migratory bird and waterfowl hunting at Patuxent. The use of non-lead ammunition for deer hunting will initially be voluntary, and we plan to require non-lead ammunition for all activities

starting at the beginning of the fall 2026-2027 hunting season (after a 4-year phase-in period).

V. Pertinent Species and Habitat:

A. Include species/habitat occurrence map:

B. Complete the following table:

Species/Critical Habitat	Status
Northern long-eared bat	T
Yellow lance mussel	T
Puritan tiger beetle	T
Sensitive joint vetch	T
Swamp pink	T
Monarch butterfly	C

*Status: E= Endangered, T=Threatened, T(s/a)=Threatened by Similarity of Appearance, PE=Proposed Endangered, PT= Proposed Threatened, CH= Critical Habitat, PCH= Proposed Critical Habitat, C=Candidate Species.

VI. Location (attach map):

A. Ecoregion Number and Name:
Northeast Region, Region 5

B. County and State:
Anne Arundel and Prince George Counties, Maryland

C. Section, Township, and Range (or latitude and longitude)
39.03 26.24 x –76.45 44.12

D. Distance (miles) and direction to nearest town:
Varies, see Hunt Maps

E. Species/habitat occurrence: Maps are available of Northern long-eared bat detections via passive acoustic surveys. Detections (high and low quality) occurred in 2016 and 2017 at survey points 1, 2, 19, 30 32, 33, 37, 38, 40, 41, and 43. Monarchs are not formally surveyed and mapped, although frequently seen in meadows containing host and nectar plants. Yellow lance mussel, puritan tiger beetle, sensitive joint vetch, and swamp pink have not been found on the refuge.

Patuxent Research Refuge uses IPaC and ECOS databases and targeted surveys to identify threatened and endangered species on the refuge in order to ensure a thorough review for this Biological Evaluation. As these databases are updated approximately every 90 days, 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 subsequent updates to IPaC or ECOS from the refuge and other sources.

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 activities will have either no effect on or are not likely to adversely affect the species.

VII. Determination of Effects:

For each species below, when applicable, we describe the effects of the proposed new hunting opportunities and evaluate the effect of the plan to require non-lead ammunition, which would take effect at the beginning of the fall 2026-2027 hunting season (after a 4-year phase-in period). The proposed action expands opportunities on existing acreage, so we expect only a very minor increase in the number of hunters (less than 50) using the refuge. We estimate that an increase of less than 50 hunters annually would result in an additional annual take of 50 deer, 10 turkey, 25 squirrel, 25 Canada goose, 20 mallard, and 50 wood duck.

Over the next few years, the refuge will encourage all hunters to adopt lead-free ammunition, prior to the beginning of the fall 2026-2027 hunting season, when we plan to require lead-free ammunition to participate in any hunting activity on the refuge. This plan may result in hunters reducing the amount lead entering the environment earlier. There may be some effect on all species in the interim as discussed below for each species, but by the beginning of the fall 2026-2027, there will be no new introduction of lead and the only potential effects would be from the bioaccumulation of lead from previous years.

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

Northern long-eared bat

Northern long-eared bats (NLEB) primarily use mines and caves in the winter to hibernate and use upland forests to forage and roost throughout the rest of the year. The species is most sensitive to disturbance during hibernation and when raising young, which are activities that are not known to occur on the refuge. There are no caves or mines found on refuge property, while the refuge does have forested areas.

The NLEB may occur in some hunting zones but are not likely to experience any disturbance \even if bats and hunters may briefly overlap in time and space. This species is not known to winter in this region; it is only present in spring and summer (April – September). The only overlap with hunting that may occur is with the May turkey hunting and/or September bow season. With a restriction on the number of turkey hunt dates offered, a lower hunter density, and a reduced bag limit of 1 turkey per year, we anticipate that turkey hunting will occur in locations that are very unlikely to overlap with the presence of bats, and any potential disturbance effects from turkey hunting are extremely unlikely to occur and are therefore considered discountable.

Bats are typically nocturnal and inactive during most hunting seasons and times, and not present for most of the hunting seasons; therefore, disturbance would be highly unlikely. The species roosts in spring and summer in exfoliating bark of snags, downed logs or dense leaf clumps in

trees. During the fall hunting season, gunshots could result in flushing of bats from roosting trees; however, bats are more likely to remain in the trees during daylight hours. Such disturbances are temporary and last only for the duration of the noise, not fundamentally unlike other temporary disturbances that bats may naturally experience without long-term effects, and therefore any potential effects are expected to be insignificant. Other possible disturbances include hunters climbing and placing portable tree stands on trees. However, hunters typically select live trees for safety reasons while bats are most often in dead or dying trees with large slabs of peeling bark. Further, hunting activities would not result in any roost tree destruction as no tree cutting or other habitat alteration is permitted on the refuge.

The potential for lead impacts through bioaccumulation is discountable due to Northern long-eared bats' diet and foraging habits. Lead bullet fragments would have to break down in the soil in order to be taken up by plants near the area in which the fragments fall on or penetrate the soil surface. Typically, however, plants do not take heavy metals up until they have reached critical thresholds in the soil (Sharma and Dubey 2005). If lead is taken up by plants, it is mainly through the root system and partly, in minor amounts through the leaves. Inside the plants lead accumulates primarily in the root, but a part of it is translocated to the aerial portions. Larvae of certain herbivorous insect species could ingest some of the lead when they eat the exposed plants. Some of the insects could then be consumed by bats. Northern long-eared bats' diet is insects such as moths, flies, leafhoppers, caddisflies and beetles, only some of which are herbivorous. In addition, bats are transitory in nature and will not consume their entire diets on the refuge area. Considering the chain of events that are necessary for exposure and the small amount of lead that would contribute to lead concentrations in refuge soils, it is unlikely that bats that occur on refuges will consume lead derived from ammunition fired by hunters on the refuge.

Because the potential for overlap in time or space between hunters and bats is very low; because the expected impacts to roosting bats, even if there is overlap, are insignificant; and because the potential for lead impacts are discountable, the proposed hunting activities are not likely to adversely affect the NLEB.

Monarch butterfly

Monarch butterflies migrate through the refuge, passing through Patuxent as late as November. There are several hundred acres of meadow/grassland habitat with host and nectar plants. Most nectar sources have senesced by the start of the fall hunting season.

Hunters are most likely to use tracts through forested parts of the refuge, where monarchs and their nectaring plants generally do not occur. Furthermore, given that only light foot travel from hunters accessing the area is expected to occur on these acres, we anticipate that any potential damage to nectaring plants from foot traffic disturbance will be extremely unlikely, and therefore considered discountable. While hunters are walking through habitat used by monarchs, there could be some impacts including flushing while resting or feeding. This disturbance is minimal as the monarchs easily move to another spot when disturbed. Furthermore, hunting does not result in the removal of vegetation, including nectaring sources or milkweed, and so it would have negligible impacts to habitat resources important for monarchs. Noise disturbance from discharging of a firearm while hunting may startle the species resulting in change in flight pattern or a startle response in caterpillars, but this impact will not result in long-term negative

impacts and is considered discountable as this type of noise is not frequent enough to result in habituation to noise that could cause butterfly to not respond to natural threats like parasitism (Taylor and Yack, 2019).

The potential for lead impacts to monarchs is discountable due to their diets. Adult monarch butterflies feed on nectar. Nectar typically carries less lead contaminants than other parts of the plant if lead is absorbed through the plant. Larvae consume the leaves and stems of milkweeds, where higher concentrations of lead could be present, if lead is absorbed through the plant. Lead absorption by plants typically occurs first through roots and only makes its way into other plant parts if concentrations are high enough. This means that, as with bats, bioaccumulation through the plant to the monarch butterfly or larvae could potentially occur. However, as with bats, it relies on the very unlikely occurrence that lead concentrations in the soil from hunting activities reach high enough levels for uptake by plants, and in this case, it would further require uptake by milkweed and the specific plants that monarchs rely on for nectar sources. Overall, lead is strongly adsorbed onto soil particles and is not readily translocated to above-ground portions of plants (McLaughlin 2002).

Given that hunters are not likely to overlap with areas where monarch and their plants are known to occur; that any potential disturbance from noise is expected to be insignificant; and because that bioaccumulation through plants into caterpillars or butterflies is discountable, the proposed activities are not likely to jeopardize the monarch butterfly.

Yellow lance mussel

This species may be present in the Patuxent River or Little Patuxent River, but to date has not been observed. Other mussel species however do occur in abundance. Hunting activities are not likely to adversely affect yellow lance or other mussel species because they are an aquatic species living in flowing waters, largely isolated from hunting activity. Therefore, the proposed activities are not likely to overlap in space with the yellow lance mussel, so any potential effects from disturbance are extremely unlikely, and therefore considered discountable.

Specific to potential impacts from continued use of lead ammunition for deer hunting, during the interim period before the planned non-lead requirement would take effect, there is a chance that lead could enter the water where mussels live. Typically, lead is not soluble in water unless the conditions are right, such as the body of water is more acidic than typical of freshwater. Even if the small amount of lead added to the refuge from hunting deer in the interim reaches the rivers, it is not likely to accumulate in the water column of the flowing rivers and affect filter feeders like mussels.

Before the non-lead requirement is planned to take effect in 2026, we expect the effects from authorized lead use from ammunition to be discountable and insignificant due to the small amounts of lead that are expected to enter the environment, and the specific circumstances that would need to occur for lead to have a measurable effect on the species (e.g., acidity and lead at high enough concentrations).

Because yellow lance mussels may not even be present on the refuge and because any potential lead added to the environment before the planned non-lead requirement takes effect are highly

unlikely to occur, the proposed activities are not likely to adversely affect yellow lance mussels.

Puritan tiger beetle

This species has not been known to occur on this refuge despite decades of searches in the most likely habitat, along Little Patuxent River. The puritan tiger beetle is found on or near earthen shoreline bluffs, typically with sparse to no vegetation and narrow, sandy beaches along the cliff bases. The refuge has one bluff area along the Little Patuxent River, composed of red clay along an inaccessible section of the river. The immature stages of crickets and tenebroid beetles are capable of uptaking lead into the exoskeleton from their prey items (e.g., other insects and crustaceans), and it may also be possible for tiger beetles. However, hunting activities at Patuxent do not overlap in space with the possible habitat of Puritan tiger beetles, with hunters possibly atop the cliff and beetles on or below the cliff. Considering the chain of events that are necessary for exposure and the small amount of lead that would contribute to lead concentrations in refuge soils, it seems likely that beetles, if they were to would occur on the refuge, would not consume lead derived from ammunition fired by deer hunters on the refuge. Therefore, it is unlikely that the small amount of lead added to the refuge from hunting deer before the planned non-lead requirement takes effect would adversely impact the Puritan tiger beetle.

Due to the inaccessibility of hunters to the lone suitable habitat of beetles, and because the species likely isn't even present on the refuge, the proposed hunting activities are not likely to adversely affect Puritan tiger beetles.

Swamp pink and sensitive joint vetch

There have been many botany forays throughout the refuge's 85-year history, and to date swamp pink and sensitive joint vetch have not been found. Swamp pink is found in perennially saturated, spring-fed, nutrient- poor, shrub swamps and forested wetlands, of which the refuge has many. Sensitive joint vetch inhabits the intertidal zone of fresh to slightly salty (brackish) tidal river segments. The refuge is far enough upstream of the Patuxent River that it experiences very little tidal impact, and its riparian zones within the refuge are heavily forested, making them too shady for this species. Swamp pink leaves lay on the ground through winter (often covered with leaf litter) with a rosette visible in the middle; that rosette blooms in March through May. Even if the plant species were to occur on the refuge, any potential effects to the species from trampling would be considered extremely unlikely, and therefore discountable, because for the spring turkey hunt (Mid-April to May), the hunters do not walk through habitat where swamp pink could occur. Furthermore, the refuge is proposing to offer a limited turkey hunt, where only 3 to 5 hunters are selected to hunt each day.

Sharma and Dubey (2005) found that excess lead in plants causes a variety of toxic symptoms including stunted growth, chlorosis, blackening of root systems, inhibited photosynthesis, disrupted mineral nutrition and water balance, and altered plant hormones. Rattner et al. (2008) found that migration of lead from soil to roots and other parts of plants generally is considered to be minimal (Sorvari et al. 2006). Studies have documented elevated lead levels in plants in the vicinity of shooting ranges (Peterson et al. 1993, Mellor and McCartney 1994, Rooney et al. 1999, Hui 2002), but as proposed in this plan, hunters will not be concentrated or reach the numbers expected at a shooting range. As previously explained, hunters would be dissipated throughout the refuge and are unlikely to be in the area where these species could be found.

Also, the migration of lead from soil to roots and other parts of the plant is expected to be minimal, so the use of lead for certain activities before the planned non-lead requirement would take effect in 2026 is not likely to adversely impact these species.

There are no known occurrences of swamp pink or sensitive joint vetch, and any impacts from hunting or the associated use of lead ammunition would be considered discountable because they are extremely unlikely to occur. Therefore, the proposed activities are not likely to adversely affect either species.

All Species

The best available science indicates that lead ammunition and tackle may have negative impacts on wildlife and the environment (Golden et al. 2016). Animals can be poisoned by lead in a variety of ways, including "ingestion of bullet fragments and shot pellets left in animal carcasses, spent ammunition left in the field, lost fishing tackle, lead-based paints, large-scale mining, and lead smelting activities. Despite a large body of scientific literature on exposure to lead and its toxicological effects, controversy still exists regarding its impacts at a population level" (Haig et al. 2014). The use of non-lead ammunition will initially be voluntary, and we plan to require non-lead ammunition and tackle, for all activities starting at the beginning of the fall 2026-2027 hunting season (after a 4-year phase-in period). This planned phase-in period will ensure continuity of visitor opportunities as hunters understand the changes and become more familiar with the availability and use of non-lead alternatives. We will educate hunters about the impacts of lead and strongly encourage non-lead ammunition alternatives for the next 4 years.

The bioaccumulation of lead is a potential concern, but it does not likely present a significant issue on this refuge as: 1) non-lead shot is currently required for hunting waterfowl; 2) we plan to require the use of non-lead ammunition on the refuge at the beginning of the fall 2026-2027 hunting season; 3) the refuge strongly encourages use of non-lead alternatives for hunting big game for the next 4 years; 4) we will educate hunters and the public to the potential adverse impacts of lead; and 5) the updated hunting activities are not likely to introduce substantially more lead into the environment over existing amounts with the current or proposed programs. Some hunters will also choose non-lead methods of take such as archery.

We understand that reinitiation of consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law), and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

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

Hunting activities may affect, but are not likely to adversely affect, any threatened or endangered species at PRR. However, if there is a potential for hunting activities to have a negative impact on such species, or a new species of concern is identified on refuge lands, we will reevaluate our programs and implement program changes as necessary.

VIII. Effects Determination and Response Requested:

Species/Critical Habitat	Determination	Response Requested
Northern long-eared bat	NL	Concurrence
Yellow lance mussels	NL	Concurrence
Puritan tiger beetle	NL	Concurrence
Sensitive joint vetch	NL	Concurrence
Swamp pink	NL	Concurrence
Monarch butterfly	NJ	Concurrence

Determination/Response Requested:

NE= no effect. This determination is appropriate when the proposed action will not directly, indirectly, or cumulatively impact, either positively or negatively, any listed, proposed, candidate species or designated/proposed critical habitat. Response requested is optional, but A Concurrence is recommended for a complete Administrative Record.

NL= not likely to adversely affect. This determination is appropriate when the proposed action is not likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat or there may be beneficial effects to these resources. Response requested is A Concurrence.

NJ= not likely to jeopardize. This determination is appropriate when the proposed action is not likely to jeopardize the continued existence of a candidate species. No critical habitat has been designated for this candidate species; therefore, none will be affected. Response requested is A Concurrence.

AA= likely to adversely affect. This determination is appropriate when the proposed action is likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat. Response requested for listed species A Formal Consultation. Response requested for proposed or candidate species is A Formal Consultation.

IX. References

This determination is based upon the science referenced in the environmental assessment associated with the proposed action described in this analysis. Where there is not an overlap in literature cited, specific references have been included.

Golden, N.H., S.E. Werner and M.J. Coffey. 2016. A Review and Assessment of Spent Lead Ammunition and its Exposure and Effects to Scavenging Birds in the United States. P.de. Voogt (ed.), Reviews of Environmental Contamination and Toxicology 237:123-191.

Haig, S., J. D'Eilia, C. Eagles-Smith, J.M. Fair, J. Gervais, G. Herring, J.W. Rivers, and J.H. Schulz. 2014. The persistent problem of lead poisoning in birds from ammunition and fishing tackle. The Condor 116:408-428.

Hui, Clifford A. 2002. LEAD DISTRIBUTION THROUGHOUT SOIL, FLORA, AND AN INVERTEBRATE AT A WETLAND SKEET RANGE, Journal of Toxicology and Environmental Health, Part A, 65:15, 1093-1107, DOI: 10.1080/152873902760125246

McLaughlin, M.J. 2002. Bioavailability of metals to terrestrial plants. Pages 39-69 in H.E. Allen, editor. Bioavailability of Metals in Terrestrial Ecosystems: Importance of Partitioning for Bioavailability to Invertebrates, Microbes, and Plants. SETAC Press, Pensacola, Florida.

Mellor, Antony, and C. McCartney. "The effects of lead shot deposition on soils and crops at a clay pigeon shooting site in northern England." Soil Use and Management 10.3 (1994): 124-129.

Peterson, S., R. Kim, and C. Moy. 1993. Ecological risks of lead contamination at a gun club: waterfowl exposure via multiple dietary pathways. 14th Annual Meeting of the Society of Environmental Toxicology and Chemistry. Abstract.

Rattner, B.A., J.C. Franson, S.R. Sheffield, C.I. Goddard, N.J. Leonard, D. Stang, and P.J. Wingate. Sources and Implications of Lead-based Ammunition and Fishing Tackle to Natural Resources. Wildlife Society Technical Review. The Wildlife Society, Bethesda, Maryland, USA. 2008.

Rooney, C.P., McLaren, R.G. & Cresswell, R.J. Distribution and Phytoavailability of Lead in a Soil Contaminated with Lead Shot. Water, Air, & Soil Pollution 116, 535–548 (1999). https://doi.org/10.1023/A:1005181303843

Sharma, P. and Dubey R.S. March 2005. Lead toxicity in plants. Brazilian Journal of Plant Physiology 17 (1). https://doi.org/10.1590/S1677-04202005000100004

Sorvai, J., R. Anitikainen, and O. Pyy. 2006. Environmental contamination at Finnish shooting ranges — the scope of the problem and management options.

Science of the Total Environment 366:21-31.

Taylor, C. J. and Yack J.E. November 2019. Hearing in caterpillars of the monarch butterfly (Danaus plexippus). Journal of Experimental Biology. 222(22). https://journals.biologists.com/jeb/article/222/22/jeb211862/225206/Hearing-in-caterpillars-of-the-monarch-butterfly

JENNIFER GREINER Digitally signed by JENNIFER GREINER Date: 2022.09.01 11:36:30 -04'00' — 9/1/2022

Signature (Originating Station) — Date

Refuge Manager

Title

X. Review Ecological Services Office Evaluation

A. Concurrence X **Nonconcurrence** _____

B. Formal consultation required

C. Conference required

D. Informal conference required

E. Remarks (*attach additional pages as needed*):

GENEVIEVE PULLIS Digitally signed by GENEVIEVE PULLIS Date: 2022.09.02 11:25:02 -04'00' — 9/2/2022

Signature — Date

Field Supervisor — Chesapeake Bay Field Office

Title — Office

FINDING OF NO SIGNIFICANT IMPACT
ENVIRONMENTAL ASSESSMENT OF HUNTING PLAN

PATUXENT RESEARCH REFUGE
LAUREL, MARYLAND

The U.S. Fish and Wildlife Service (Service) is expanding hunting opportunities for white-tailed deer, migratory game birds (mourning dove and waterfowl), and forest/upland game (turkey, gray squirrel, woodchuck, and rabbit) on Patuxent Research Refuge (PRR, refuge) in accordance with the refuge's 2022 Hunting Plan and the 2013 Comprehensive Conservation Plan (CCP).

Selected Action

Alternative B - Proposed Action Alternative

Several recent changes were made to the refuge hunting program in 2018 including greater alignment with State of Maryland (State) regulations and offering a mentored hunt program. We opened additional acreage on the North and South tracts to the hunting program, opened to sea duck, light goose and dark goose as huntable species, and opened to a primitive firearm hunt season. In summary, the following additional changes are proposed as part of this new plan:

- Aligning with the State for all deer hunting days and seasons (including those at the South tract).
- Aligning with State regulations for mourning dove hunting.
- Permitting use of dogs for waterfowl, rabbit, and mourning dove hunting.
- Expanding spring turkey hunting on 1,812 acres to include the South Tract and Schafer Farm.
- Expanding rabbit, gray squirrel, mourning dove and woodchuck hunting on the South Tract (1,336 acres) and Schafer Farm unit (476 acres).
- Facilitating additional mentored hunts where possible.
- Use of non-lead ammunition is currently required for upland game, turkey, migratory bird, and waterfowl hunting at PRR. Hunters are encouraged to voluntarily use non-lead ammunition when hunting deer. By fall of 2026, we will phase out use of lead ammunition for all hunting that occurs on the refuge.

As part of a next year's proposed rule, Patuxent Research Refuge will propose a non-lead requirement, which will take effect on September 1, 2026. The EA analyzes the impacts of lead ammunition; based on the breadth of comments received on the plan to require non-lead ammunition by 2026, the Service intends to complete additional analysis and provide another opportunity to comment during a next year's annual rulemaking.

This alternative was selected over the other alternatives 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 (NWRSAA) of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997. The Service believes that expanding hunting opportunities on the refuge 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, includes direction to Department of the Interior agencies to "increase outdoor recreation opportunities for all Americans, including opportunities to hunt; 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 Refuge System. 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

Alternative A - No Action Alternative

The No Action Alternative would continue to provide hunting opportunities for waterfowl (ducks, light geese, dark geese), migratory birds (mourning dove), white-tailed deer, upland game (rabbit, gray squirrel, woodchuck), and wild turkey on designated areas of the refuge. No expansion or reduction of hunting programs would occur, and the programs would be conducted as they are currently. This alternative was not selected, because the refuge would not increase its impact on the economy and would not provide new hunting and access opportunities. While this alternative has the least direct impacts of physical and biological resources, it would not meet mandates under the NWRSAA and Secretarial Order 3356.

This action is not likely to adversely affect endangered or threatened species or their critical habitat. Effects on other wildlife and habitat would be negligible, although there may be some negative effects as the potential of lead being present and bioavailable for wildlife and aquatic species to consume would continue to occur under this alternative, even if lead entering the environment from hunting activities is estimated to be small. The refuge would still be able to manage for species of concern and meet the refuge purpose to conserve wetlands and manage for migratory birds.

This alternative helps meet the purpose and needs because it provides additional wildlife-dependent recreation opportunities on the refuge meeting the Service's priorities and mandates. However, it continues to pose a threat to human health and the environment by continuing to allow the use of lead ammunition. There would be no new authorizations under this alternative, but the nature of discarded lead means that continuing to allow the use of lead ammunition on Service lands and waters would mean adding newly deposited lead to the current amount of lead in the environment on Service lands and waters. This would mean the risk of adverse impacts

from lead available in the environment would continue and even increase for natural resources and for human health under the No Action Alternative. This alternative was not selected, because it would not fulfill the Service's mandate under the NWRSAA to expand compatible priority uses as well as the proposed action.

Summary of Effects of the Selected Action

An Environmental Assessment (EA) was prepared in compliance with the National Environmental Policy Act (NEPA) to provide 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 the proposed action and no action alternative. It is incorporated as part of this finding.

We have updated the EA to include additional information, primarily for threatened and endangered species. While our conclusions have not changed, we wanted to utilize the latest research and best available information with regards to the potential impacts of lead ammunition.

Under the preferred action alternative, although a great many hunters and anglers are already voluntarily making the switch to nonlead ammunition, the refuge will propose the required use of non-lead ammunition by the 2026-2027 hunting season for all species. This will allow the continued use of lead ammunition for hunting activities until the full phased in proposal is completed. In the interim, the refuge will encourage hunters to voluntarily transition to non-lead ammunition through outreach ahead of the proposed 2026-2027 proposed deadline.

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

Table E-1. Summary of Impacts

Affected Environment	Potential Impacts of the Selected Action
White-tailed deer	Minimal local impacts to this species. The refuge will expand white-tailed deer hunting on the refuge's South Tract and Schafer Farm portion of the Central Tract to match the same dates of opportunity with the North Tract. We assume a few (i.e., less than 20) additional deer would be harvested as a result. Deer hunting in the South Tract and Schafer Farm area of the refuge may result in slightly more hunters traversing the habitat and hunter conflicts. Non-lead ammunition will be required for all hunting except for deer. The use of non-lead ammunition for hunting deer will initially be voluntary and will transition to be required for use after a 4-year proposed phase-in period is completed in 2026.

Affected Environment	Potential Impacts of the Selected Action
Forest game/upland game (turkey, gray squirrel, eastern cottontail rabbit, and woodchuck/groundhog)	Turkey and squirrel do not expect significant changes. No rabbits have been harvested on the refuge since 2004, and harvest of woodchuck have never been reported. We expect that this will remain the case for the foreseeable future since the refuge is primarily a forest, and most rabbits and woodchuck occur on the Central Tract where hunting is more restricted due to office complexes, residences, and USGS captive species research pens.
Migratory game birds (waterfowl and mourning dove)	No significant cumulative impacts of migratory bird management on local, regional, or Atlantic Flyway populations due to the time of year. Overall populations will continue to be monitored and future harvests will be adjusted as needed under the existing flyway and State regulatory processes.
Non-target wildlife and aquatic species	No significant impacts are anticipated. The expanded hunting program is expected to slightly increase impacts to refuge wildlife overall, including flushing of wildlife, spread of invasive species via clothing, footwear, and tires, and road mortality from vehicles on back roads.
Threatened and endangered species and other special status species	For more detail, see the completed Intra-Service Section 7 Evaluation (Appendix C). Species evaluated are: Northern long-eared bat, yellow lance mussel, Puritan tiger beetle, sensitive joint vetch, swamp pink, and monarch butterfly. Hunting activities may affect, but are not likely to adversely affect, any threatened or endangered species at PRR. However, if there is a potential for hunting activities to have a negative impact on such species, or a new species of concern is identified on refuge lands, we will reevaluate our programs and implement program changes as necessary.
Vegetation and habitat	Minimal impacts on plants by hunters. Negative impacts of recreational hunting could include the temporary trampling of vegetation and light soil erosion. Most hunting activities occur during the fall and winter, when plants become dormant, and the ground is often frozen and/or covered in snow. Additionally, hunter use during all seasons will be dispersed throughout the refuge, minimizing the impact to any one area. The proposed management will not change the overall composition of the refuge vegetation and habitats. It is

Affected Environment	Potential Impacts of the Selected Action
	expected to further aid in keeping deer within Maryland Department of Natural Resources' (MDDNR) recommended density for the central region's carrying capacity of 20 deer per square mile. Controlling the deer population is a strategy that directly supports the goals and objectives for floodplain and upland forest habitats in the refuge CCP (2013).
Visitor use and experience	Minimal adverse impacts to non-hunting public. Novice deer hunters and their mentors may increase hunting pressure during the mentored deer hunt on the South Tract (Loblolly Area), but the only anticipated conflicts will likely be from other hunters. The North Tract and South Tract trails are also closed during the deer firearm season to reduce conflict between recreational users.
Cultural resources	No additional adverse impacts would occur under this alternative. No impacts to cultural resources are anticipated above what may be caused by any refuge visitor.
Refuge management and operations	No observable impacts on structures and facilities. While increased hunter use is anticipated, only a slight increase of staff time is expected.
Socioeconomics and environmental justice	Negligible short-term impacts with minor long-term benefits to the local economy. Expanding hunting programs at the refuge would likely enrich the local economy by attracting additional refuge visitors to the area. There is no expectation of disproportionate effects to the overwhelmingly minority communities surrounding the refuge. We expect a positive, but negligible, effect on human health. Phasing out the use of lead ammunition would help to eliminate the risk of human health impacts that would follow if the Service continued to allow the use of certain lead ammunition for certain species on current and future Service lands within the authorized boundary of the refuge. There is some possibility of negative economic impacts for socioeconomically disadvantaged hunters who must comply with the proposed non-lead ammunition requirements after 2026. While non-lead ammunition has become essentially equivalent in price to lead ammunition, certain types of non-lead ammunition can cost more than certain types of lead ammunition. The minor economic

Affected Environment	Potential Impacts of the Selected Action
	burden involved in transitioning between ammunition could be more impactful to low-income hunters. In order to prevent the negative impacts of this switch, the refuge has begun and will continue specific outreach about the requirement to these groups and has put in place measures to mitigate the economic input beyond the phased proposal, which already affords hunters time to gradually transition their supplies of ammunition. The Service will continue educating hunters on the use of non-lead ammunition during the proposed phased in time period, provide resources on companies that produce non-lead ammunition for purchase and work with partner organizations on non-lead ammunition giveaways or exchanges if possible. With these mitigation measures, minority and/or low-income communities are not disproportionately impacted from this alternative.

Measures to mitigate and/or minimize adverse effects have been incorporated into the selected action. Hunting is a well-established activity at PRR. The greatest numbers of hunters are anticipated in October, November, and December and, thus, would not be disturbing to most wildlife during breeding seasons, except for nesting bald eagles. To avoid conflicts with other biological resources on the refuge, and other refuge uses, the refuge ends hunting of upland game species on January 31 to allow the visitors to use the North Tract and South Tract during the spring and summer. To avoid conflicts and safety issues with ongoing research, residential, office, and maintenance areas on the Central Tract, the refuge operates lottery hunts for assigned stands. To minimize conflicts with other refuge users in the spring, the refuge runs a limited lottery hunt for the spring turkey season.

While refuges, by their nature, are unique areas protected for conservation of fish, wildlife and habitat, the proposed 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 State 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 the refuge on an annual basis. This ensures that the program continues to contribute to the biodiversity and ecosystem health of the refuge, and that the 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. 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 and anglers 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 any cultural or historical resources.

9. The action will not impact any wilderness areas because there are none at the refuge.

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 and anglers must use established access points that will not be located near sensitive habitats.

Additionally, the following stipulations are necessary to ensure compatibility:

- We allow the hunting of rabbit, woodchuck, and gray squirrel in designated areas of the refuge in accordance with regulations and seasons set forth by the State from September 1 to January 31 only. Upland hunting for these species is closed on the refuge the remainder of the Maryland State season.

- Hunters are required to check in and out at the HCS every time they enter or exit the refuge, change hunting methods of harvest, or change hunting areas including North Tract, Central Tract and M-R Lottery Hunts, and Schafer Farm hunting areas.

- Non-lead ammunition is required for hunting upland game, migratory birds, and turkey. By fall 2026, we will propose the required use of non-lead ammunition for hunting deer.

These measures to mitigate and/or minimize adverse impacts have been incorporated into the proposal. The proposal is compatible with the purposes of the refuge and the mission of the Refuge System (Appendix A).

Public Review

This Compatibility Determination (CD) is part of the Patuxent Research Refuge Hunting Plan and the accompanying NEPA compliance. The plan was coordinated with all interested and/or affected parties, including State partners. We released the draft plan, CD and EA for public review and comment from May 3 through August 8, 2022, a total of 97 days. We informed the public through local venues, the refuge website, and social media.

A total of 4 comment letters were submitted from the public that offered input to the refuge.

Commenters
1. Michael Brown
2. Lotte Fleck
3. Jason Hay
4. E. Hardy Kern (submitted signatures for American Bird Conservancy, National Wildlife Refuge Association, Association of Zoos and Aquariums, National Wildlife Rehabilitators Association, Maryland Ornithological Society, Center for Biological Diversity, Audubon Mid-Atlantic, EarthJustice, and Maryland Bird Conservation Partnership)

We grouped similar substantive comments together and summarized and organized them by subject in the discussion below.

Comment: Opposed to hunting in any form upon the refuge. (1, 2)

RESPONSE: The Service prioritizes facilitating wildlife-dependent recreational opportunities, including hunting and fishing, on Service land in compliance with applicable Service law and policy. For refuges, the Administration Act, as amended, stipulates that hunting (along with fishing, wildlife observation and photography, and environmental education and interpretation), if found to be compatible, are a legitimate and priority general public use of a refuge and should be facilitated (16 U.S.C. 668dd(a)(3)(D)). So, we only allow hunting of resident wildlife on national wildlife refuges only if such activity has been determined compatible with the established purpose(s) of the refuge and the mission of the Refuge System as required by the Administration Act. We determined that the proposed actions were compatible or would not have these detrimental impacts.

Each station manager decides regarding hunting and fishing opportunities only after rigorous examination of the available information, consultation and coordination with States and tribes, and compliance with the NEPA, ESA, and other applicable laws and

regulations. The many steps taken before a station opens or expands a hunting opportunity on the refuge ensures that the Service does not allow any opportunity that would compromise the purpose of the station or the mission of the agency.

Hunting of resident wildlife on refuges generally occurs consistent with State regulations, including seasons and bag limits. Refuge-specific hunting regulations can be more restrictive (but not more liberal) than State regulations and often are more restrictive in order to help meet specific refuge objectives. These objectives include resident wildlife population and habitat objectives, minimizing disturbance impacts to wildlife, maintaining high-quality opportunities for hunting and other wildlife-dependent recreation, eliminating, or minimizing conflicts with other public uses and/or refuge management activities, and protecting public safety.

The word “refuge” includes the idea of providing a haven of safety for wildlife, and as such, hunting might seem an inconsistent use of the Refuge System. However, again, the Administration Act stipulates that hunting, if found compatible, is a legitimate and priority general public use of a refuge. Furthermore, we manage refuges to support healthy wildlife populations that in many cases produce harvestable surpluses that are a renewable resource. As practiced on refuges, hunting does not pose a threat to wildlife populations. It is important to note that taking certain individuals through hunting does not necessarily reduce a population overall, as hunting can simply replace other types of mortality. In some cases, however, we use hunting as a management tool with the explicit goal of reducing a population; this is often the case with exotic and/or invasive species that threaten ecosystem stability. Therefore, facilitating hunting opportunities is an important aspect of the Service's roles and responsibilities as outlined in the legislation establishing the Refuge System, and the Service will continue to facilitate these opportunities where compatible with the purpose of the specific refuge and the mission of the Refuge System.

Comment: Hunting closures cause undue hardship on most visitors. (2)

RESPONSE: Congress, through the Administration Act, as amended, envisioned that hunting, fishing, wildlife observation and photography, and environmental education and interpretation would all be treated as priority public uses of the NWRS. Therefore, the Service facilitates all of these uses on refuges, as long as they are found compatible with the purposes of the specific refuge and the mission of the NWRS. For this rulemaking, we specifically analyzed the possible impacts of the proposed changes to hunting program at Patuxent Research Refuge on visitor use and experience, including public safety concerns and possible conflicts between user groups.

The refuge is the largest, and one of the three closest public hunting areas to Washington D.C. and Baltimore metropolitan areas. The Service considers public safety to be a top priority. Refuge staff have determined the most effective plan is to only allow hunters in the northern zone during shotgun season due to the daily safety communication challenges. Shotgun season is only 2 weeks of the 52 weeks a year in which the minority of hunters have priority access. Activities in the southern zone are still open to other visitors during this hunting season.

Comment: Support lead removal and propose an accelerated phase out of lead ammunition. (3, 4)

RESPONSE: The Service thanks you for your support of the proposed plan. We also thank you for the additional research and citations supporting the harmful effects of lead on eagles, avian scavengers, and waterbirds. We think the four-year timeline is necessary to educate hunters and ease the transition to non-lead alternatives. This proposed phase-out period will provide hunters time to gradually transition their supplies of ammunition to non-lead alternatives, lessening the impact of the change.

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 Patuxent Research Refuge does not constitute a major Federal action significantly affecting the quality of the human environment under the meaning of section 102 (2) (c) of the National Environmental Policy Act of 1969 (as amended). 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 the refuge.

The Service has decided to select the proposed action as described in the EA and implement the Hunting Plan for Patuxent Research Refuge upon publication of the final 2022/2023 Station-Specific Hunting Regulations. This action is compatible with the purposes of the refuge and the mission of the Refuge System, and consistent with applicable laws and policies. See attached Compatibility Determination (Appendix A).

HOLLY GABORIAULT Digitally signed by HOLLY GABORIAULT Date: 2022.09.02 12:26:06 -04'00'

Regional Chief (Acting),
National Wildlife Refuge System

9/2/22
Date