Chesapeake Marshlands National Wildlife Refuge Complex
Supplemental Environmental Assessment

June 2023

U.S. Fish and Wildlife Service

Blackwater National Wildlife Refuge
Cambridge, MD 21613

Eastern Neck National Wildlife Refuge
Rock Hall, MD 21661

Submitted By:
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Signature Date

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Supplemental Environmental Assessment

Executive Summary

Introduction

The U.S. Fish and Wildlife Service (Service) prepared this Supplemental Environmental Assessment (EA) to evaluate the effects associated with the proposed action of requiring non-lead ammunition and tackle beginning September 1, 2026, and to comply with the National Environmental Policy Act (NEPA) in accordance with the Council on Environmental Quality regulations (40 CFR 1500-1509) and Department of the Interior (43 CFR 46; 516 DM 8) and Service (550 FW 3) regulations and policies. This document is a supplement to, and updates, a previous EA for the Chesapeake Marshlands National Wildlife Refuge Complex (NWRC, Complex) Hunting and Fishing Plan, prepared and approved by the Service in September 2022 (hereafter referred to as the 2022 EA). The Service issued a Finding of No Significant Impact (FONSI) for the proposed action and 2022 EA on September 2, 2022.

The proposed action would apply to Eastern Neck and Blackwater National Wildlife Refuges (NWR, refuges), part of the Chesapeake Marshlands NWRC, in accordance with each refuge's respective Comprehensive Conservation Plans (CCPs) and the Chesapeake Marshlands NWRC Hunting and Fishing Plan.

As part of the final rule "2022-2023 Station-Specific Hunting and Sport Fishing Regulations" published in the Federal Register on September 16, 2022 (87 FR 57108), the following passage is specified:

> *"As part of the 2023-2024 proposed rule, Blackwater, Chincoteague, Eastern Neck, Erie, Great Thicket, Patuxent Research Refuge, Rachel Carson, and Wallops Island NWRs will propose a non-lead requirement, which will take effect on September 1, 2026. In the June 9, 2022, proposed rule (87 FR 35136), the Service intended to phase out the use of lead on these eight refuges by allowing the use of lead ammunition and tackle for all new hunting and fishing opportunities—until fall 2026, which is when the Service plans to require non-lead ammunition and tackle for all activities on these refuges. (To clarify, if a refuge proposed to expand pre-existing opportunities that previously required non-lead ammunition or tackle, then non-lead ammunition and tackle would still be required for those activities.) Based on the breadth of comments received on the eight refuges' plan to require non-lead ammunition and tackle by fall 2026, the Service will propose these requirements next year and provide another opportunity to comment during the 2023-2024 rulemaking."*

The Service committed in the 2022 Rule to consider the future of lead use based on numerous public comments. The Service received over 48,000 comments on the proposed rule, with a large portion of those comments concerning lead ammunition and fishing tackle. Thus, this Supplemental EA includes additional information, analyzing the potential impacts of lead under

alternatives of requiring or not requiring non-lead ammunition and tackle beginning September 1, 2026, and utilizes the latest research and best available science where applicable.

Purpose and Need

The purpose of the proposed non-lead ammunition and tackle requirement is to provide compatible wildlife-dependent recreational opportunities on Chesapeake Marshlands NWRC. The stated objectives of a hunting and fishing program on Chesapeake Marshlands NWRC are to:

- Provide the public with a quality recreational experience on refuge lands and waters and increase opportunities and access for consumptive and non-consumptive users of the refuge. The National Wildlife Refuge System Improvement Act of 1997 identified hunting and fishing, where compatible, as two of the six priority public uses;

- Design hunting and fishing programs that are administratively efficient and manageable with existing staffing levels and in alignment with Maryland Department of Natural Resources (MDDNR) regulations when possible;

- Implement hunting and fishing programs that are safe and enjoyable for all refuge users; and,

- Design a hunting program that aligns with refuge habitat management objectives.

Lead ammunition and tackle can present a risk of adverse impacts to wildlife health and the best available scientific evidence shows that lead use is currently impacting wildlife nationwide. Some species present on the refuges are especially susceptible to lead exposure from ammunition and tackle. Additionally, even though the current level of lead available in the environment on the refuges may not be causing adverse impacts, the continued use of lead for hunting and fishing could lead to accumulated lead levels that present a danger to wildlife health. Thus, the proposed requirement to use non-lead ammunition and tackle beginning September 1, 2026, may immediately benefit wildlife health and protects against the accumulation of lead on the refuges beyond 2026. This requirement is also needed because by addressing a potential threat to wildlife health it ensures that both the current hunting and fishing programs, and any future openings and expansions, can be compatible with our conservation mission and the purposes of the refuges.

The need for the proposed action is evidenced by the requirement to meet the Service's priorities and mandates as outlined by the National Wildlife Refuge System Administration Act (NWRSAA) of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, 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)). 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 would also promote two of the priority public uses of the National Wildlife Refuge System (Refuge System). By providing opportunities for visitors to hunt and fish, we can promote stewardship of our natural resources and increase public

appreciation and support for the Refuge System.

The No Action Alternative (see below), in contrast, does not meet this need because the use of lead ammunition for hunting and lead tackle for fishing on this refuge beyond September 1, 2026, would likely not be compatible recreational uses. Nevertheless, we are analyzing it as the No Action Alternative as it is the baseline needed to evaluate the proposed action. If the current hunting and fishing program were to continue under the No Action Alternative, the Service would have to reevaluate the opportunities expanded in the 2022 Rule that permitted the use of lead ammunition and tackle, since these expansions were previously analyzed and adopted with the expectation of implementing the planned non-lead ammunition and tackle requirement beginning September 1, 2026. This reevaluation would include revisiting the relevant Hunting and Fishing Plan discussion, NEPA analysis, and ESA Section 7 analysis, in addition to evaluating the compatibility, so that we can determine whether those opportunities can remain open on this refuge.

Alternatives

For this Supplemental EA, two alternatives are analyzed: the No Action Alternative and the Proposed Action Alternative. The No Action Alternative would continue the refuges' current hunting and fishing program. At Blackwater NWR, the refuge would allow hunting of white-tailed deer, sika, turkey, goose, and duck. At Eastern Neck NWR, the refuge would continue to allow white-tailed deer and turkey hunting. Under this alternative, 19,119 acres of Blackwater NWR would be open to hunting and 1,985 acres of Eastern Neck NWR would be open to hunting. No expansion or reduction of hunting and fishing programs would occur, and the programs would be conducted as they are currently. Fishing is available at both refuges. All hunting and fishing seasons align with Maryland (State) regulations. Under this alternative, the use and possession of lead ammunition and tackle would continue to be allowed for hunting big game and fishing activities.

Under the proposed Action Alternative (Alternative B), we will eliminate use of lead ammunition for all hunting and lead tackle for fishing on Chesapeake Marshlands NWRC starting September 1, 2026. Until then, over the next 3 years we will provide outreach and education opportunities for hunters and anglers to learn about lead impacts and available alternatives. We will initially encourage the voluntary use of non-lead ammunition for hunting and non-lead tackle for fishing.

Environmental Consequences

Potential effects from lead ammunition and tackle use in the three-year transition period and potential, positive environmental impacts due to the non-lead requirement, as compared to allowing the continued use of lead, are considered in this Supplemental EA.

Due to the continued use of lead (prior to September 1, 2026) for hunting and fishing, there remains concern about the bioavailability of spent lead ammunition (bullets) and lead fishing tackle on the environment, the health of fish and wildlife, and human health. The Service is aware of fish and wildlife species, including endangered and threatened species, that are susceptible to biomagnification of lead from their food sources. There is also evidence that some species are susceptible to direct ingestion of lead ammunition or lead tackle due to their foraging

behaviors.

Public Review

With the 2022 EA package, including the EA, Hunting and Fishing Plan, and Compatibility Determinations, the public had the opportunity to review and comment on each of the draft documents from May 3 through August 8, 2022, a total of 97 days. We distributed a press release to news organizations and alerted visitors to the plan's availability on the refuge website. We also provided an open house event on June 9 for the public to discuss concerns or learn more about the plan. A total of 12 people attended the open house. A total of 24 comment letters were submitted that offered input to the refuge. A summary of the comments and our responses can be found in Appendix E of the 2022 EA.

This Supplemental EA has been thoroughly coordinated with all interested and/or affected parties. Refuge staff coordinated with State agency staff in preparation of the Hunting and Fishing Plan and incorporated their comments into the documents. There are currently no federally recognized tribes in Maryland. The public will be notified of the availability of the Supplemental EA and associated documents 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.

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Supplemental Environmental Assessment

Blackwater National Wildlife Refuge and Eastern Neck National Wildlife Refuge, units of the Chesapeake Marshlands National Wildlife Refuge Complex

This Supplemental Environmental Assessment (EA) evaluates the effects associated with the proposed action of requiring non-lead ammunition and tackle beginning September 1, 2026, 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. This document is a supplement to, and updates, a previous EA for the Chesapeake Marshlands National Wildlife Refuge Complex (NWRC, Complex) Hunting and Fishing Plan, prepared and approved by the Service in September 2022 (hereafter referred to as the 2022 EA). The Service issued a Finding of No Significant Impact (FONSI) for the proposed action and 2022 EA on September 2, 2022. 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 Environmental Assessment is included at the end of the document.

Proposed Action

The U.S. Fish and Wildlife Service (Service) is proposing to eliminate use of all lead ammunition for hunting and lead tackle for fishing starting September 1, 2026, on Eastern Neck and Blackwater National Wildlife Refuges (NWR, refuges), part of the Chesapeake Marshlands NWRC, in accordance with each refuge's respective Comprehensive Conservation Plans (CCPs) and the Chesapeake Marshlands NWRC Hunting and Fishing Plan (Appendix D).

Eastern Neck NWR is a 2,285-acre island approximately 8 miles south of Rock Hall in Kent County, Maryland. Blackwater NWR is over 32,000 acres of brackish marsh, open water, and forested habitats in Dorchester, Cecil, and Wicomico counties, Maryland. Until then, we will encourage the use of non-lead ammunition for big game (white-tailed deer, sika, and turkey) and small game (coyote) hunts, non-lead tackle for fishing, and will educate hunters and anglers about lead and its impacts.

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.

Eastern Neck NWR was established pursuant to the Migratory Bird Conservation Act of 1929, as amended, {16 U.S.C. 715d}. The primary purpose of the refuge is to "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act).

Blackwater NWR was established under the authority of the Migratory Bird Conservation Act of

1929, as amended, {16 U.S.C. 715d}. Additional lands have been added to the refuge under the authorities of the Endangered Species Act of 1973 {16 U.S.C. 1534}, Refuge Recreation Act of 1966, as amended, {16 U.S.C. 460k-1}, North American Wetlands Conservation Act {16 U.S.C. 4401-413}, and the Refuge Administration Act {16 U.S.C. 668ddb}. The primary purpose of the refuge is "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act), "…to conserve (A) fish or wildlife which are listed as endangered or threatened species...or (B) plants." 16 U.S.C. § 1534 (Endangered Species Act of 1973), "...suitable for -- (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species..." 16 U.S.C. § 460k-1 (Refuge Recreation Act), "…(1) to protect, enhance, restore, and manage an appropriate distribution and diversity of wetland ecosystems and other habitats for migratory birds and other fish and wildlife in North America; (2) to maintain current or improved distribution of migratory bird populations; and (3) to sustain an abundance of waterfowl and other migratory birds consistent with the goals of the North American Waterfowl Management Plan and the international obligations contained in the migratory bird treaties and conventions and other agreements with Canada, Mexico, and other countries." 16 U.S.C. § 4401-413 (North American Wetlands Conservation Act), and "…to protect, enhance, restore, and manage wetland ecosystems and other habitats for migratory birds, endangered and threatened species, and other wildlife." 16 U.S.C. § 668ddb (Refuge Administration Act).

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.

As part of the final rule "2022-2023 Station-Specific Hunting and Sport Fishing Regulations" (2022 Rule) published in the Federal Register on September 16, 2022 (87 FR 57108), the following passage is specified:

> *"As part of the 2023-2024 proposed rule, Blackwater, Chincoteague, Eastern Neck, Erie, Great Thicket, Patuxent Research Refuge, Rachel Carson, and Wallops Island NWRs will propose a non-lead requirement, which will take effect on September 1, 2026. In the June 9, 2022, proposed rule (87 FR 35136), the Service intended to phase out the use of lead on these eight refuges by allowing the use of lead ammunition and tackle for all new hunting and fishing opportunities—until fall 2026, which is when the Service plans to require non-lead ammunition and tackle for all activities on these refuges. (To clarify, if a refuge proposed to expand pre-existing opportunities that previously required non-lead ammunition or tackle, then non-lead ammunition and tackle would still be required for those activities.) Based on the breadth of comments received on the eight refuges' plan to require non-lead ammunition and tackle by fall 2026, the Service will propose these requirements next year and provide another opportunity to comment during the 2023-2024 rulemaking."*

The Service committed in the 2022 Rule to consider the future of lead use based on numerous public comments. The Service received over 48,000 comments on the proposed rule, with a large portion of those comments concerning lead ammunition and fishing tackle.

Purpose and Need for the Action

The purpose of the proposed non-lead ammunition and tackle requirement is to provide compatible wildlife-dependent recreational opportunities on Chesapeake Marshlands NWRC. The stated objectives of a hunting and fishing program on Chesapeake Marshlands NWRC are to:

- Provide the public with a quality recreational experience on refuge lands and waters and increase opportunities and access for consumptive and non-consumptive users of the refuge. The Refuge System Improvement Act of 1997 identified hunting and fishing, where compatible, as two of the six priority public uses;

- Design hunting and fishing programs that are administratively efficient and manageable

with existing staffing levels and in alignment with Maryland Department of Natural Resources (MDDNR) regulations when possible;

- Implement hunting and fishing programs that are safe and enjoyable for all refuge users; and,

- Design a hunting program that aligns with refuge habitat management objectives.

Lead ammunition and tackle can present a risk of adverse impacts to wildlife health and the best available scientific evidence shows that lead use is currently impacting wildlife nationwide. Some species present on the refuge are especially susceptible to lead exposure from ammunition and/or tackle. Additionally, even though the current level of lead available in the environment on the refuge may not be causing adverse impacts, the continued use of lead for hunting and fishing could lead to accumulated lead levels that present a danger to wildlife health. Thus, the requirement to use non-lead ammunition and tackle beginning September 1, 2026, may immediately benefit wildlife health and protects against the accumulation of lead on the refuge beyond 2026. This requirement is also needed because by addressing a potential threat to wildlife health it ensures that both the current hunting and fishing programs and any future hunting and fishing opening and expansions can be compatible with our conservation mission and the purposes of the refuge.

The need for the proposed action is evidenced by the requirement to meet the Service's priorities and mandates as outlined by the NWRSAA of 1966, as amended by the Refuge System Improvement Act of 1997, 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)). 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 would also promote two of the priority public uses of the Refuge System. By providing opportunities for visitors to hunt and fish, we can promote stewardship of our natural resources and increase public appreciation and support for the Refuge System.

The No Action Alternative (see below), in contrast, does not meet this need because the use of lead ammunition for hunting and lead tackle for fishing on this refuge beyond September 1, 2026, would likely not be compatible recreational uses. Nevertheless, we are analyzing it as the No Action Alternative as it is the baseline needed to evaluate the proposed action. If the current hunting and fishing program were to continue under the No Action Alternative, the Service would have to reevaluate the opportunities expanded in the 2022 Rule that permitted the use of lead ammunition and tackle, since these expansions were previously analyzed and adopted with the expectation of implementing the planned non-lead ammunition and tackle requirement beginning September 1, 2026. This reevaluation would include revisiting the relevant Hunting and Fishing Plan discussion, NEPA analysis, and ESA Section 7 analysis, in addition to evaluating the compatibility, so that we can determine whether those opportunities can remain open on this refuge.

Alternatives

Alternative A – No Action- Maintain Current Hunting and Fishing Opportunities

The No Action Alternative would continue to provide the hunting and fishing opportunities currently offered at Blackwater and Eastern Neck NWRs. Big game hunting on the refuges will generally take place within the season dates established by the State of Maryland. White-tailed deer and sika hunting is normally between September and late January. Hunters can access the refuges up 3 hours before legal sunrise and must exit within 3 hours after legal sunset (including parking lots). Hunting for wild turkeys (bearded birds only) will be during the State spring season, April through May, on designated hunt days, and will follow the State shooting hours. Specific regulations for each hunt will be published by the refuge in advance of the hunt seasons. Waterfowl hunting at Blackwater NWR will take place within the State framework and usually occurs between October and the end of January. Fishing and crabbing will be authorized and regulated according to provisions in 50 CFR, Subchapter C, Part 33 and consistent with State regulations. Fishing and crabbing will be restricted to opportunities from the Key Wallace Drive causeway, with parking at the start of Wildlife Drive, or from boats which provide the only other access to refuge regulated waters of the Blackwater/Little Blackwater River systems. Under this No Action Alternative, lead ammunition and tackle could continue to be used, beyond September 2026 and potentially indefinitely, for hunting and fishing activities.

Alternative B – Proposed Action Alternative- Expand Hunting and Fishing Opportunities

Under the Proposed Action Alternative, we will eliminate use of lead ammunition for hunting of all species, and use of lead tackle for fishing on Chesapeake Marshlands NWRC starting on September 1, 2026. Until then, we will continue to encourage the voluntary use of non-lead ammunition for big game (white-tailed deer, sika, and turkey) and small game (coyote) hunts, and non-lead tackle for fishing. The transition period will allow hunters and anglers time to adapt to the new regulations so that they can continue to engage in hunting and fishing opportunities on the refuge without interruption. 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 and fishing program, however, may take the necessary steps to impose further restrictions, recommend that the refuge be closed to the activities, or further liberalize regulations up to the limits of the State. We will restrict hunting or fishing if it becomes inconsistent with other, higher priority refuge programs or endangers refuge resources of public safety.

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 refuges 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 and fishing plan, as described in the “purpose and need” section of this EA. Closing the refuge to hunting would conflict with the Refuge System Improvement Act, which provides that hunting is an appropriate and priority use of the Refuge System, shall receive priority consideration in refuge planning and management, mandates that hunting opportunities should be facilitated when feasible, and directs the Service to administer the Refuge System so as

to “provide increased opportunities for families to experience compatible wildlife-dependent recreation, particularly opportunities for parents and their children to safely engage in traditional outdoor activities, such as fishing and hunting.” Furthermore, Department of the Interior Secretarial Order 3356, signed in 2017, directs the Service to enhance and expand public access to lands and waters on national wildlife refuges for hunting, fishing, recreational shooting, and other forms of outdoor recreation. An alternative that failed to provide any opportunity to participate in hunting activities, where such activities are compatible with the purposes of the Refuge System, would also fail to meet the goals of the Refuge System.

Refuge staff have worked closely with MDDNR and other partners to develop the proposed hunting and fishing plan. There are no unresolved conflicts about the proposed action with respect to alternative uses of available resources. Additionally, the proposed action builds on a well-established existing hunting and fishing program, and includes the addition of areas developed, in part, from the planning process of the refuge’s Comprehensive Conservation Plan (CCP). Therefore, the Service does not need to consider additional alternatives (43 CFR 46.310).

Affected Environment and Environmental Consequences

This section is organized by affected resource categories and for each affected resource discusses both (1) the existing environmental and socioeconomic baseline in the action area for each resource and (2) the 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 the written analyses of the environmental consequences on a resource only when the impacts on that resource could be more than negligible and therefore considered an “affected resource.” Resources that would not be more than negligibly impacted by the action may be dismissed from further analyses. We determine significance by considering the degree of effects to that environment, and connected actions are used to assist in determining significance.

Blackwater NWR consists of approximately 32,000 acres in Dorchester and Wicomico counties, Maryland. Garrett Island, also part of Blackwater NWR, is in Cecil County and is not addressed in this analysis. Eastern Neck NWR is a 2,286-acre island situated at the southern tip of Kent County, at the confluence of the Chester River and the Chesapeake Bay. Both refuges are made of tidal marsh, mixed hardwoods and loblolly pine forests, freshwater wetlands, croplands, and open water. The proposed action would take place in designated hunting units totaling 19,842 acres on Blackwater NWR and 1,985 acres on Eastern Neck NWR. For more information regarding and the general characteristics of Eastern Neck and Blackwater NWR’s environment, please refer to their respective CCPs.

The following resources either (1) do not exist within the project area or (2) would either not be affected or only negligibly affected by the proposed action:

- Air quality - The Service's hunting and fishing programs produce negligible impacts to air quality. Some hunting equipment can discharge gases and hunters and anglers using vehicles for transportation to and from recreational areas on the refuge produce emissions, but the amount of air pollution from these sources is negligible and the pollutants produced do not have substantial localized effects.
- Floodplains - The Service's hunting and fishing programs do not affect water flows or other factors relevant to flooding and floodplain landscapes. Therefore, no effects to floodplains are expected as a result of proposed regulations changes and expanding access. No modifications will be made that will increase the floodplain elevation or negatively impact its function and value and thus there will be no impacts to E.O. 11988 – Floodplain Management. E.O. 11990-Protection of Wetlands only applies if the refuge creates structures to support hunting and fishing in wetlands. This Executive Order will be evaluated on a project-by-project basis, e.g., if an accessible blind or fishing dock were to be built in the future to support hunting and fishing activities. As it stands now, there would be no impact to wetlands due to this proposed activity related to developing supporting infrastructure. Wetland impacts specific to vegetation and habitat and water quality are addressed in those respective sections. The proposed action complies with E.O. 11988 – Floodplain management – Fed. Reg. 26951 (1977) and E.O. 11990-Protection of Wetlands.
- Wilderness - The refuges do not have any designated wilderness areas per the Wilderness Act, 16 U.S.C. 1131 et seq. nor does the Complex have any waterways that fall under the Wild and Scenic Rivers Act, 16 U.S.C. 1271 et seq. Given this, no effect to wilderness or wild and scenic rivers are expected. The proposed action complies with the Wilderness Act, 16 U.S.C. 1131 et seq. and the Wild and Scenic Rivers Act, 16 U.S.C. 1271 et seq.

As such, these resources are not further analyzed in this EA. As stated above, this section predicts the foreseeable impacts of implementing the hunting and fishing 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 refuges in comparison with the entire Atlantic Flyway or the breeding ranges of the many birds and wildlife that use it. We recognize that the refuges are not isolated ecologically from the lands around them; however, we may have overstated positive or negative impacts in that larger geographic context. Nevertheless, many of the actions we propose conform to the CCP and other regional landscape plans, and provide positive, incremental contributions to those larger landscape goals.

Potential effects from lead ammunition and tackle use during the 3-year transition period and potential positive environmental impacts due to the non-lead requirement, as compared to allowing the continued use of lead, are considered in this Supplemental EA.

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. Generally, in this analysis four types of

potential lead impacts are addressed: lethal and sublethal impacts, for both target and non-target species.

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 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 1985a, 1985b; 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).

To date, more than 30 species of birds have been documented to have ingested lead fishing tackle, along with 3 mammal and 2 reptile species (Grade et al. 2019). It is estimated that 75 North American bird species may be at risk of lead tackle ingestion due to their foraging behavior (US EPA 1994). Environmental lead exposure, even at low levels, could very well contribute to wildlife mortality by impairing organ functions, increasing susceptibility to trauma and disease, and hindering the complex mental processes and social behaviors required for reproductive success and survival (Grade et al. 2019). The proposed requirement of non-lead ammunition on the refuge starting September 1, 2026, will help address concerns about the bioavailability of lead on the refuges.

Big Game (White-tailed deer, sika, wild turkey)

Description of Affected Resource

White-tailed deer are common and widespread on both Eastern Neck and Blackwater NWRs. Sika, a non-native species of elk, is abundant on Blackwater NWR. Road-based surveys using distance sampling were completed on Blackwater NWR in 2017, 2018, and 2019 to estimate the

density of white-tailed deer and sika on the refuge (Haus and Bowman 2018, 2019; Holland and Bowman 2020). Forward-looking infrared sensors (FLIR) were used to increase detections. Surveys were conducted in August and September each year. Density of deer (white-tailed deer and sika combined) averaged 52.2 deer per-square-mile over the 3-year period. Too few white-tailed deer were detected to develop reasonable density estimates for that species, but density of sika was estimated to be 42.1 per-square-mile. Though there was a fair amount of variation from year to year, all estimates are well above what would be considered ecologically sustainable for the area. The survey indicates deer populations are generally robust on Blackwater NWR.

Maryland's Statewide pre-hunt white-tailed deer population was estimated at 240,000 in 2019, a 12 percent increase from the previous 5-year average of 212,000 (Eyler et al. 2020). Maryland annually monitors deer abundance using harvest estimates and age structure of the deer herd to inform management decisions.

Maryland's wild turkey population is estimated at 40,000 birds based on fall, winter, and spring harvest data, and production surveys in July and August (B. Long, personal communication, May 21, 2021). Since 2010, the population has been increasing at a rate of 4 percent per year with increasing numbers in three out of five of the State's management regions including the Central, Southern, and Upper Eastern Shore regions. The population in the Lower Eastern Shore and the Western Region of the State have been stable since 2010 (Long 2019).

Impacts on Affected Resource

Alternative A: No Action Alternative

Under this alternative, the current big game hunt program would be maintained at Eastern Neck and Blackwater NWRs. Hunters harvested an average of 68.0 (range 50 to 91) white-tailed deer on Eastern Neck NWR during the most recent 5-year period (2016-2020). During this period, hunters harvested an average of 403.4 (range 350 to 445) sika and 70.4 (range 43 to 95) white-tailed deer on Blackwater NWR. Statewide harvest in 2020-2021 consisted of 78,275 white-tailed deer and 3,454 sika.

The most recent 5-year average (2016-2020) for annual wild turkey harvest on Eastern Neck NWR is 2.4 birds (range 0 to 5) and is 5.4 on Blackwater NWR (range 3 to 11). These data are based on birds harvested and reported via MDDNR's harvest reporting system. Wild turkey harvest for the spring 2020 hunt was 4,303 Statewide, 206 in Kent County, and 211 in Dorchester County.

The current hunting program on refuge lands carries the potential for adverse health impacts to huntable big game wildlife species from discarded lead in the environment in addition to the inherent impacts of intentional harvest from hunting. Some wildlife species are susceptible to direct ingestion of lead fragments that may remain in gut piles discarded in the field and/or bioaccumulation of lead from their food sources, whether on land or in waters of the refuges. Continued use of lead ammunition under this alternative and any future expansions to the current hunting program, without restrictions on the use of lead ammunition increases these potential adverse effects.

Alternative B: Proposed Action Alternative

Refuges, including Blackwater and Eastern Neck NWRs, 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.

Lead that could enter the environment from proposed hunting activities would include fragments from ammunition that has left the body of harvested animals or left behind in discarded gut piles in the field. Given the estimated numbers of hunters and amount of take estimated using lead ammunition, the lead that would enter the environment over the next three years is likely very small.

As non-lead requirements for ammunition take full effect after September 1, 2026, lethal and sublethal impacts to huntable wildlife species from discarded lead in the environment and the potential for exposure to lead that may result in adverse human health impacts decreases substantially and becomes negligible. Lead from previous hunting activities will still be present in the environment and may impact wild species; however, the impact is likely negligible given the likely low amount of lead currently present and available in the environment from hunting activities and minor adverse risk of bioaccumulation. This residual lead from hunting activity will also degrade over time.

Coyote

Description of Affected Resource

Coyotes are a recent arrival to Maryland. Historically found west of the Mississippi River, coyotes moved east as competing predator populations declined post-European colonization. Established coyote populations now exist in every State, including Maryland where the first documented coyote was found in 1972. Because of the ecological and social concerns related to the expanding coyote population in the State, MDDNR currently allows year-round harvest of coyote with no bag limit. Maryland's Archery Hunter Survey found coyotes Statewide in 2018-2019, with the highest observation rates in the western part of the State and lowest on the eastern coastal plain. Statewide, 0.4 (SE 0.1) coyotes were observed per 100 hours. On the eastern coastal plain, the region that includes Eastern Neck and Blackwater NWRs, 0.04 (SE 0.03) coyotes were observed per 100 hours.

Impacts on Affected Resource

Alternative A: No Action Alternative

The harvest of coyote on Eastern Neck and Blackwater NWRs is currently allowed; however, very few hunters encounter coyotes while hunting deer on the refuge. Under this alternative, potential impacts associated with lead ammunition would be similar to those described above under the section on big game.

Alternative B: Proposed Action Alternative

We anticipate similar impacts to coyote as described above under the section on big game.

Waterfowl (Duck and Goose)

Description of Affected Resource

Winter waterfowl populations for Maryland are best characterized using Midwinter Waterfowl Survey data. Each year in early January, aerial survey teams of pilots and biologists make visual estimates of ducks, geese, and swans found along most of the State's key waterfowl habitats. In the most recent 5-year period for which data are available (2016 to 2020), the survey counted an average of approximately 738,400 waterfowl, including 84,600 dabbling ducks, 209,700 divers, and 381,400 Canada geese. Harvest for these species is cooperatively regulated among an international consortium of wildlife managers (Atlantic Flyway Council) and is based on surveys, harvest data, and habitat data.

Impacts on Affected Resource

Alternative A: No Action Alternative

Under this alternative, the current waterfowl hunting program would be maintained at Blackwater NWR. Eastern Neck NWR would remain closed to waterfowl hunting. Lead shot was completely banned for the hunting of waterfowl (i.e., ducks, geese, swans, brant, and coot) throughout the United States beginning in 1991.

While there would be no lead use in hunting these species under Alternative A, lead use for other hunting or fishing could potentially impact these species. For example, the accumulation of lead in the soil from continued lead use could impact the vegetation and herbivorous insect food sources of migratory birds. Similarly, lead ammunition from big game and small game hunting that ends up in or near water on the refuge, although this is unlikely to occur, could be ingested by waterfowl and result in negative impacts. Birds may also ingest sinkers, hooks, floats, lures, and fishing line. In both cases, accumulation of lead in the environment over time increases the chances for negative impacts to occur.

Alternative B: Proposed Action Alternative

Impacts described under the No Action Alternative would be comparable to the Proposed Action Alternative. To date, more than 30 species of birds have been documented to have ingested lead fishing tackle, along with 3 mammal and 2 reptile species (Grade et al. 2019). It is estimated that 75 North American bird species may be at risk of lead tackle ingestion due to their foraging behavior (US EPA 1994). Environmental lead exposure, even at low levels, could very well contribute to wildlife mortality by impairing organ functions, increasing susceptibility to trauma and disease, and hindering the complex mental processes and social behaviors required for reproductive success and survival (Grade et al. 2019). However, it is unlikely that the amount of lead entering the environment from the proposed fishing activities of Alternative B would cause additional adverse effects toward migratory bird species.

The refuge currently prohibits lead ammunition for hunting of these species, so the proposed lead use requirement would not change the impacts of these hunts. After the proposed non-lead requirement takes effect, there may also be a benefit to these species because no new lead will enter the environment.

Fish

Description of Affected Resource

The tidal creeks and shallow ponds at Eastern Neck and Blackwater NWRs provide spawning, nursery, and/or feeding habitat for a variety of finfish and shellfish. Many fish species move into shallow waters in summer and out to deeper waters in the Chesapeake Bay in the fall. The most common finfish found on Blackwater NWR include black crappie (*Pomoxis nigromaculatus*), bluegill (*Lepomis macrochirus*), brown bullhead (*Ameiurus nebulosus*), common carp (*Cyprinus carpio*), gizzard shad (*Dorosoma cepedianum*), pumpkinseed (*Lepomis gibbosus*), and white perch (*Morone americana*). Northern snakehead (*Channa argus*), an invasive species first recorded in the Blackwater River on March 16, 2012, has rapidly colonized the drainage. Key species on Eastern Neck NWR are striped bass, white perch, yellow perch, spot (*Leiostomus xanthurus*), Atlantic croaker (*Micropogonias undulatus*), channel catfish, blue catfish (*Ictalurus furcatus*), and blue crab (*Callinectes sapidus*).

Impacts on Affected Resource

Alternative A: No Action Alternative

Recreational fishing by the public can have negative impacts on fish populations if it occurs at high levels or is not managed properly. Potential impacts from fishing include direct mortality from harvest and catch-and-release, injury to fish caught and released, changes in age and size class distribution, changes in reproductive capacity and success, loss of genetic diversity, altered behavior, and changes in ecosystems and food webs (Lewin et al. 2006, Cline et al. 2007). In addition, recreational fishing may lead to the accidental or deliberate introductions of non-native fish that may negatively affect native fish, wildlife, or vegetation.

Under this alternative, the current recreational fishing program would be maintained at Eastern Neck and Blackwater NWRs. Harvest levels would likely not change dramatically under this action as no new opportunities would be provided. The No Action Alternative would allow for hunting and fishing activities to continue adding lead ammunition and derelict tackle to refuge and surrounding waters. Lead ammunition and tackle may then release lead into the water column, decreasing water quality and affecting fish species. Thus, continuing to permit the use of lead ammunition and tackle on refuge lands and waters could mean an increase of lead in the environment, even at small amounts as estimated, and continue to have potentially negative impacts to fish species.

Alternative B: Proposed Action Alternative

Under this alternative, it is unlikely that additional lead ammunition or tackle would be introduced to refuge waters from future hunting and fishing activities beyond September 1, 2026, even if the Service's hunting and fishing programs are expanded. This would greatly reduce lead contamination of refuge and surrounding waters, and ultimately result in a positive, if minor, benefit to fish species in and around the refuges. Continued use of lead ammunition and tackle over the three-year transition period will have negligible impacts as long-term impacts of this continued use in Alternative A is considered negligible.

Non-Target Wildlife and Aquatic Species

Description of Affected Resource

Eastern Neck and Blackwater NWRs support a diversity of wildlife species typical of the forests,

fields, and wetlands of the Chesapeake Bay region. The two refuges provide a mosaic of habitats for a wide variety of avian species which includes migratory waterfowl, shorebirds, raptors, songbirds, and an assortment of marsh birds. Pollinator species are as diverse as the habitats on the Complex with its freshwater wetlands, forested habitats, and species-rich grasslands. These habitats also support an abundance of reptiles and amphibians, including spotted turtle (*Clemmys guttata*), plain-bellied watersnake (*Nerodia erythrogaster*), and narrow-mouthed toad (*Gastrophryne carolinensis*). Frequently encountered mammals include red fox (*Vulpes vulpes*) and muskrat (*Ondatra zibethicus*). A more comprehensive discussion of the rich diversity of species found on the two refuges can be found in their respective CCPs.

The best available science indicates that lead ammunition and tackle may have negative impacts on fish and 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; U.S. Fish and Wildlife Service 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

Under this alternative, hunting and fishing opportunities would continue on Eastern Neck and Blackwater NWRs as they are currently permitted. This alternative currently results in some short-term but negligible negative impacts to small mammal, birds, and other wildlife due to disturbance in areas where human access for hunting activities occurs.

Lead has no known biological function in living things, but the bioavailability of the spent lead ammunition and lead tackle, may have adverse impacts on the environment, especially for mammals and birds, specifically waterfowl and raptors. For birds, this typically occurs through direct ingestion of lead through soil, sediment or directly from food items (Rattner et al. 2008). Upland game birds and waterfowl may be exposed to lead when they ingest spent shot or ammunition fragments along with grit or pebbles, they need to fill their gizzards, a specialized organ involved in breaking down food (Kreager et al. 2008; Franson et al. 2009). Avian predators and scavengers can be susceptible to lead poisoning when they ingest lead fragments (the result of lead's brittle quality causing fragmentation upon impact) or pellets in the tissues of animals killed or wounded by lead ammunition (Platt 1976; Pattee et al 1981; Craig et al. 1990; Church et al. 2006; Hunt et al. 2006; Cade 2007; Pauli and Buskirk 2007; Stroud and Hunt 2009; Finkelstein et al. 2012; Rideout et al. 2012; Cruz-Martinez et al. 2015; Herring et al. 2016).

Lead poisoning affects the blood, nervous and immune systems of wildlife (Eisler 1988). According to Fallon et al. (2017) clinical signs may include "...ataxia, impaired mobility, lowered sensory abilities, vomiting, anemia, lethargy, gastrointestinal stasis, weakness and

mortality." Exposure to high amounts of lead in a short amount of time typically causes severe impairment of these systems and results in rapid death (Gill and Langelier 1994; Kelly et al. 1998; Schulz et al. 2006). Exposure to smaller amounts of lead over longer time periods, however, can cause anemia, lethargy, neurological disorders, an impaired ability to fight off disease and other negative effects (Jacobsen et al. 1977; Wobester 1997; Friend and Franson 1999; Pattee and Pain 2003; Franson and Pain 2011; Pain et al. 2019). These effects can in turn lead to indirect negative effects of lead exposure, such as increased susceptibility to predation. Thus, even lead exposure that does not directly kill wildlife, sublethal lead poisoning can have substantial adverse effects on wildlife health, including on reproduction (Scheuhammer 1987; Kendall et al. 1996; Provencher et al 2016; Pain et al. 2019, SETAC 2021).

Overall, the Service anticipates no measurable negative impacts to resident non-hunted wildlife populations locally, regionally, or globally due to the activity of hunting and fishing, as the impact of the current program does not result in more than temporary flushing or relocation. However, continuing to permit the use of lead ammunition and tackle on refuge lands and waters could mean an increase of lead in the environment, even at small amounts as estimated, and continue to have potentially negative impacts, especially potential cumulative impacts, to wildlife and aquatic species.

Alternative B: Proposed Action Alternative

Hunting and fishing activities can impact both target and non-target species.
The best available science indicates that lead ammunition and tackle may have negative impacts on wildlife and the environment (Golden et al. 2016; Hanley et al, 2022; Slabe et al, 2022). 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, and lost fishing tackle (Haig et al. 2014). Under Alternative B, continuing to permit the use of lead ammunition and tackle on refuge lands and waters until September 1, 2026, would mean a short-term increase of lead in the environment even at small amounts as estimated, and would temporarily continue to have negative impacts to wildlife and aquatic species. To move towards reduction and future elimination of this threat on the refuge, we will be eliminating the use of lead ammunition and fishing tackle over a 3-year period to educate and work with hunters and anglers on the use of non-lead alternatives. The transition to non-lead ammunition and tackle for all hunting and fishing will minimize the inadvertent exposure and subsequent lethal or sub-lethal impacts to wildlife, including bald and golden eagles, as well as other scavenging species and provide hunters and anglers adequate time to transition to using alternatives. The continued use of lead ammunition and fishing tackle in the short term (3 years) under Alternative B may cause additional lethal or sub-lethal impacts to non-target wildlife and aquatic species. However, after the transition period is complete, this impact will be greatly reduced, and will result in unlikely exposure of non-target species to lead ammunition and fishing tackle from hunting and fishing activities on the Chesapeake Marshlands NWRC. This reduced risk should continually decrease over time following the non-lead requirement as any remnant sources of lead from hunting and fishing activities will degrade.

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) the refuge strongly encourages use of non-lead alternatives for hunting big game and for fishing for

the next 3 years; (3) we would require the use of non-lead ammunition and tackle for all species beginning September 1, 2026; and (4) we will educate hunters, anglers, and the public to the potential adverse impacts of lead. Some hunters will also choose non-lead methods of take such as archery.

Threatened and Endangered Species, and Other Special Status Species

Description of Affected Resource

According to the Service's Information for Planning and Consultation Tool (IPaC), threatened, endangered, or special status species on or near refuge hunting and fishing action areas are:

- Federally endangered Northern long-eared bat (Blackwater NWR only)
- Federally threatened Eastern black rail
- Monarch butterfly (candidate species)
- Special Federal status bald and golden eagles

Additionally, IPaC indicates the federally threatened puritan tiger beetle is found in Kent County, but there are no records of this species on or near refuge lands.

Northern long-eared bats are federally endangered. First detected on Blackwater NWR during a systematic survey of bat habitats in 2016, the species was detected again by Salisbury University in 2019. We currently have no indication that the species breeds in our area and there are no known hibernacula on the refuge.

Black rails are federally threatened and occur on both refuges during the breeding season. The species is found in irregularly flooded tidal marshes and occasionally non-tidal shallow wetlands. Additionally, Eastern narrow-mouthed toad (*Gastrophryne carolinensis*), rare skipper (*Problema bulenta*), and catchfly cutgrass (*Leersia lenticularis*) are listed as threatened or endangered by the State (Maryland Natural Heritage Program 2016). All three species are found on Blackwater NWR. Only the rare skipper is found on Eastern Neck NWR.

After four decades of protection under the Endangered Species Act, the bald eagle was removed from the Federal list of endangered and threatened wildlife in 2007. However, they are still protected under the Bald and Golden Eagle Act and the Migratory Bird Treaty Act. Forests, shorelines, and wetlands provide important breeding, foraging and roosting locations for bald eagles on both refuges. Golden eagles are seen annually on Blackwater NWR during the non-breeding season and less frequently on Eastern Neck NWR. During the winters 2007-2008 through 2016-2017, a minimum of four to eight golden eagles were present annually on and around Blackwater NWR (Inskip and Golden 2017).

In accordance with Section 7 of the Endangered Species Act (ESA), the refuge has completed an initial analysis of the effects of the proposed action. Given that the proposed action could change in light of the public comment period for the proposed rulemaking, the initial documentation is considered to be a draft and will not be finalized until the Service publishes a final rulemaking.

Although the finalized ESA Section 7 documentation will accompany the final rule and NEPA decision documentation, a summary of the initial Section 7 analysis is reported here.

Impacts on Affected Resource

Alternative A: No Action Alternative

The current level of hunting and fishing activity has not adversely affected federally listed species on the refuges. Deer hunting occurs from September through the end of January, with the most participation from October through early December, when eagles are not nesting.

Under the No Action Alternative, lead ammunition and tackle would still be permitted on refuge lands and waters into the future, which would mean a continued and increasing risk to listed species and special status species from lead present in the environment over time. Although the Service has preliminarily determined that the impacts of lead ammunition and tackle from the proposed action are not likely to adversely affect such species, the Service continues to seriously consider the effects of the accumulation of lead in the environment on certain refuge lands from these activities over time. For example, the bald eagle may eat discarded gut piles from animals harvested with lead ammunition or fish that have consumed lead tackle. Given that increasing the amount of lead introduced into the environment could lead to these effects over time, the Service concludes that the No Action Alternative would ultimately present a potential risk to these natural resources in the long run with continued use of lead tackle and ammunition.

Alternative B: Proposed Action Alternative

Northern long-eared bats

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, activities that are not known to occur on the refuge. There are no known hibernacula anywhere on the eastern shore of Maryland. The only hunting that takes place May through August when bats might be raising young is during turkey season in April/May. NLEB might still occur in hunting zones in September and October, but the numbers would be few as most NLEB will have left for their hibernaculum.

Before the proposed non-lead ammunition and tackle requirement would take effect in 2026, the potential for impacts from lead to bats 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 seems likely that bats that occur on refuges will not consume lead derived from ammunition fired by hunters on the refuge. Therefore, any potential lead added to the environment during this interim time period, before the non-lead requirement takes effect on September 1, 2026, is not likely to adversely affect this species. After the non-lead ammunition and tackle requirement takes effect in 2026, there may also be some beneficial impacts to the species because no new lead will enter the environment and the remaining lead ammunition and tackle will become less bioavailable over time, which will decrease the overall risk of adverse effects to this species. Therefore, proposed action to ultimately require non-lead ammunition and tackle is not likely to adversely affect this species.

Eastern black rails

Despite dedicated surveys by refuge staff and the Maryland DNR in recent years, black rails have not been found on Blackwater NWR since 2016. At Eastern Neck NWR, one black rail was last detected in 2019. Extensive surveys were conducted both in historically productive areas but also in areas with new colonizing potential. The habitat at these refuges—especially Blackwater—is getting worse for black rail with each passing year as sea levels rise. It is unlikely that black rails are present on the two refuges, and if they are, the numbers are extremely low.

Hunting takes place September through May and only overlaps with the breeding season for black rails during the turkey hunt in May. Turkey hunting takes place in the upland habitats, where the species does not occur. If black rails are present on the refuges, they could linger before migration until September or October and overlap with the fall hunting season.

Before the proposed non-lead requirements would take effect in 2026, the potential for lead impacts to black rails is discountable because of the bird's preferred habitat. Black rails likely eat mostly small invertebrates and seeds, but because they are rarely seen, little is known about their feeding habits. If black rails were present on the refuge, they would be located in the interior of marshes, where lead ammunition is highly unlikely to be found. Although it is extremely unlikely to occur, even if lead deposited in uplands could leach out into coastal or wetland habitats that black rails use, the increase in lead ammunition would be extremely minor and dispersed, and therefore considered discountable and insignificant. Given that there is already a federal ban on the use of lead ammunition for waterfowl hunting, and that hunting with lead ammunition primarily occurs in upland areas, any potential lead added to the environment during this interim time period, before the non-lead requirements takes effect, is not likely to adversely affect this species. After the non-lead requirement takes effect in 2026, there may also be some beneficial impacts to the species because no new lead will enter the environment and the remaining lead will become less bioavailable over time, which will decrease the overall risk of adverse effects to this species. Therefore, proposed action to ultimately require non-lead ammunition and tackle is not likely to adversely affect this species.

Monarch butterflies

Monarchs use the refuge grasslands, wetlands, old fields, agricultural margins, and roadsides during spring and fall migration, as well as during the spring and summer breeding season. Hunting is allowed from September to February, with a short spring turkey season in April/May.

Before the proposed non-lead requirement would take effect in 2026, we expect the effects from authorized lead use from ammunition and tackle in the interim 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. 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. Therefore, any potential lead added to the environment during this interim time period, before the non-lead requirement takes effect on September 1, 2026, is not likely to adversely affect this species.

After the non-lead ammunition and tackle requirement takes effect in 2026, there may also be some beneficial impacts to the species because no new lead will enter the environment and the remaining lead will become less bioavailable over time, which will decrease the overall risk of adverse effects to this species. Therefore, proposed action to ultimately require non-lead ammunition and tackle is not likely to adversely affect this species.

<u>All species</u>
The best available science indicates that lead ammunition and tackle may have negative impacts on wildlife and the environment (Golden et al. 2016. Hanley et al, 2022. Slabe et al, 2022). 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, and lost fishing tackle (Haig et al. 2014). The voluntary use of non-lead ammunition and tackle will initially be encouraged, and we would require non-lead ammunition and tackle for all activities starting September 1, 2026 (after a 3-year transition period). This transition period will ensure continuity of visitor opportunities as hunters and anglers 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 3 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) the refuge will strongly encourage use of non-lead alternatives for fishing and hunting for the next 3 years; (3) we will require the use of non-lead ammunition and fishing tackle on the refuge starting September 1, 2026; and (4) we will educate hunters, anglers, and the public to the potential adverse impacts of lead. Some hunters will also choose non-lead methods of take such as archery. As a result, the proposed hunting and fishing activities are not likely to adversely affect any of the above listed species.

Habitat, Vegetation and Soils

Description of Affected Resource

Eastern Neck and Blackwater NWRs manage a range of diverse habitats. Both refuges are dominated by tidal and non-tidal wetlands, forested habitats of varying ages, complexity, and composition, as well as croplands and managed wetland impoundments. Big game hunting is focused on uplands habitats, but wetlands and wetland edges are key locations for sika hunters. Waterfowl hunting and fishing would occur in tidal and riverine habitats. Fishing in non-tidal ponds would take place during youth fishing or other special events. As for foreseeable environmental trends, the biological integrity, diversity, and environmental health of the refuge's habitats are threatened by relative sea level rise, invasive plant and animal species, and an overabundance of sika.

Lead is naturally present in all soils and generally occurs in the range of 15 to 40 parts lead per million parts of soil (ppm), or 15 to 40 milligrams lead per kilogram of soil (mg/kg). Pollution can increase soil lead levels to several thousand ppm (University of Massachusetts Amherst 2022). Soil surveys have not been completed on the refuge to determine exact lead concentrations of soil on the refuge. However, based upon a map showing the spatial distribution of soil lead concentrations (ppm dry weight) across the continental United States it is estimated that the lead concentrations found in the soil of the refuge is between 20-25 ppm (Haig et al. 2014). This range is within the normal range of lead concentration generally found in soils. There is no single threshold that defines acceptable levels of lead in soil, however, the Environmental Protection Agency defines a soil lead hazard as bare soil on residential real property or on the property of a child-occupied facility that contains total lead equal to or exceeding 400 ppm in a play area, or an average of 1,200 ppm of bare soil in the rest of the yard based on soil samples (EPA 2020).

While the use of lead in the Service's current hunting and fishing programs does not affect the traditional quality or characteristics of wildlife habitats such as vegetation cover, the use of lead ammunition, and to a lesser extent lead tackle, can introduce small amounts of lead into the soils and aquatic environments on refuge lands causing negligible negative effects given lead is a toxic pollutant. One likely scenario is that lead ammunition from a gunshot that misses its target or lead ammunition fragments that exits the target becomes lodged in the ground, introducing lead fragments into the soil. Other scenarios of lead being introduced to the soil is from gut piles left behind from harvested game, or derelict fishing tackle left behind. Lead enters aquatic environments via spent ammunition that has either exited or missed its intended target, or tackle left behind. Lead can become more bioavailable in aquatic environments having potentially more impact in habitats like wetlands and bottomland swamps which are present on the refuge. Although, lead typically has low solubility in water, certain conditions, including high acidity (such as naturally acidic bogs or wetlands downstream of acidic mine drainage), or direct point sources of discharge can increase lead in water (IPCS 1995; Eisler 1998; U.S. Department of Health and Human Services 2007).

It is unlikely that lead tackle would find its way into the soils of refuge lands unless dropped along the shore because it is much more likely to be discarded directly into refuge waters from lost tackle snagged on downed trees or debris in the water, if anywhere. However, some ammunition, including lead ammunition, may become lodged in soils following missed shots by

hunters or from fragmentation off single projectile ammunition that penetrates and exits game species. When this does occur, it could lead to metals and other components of the ammunition impacting the composition of soils. In the case of lead ammunition, loose lead fragments may enter the soil after impact, and if the amount of lead reaches high enough concentrations, these lead fragments, if small enough, could be taken up by plants. If taken up by plants, lead can adversely affect plant growth. The introduction of lead in this manner is highly localized and it is unlikely that lead introduced from the Service's hunting and fishing program would introduce sufficient lead to the soils of any area for plants to take it up. There is scientific evidence that lead in soil can adversely impact plants, including inhibiting their growth of roots and cell walls provided concentration of lead is in the correct form and high enough concentration for plant absorption (Balsberg-Pahlsson 1989; Eisler 1998; Tomar et al. 2000). However, the toxicity of lead from soil absorption to seed germination is very small (Balsberg-Pahlsson 1989) and the migration of lead from soil to roots and other parts of plants generally is considered to be minimal (Sorvari et al. 2006; Rattner et al. 2008). Additionally, uptake of lead varies by plant species (Eisler 1998; Finster et al. 2004, U.S. Department of Health and Human Services 2007).

Impacts on Affected Resource

Alternative A: No Action Alternative

Big game hunting would continue to occur in upland and, to a lesser extent, wetland habitats on the refuges. Fishing and waterfowl hunting would continue in tidal wetlands and riverine habitats. Hunters and anglers 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 anglers and hunters occurs.

Although the amount of lead introduced, both annually and cumulatively to date, is unlikely to be enough in any particular area to negatively impact plants and habitats through soil contamination, under this alternative, there would be continued introduction of lead into the soils on refuge lands. In the long run, this increasing amount of lead could be taken up by plants, potentially causing direct negative impacts to vegetation and habitat on the refuge in areas with concentrated hunting and fishing activities. Although negative impacts from accumulated lead ammunition or tackle in soils remain a possibility in the future because continued use of lead ammunition would mean increasing lead levels over time, any potential impact is still likely a negligible impact to habitat and vegetation given the amount of lead annually introduced on the refuge from these activities.

Alternative B: Proposed Action Alternative

Under the Proposed Action Alternative, as discussed above, it is unlikely that further introduction of lead into the soils on refuge lands that could be taken up by plants would occur once the non-lead ammunition and fishing tackle requirement takes effect on September 1, 2026. Until the regulation takes effect, it is estimated the additional lead entering the environment from these activities will not reach a level that will negatively impact vegetation or habitat on the refuges. As current lead levels from hunting and fishing activities are likely not sufficient to negatively impact plants or their habitats over the long term, the proposed action would prevent future lead levels in the soil from becoming high enough to potentially negatively impact plants or habitat, reducing that future risk of impact or cumulative impacts even more.

Water Quality

Description of Affected Resource

Blackwater NWR spans five subwatersheds of the southeastern Chesapeake Bay, including the Little Choptank, Fishing Bay, Transquaking River, Marshyhope Creek, and Nanticoke River subwatersheds. Collectively these subwatersheds encompass more than 477,000 acres of land and waters. The main section of Blackwater NWR is drained by the Blackwater River, which empties into Fishing Bay to the southeast, a large shallow embayment at the north end of Tangier Sound. The Nanticoke Unit of Blackwater NWR borders both the mainstem of the Nanticoke River and its tributary, Marshyhope Creek.

Eastern Neck NWR is wholly contained within the Lower Chester River Basin subwatershed of the northeastern Chesapeake Bay at the lowest reach of six subwatersheds that comprise the Chester River drainage. The Lower Chester River Basin subwatershed comprises over 80,000 acres of lands and waters in Kent and Queen Anne Counties in Maryland. The refuge borders both the waters of the Chester River and the Chesapeake Bay proper.

The Service maintains water quality in the interest of ecological health and impacts to water quality are considered for all hunting and fishing activities on or originating from Service lands and waters. Subject to determining it will not adversely impact water quality, the Service permits hunting near and fishing in waters within or surrounding refuges, including with lead ammunition and tackle. However, the Service is not authorized to regulate fishing or other waterborne activities within the navigable waters of the State of Maryland or within areas where water bottoms are State-owned. The waters surrounding both Blackwater NWR and Eastern Neck NWR, except in the seasonally closed areas of the Blackwater River where the Service maintains ownership, have State-owned water bottoms; therefore, we do not regulate fishing or other water-based activities within these areas. Nonetheless, access is provided to waters under State jurisdiction via refuge lands. This means lead ammunition and lead tackle may be present in both Service waters (e.g., landlocked ponds and other non-navigable waters), as well as surrounding navigable waterways that connect to Service lands when permitted for use. Lead ammunition and tackle in aqueous environments can dissolve into the surrounding water, under certain water quality conditions, by weathering and abrasion (Eisler 1988; Rattner et al. 2008). The Service considers the amount of lead ammunition and tackle in these waters to be minimal, and thus the amount of lead, to be negligible at this current time.

Impacts on Affected Resource

Alternative A: No Action Alternative

Motorized and non-motorized boats can access refuge-regulated waters and navigable waters adjacent to Service lands via several soft launches, as well as partner-managed and off-refuge public boat ramps. The majority of boating activity is non-motorized due to the shallow nature of these waters. The Service-owned portion of the Blackwater River at Blackwater NWR is seasonally closed to motorized and non-motorized boats from October 1 through April 1. Access to the Key Wallace Drive soft launch at Blackwater NWR and Ingleside Recreation Area soft launch at Eastern Neck NWR is only available from April 1 to September 30 while all other boat access points are available year-round. The use of boats by hunters and anglers has the potential to affect water quality negatively by increasing erosion, stirring up bottom sediments, or

introducing pollutants into waterways. The impacts from boating are expected to continue to be minor and short-term, as no evidence exists that current hunting and fishing activity at either Blackwater or Eastern Neck NWR degrade water quality on or around waterways associated with refuge properties. Hunting and fishing are, therefore, expected to have minimal adverse impacts on waterway health based upon staff observations of past effects. These impacts are not likely to be significant at the existing level of use.

The No Action Alternative would allow for hunting and fishing activities to continue adding lead ammunition and derelict tackle to refuge and surrounding waters. Lead ammunition and tackle may then release lead into the water column, decreasing water quality. Although future expansions to the hunting and fishing programs could also increase the amount of lead contamination in both refuges and surrounding waters, impacts to water quality are negligible given the small amount of lead added from lead ammunition fragments and abandoned derelict fishing tackle.

Alternative B: Proposed Action Alternative

Under this alternative, it is unlikely that additional lead ammunition or tackle would be introduced to refuge waters from future hunting and fishing activities beyond September 1, 2026, even if the Service's hunting and fishing programs are expanded. This would greatly reduce lead contamination of refuge and surrounding waters, and ultimately result in a positive, if minor, benefit to water quality in and around the refuges. Continued use of lead ammunition and tackle over the three-year transition period will have negligible impacts as long-term impacts of this continued use in Alternative A is considered negligible.

Visitor Use and Experience

Description of Affected Resource

Blackwater NWR is open to all six of the Refuge System's priority public uses, which include wildlife observation, photography, environmental education, interpretation, hunting, and fishing. In 2020, Blackwater NWR had a total of 233,148 visits. Of those visits, 13,200 were for hunting and 24,000 were for fishing. Previously, fishing was not a major use at Blackwater NWR, but the popularity of snakehead fishing recently has increased participation.

Eastern Neck NWR is open to wildlife observation, photography, interpretation, hunting, and fishing. In 2020, Eastern Neck NWR had a total of 100,298 visits. Of those visits, 598 were for hunting and 10,000 were for fishing.

Hunting and fishing have occurred at both Blackwater NWR and Eastern Neck NWR lands and waters since the beginning of recorded history in our country. Prior to acquisition, migratory waterfowl and deer were hunted by residents and private hunt clubs on both refuges. As the Service acquired lands for the Complex, deer hunting traditions continued.

Impacts on Affected Resource

Alternative A: No Action Alternative

During permitted deer hunt days, designated areas of Blackwater NWR are closed to everyone except those permitted to hunt. At Blackwater NWR, this use infrequently conflicts with other public uses, as non-hunting visitors are not able to enjoy the wildlife drive, Key Wallace Trail,

and Tubman Road Trail for a handful of days throughout the year. Fishing has become a very popular activity on Key Wallace Drive and generally does not conflict with other user activities.

At Eastern Neck NWR, hunting does not conflict with other public uses because most of the refuge is closed to non-hunting uses during hunts. Fishing is limited and generally does not impact non-fishing visitors.

With continued use of lead ammunition and tackle under this alternative, there would continue to be potential adverse risks to hunters and anglers from lead exposure by consuming harvested game or using lead tackle. Anglers may be more susceptible to elevated levels of lead in blood from use of lead tackle as lead could transfer to hands while tying on lures and weights and be accidentally ingested (Grade et. al. 2019; Sahmel et al. 2015). Studies have found that wildlife hunted with lead ammunition and consumed by humans can increase exposure to potential risks to human health due to the accidental ingestion of lead fragments (Fisher et al. 2006; Tsuji et al. 2008; Iqbal et al. 2009; Hunt et al. 2009; Cornatzer et al. 2009; Kosnett 2009; Verbugge et al. 2009; Johnson et al. 2013; ATSDR 2020). A study done in North Dakota found that those who ate wild game had significantly higher levels of lead in their blood than those who did not (Iqbal et al. 2009).

Other users will likely not face risks associated with exposure to lead from lead ammunition or tackle discarded on the refuge as the additional lead added is expected to stay under contaminated soil levels that would adversely impact human health. Therefore, we conclude that any impact to other refuge users' health from potential lead exposure would be negligible.

Alternative B: Proposed Action Alternative

Under this alternative, no change is expected to the experience of non-hunting and fishing refuge visitors from the transition to a non-lead requirement. Staring September 1, 2026, hunters and anglers would be required to use non-lead ammunition and tackle. Although the activity of hunting and fishing would not change, hunters and anglers may have a harder time finding equipment that meets this new requirement, potentially reducing their quality of experience if they are not able to partake in the activity.

However, quality of experience may increase over time as these resources become more available as demand for non-lead ammunition and tackle increases. To prevent the loss of hunters and anglers from being able to participate in these activities, the transition approach over three years is proposed to allow hunters and anglers time to replace fishing tackle and find suitable ammunition alternatives. Hunters can purchase non-lead ammunition in most gun stores and sporting goods retailers. If the bullet size, caliber, or gauge is unavailable, most retail stores will special order ammunition, or it can be ordered through the mail or online. There are many companies that sell lead-free tackle that can be ordered directly through mail or online if not available in local bait shops. If anglers and hunters are not able to find non-lead alternatives there may be a slight decrease in participation of these activities for a short time period after regulations take effect. However, non-lead ammunition and tackle is becoming more widely available for anglers and hunters to purchase, so it is likely hunting, and fishing visits will not appreciably decline due to this regulation change. The transition approach also allows anglers and hunters to acclimate and prepare for participating in hunting and fishing activities in compliance with the new regulations.

Long-term, this action could produce positive human health benefits for all visitors to the refuge with a decreased risk of exposure to lead ammunition or tackle discarded on refuge land and waters in the future. Thus, the proposed action will have a potentially positive effect, if any effect, on visitor health.

Cultural Resources

Description of Affected Resource

Humans have occupied the area of Blackwater NWR for more than 11,000 years. The refuge contains 9 known prehistoric archeological sites and 60 archaeological sites. Because no comprehensive subsurface archaeological survey has been conducted, these known sites are likely to represent only a small subset of all preserved sites on the refuge.

Blackwater NWR contains two confirmed 18th century archaeological sites. In 2021, the Ben Ross homesite was discovered in the Peter's Neck area of the refuge. Ben Ross is the father of the famed abolitionist Harriet Tubman and she likely spent time with him here before escaping slavery and leading others to freedom. For more additional information regarding the cultural resources at Blackwater NWR, refer to our CCP (2010).

Eastern Neck NWR has extensive prehistoric archaeological and historical sites. In a 1978 study, 19 archaeological sites were documented on Eastern Neck; 12 of these had prehistoric components and 13 had historic components (Thompson and Gardner). The historic sites date primarily the late 18th and 19th centuries and the prehistoric material dated to the Woodland period.

The Service, as the lead Federal agency, has chosen to use the NEPA substitution process to fulfill obligations under the National Historic Preservation Act of 1966, as amended (NHPA). While obligations under NHPA and NEPA are independent, the regulations implementing NHPA allow for the use of NEPA review to substitute for various aspects of the NHPA section 106 (16 U.S.C. 470f) review to improve efficiency, promote transparency and accountability, and support a broadened discussion of potential effects that a project may have on the human environment (36 CFR 800.3 through 800.6). During preparation of the Supplemental EA, the Service will ensure that the NEPA substitution process will meet any NHPA obligations.

Impacts on Affected Resource

Alternative A: No Action Alternative

Hunting and fishing, regardless of method or target species, are consumptive activities that do 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 and anglers 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/fishing, nor is it likely that hunters/anglers 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 17 full-time permanent employee positions that oversee the Chesapeake Marshlands NWR Complex and are stationed at Blackwater NWR headquarters located in Cambridge, Maryland: 3 wildlife biologists, 3 visitor services specialists, 1 facility operations specialist, 3 maintenance workers, 3 wildland firefighters, 1 budget specialist, 1 administrative assistant, a deputy manager, and a refuge complex manager. We also have 2 term biologists. In addition, we have 1 term biologist stationed at Eastern Neck NWR in Rock Hall, Maryland.

At Blackwater NWR, core infrastructure includes a Visitor Center, restrooms, a 4-mile wildlife drive, Environmental Education Building, headquarters, fire cache, and refuge shop compound. An observation walkway and platform exist off Wildlife Drive as well as a photo blind. There are two single-family houses used for quarters, as well as a fire bunkhouse and a trailer also used for quarters. The historical headquarters office building currently still exists and was last used for intern quarters. There are also numerous sheds and storage areas. The refuge also includes paved and gravel roads to the infrastructure, four trails, kiosks, interpretive signs, a Romtec toilet, and ample parking.

Over 27 miles of hunt roads are maintained on the refuge, plus 44 individual parking lots for hunters. There is a parking area and soft launch maintained on Route 335 that is popular with anglers, hunters, and other paddlers, as well as a seasonally closed soft launch on Key Wallace Drive near the bridge.

At Eastern Neck NWR, there is a historic lodge used as a contact station, restrooms, a single-family house used as quarters, and a small bunkhouse, as well as a shop compound. There are 7 trails and boardwalks and 20 parking areas for hunters.

Impacts on Affected Resource

Alternative A: No Action Alternative

Annual operating costs to administer the refuge's current hunting and fishing programs are approximately $103,010. This includes costs related to equipment, law enforcement, public outreach materials, collection and analysis of hunt data and biological information, and maintenance of roads, trails, and kiosks. The refuge manager coordinates the budget each year to ensure funds are available. Hunters currently use refuge infrastructure, such as parking areas and refuge trails, to gain access to refuge lands. There would be no adverse impacts to refuge facilities observed under this alternative.

Alternative B: Proposed Action Alternative

For the proposed action, the proposed non-lead ammunition requirement will not impact refuge infrastructure (parking, trails, roads)

Local and Regional Economies

Description of Affected Resource

Hunting on the eastern shore of Maryland is extremely popular for out-of-town visitors, with hunters travelling from Baltimore, the DC metropolitan area, Philadelphia, and Delaware, all less

than 2 hours away. In Cambridge, hotels are usually booked for most of the peak season for deer since campgrounds are very limited. The presence of a strong population of sika on public lands is the primary draw to Dorchester in particular. There have been numerous national shows, podcasts, articles, and other media featuring public hunting for sika for many years. The advent of specialized social media groups focusing on sika in the region, as well as apps such as OnX and HuntStand, has made public land hunting on the refuge and neighboring WMAs more accessible to those not local to the area. For example, one sika social media page has over 8,100 followers from all over the U.S. Likewise, snakehead fishing has grown exponentially in the past several years and has a related snakehead fishing page with over 9,300 followers. Followers regularly ask questions on where to hunt or fish the refuge, techniques, and how to overcome the challenges to hunting the marsh.

Local hunting and fishing guides also charge clients over $350 per day for a hunt on nearby private lands, with many hunters choosing to hunt the refuge as well. Lastly, many local landowners around Blackwater NWR lease their properties to hunt clubs with members from all over who choose to hunt both the refuge and their lease property. From hotel, meals, leases and guides, the hunt program at Blackwater NWR helps fuel a broader economy that revolves under sika hunting in Dorchester.

Blackwater NWR is located in Dorchester County. From 1970 to 2019, the population grew 8 percent from 29,506 to 31,929 (and 4% from 2000 to 2019), with a 20 percent increase in employment. Between 2000 to 2019, most growth came from migration at 71 percent compared to 17 percent from natural change such as births and deaths (Headwaters Economics 2021).

From 2001 to 2019 within Dorchester, the growth areas for jobs were accommodation and food services (453 new jobs), health care and social assistance, and finally administrative and waste services. In 2019, the largest number of jobs were in manufacturing, social assistance and health care, and retail. Unemployment has declined by 4.9 percent between 2010 to 2020.

Eastern Neck NWR is located in Kent County. From 1970 to 2019, the population grew 20 percent from 16,247 to 19,422 (and 1% from 2000 to 2019), with a 67 percent increase in employment. Between 2000 to 2019, most growth came from migration at 53 percent compared to 43.7 percent from natural change such as births and deaths (Headwaters Economics 2021).

From 2001 to 2019 within Kent County, the growth areas for jobs were educational services (219 new jobs), transportation and warehousing (216 new jobs), and real estate and rental and leasing (207 new jobs). In 2019, the largest number of jobs were in social assistance and health care, retail trade, and government. Unemployment has declined by 2.5 percent between 2010 to 2020.

Impacts on Affected Resource

Alternative A: No Action Alternative

Blackwater NWR had an overall economic impact of $7.8 million, including $667,000 in total tax revenue, 63 jobs, and $2.3 million in employment income to Dorchester and Wicomico Counties. Visitor recreation expenditures for 2017 were $5.8 million, with non-residents accounting for 95 percent of the total. Expenditures from hunting visits in particular are estimated at $224,900 and from fishing, over $331,800.

Eastern Neck NWR had total visitor expenditures of $709,000 in 2017 with non-residents accounting for $417,000 or 59 percent of total expenditures. Recreational expenditures from hunting accounted for $10,900 and for fishing, over $134,000. The contribution of recreational spending in local communities was associated with $250,000 in employment income, $72,000 in total tax revenue, and $823,000 in economic output (Caudill and Carver 2019).

While population growth is relatively stable in both counties, increased population growth will continue to stress ecosystems surrounding both refuges through direct loss of remaining habitat as well as fragmentation and degradation of remaining resources. Management cannot reverse this trend, but refuges and other conserved lands will become even more important for ecosystem health and biodiversity. Within Dorchester County, 75.4 percent of the land is in private ownership, compared to the national 61.1 percent. The Service owns 4.7 percent of the county, versus the national average of 3.9 percent. Within Kent County, over 95 percent is in private ownership, with only 1.2 percent owned by the Service. These lands are, therefore, valuable assets for public hunters and anglers. Public lands for hunting will experience more pressure and popularity as suitable lands for hunting decrease or remain constant. The current hunt and fish programs will continue to have a beneficial impact on the local economy. Hunting also assists with local farmers and crop damage, both in harvesting deer and increasing pressure.

Alternative B: Proposed Action Alternative

There is some possibility of negative economic impacts for hunters and anglers who must comply with the proposed non-lead requirements beginning on September 1, 2026. While certain types of non-lead ammunition and tackle can cost more than certain types of lead ammunition and tackle, the price of non-lead ammunition is the same or less than that of premium lead ammunition. 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). There are non-lead alternatives to leaded tackle; however, in 2006, it was estimated that an angler's annual increase in cost from transitioning to lead-free tackle would be between $5 to $25 (Minnesota Office of Environmental Assistance 2006; Rattner et al. 2008).

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 transition implementation, which already affords hunters and anglers time to gradually transition their supplies of ammunition and tackle. In order to mitigate economic impacts to hunters and anglers who previously used lead ammunition or tackle, in addition to implementing the requirement in September 2026, the Service will continue educating hunters and anglers on the use of non-lead ammunition and tackle during the transition period, provide links to resources on companies that produce non-lead ammunition and tackle for purchase and work with partner organizations on non-lead ammunition and tackle issues if possible.

Environmental Justice

Description of Affected Resource

E.O. 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.

Blackwater NWR

Within Dorchester County, both the percentage of residents who do not have a high school degree as well as those that do, closely match the national percentages of 12 percent and 88 percent respectively. The percentage of residents with a bachelor's degree or higher is 21.2 percent compared to the national average of 32.1 percent. Differences in education levels can inform decision makers with outreach efforts and determine if management actions or plans might disproportionately impact certain groups. Furthermore, the most prevalent income category is 17.7 percent at $50,000 to $74,999, with the least at 2.2 percent at $150,000 to $199,999 (Headwaters Economics 2021). Income distribution across households is a key indicator for economic policy.

The minority population of people of color is only slightly lower at 37.1 percent than the national estimate of 39.3 percent based on U.S. Census Bureau data (Headwaters Economics 2021). According to the EPA's Environmental Justice screening tool, people of color population is below the 25th percentile nationally. The low income, linguistically isolated, and lower than a high school education demographics are between the 25th and 50th national percentiles in the area of the refuge. In the area around Blackwater NWR, the population of people over the age of 64 near Blackwater NWR is above the 75th percentile nationally.

Residents who speak English less than very well is 2.8 percent versus the national of 8.4 percent in 2019. Primary messaging to the community is therefore in English. Different cultures and populations may interact with public lands in different ways based on traditions, cultures, and family experiences.

Dorchester County has a slightly higher than national percentage of families in poverty at 10.7 percent compared to 9.5 percent. However, there are significantly more single mother families in poverty at 6.6 percent compared to 4.3 percent nationally. This has increased for the county, whereas nationally has decreased. Families in poverty may have to make compromises to meet basic needs, have lower education, and may be less likely to participate in outdoor recreation or public decision-making processes.

Eastern Neck NWR

Within Kent County, the percentage of residents who do not have a high school degree as well as those that do, are about the same as the national percentages of 12 percent and 88 percent respectively. The percentage of residents with a bachelor's degree or higher is better than the national average at 35.1 percent compared to 32.1 percent. Furthermore, the most prevalent income category is 16.4 percent at $100,000 to $149,999, with the least at 5 percent at less than $10,000. Income distribution across households is a key indicator for economic policy.

The minority population of people of color is significantly lower at 22.3 percent than the national estimate of 39.3 percent based on U.S. Census Bureau data (Headwaters Economics 2021). According to the EPA, the people of color, linguistically isolated, and people under the age of

five demographics are between the 25th and 50th percentiles nationally. The area of the refuge is above the 75th percentile for the population of people over the age of 64.

Residents who speak English less than very well is 2.5 percent, versus the national percentage of 8.4 in 2019 (Headwaters Economics 2021). Primary messaging to the community is, therefore, in English. Different cultures and populations may interact with public lands in different ways based on traditions, cultures, and family experiences.

Kent County has a much lower percentage of families in poverty at 6.4 percent compared to 9.5 percent nationally, and less single mother families in poverty at 3 percent compared to 4.3 percent nationally. The area around Eastern Neck is in between the 50th and 75th percentiles nationally for the low income and lower than a high school education demographics. Families in poverty may have to make compromises to meet basic needs, have lower education, and may be less likely to participate in outdoor recreation or public decision-making processes.

Impacts on Affected Resource

Alternative A: No Action Alternative

The current hunting and fishing programs at Blackwater and Eastern Neck do not cause issues with environmental justice as they take place on the refuges and provide a local and low-cost recreational opportunity that also provides local food sources. The programs also support the local economies as stated above.

There is a possibility of human health impacts from the current hunting and fishing program allowing and continuing to allow the use of certain types of lead ammunition and tackle 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 and fishing programs.

Alternative B: Proposed Action Alternative

The Proposed Action Alternative would have a positive, but negligible, effect on human health. It would reduce the risk of potential exposure to increased blood lead levels for hunters and anglers engaged in these activities on the refuge through reduced incidental consumption or handling of lead (Frank et al. 2019, Fisher et al. 2006, Tsuji et al. 2008, Iqbal et al. 2009, Grade et al. 2019, Sahmel et al. 2015). Under this alternative where use of lead ammunition and fishing tackle will be transitioned out after 3 years, hunters and anglers will experience decreased exposure and risk of elevated blood lead levels due to incidental consumption or handling of lead ammunition and tackle from these activities. The Service has found these impacts negligible for all opportunities in the current hunting and fishing programs, which makes the benefit negligible.

There is, however, some possibility of negative economic impacts for socioeconomically disadvantaged hunters and anglers who must comply with the proposed requirements. Even though non-lead ammunition and tackle can cost the same, or up to 30 percent more expensive, as lead, the cost of several boxes per year is minor compared to the other expenses involved such as firearm cost. Deer and turkey hunting also require less ammunition than small game. The minor economic burden involved in transitioning between ammunition and/or tackle types could be more impactful to low-income hunters and anglers. Today, the cost of lead tackle is still much

less than the lead-free alternatives potentially making the transition more difficult for low-income anglers (Marohn 2020).

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 September 2026 implementation, which already affords hunters and anglers time to gradually transition their supplies of ammunition and tackle. The Service will continue educating hunters and anglers on the use of non-lead ammunition and tackle during the transition period, provide links to resources on companies that produce non-lead ammunition and tackle for purchase, and work with partner organizations on non-lead ammunition or tackle issues. With these mitigation measures, minority and/or low-income communities are not disproportionately impacted from this alternative.

Monitoring

Game species are monitored by MDDNR through field surveys and harvest reports generated by mandatory check-in of harvests. MDDNR has determined that populations of game species are at acceptable levels to support hunting and these assessments are reviewed and adjusted periodically. To get a better estimate of deer density on Blackwater NWR, the refuge partnered with University of Delaware in 2017 to design and implement road-based surveys using distance sampling to estimate the density of white-tailed deer and sika on the refuge (Haus and Bowman 2018, 2019; Holland and Bowman 2020). Forward-looking infrared sensors (FLIR) were used to increase detections. Surveys were conducted in August and September each year. These were completed in 2017, 2018, and 2019, but were not conducted in 2020 due to COVID. These surveys are needed to better understand current herd density, potential for impacts to habitats, and population trends. A minimum of 5 years of data will be collected and may be continued based on the necessity of the data for refuge decision making and the recommendation of University of Delaware and MDDNR.

Monitoring of fish communities has been conducted by the Service's Chesapeake Bay Field office in partnership with MD DNR in 2006-2007 and replicated in 2018-2019 (Newhard and Love 2019). This is not scheduled to be repeated but may be in the future to monitor changes due to snakehead populations and increased salinity upon fish species and communities. Since angling is focused on the exotic snakehead, angling pressure should benefit, not harm, native fish species.

We will continue to base the annual harvest on the observed population size and habitat conditions. If the results of monitoring programs indicate that fish and wildlife populations are negatively impacted by any of the proposed harvest management strategies, the regulations would be changed. 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 harvest objectives in the future. The Chesapeake Marshlands NWR Complex Inventory and Monitoring Plan (IMP) is under development.

Summary of Analysis

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

Significant Impact (FONSI).

Alternative A: No Action Alternative

There would be no additional costs to the refuge under this alternative. There would be no change to the current public use and wildlife management programs on the refuges. The refuges would not increase their impact to the economy and would not provide new hunting and access opportunities. In addition, this alternative would not meet mandates under the NWRSAA and Secretarial Order 3356.

Effects on wildlife and habitat would likely not be significant in the short term, although there may be some potential negative effects under this alternative due to lead being present and bioavailable for wildlife and aquatic species to ingest, and could have negative impacts if lead accumulates to high levels over time. Given that increasing the amount of lead in the environment could lead to negative effects over time, this alternative could ultimately have some negative impacts on certain endangered, threatened, and special status species over time with continued use of lead ammunition and tackle. The refuges 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 and tackle, as the addition of lead from these activities in a given hunting/fishing season are small. 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.

While this alternative provides wildlife-dependent recreation opportunities on the refuges, in line with the Service's priorities and mandates, it does not meet the purpose and needs of the Service as described above because it would allow for continued lead use in hunting and fishing activities, which would continue to pose a threat to human health and the environment. Nevertheless, we are analyzing it as the No Action Alternative as it is the baseline needed to evaluate the proposed action. The nature of discarded lead means that continuing to allow the use of lead ammunition and tackle on Service lands and waters would mean adding newly deposited lead to the current amount of lead already 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. If the current hunting and fishing program were to continue under the No Action Alternative, the Service would have to reevaluate the hunting/fishing opportunities expanded in the 2022 Rule that permitted the use of lead ammunition and tackle, since these expansions were previously analyzed and adopted with the expectation of implementing the planned non-lead ammunition and tackle requirement beginning September 1, 2026.

Alternative B: Proposed Action Alternative

As described above, this alternative is the Service's preferred action because it offers the best opportunity for public hunting and fishing that would reduce the potential impacts on physical and biological resources from lead entering the environment, while meeting the Service's mandates under NWRSAA and Secretarial Order 3356. The proposed requirement to use non-lead ammunition and tackle beginning September 1, 2026 will have a positive impact in reducing the potential for lead to affect wildlife health and preventing accumulation of lead at higher

levels beyond 2026.

Economic impacts to hunters and anglers due to required use of non-lead ammunition and tackle will be mitigated by a transition approach and outreach programs. This alternative best meets the purpose and need stated earlier.

List of Sources, Agencies and Persons Consulted
Maryland Department of Natural Resources:
Karina Stonesifer, Associate Director Game Management
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Tom Bonetti, Hunting and Fishing Coordinator, Regional Office

State Coordination
National wildlife refuges, including Chesapeake Marshlands NWRC, conduct hunting and fishing programs within the framework of State and Federal regulations. Refuge staff worked with State partners early in the process and throughout the development of the plan. The Complex has moved ahead with developing this hunting and fishing plan based upon earlier and annual formal coordination with MD DNR and Patuxent NWR, which is the only other refuge in the State. Any deviations from the state regulations are discussed and approved in writing before announcing. The refuge is also an active member of the MDDNR's deer management stakeholder group. Chesapeake Marshlands NWRC has initiated and led several mentoring efforts with the MDDNR, including the First Shot mentored hunt program for adults beginning in 2018 with National Wild Turkey Federation and other partners, which has held over 107 hunts to date for deer and turkey. Maryland refuge managers formally met with MDDNR biologists and leadership in June 2021 to discuss the process and updates of all Maryland refuge hunting and fishing plans.

The Complex provided a public hunting/fishing meeting on June 9, 2022. We also worked with LeCompte WMA to host a voluntary non-lead workshop for MDDNR and FWS staff on September 16, 2022, and the public on September 17, 2022.

Refuge Complex staff will continue to annually consult and coordinate with MDDNR and Patuxent NWR 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 and fishing 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
After consideration of the proposed action, we determined that they will not impact historic properties or other cultural resources and that Tribal Nations do not own land that would be impacted by changes in the hunting and fishing program on the Complex. We made a determination in good faith that the proposed action does not have potential for effect on the interests of any Tribal Nations, and consequently outreach is not warranted.

Public Outreach
Several annual hunt meetings were held with the public on April 5, 2017, and March 24, 2018, (March 2020 was cancelled due to COVID) to share the current hunt program, harvests, monitoring and solicit input on the program. These comments, as well as others provided since 2017 to the staff, were taken into consideration in drafting these documents. We released the draft plan and EA for public review and comment from May 3 through August 8, 2022, a total of 97 days. We distributed a press release to news organizations and alerted visitors to the plan's availability on the refuge websites. We also provided an open house event on June 9 for the public to discuss concerns or learn more about the plan. A total of 12 people attended the open house. A total of 24 comment letters were submitted that offered input to the refuge for the 2022 EA.

The public will be notified of the availability of the Chesapeake Marshlands NWRC Hunting and Fishing Plan, EA, and CDs for review and will include no less than a 60-day comment period. They will be informed through local media, refuge website, and social media. Comments 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: _____Date:_____

Name/Title/Organization: _____

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OTHER APPLICABLE STATUTES, EXECUTIVE ORDERS AND REGULATIONS

Cultural Resources

- American Indian Religious Freedom Act, as amended, 42 U.S.C. 1996 – 1996a; 43 CFR Part 7.
- Antiquities Act of 1906, 16 U.S.C. 431-433; 43 CFR Part 3.

- Archaeological Resources Protection Act of 1979, 16 U.S.C. 470aa – 470mm; 18 CFR Part 1312; 32 CFR Part 229; 36 CFR Part 296; 43 CFR Part 7.
- National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470-470x-6; 36 CFR Parts 60, 63, 78, 79, 800, 801, and 810.
- Paleontological Resources Protection Act, 16 U.S.C. 470aaa – 470aaa-11.
- Native American Graves Protection and Repatriation Act, 25 U.S.C. 3001-3013; 43 CFR Part 10.
- Executive Order 11593 – Protection and Enhancement of the Cultural Environment, 36 Fed. Reg. 8921 (1971).

Fish and Wildlife

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

Natural Resources

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

Water Resources

- Coastal Zone Management Act of 1972, 16 U.S.C.1451 et seq.; 15 CFR Parts 923, 930, 93.
- Federal Water Pollution Control Act of 1972 (commonly referred to as Clean Water Act), 33 U.S.C. 1251 et seq.; 33 CFR Parts 320-330; 40 CFR Parts 110, 112, 116, 117, 230-232, 323, and 328.
- Rivers and Harbors Act of 1899, as amended, 33 U.S.C. 401 et seq.; 33 CFR Parts 114, 115, 116, 321, 322, and 333.Safe Drinking Water Act of 1974, 42 U.S.C. 300f et seq.; 40 CFR Parts 141-148.
- Executive Order 11988 – Floodplain Management, 42 Fed. Reg. 26951 (1977).
- Executive Order 11990 – Protection of Wetlands, 42 Fed. Reg. 26961 (1977).

COMPATIBILITY DETERMINATION

Refuge Use Category

Hunting

Refuge Use Type(s)

Recreational hunting of big game (white-tailed deer, wild turkey, and sika), and waterfowl (ducks and geese). We also allow the incidental take of coyote while deer hunting.

Refuge Name

Blackwater National Wildlife Refuge

Refuge Purpose(s) And Establishing and Acquisition Authority(ies)

- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act);

- "…to conserve (A) fish or wildlife which are listed as endangered or threatened species...or (B) plants." 16 U.S.C. § 1534 (Endangered Species Act of 1973);

- "…for...incidental fish and wildlife-oriented recreational development...the protection of natural resources...the conservation of endangered species or threatened species..." 16 U.S.C. § 460k-1 (Refuge Recreation Act);

- "…to protect, enhance, restore, and manage an appropriate distribution and diversity of wetland ecosystems and other habitats for migratory birds and other fish and wildlife" 16 U.S.C. § 4401-413 (North American Wetlands Conservation Act); and

- "…to protect, enhance, restore, and manage wetland ecosystems and other habitats for migratory birds, endangered and threatened species, and other wildlife." 16 U.S.C. § 668ddb (Refuge Administration Act).

National Wildlife Refuge System Mission

The mission of the National Wildlife Refuge System, otherwise known as 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 (Pub. L. 105-57; 111 Stat. 1252).

Description Of Use

The use is public hunting of white-tailed deer, sika, wild turkey, and waterfowl on Blackwater NWR. We also allow the incidental take of coyote while deer hunting. 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.

Is this an existing use?

Yes. This compatibility determination reviews and replaces the 2006 compatibility determination (CD) for waterfowl hunting, and the 2017 CD for big game hunting.

What is the use?

The use is hunting. It is a priority public use of the Refuge System under the NWRSAA of 1966 (16 U.S.C. 668dd-668ee) and the Refuge System Improvement Act of 1997 (Public Law 105–57).

Is the use a priority public use?

Yes

Where would the use be conducted?

The use will occur on 19,842 acres at Blackwater NWR (see Figures A-1 thru A-3), which is approximately 62 percent of the total available refuge area. Areas that are not open to hunting are also indicated.

When would the use be conducted?

Big game hunting on the refuge will generally take place within the season dates established by the State of Maryland. White-tailed deer and sika hunting is normally between September and late January. Hunters can access the refuge up 3 hours before legal sunrise and must exit within 3 hours after legal sunset (including parking lots). This change allows for the differences in length of day as well as accessing remote, difficult to hunt locations, including retrieving of deer shot at last legal hour. Shooting hours follow the State regulations of one-half-hour before sunrise and one-half-hour after sunset. Scout days will be published each year and will be from 7:00 AM to sunset on those dates. Hunting for wild turkeys (bearded birds only) will be during the State spring season, April through May, on designated hunt days, and will follow the State shooting hours. Specific regulations for each hunt will be published by the refuge in advance of the hunt seasons. Waterfowl hunting at Blackwater NWR will take place within the State framework and usually occurs between October and the end of January.

How would the use be conducted?

Blackwater NWR hunters must use a website administered by a third-party vendor, *www.recreation.gov*. Hunting brochures, hunting application procedures, seasons, bag limits, methods of hunting, maps depicting areas open to hunting, and the terms and conditions under which we issue hunting permits are available at the refuge visitor center, administration office, and on the refuge's website. Waterfowl hunters are also required to have a permit to hunt at Blackwater NWR obtained through Recreation.gov.

Youth hunters are required to use the standard refuge hunt permit (Big/Upland Game Hunt Application OMB control number 1018-0140). Mentored deer and turkey hunts will be administered by application through the refuge, Maryland Department of Natural Resources (MDDNR) and conservation partners at Blackwater NWR and no refuge-specific permit is required.

Administrative fees will be charged for the permits. Fees will be utilized to administer the hunt which includes but is not limited to maintaining roads, parking areas, gates, and signs.

Hunters may walk in from existing designated parking areas, and all vehicle access will be prohibited. During the firearms seasons, vehicles will be restricted to designated roadways and existing parking areas. Waterfowl hunt units are boat access only. There will be no off-road vehicles or all-terrain vehicle (ATV) use allowed during any hunting season, except for persons with disabilities in designated areas. Boat access may be allowed for big game hunting, at the manager's discretion, where it does not conflict with areas closed for the protection of wintering waterfowl. Sections of Wildlife Drive and some refuge trails may be closed for designated periods of time during the firearms hunts to allow for the harvest of white-tailed deer and sika. Certain units of the refuge are designated for hunters with permanent disabilities.

The refuge will now allow rifle hunting using straight-walled cartridges only. Beginning in the 2020-2021 season, MDDNR allowed the use of straight-walled cartridges in shotgun-only counties. The ballistics of straight-walled cartridges are similar to those of shotgun slugs yet are slower and have less range than typical rifle (bottleneck) cartridges. The main advantage to straight-walled cartridges over shotgun slugs is improved accuracy, while still maintaining the approximate range of shotguns for safety.

The use of non-lead ammunition for big game and incidental coyote hunting will initially be voluntary but would be required in the fall of 2026 after a 3-year transition period. This transition 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.

Why is this use being proposed or reevaluated?

This use is a priority public use and being reevaluated to meet the 15-year mandatory requirement for reevaluation. Hunting is one of the six priority public uses outlined in the Refuge System Improvement Act of 1997. The Service supports and encourages priority uses when they are appropriate and compatible on national wildlife refuge lands. Hunting is used in some instances to manage wildlife populations. Hunting is a healthy, traditional recreational use of renewable natural resources deeply rooted in America's heritage, and it can be an important wildlife management tool. At Blackwater NWR, hunting serves as a useful habitat management tool and helps fulfill Objective 4.3.3 of the Chesapeake Marshlands Comprehensive Conservation Plan (CCP), which calls for expanded opportunities for hunting where appropriate (USFWS 2006).

Furthermore, 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 would promote one of the priority public uses of the Refuge System and providing opportunities for visitors to hunt would promote stewardship of our natural resources and increase public appreciation and support for the refuge.

Availability Of Resources

The combined hunt program at Blackwater and Eastern Neck NWRs is estimated to cost approximately $103,010 annually to administer (Table A-1). The refuge receives fees through the sale of hunt permits to help offset the cost of implementing the various hunts. From fall 2020 to winter 2021, the deer hunts at Blackwater NWR generated $99,043 in permit fees, with a 5-year average of $80,944.60. In 2020-2021, 4,732 permits were sold, and the 5-year average for permits is 4,765. The 2021 spring turkey hunt at Blackwater generated $1,429. Funds are needed for staff time for planning and annual program preparation, outreach and public relations, permit administration, enforcement, boundary and sign posting, and roads and parking lot maintenance. Furthermore, *www.recreation.gov* charges a $6 service fee that the vendor retains for their services.

The Refuge Recreation Act requires that funds are available for the development, operation, and maintenance of the permitted forms of recreation. The recreation fee ($10 to $20) is the minimal amount needed to offset the cost of managing the hunting programs. This fee may increase in time if deemed necessary by the refuge manager to offset program costs.

Administrative fees collected through the hunts will continue to fund the annual development of regulations, maps, and leaflets. Any remaining revenue generated from the administrative process will be used to replace signs, post closed areas, and maintain parking areas and roads. There may be some costs to the refuge budget associated with these programs in the form of infrastructure maintenance and law enforcement. These costs should be minimal relative to total refuge operations. Maintenance costs would not diminish resources dedicated to other refuge management programs.

Anticipated Impacts of the Use

The overall impacts of this use are fully reviewed and discussed in the Blackwater and Eastern Neck NWRs Hunting and Fishing Environmental Assessment. Impacts of hunting to refuge resources, whether adverse or beneficial, are those that are reasonably foreseeable and have a reasonably close causal relationship to the use. This CD includes the written analyses of the environmental consequences on a resource only when the impacts on that resource could be more than negligible and therefore considered an "affected resource." Some of the impacts addressed in this CD include those from both hunters and anglers, as the CD was developed in connection with the Environmental Assessment for the Hunting and Fishing Plan.

Short-term impacts

White-tailed Deer and Sika
White-tailed deer are common and widespread on Blackwater NWR. Sika, a non-native species of elk, is abundant on Blackwater NWR. Road-based surveys using distance sampling were completed on Blackwater NWR in 2017, 2018, and 2019 to estimate the density of white-tailed deer and sika on the refuge (Haus and Bowman 2018, 2019; Holland and Bowman 2020). Forward-looking infrared sensors (FLIR) were used to increase detections. Surveys were conducted in August and September each year. Density of deer (white-tailed deer and sika combined) averaged 52.2 deer per-square-mile over the 3-year period. Too few white-tailed deer were detected to develop reasonable density estimates for that species, but density of sika was estimated to be 42.1 per-square-mile. Though there was a fair amount of variation from year to year, all estimates are well above what would be considered ecologically sustainable for the area. The survey indicates deer populations are generally robust on Blackwater NWR.

Maryland's Statewide pre-hunt white-tailed deer population was estimated at 240,000 in 2019, a 12 percent increase from the previous 5-year average of 212,000 (Eyler et al. 2020). Maryland annually monitors deer abundance using harvest estimates and age structure of the deer herd to inform management decisions.

Wild Turkey
The MDDNR conducts an annual observation survey during the months of July and August of wild turkey reproductive success (Long 2020). 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. On Blackwater NWR, wild turkeys are common and widespread throughout the refuge and surrounding area and are present in numbers sufficient to sustain optimum population levels for priority refuge objectives in addition to hunting.

Coyote
We will allow incidental coyote hunting concurrent with established refuge deer hunts. On the eastern coastal plain, the region that includes Blackwater NWR, 0.04 (SE 0.03) coyotes were observed per 100 hours during Maryland DNR's Archery Hunter Survey 2018-2019. We anticipate that very few hunters will encounter coyotes while hunting deer on the refuge; thus, we do not anticipate many coyotes will be harvested.

Waterfowl
Populations of waterfowl on the refuge are monitored through both aerial and ground-based surveys. Waterfowl on the refuge are present in numbers sufficient to allow hunting, while not compromising other refuge objectives. Service policy 605 FW2 states no more than 40 percent of the refuge may be open for hunting of migratory birds in most cases. Blackwater NWR will maintain over 23,000 acres of inviolate sanctuary. This will ensure waterfowl populations are not impacted as a result of hunting on the refuge.

Non-target species
Competition between target species and other wildlife is primarily associated with crop depredation by white-tailed deer and sika in moist soil impoundments and agricultural fields, both on the refuge, as well as adjacent private land. This depredation can drastically reduce the energetic carrying capacity provided by these habitat management actions for waterfowl. In addition, overbrowsing of forest understory can have a negative effect on nesting passerines (Chollet and Martin 2013; Tymkiw et al. 2013).

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, dispersed nature of hunters on the refuge, chronic adverse impacts on wildlife populations from hunting-related disturbances would be negligible in most instances. Areas of known communal eagle roosts, waterfowl concentrations, or other sensitive areas are typically closed to most hunting activity.

Lead ammunition and tackle can be used on the refuge for hunting and fishing as detailed in the Hunting and Fishing Plan. The best available science indicates that lead ammunition and tackle may have negative impacts on wildlife and the environment (Golden et al. 2016; Hanley et al, 2022; Slabe et al, 2022). To move towards reduction and future elimination of this threat on the refuge, we will be eliminating the use of lead ammunition over a 3-year period to educate and work with hunters on the use of non-lead alternatives. The transition to non-lead ammunition for all big game 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. Recent modeling has even indicated that lead poisoning suppresses population growth in eagles (Slabe et al. 2022).

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. 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. There are no known levels of predation by target species on other wildlife that would be of concern on Blackwater NWR.

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 (Kramer and Redig 1997, O'Halloran et al. 1989, Kelly and Kelly 2005, Golden et al. 2016). 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) the refuge strongly encourages use of non-lead alternatives for hunting big game (deer and turkey) and for fishing for the next 3 years; (3) we would require the use of non-lead ammunition and tackle for all species beginning September 1, 2026; (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 hunting program. Some hunters will also choose non-lead methods of take such as archery.

Habitat and Vegetation

The physical effects on vegetation from hunting are expected to be minimal the refuge, as hunters tend to travel on existing roads and game trails. Some off-trail hiking is anticipated, but it will generally be dispersed over large areas. Possible negative cumulative impacts of recreational hunting include temporary trampling of vegetation and light soil erosion. Spring turkey season could cause some trampling effects to growing plants, especially in wet areas; however, we do not expect these impacts to be substantial, because turkey hunter density is expected to be low and dispersed. Most hunting occurs during the fall, but hunters tend to disperse when in the woods; as a result, we do not anticipate substantial impacts to habitats. Some hunt seasons extend into winter when the ground is either frozen, covered in snow, and/or when plants are dormant. Hunters will have little impact on plants during this period. For these reasons, cumulative impacts to plant communities and soils are not likely to be significant during the fall, winter, or spring hunting seasons.

The impacts of the existing deer herd on vegetation on the refuge, particularly agricultural crops, are striking. Excessive white-tailed deer and sika herbivory has significant negative impacts on the refuge farm program, resulting in the total loss of crops in some fields. This directly impacts the ability of the refuge to meet the goals and objectives outlined in the CCP. Neighboring farmers in the Blackwater area are reporting an unacceptable level of crop depredation as well. The herd's impacts to forest resources are more subtle. Deer herbivory has been noted as the cause of failure on a number of tree planting projects at Blackwater NWR. The refuge is currently undertaking a small-scale study evaluating the potential impact of deer browse on forest regeneration.

Positive effects on vegetation may result from maintaining white-tailed deer and sika populations at levels commensurate with the carrying capacity of available habitat. The impacts of dense deer populations on forest regeneration and the composition and diversity of the herbaceous understory have been well-documented (Behrend et al. 1970; Côté et al. 2004; Tierson et al. 1966; Tilghman 1989; White 2012). Disturbances that typically promote forest diversity, such as fire and small canopy gaps, may not have the desired benefits if browsers are overabundant (Nuttle et al. 2013). An overabundance of deer can suppress native vegetation, facilitating the success of invasive species in forested habitats (Knight et al. 2009). Lessening the impact of excessive deer herbivory is a key forest management strategy (Nuttle et al. 2013; White 2012) and will likely become even more important as the climate warms (Galatowitsch et al. 2009).

Well-managed hunting has the potential to effectively control deer populations (Brown et al. 2000; Oyer and Porter 2004). The net impact of deer hunting on vegetation should be positive, and result in better regeneration of forest canopy species and an increase in the diversity of the herbaceous understory.

Federal and State Endangered Species

Northern long-eared bats

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. There are no known hibernacula anywhere on the eastern shore of Maryland. The only hunting that takes place May through August when bats might be raising young is during turkey season in April/May. NLEB might still occur in hunting zones in September and October, but the numbers would be few as most NLEB will have left for their hibernaculum.

Potential disturbances from expanded hunting, such as an increase in gun noise or additional portable tree stands, are expected to be insignificant. Noise from firearms could disturb roosting bats, but it is likely that the bats would remain in the tree during daylight hours. Such noise disturbances are temporary, 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. If disturbed, it's likely that the bats would remain in its tree but even if a bat is flushed, the animal would fly away from the disturbance to roost in a nearby tree, which is a normal behavior and a response typical to many kinds of natural disturbances without long-term effects. Further, hunting activities would not result in any roost tree destruction as no tree cutting or other habitat alteration is permitted on the refuge. For turkey hunting, the activities are strictly on the ground, so there is no tree stand use, and it is a diurnal activity Turkey hunts are also only 2 days per week, with limited hunters per unit, to maximize success and opportunity. Given the small number of participants and the fact turkey hunting will occur in locations that are very unlikely to overlap with the presence of the bats, any potential disturbance effects from mentored turkey hunts are extremely unlikely to occur and are therefore considered discountable.

The potential for lead impacts to bats 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. 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 bats that occur on refuges will not 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.

Eastern Black Rails

Despite dedicated surveys by refuge staff and the Maryland DNR in recent years, black rails have not been found on Blackwater NWR since 2016. At Eastern Neck NWR, one black rail was last detected in 2019. The habitat at these refuges—especially Blackwater—is getting worse for

black rail with each passing year as sea levels rise. It is unlikely that black rails are present on the two refuges, and if they are, the numbers are extremely low.

Hunting takes place September through May and only overlaps with the breeding season for black rails during the turkey hunt in May. Turkey hunting takes place in the upland habitats, where the species does not occur. If black rails are present, there is the potential that hunters and anglers may disturb birds by traversing through their habitat, creating noise, or damaging plants in the rail's habitat. However, these effects are highly unlikely to occur given that rails are typically found in the interior of marshes while fishing is conducted in open water, and hunting is typically conducted in uplands or marsh edges. In the unlikely event that a bird was disturbed, the bird would walk or fly away as a normal behavioral response that is typical for any routine disturbance without any long-term effects, so any potential impacts are expected to be insignificant.

The potential for lead impacts to black rails is discountable because of the bird's preferred habitat. 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.

Monarch butterflies

Monarchs use the refuge grasslands, wetlands, old fields, agricultural margins, and roadsides during spring and fall migration, as well as during the spring and summer breeding season. Hunting is allowed from September to February, with a short spring turkey season in April/May. Hunting has not been shown to have negative impacts on monarch breeding or migration. When most hunters are walking through habitat used by monarchs, primarily from September to mid-November, monarchs are passing through on their annual southerly migration, seeking nectar sources including goldenrods, sunflowers, blazing stars, and ironweeds.

Hunters and anglers 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 and anglers 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 or anglers 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 which is a normal behavior response that does not result in long-term effects. Additionally, all fishing and crabbing is from April 1 through September 30, and only available via the roadside or by boat; thus, any potential impact would be unlikely, concentrated, minimal, insignificant, and leave plenty of available nectar sources on other areas of the refuge and unit.

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, all of which can only happen if lead concentrations in the soil are high. 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. Given that

hunters and anglers 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 that bioaccumulation through plants into caterpillars or butterflies is discountable, the proposed activities are not likely to jeopardize the monarch butterfly.

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, Hanley et al, 2022, Slabe et al, 2022). 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, and lost fishing tackle (Haig et al. 2014). The transition period will ensure continuity of visitor opportunities as hunters and anglers understand the changes and become more familiar with the availability and use of non-lead alternatives. We will educate hunters and anglers about the impacts of lead and strongly encourage non-lead ammunition alternatives for the next 3 years.

The bioaccumulation of lead is a potential concern, but it does not present a significant issue on this refuge for listed species, as: (1) non-lead shot is currently required for hunting waterfowl; (2) the refuge will strongly encourage use of non-lead alternatives for the next 3 years; (3) we will require the use of non-lead ammunition and fishing tackle on the refuge on September 1, 2026; (4) we will educate hunters, anglers, and the public to the potential adverse impacts of lead; and (5) the proposed hunting and fishing activities are not likely to introduce substantially more lead into the environment over existing amounts with the proposed hunting program and transition from lead over the next 3 years. Some hunters will also choose non-lead methods of take such as archery. As a result, the proposed hunting and fishing activities are not likely to adversely affect any of the above listed species.

A more detailed discussion of threatened and endangered species, and the potential impacts of the proposed hunting activities to those listed species, can be found in the Intra-Service Section 7 Biological Evaluation (Appendix C).

Visitor Uses and Experiences

Impacts on non-hunting public uses are minimal. Public use facilities are unaffected by the archery hunt. Sections of Wildlife Drive and some refuge trails may be closed for designated periods of time during the firearms hunts to allow for the harvest of white-tailed deer and sika in these areas. The timing of these closures is designed to maximize deer harvest and minimize impacts to the non-hunting public. The Visitor Center and approximately one-third of Wildlife Drive will remain open and are unaffected by the temporary closures at Blackwater NWR.

Wetlands and Water Resources

Hydrology impacts from hunting would be minimal and only result from the use of roads and trails. Unsurfaced trails are susceptible to a variety of impacts including vegetation loss and compositional changes, soil compaction, erosion and muddiness, exposure of plant roots, trail widening, and the proliferation of visitor-created side trails (Marion and Leung 2001). However, these effects are considered minimal since hunters are generally dispersed, which reduces repeated erosive actions on soils.

Long-Term impacts

Cumulative impacts on the environment result from incremental impacts of a proposed action when these are added to other past, present, and reasonably foreseeable future actions. While cumulative impacts may result from individually minor actions, they may, viewed as a whole, become substantial over time.

The potential for adverse impacts to human health due to the inadvertent consumption of lead in individual animals that are successfully harvested with lead ammunition would still exist during the next three years, however it will likely be reduced as some hunters adopt early use of non-lead ammunition. As non-lead requirements for ammunition take full effect on September 1, 2026, health impacts to huntable wildlife species from discarded lead in the environment and the potential for adverse human health impacts decreases substantially and becomes negligible. Lead from previous hunting activities will still be present in the environment and may impact wild game species, however, the impact is likely negligible given the likely low amount of lead currently present and availability in the environment from hunting activities and minor adverse risk of bioaccumulation.

The Service believes that hunting on the refuge will not have a significant impact on local, regional, or Atlantic flyway migratory bird populations because the percentage likely to be taken on the refuges, 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.

Economic impacts to hunters and anglers due to required use of non-lead ammunition and tackle will be mitigated by a transition approach and outreach programs. Additional hunting would not add more than slightly to the cumulative impacts stemming from hunting at the local, regional, or Atlantic flyway levels.

Public Review and Comment

This Compatibility Determination (CD) is part of the Chesapeake Marshlands NWR Hunting and Fishing 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 websites, and social media. A total of 24 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 E of the 2022 EA).

Determination

Is the use compatible? Yes

Stipulations Necessary to Ensure Compatibility

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

1. Hunters must notify and receive permission from a Service law enforcement officer, refuge manager, or designee if they need to enter a refuge closed area or another hunting area for which they do not possess a valid permit to retrieve game.
2. The use of bicycles, airboats, boats, ATVs, motorized off-road vehicles, and amphibious vehicles or Argos to access the refuge is prohibited except as authorized by the refuge manager, within certain hunt areas, on designated days, routes of travel, waterways, and launch sites.
3. Dogs may be used while waterfowl hunting but must be controlled while on refuge property when not actively retrieving.
4. Non-lead ammunition will be required for big game and coyote hunting beginning on September 1, 2026.

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.

Additionally, hunting provides wildlife-dependent recreation to the public in a region where these opportunities are limited by private land ownership and development. The vast majority of private lands are posted as "No Trespassing," and this limits hunting opportunities for hunters without the agreement of private landowners. The refuge provides a low-cost, safe, and enjoyable option.

This activity would not conflict with any of the other priority public uses or adversely affect biological resources. Therefore, through this planning process, we have determined that hunting on Blackwater NWR, 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 the refuge.

Signature of Determination
Refuge Manager Signature and Date

Signature of Concurrence
Assistant Regional Director Signature and Date

Mandatory Reevaluation Date
Delete this text and insert year for reevaluation

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COMPATIBILITY DETERMINATION

Refuge Use Category

Hunting

Refuge Use Type(s)

Recreational hunting of big game (white-tailed deer and wild turkey) and small game (coyote).

Refuge Name

Eastern Neck National Wildlife Refuge

Refuge Purpose(s) And Establishing and Acquisition Authority(ies)

- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act);

National Wildlife Refuge System Mission

The mission of the National Wildlife Refuge System, otherwise known as 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 (Pub. L. 105-57; 111 Stat. 1252).

Description Of Use

The use is public hunting of white-tailed deer and wild turkey on Eastern Neck NWR. We also allow the incidental take of coyote while deer hunting. 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.

Is this an existing use?

Yes. This compatibility determination reviews and replaces the 2010 compatibility determination (CD) for hunting.

What is the use?

The use is hunting. It is a priority public use of the Refuge System under the NWRSAA of 1966 (16 U.S.C. 668dd-668ee) and the Refuge System Improvement Act of 1997 (Public Law 105–57).

Is the use a priority public use?

Yes

Where would the use be conducted?

The use will occur on 1,985 acres at Eastern Neck NWR (see Figure A-4) which is approximately 87 percent of the total available refuge area. Areas that are not open to hunting are also indicated.

When would the use be conducted?

Big game hunting on the refuge will generally take place within the season dates established by the State of Maryland. White-tailed deer hunting is normally between September and late January. Hunters can access the refuge up 3 hours before legal sunrise and must exit within 3 hours after legal sunset (including parking lots). This change allows for the differences in length of day as well as accessing remote, difficult to hunt locations, including retrieving of deer shot at last legal hour. Shooting hours follow the State regulations of one-half-hour before sunrise and one-half-hour after sunset. Scout days will be published each year and will be from 7:00 AM to sunset on those dates. Hunting for wild turkeys (bearded birds only) will be during the State spring season, April through May, on designated hunt days and will follow the State shooting hours. Specific regulations for each hunt will be published by the refuge in advance of the hunt seasons.

How would the use be conducted?

Eastern Neck NWR hunters must use a website administered by a third-party vendor, *www.recreation.gov*. Hunting brochures, hunting application procedures, seasons, bag limits, methods of hunting, maps depicting areas open to hunting, and the terms and conditions under which we issue hunting permits are available at the refuge visitor center, administration office, and on the refuge's website.

The youth mentored turkey hunt at Eastern Neck NWR is not administered through *www.recreation.gov* and applicants must email their application to be entered into a random drawing that is conducted in partnership with the National Wild Turkey Federation. Youth hunters are required to use the standard refuge hunt permit (Big/Upland Game Hunt Application OMB control number 1018-0140). Mentored deer and turkey hunts will be administered by application through the refuge, Maryland Department of Natural Resources (MDDNR) and conservation partners at Blackwater NWR and no refuge-specific permit is required.

Administrative fees will be charged for the permits. Fees will be utilized to administer the hunt which includes but is not limited to maintaining roads, parking areas, gates, and signs. Youth participating in the designated youth hunt days will not be required to pay a fee for Eastern Neck NWR.

Hunters may walk in from existing designated parking areas, and all vehicle access will be prohibited. During the firearms seasons, vehicles will be restricted to designated roadways and existing parking areas. There will be no off-road vehicles or all-terrain vehicle (ATV) use allowed during any hunting season except for persons with disabilities in designated areas. Certain units of the refuge are designated for hunters with permanent disabilities.

The refuge will now allow rifle hunting using straight-walled cartridges only. Beginning in the 2020-2021 season, MDDNR allowed the use of straight-walled cartridges in shotgun-only counties. The ballistics of straight-walled cartridges are similar to those of shotgun slugs yet are slower and have less range than typical rifle (bottleneck) cartridges. The main advantage to straight-walled cartridges over shotgun slugs is improved accuracy while still maintaining the approximate range of shotguns for safety.

The use of non-lead ammunition for big game will initially be voluntary and would be required in the fall of 2026 after a 3-year transition period. This transition 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.

Why is this use being proposed or reevaluated?

This use is a priority public use and being reevaluated to meet the 15-year mandatory requirement for reevaluation. Hunting is one of the six priority public uses outlined in the Refuge System Improvement Act of 1997. The Service supports and encourages priority uses when they are appropriate and compatible on national wildlife refuge lands. Hunting is used in some instances to manage wildlife populations. Hunting is a healthy, traditional recreational use of renewable natural resources deeply rooted in America’s heritage, and it can be an important wildlife management tool. At Eastern Neck NWR, hunting serves as a useful habitat management tool and helps fulfill Objective 4.3.3 of the Chesapeake Marshlands Comprehensive Conservation Plan (CCP) which calls for expanded opportunities for hunting where appropriate (USFWS 2006).

Furthermore, 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 would promote one of the priority public uses of the Refuge System and providing opportunities for visitors to hunt would promote stewardship of our natural resources and increase public appreciation and support for the refuge.

Availability Of Resources

The combined hunt program at Blackwater and Eastern Neck NWRs is estimated to cost approximately $103,010 annually to administer (Table A-1). The refuge receives fees through the sale of hunt permits to help offset the cost of implementing the various hunts. In 2020-2021, the deer hunts at Eastern Neck NWR generated $6,247 with 627 permits sold. Funds are needed for staff time for planning and annual program preparation, outreach and public relations, permit administration, enforcement, boundary and sign posting, and roads and parking lot maintenance. Furthermore, *www.recreation.gov* charges a $6 service fee that the vendor retains for their services.

The Refuge Recreation Act requires that funds are available for the development, operation, and maintenance of the permitted forms of recreation. The recreation fee ($10 to $20) is the minimal amount needed to offset the cost of managing the hunting programs. This fee may increase in time if deemed necessary by the refuge manager to offset program costs.

Administrative fees collected through the hunts will continue to fund the annual development of regulations, maps, and leaflets. Any remaining revenue generated from the administrative process will be used to replace signs, post closed areas, and maintain parking areas and roads. There may be some costs to the refuge budget associated with these programs in the form of infrastructure maintenance and law enforcement. These costs should be minimal relative to total refuge operations. Maintenance costs would not diminish resources dedicated to other refuge management programs.

Anticipated Impacts of the Use

The overall impacts of this use are fully reviewed and discussed in the Blackwater and Eastern Neck NWRs Hunting and Fishing Environmental Assessment. Impacts of hunting to refuge resources, whether adverse or beneficial, are those that are reasonably foreseeable and have a reasonably close causal relationship to the use. This CD includes the written analyses of the environmental consequences on a resource only when the impacts on that resource could be more than negligible and therefore considered an "affected resource." Some of the impacts addressed in this CD include those from both hunters and anglers, as the CD was developed in connection with the Environmental Assessment for the Hunting and Fishing Plan.

Short-term impacts

White-tailed Deer

White-tailed deer are common and widespread on Eastern Neck NWR. Maryland's statewide pre-hunt white-tailed deer population was estimated at 240,000 in 2019, a 12 percent increase from the previous 5-year average of 212,000 (Eyler et al. 2020). Maryland annually monitors deer abundance using harvest estimates and age structure of the deer herd to inform management decisions.

Wild Turkey
MDDNR conducts an annual observation survey during the months of July and August of wild turkey reproductive success (Long 2020). 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. On Eastern Neck NWR, wild turkeys are common and widespread throughout the refuge and surrounding area and are present in numbers sufficient to sustain optimum population levels for priority refuge objectives in addition to hunting.

Coyote
We will allow incidental coyote hunting concurrent with established refuge deer hunts. On the eastern coastal plain, the region that includes Eastern Neck NWR, 0.04 (SE 0.03) coyotes were observed per 100 hours during Maryland DNR's Archery Hunter Survey 2018-19. We anticipate very few hunters will encounter coyotes while hunting deer on the refuge; thus, we do not anticipate many coyotes will be harvested.

Waterfowl
Eastern Neck NWR does not allow any waterfowl hunting. This will ensure waterfowl populations are not impacted as a result of hunting on the refuge.

Non-target species
Competition between target species and other wildlife is primarily associated with crop depredation by white-tailed deer and sika in moist soil impoundments and agricultural fields, both on the refuge, as well as adjacent private land. This depredation can drastically reduce the energetic carrying capacity provided by these habitat management actions for waterfowl. In addition, overbrowsing of forest understory can have a negative effect on nesting passerines (Chollet and Martin 2013; Tymkiw et al. 2013).

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, dispersed nature of hunters on the refuge, chronic adverse impacts on wildlife populations from hunting-related disturbances would be negligible in most instances. Areas of known communal eagle roosts, waterfowl concentrations, or other sensitive areas are typically closed to most hunting activity.

Lead ammunition and tackle can be used on the refuge for hunting and fishing as detailed in the Hunting and Fishing Plan. The best available science indicates that lead ammunition and tackle may have negative impacts on wildlife and the environment (Golden et al. 2016, Hanley et al, 2022. Slabe et al, 2022). To move towards reduction and future elimination of this threat on the refuge, we will be eliminating the use of lead ammunition over a 3-year period to educate and work with hunters on the use of non-lead alternatives. The transition to non-lead ammunition for all big game 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. Recent modeling has even indicated that lead poisoning suppresses population growth in eagles (Slabe et al. 2022).

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. There are no known levels of predation by target species on other wildlife that would be of concern on Eastern Neck NWR.

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 (Kramer and Redig 1997, O'Halloran et al. 1989, Kelly and Kelly 2005, Golden et al. 2016). 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) the refuge strongly encourages use of non-lead alternatives for hunting deer, coyote, and turkey, and for fishing for the next 3 years; (3) we would require the use of non-lead ammunition and tackle for all species beginning September 1, 2026; (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 hunting program. Some hunters will also choose non-lead methods of take such as archery.

Habitat and Vegetation

The physical effects on vegetation from hunting are expected to be minimal, as hunters tend to travel on existing roads and game trails. Some off-trail hiking is anticipated, but it will generally be dispersed over large areas. Possible negative cumulative impacts of recreational hunting include temporary trampling of vegetation and light soil erosion. Spring turkey season could cause some trampling effects to growing plants, especially in wet areas; however, we do not expect these impacts to be substantial, because turkey hunter density is expected to be low and dispersed. Most hunting occurs during the fall, but hunters tend to disperse when in the woods; as a result, we do not anticipate substantial impacts to habitats. Some hunt seasons extend into winter when the ground is either frozen, covered in snow, and/or when plants are dormant. Hunters will have little impact on plants during this period. For these reasons, cumulative impacts to plant communities and soils are not likely to be significant during the fall, winter, or spring hunting seasons.

The impacts of the existing deer herd on vegetation on the refuge, particularly agricultural crops, are striking. Excessive white-tailed deer herbivory has negative impacts on the refuge farm program. This directly impacts the ability of the refuge to meet the goals and objectives outlined in the CCP. The herd's impacts to forest resources are more subtle. Deer herbivory has been noted as the cause of failure on a number of tree planting projects at Eastern Neck NWR.

Positive effects on vegetation may result from maintaining white-tailed deer populations at levels commensurate with the carrying capacity of available habitat. The impacts of dense deer

populations on forest regeneration and the composition and diversity of the herbaceous understory have been well-documented (Behrend et al. 1970; Côté et al. 2004; Tierson et al. 1966; Tilghman 1989; White 2012). Disturbances that typically promote forest diversity, such as fire and small canopy gaps, may not have the desired benefits if browsers are overabundant (Nuttle et al. 2013). An overabundance of deer can suppress native vegetation, facilitating the success of invasive species in forested habitats (Knight et al. 2009). Lessening the impact of excessive deer herbivory is a key forest management strategy (Nuttle et al. 2013; White 2012) and will likely become even more important as the climate warms (Galatowitsch et al. 2009). Well-managed hunting has the potential to effectively control deer populations (Brown et al. 2000; Oyer and Porter 2004). The net impact of deer hunting on vegetation should be positive, and result in better regeneration of forest canopy species and an increase in the diversity of the herbaceous understory.

Federal and State Endangered Species

Northern long-eared bats

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. There are no known hibernacula anywhere on the eastern shore of Maryland. The only hunting that takes place May through August when bats might be raising young is during turkey season in April/May. NLEB might still occur in hunting zones in September and October, but the numbers would be few as most NLEB will have left for their hibernaculum.

Potential disturbances from expanded hunting, such as an increase in gun noise or additional portable tree stands, are expected to be insignificant. Noise from firearms could disturb roosting bats, but it is likely that the bats would remain in the tree during daylight hours. Such noise disturbances are temporary, 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. If disturbed, it's likely that the bats would remain in its tree but even if a bat is flushed, the animal would fly away from the disturbance to roost in a nearby tree, which is a normal behavior and a response typical to many kinds of natural disturbances without long-term effects. Further, hunting activities would not result in any roost tree destruction as no tree cutting or other habitat alteration is permitted on the refuge. For turkey hunting, the activities are strictly on the ground, so there is no tree stand use, and it is a diurnal activity Turkey hunts are also only 2 days per week, with limited hunters per unit, to maximize success and opportunity. Given the small number of participants and the fact turkey hunting will occur in locations that are very unlikely to overlap with the presence of the bats, any potential disturbance effects from mentored turkey hunts are extremely unlikely to occur and are therefore considered discountable.

The potential for lead impacts to bats 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. 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 bats that occur on refuges will not 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.

Eastern Black Rails

Despite dedicated surveys by refuge staff and the Maryland DNR in recent years, black rails have not been found on Blackwater NWR since 2016. At Eastern Neck NWR, one black rail was last detected in 2019. The habitat at these refuges—especially Blackwater—is getting worse for black rail with each passing year as sea levels rise. It is unlikely that black rails are present on the two refuges, and if they are, the numbers are extremely low.

Hunting takes place September through May and only overlaps with the breeding season for black rails during the turkey hunt in May. Turkey hunting takes place in the upland habitats, where the species does not occur. If black rails are present, there is the potential that hunters and anglers may disturb birds by traversing through their habitat, creating noise, or damaging plants in the rail's habitat. However, these effects are highly unlikely to occur given that rails are typically found in the interior of marshes while fishing is conducted in open water, and hunting is typically conducted in uplands or marsh edges. In the unlikely event that a bird was disturbed, the bird would walk or fly away as a normal behavioral response that is typical for any routine disturbance without any long-term effects, so any potential impacts are expected to be insignificant.

The potential for lead impacts to black rails is discountable because of the bird's preferred habitat. 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.

Monarch butterflies

Monarchs use the refuge grasslands, wetlands, old fields, agricultural margins, and roadsides during spring and fall migration, as well as during the spring and summer breeding season. Hunting is allowed from September to February, with a short spring turkey season in April/May. Hunting has not been shown to have negative impacts on monarch breeding or migration. When most hunters are walking through habitat used by monarchs, primarily from September to mid-November, monarchs are passing through on their annual southerly migration, seeking nectar sources including goldenrods, sunflowers, blazing stars, and ironweeds.

Hunters and anglers 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 and anglers 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 or anglers 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 which is a normal behavior response that does not result in long-term effects. Additionally, all fishing and crabbing is from April 1 through September 30, and only available via the roadside or by boat; thus, any potential impact would be unlikely, concentrated, minimal,

insignificant, and leave plenty of available nectar sources on other areas of the refuge and unit.

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, all of which can only happen if lead concentrations in the soil are high. 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. Given that hunters and anglers 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 that bioaccumulation through plants into caterpillars or butterflies is discountable, the proposed activities are not likely to jeopardize the monarch butterfly.

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, Hanley et al, 2022, Slabe et al, 2022). Wildlife 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, and lost fishing tackle (Haig et al. 2014). The use of non-lead ammunition will initially be voluntary, and we would require non-lead ammunition for all activities starting at the beginning of the hunting season, September 1, 2026 (after a 3-year transition period). This transition 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 3 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) the refuge strongly encourages use of non-lead alternatives for fishing and hunting for the next 3 years; (3) we would require the use of non-lead ammunition on the refuge beginning September 1, 2026; (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. As a result, the proposed hunting activities are not likely to adversely affect any of the above listed species.

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.

A more detailed discussion of threatened and endangered species, and the potential impacts of the proposed hunting activities to those listed species, can be found in the Intra-Service Section 7

Biological Evaluation (Appendix C).

Visitor Uses and Experiences
Impacts on non-hunting public uses are minimal. The Boxes Point Trail at Eastern Neck NWR is situated near a bald eagle nest and the trail being closed annually during the late winter/early spring to reduce disturbance during the nesting period.

Wetlands and Water Resources
Hydrology impacts from hunting would be minimal and only result from the use of roads and trails. Unsurfaced trails are susceptible to a variety of impacts including vegetation loss and compositional changes, soil compaction, erosion and muddiness, exposure of plant roots, trail widening, and the proliferation of visitor-created side trails (Marion and Leung 2001). However, these effects are considered minimal since hunters are generally dispersed, which reduces repeated erosive actions on soils.

Long-Term impacts

Cumulative impacts on the environment result from incremental impacts of a proposed action when these are added to other past, present, and reasonably foreseeable future actions. While cumulative impacts may result from individually minor actions, they may, viewed as a whole, become substantial over time.

The potential for adverse impacts to human health due to the inadvertent consumption of lead in individual animals that are successfully harvested with lead ammunition would still exist during the next three years, however it will likely be reduced as some hunters adopt early use of non-lead ammunition. As non-lead requirements for ammunition take full effect on September 1, 2026, health impacts to huntable wildlife species from discarded lead in the environment and the potential for adverse human health impacts decreases substantially and becomes negligible. Lead from previous hunting activities will still be present in the environment and may impact wild game species, however, the impact is likely negligible given the likely low amount of lead currently present and availability in the environment from hunting activities and minor adverse risk of bioaccumulation.

The Service believes that hunting on the refuge will not have a significant impact on local, regional, or Atlantic flyway migratory bird populations because the percentage likely to be taken on the refuges, 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.

Economic impacts to hunters and anglers due to required use of non-lead ammunition and tackle will be mitigated by a transition approach and outreach programs. Additional hunting would not add more than slightly to the cumulative impacts stemming from hunting at the local, regional, or Atlantic flyway levels.

Public Review and Comment

This Compatibility Determination (CD) is part of the Chesapeake Marshlands NWR Hunting and Fishing Plan and the accompanying NEPA compliance. The plan was coordinated with all interested and/or affected parties, including State partners. We released the 2022 EA, draft plan, and CDs 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 websites, and social media. A total of 24 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 E of the 2022 EA).

Determination

Is the use compatible? Yes

Stipulations Necessary to Ensure Compatibility

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

1. Hunters must notify and receive permission from a Service law enforcement officer, refuge manager, or designee if they need to enter a refuge closed area or another hunting area for which they do not possess a valid permit to retrieve game.

2. The use of bicycles, airboats, boats, ATVs, motorized off-road vehicles, and amphibious vehicles or Argos to access the refuge is prohibited except as authorized by the refuge manager, within certain hunt areas, on designated days, routes of travel, waterways, and launch sites.

3. Non-lead ammunition will be required for big game and coyote hunting beginning September 1, 2026.

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.

Additionally, hunting provides wildlife-dependent recreation to the public in a region where these opportunities are limited by private land ownership and development. The vast majority of private lands are posted as "No Trespassing," and this limits hunting opportunities for hunters without the agreement of private landowners. The refuge provides a low-cost, safe, and enjoyable option.

This activity would not conflict with any of the other priority public uses or adversely affect biological resources. Therefore, through this planning process, we have determined that hunting on Eastern Neck NWR, 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 the refuge.

Signature of Determination
Refuge Manager Signature and Date

Signature of Concurrence
Assistant Regional Director Signature and Date

Mandatory Reevaluation Date
Delete this text and insert year for reevaluation

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FIGURES

Figure A-1. Hunt map of Blackwater NWR – Main Unit

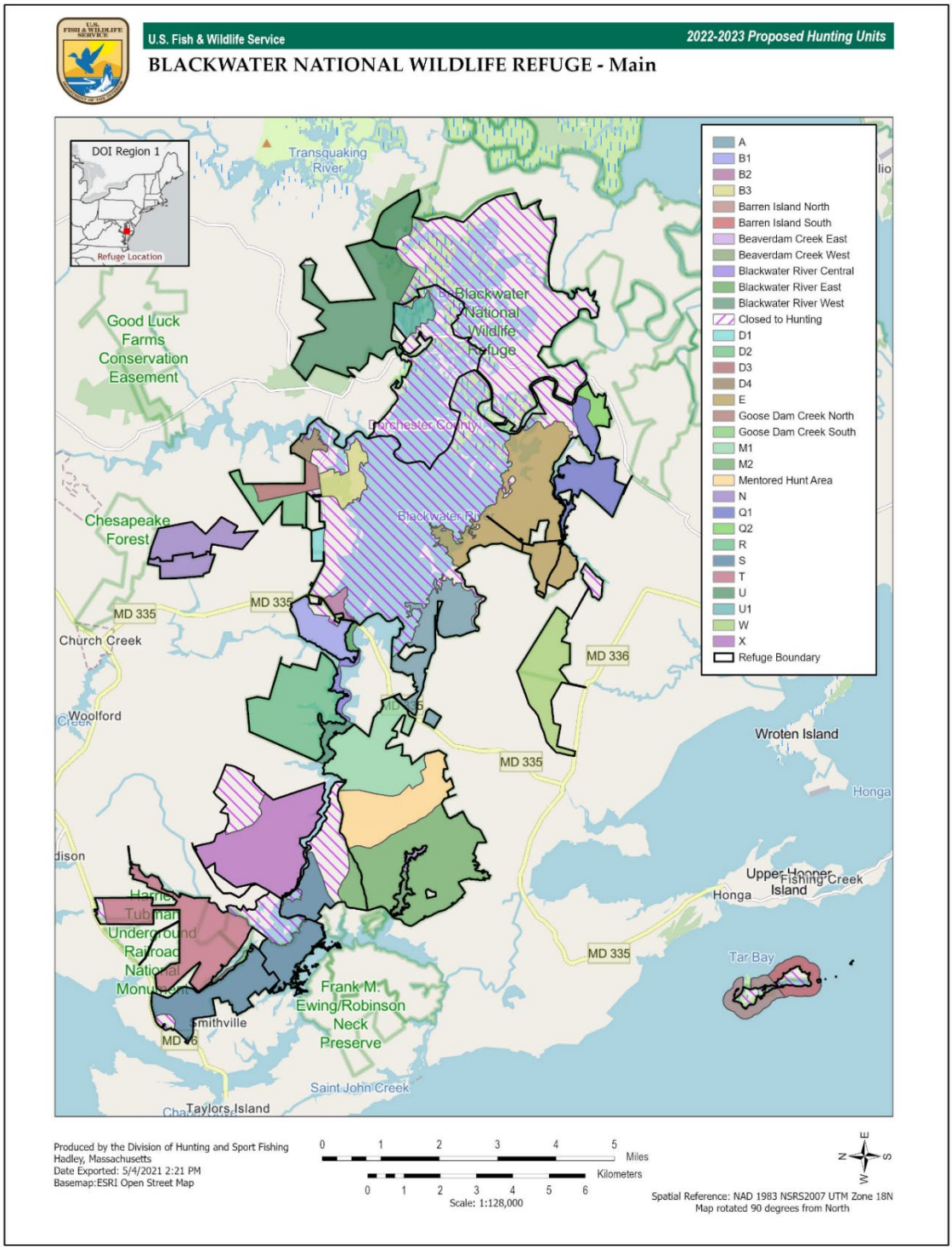


Figure A-2. Hunt map of Blackwater NWR – Nanticoke Unit

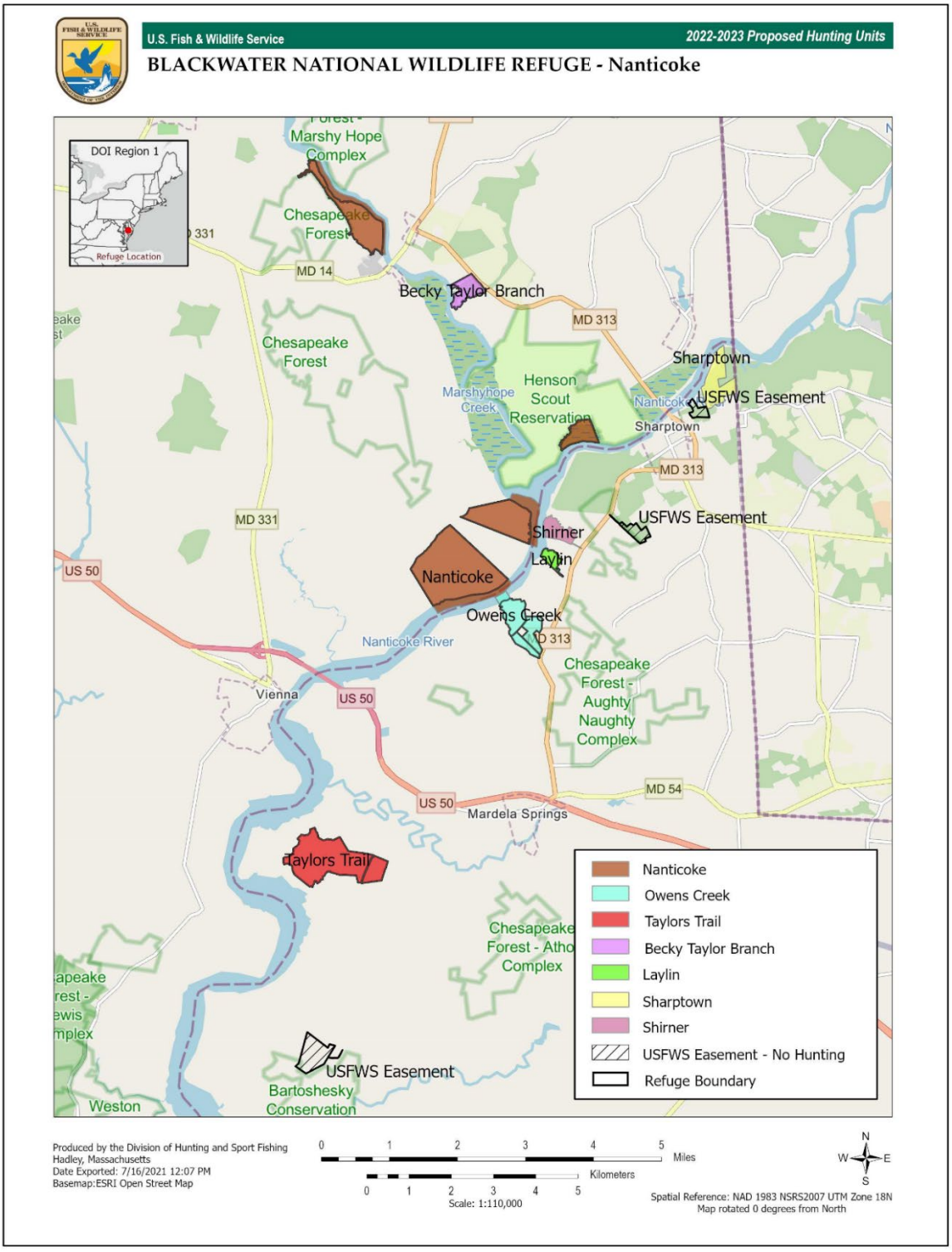


Figure A-3. Hunt map of Blackwater NWR – Southern units

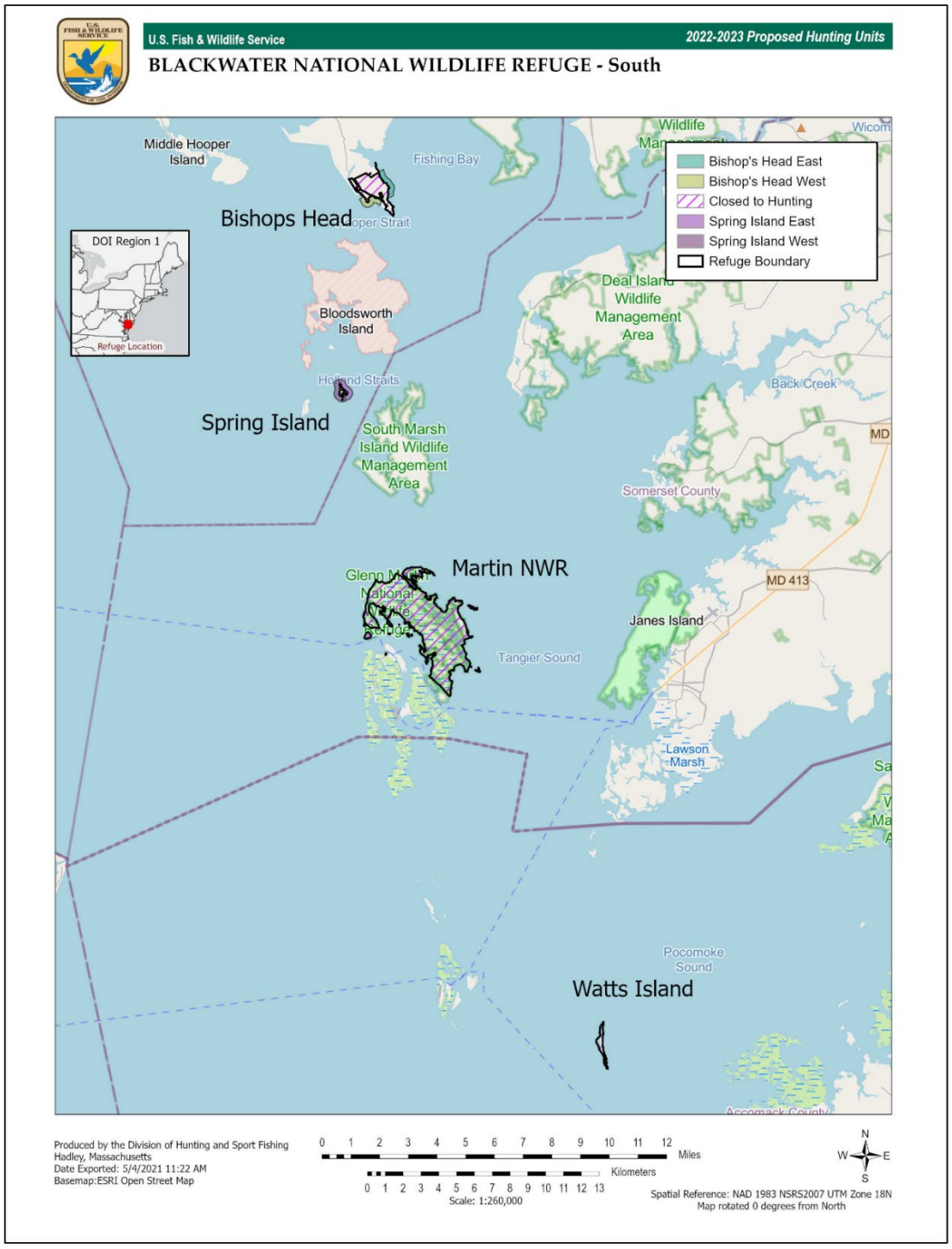
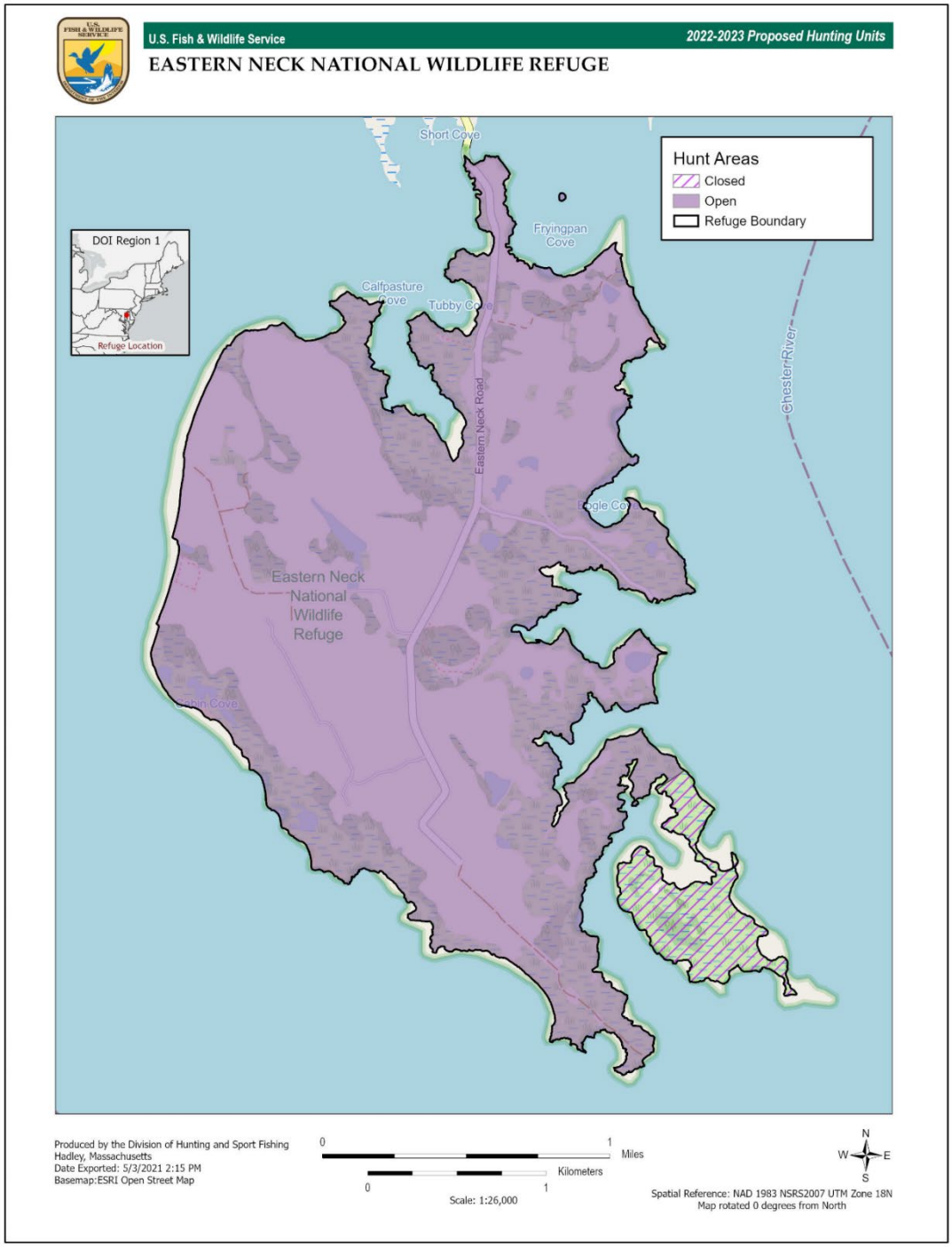


Figure A-4. Hunt map of Eastern Neck NWR



TABLES

Table A-1. Annual Funding and Staffing Requirements to Administer the Hunt Program at Blackwater and Eastern Neck NWR.

Requirement	**Costs**
Salaries (online hunt programming; 100 hrs. $45/hr.)	$4,500
Mowing hunt roads	$6,150
Regular maintenance of 1-mile of road/year	$6,000
Road overhaul (materials) of 2.7 miles road/year	$75,195
Parking lots (replacing a 100’ X100’ parking lot- 1/year)	$4,435
Replace three gates/year	$1,200
Maintain three disabled hunt blinds	$1,030
Replace three hunt Signs/year	$4,500
Total annual cost of Chesapeake Marshlands NWRC Hunt Program	$103,010

COMPATIBILITY DETERMINATION

Refuge Use Category

Fishing

Refuge Use Type(s)

Fishing (non-commercial). The harvest of fish, shellfish, or other aquatic organisms for recreational purposes and/or personal consumption (includes collection of bait for personal use).

Refuge Name

Blackwater National Wildlife Refuge

Refuge Purpose(s) And Establishing and Acquisition Authority(ies)

- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act);

- "…to conserve (A) fish or wildlife which are listed as endangered or threatened species...or (B) plants." 16 U.S.C. § 1534 (Endangered Species Act of 1973);

- "…for...incidental fish and wildlife-oriented recreational development...the protection of natural resources...the conservation of endangered species or threatened species..." 16 U.S.C. § 460k-1 (Refuge Recreation Act);

- "…to protect, enhance, restore, and manage an appropriate distribution and diversity of wetland ecosystems and other habitats for migratory birds and other fish and wildlife" 16 U.S.C. § 4401-413 (North American Wetlands Conservation Act); and

- "…to protect, enhance, restore, and manage wetland ecosystems and other habitats for migratory birds, endangered and threatened species, and other wildlife." 16 U.S.C. § 668ddb (Refuge Administration Act).

National Wildlife Refuge System Mission

The mission of the National Wildlife Refuge System, otherwise known as 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 (Pub. L. 105-57; 111 Stat. 1252).

Description Of Use

The use is recreational/sport fishing and crabbing at Blackwater NWR. Fishing 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.

Is this an existing use?

Yes. This compatibility determination reviews and replaces the 2006 compatibility determination (CD) for fishing.

What is the use?

The use is fishing. It is a priority public use of the Refuge System under the NWRSAA of 1966 (16 U.S.C. 668dd-668ee) and the Refuge System Improvement Act of 1997 (Public Law 105–57).

Is the use a priority public use?

Yes

Where would the use be conducted?

The use will occur in navigable and non-navigable waterways of the Blackwater, Little Blackwater, and Nanticoke Rivers and tributaries, including the portion of the Little Blackwater River that is immediately adjacent to the Key Wallace Drive causeway (Figure B-1). However, authorization to control recreational fishing within the boundary of Blackwater NWR (including the Nanticoke Unit) is applicable only to those waters which are defined as "non-navigable," where title was vested in the United States in fee simple absolute, or where the State did not exert its claim during original acquisition. This means that the refuge has the authority to regulate fishing on tracts (14), (14a-i), (14a-I, II), (14a-III), (14e-I), (16,a), (18), (19), (24,a-c), and (29). Therefore, for the purpose of explanation and definition, non-navigable waters within Blackwater NWR include all refuge waters except: (1) the Blackwater River partially downstream of its confluence with the Little Blackwater River, (2) where the U.S. Fish and Wildlife Service (Service) owns only to the centerline of the Blackwater River above and below the Highway 335 bridge, and (3) where the government owns only to the centerline of the Little Blackwater River and Meekins Creek. Shoreline access from refuge lands to waters within the Service's jurisdiction and control will not be authorized except for limited roadside fishing along the Key Wallace Drive causeway (14a and 14a-III). In addition, four freshwater, landlocked ponds will be permitted to be used for controlled, limited access such as special refuge fishing events and environmental education programs on Tract 100u (Briggs Pond), Tract 100m (Hog Range), Tract 100ai (Tubman Pond) and Tract 37 (Key Wallace Pond).

Access to refuge-regulated waters will be limited to a soft launch on Key Wallace Drive, a soft

launch on Route 335, and off-refuge public boat ramps at Bestpitch Ferry, Shorter's Wharf Bridge, and Smithville Bridge or from any other "off-refuge" locations. We also will allow roadside fishing on the Key Wallace Drive causeway to the bridge; fishing on the refuge will be further restricted by the very shallow tidal waterways that average less than 1.5 feet deep, except for the long meandering, unmarked Blackwater River channel which is approximately 3 feet in depth.

When would the use be conducted?

The use will be allowed daily, from dawn to dusk (i.e., daylight hours only), April 1 to September 30 from the Key Wallace Drive soft launch, unless there is a conflict with a management activity or extenuating circumstance that would necessitate deviations from these procedures. The Route 335 soft launch is open year-round. Fishing during this time period would be further restricted by weather and summer insect infestations. Fishing on the freshwater ponds would be further limited to annual events. Fishing in "navigable waters" will not be regulated by the Service, but by the State of Maryland, in the impacted Little Blackwater River along Key Wallace Drive and the Little Blackwater Bridge area. Fishing in the upper Blackwater River will also be regulated by the State.

How would the use be conducted?

Fishing and crabbing will be authorized and regulated according to provisions in 50 CFR, Subchapter C, Part 33 and consistent with State regulations. Fishing and crabbing will be restricted to opportunities from the Key Wallace Drive causeway, with parking at the start of Wildlife Drive, or from boats which provide the only other access to refuge regulated waters of the Blackwater/Little Blackwater River systems. To fish the Key Wallace Drive causeway, vehicles must be parked at the beginning of Wildlife Drive or other designated parking lots to maintain safety and not impede vehicular traffic or farm machinery. This is in compliance with the county of Dorchester, and will protect the extremely limited shoulder that is mostly marsh from eroding. Boat launching will not be permitted on the refuge except at the Route 335 soft launch and from April 1 to September 30 at the Key Wallace Drive soft launch. The uses described above will be regulated by distribution of refuge leaflets and State fishing and crabbing regulations at the Visitor Center. Law enforcement patrols and compliance checks by refuge officers will be used to enforce the provisions of 50 CFR, Subchapter C, Parts 26, 27, and 33, as applicable. Unmarked channels and depth of shallow water will limit the speed and distance traveled into the refuge by small motorboats. Based on the Refuge Annual Performance Plan (RAPP) data from 2020, approximately 24,000 people visited Blackwater NWR to fish.

The ponds are in otherwise closed areas and would be used for special events such as mentored or youth events where access can be controlled and limited.

A fishing pier or boardwalk may be constructed to access the Blackwater or Little Blackwater River if a suitable location can be found. Staff have been investigating potential locations, and have not found a suitable location yet due to the shallow water depth and deep substrate, which requires a crane and barge to drive the piles in. In addition, potential sufficient parking areas

would need to be nearby and would need to avoid conflicts with nearby active rookeries and eagle nests. Fishing from the Wildlife Drive on Blackwater NWR will remain closed due to lack of sufficient parking and conflicts with eagle nesting, a great blue heron rookery, and other public user groups. If a suitable location can be located, we will provide an American with Disabilities Act of 1990 (ADA) accessible pier that will not distract from the other approved refuge uses or the wildlife that depends on the refuge. It would cause minimal impacts to the surrounding habitat.

The use of non-lead tackle for fishing will initially be voluntary and would be required beginning September 1, 2026, after a 3-year transition period. This transition period will allow anglers time to adapt to the new regulations without diminishing fishing opportunities on the refuge. The refuge staff will provide information to assist in this transition that benefits fish and wildlife.

Key species are largemouth bass (*Micropterus salmoides*), striped bass (*Morone saxatilis*), white perch (*Morone americana*), yellow perch (*Perca flavescens*), black crappie (*Pomoxis nigromaculatus*), bluegill (*Lepomis macrochirus*), channel catfish (*Ictalurus punctatus*), common carp *(Cyprinus carpio*), blue crab (*Callinectes sapidus*), and Northern snakehead (*Channa argus*).

The refuge is not authorized to regulate fishing or other waterborne activities within the navigable waters of the State or within areas where water bottoms are State-owned. Therefore, the compatibility of recreational fishing will be evaluated only according to effects on the purpose(s) for which these tracts were acquired, and where refuge-owned land provides access to these waters. The construction of associated facilities, boat ramps, parking areas, and boardwalks/piers will be assessed in reference to their respective tracts.

Why is this use being proposed or reevaluated?

This use is a priority public use and being reevaluated to meet the 15-year mandatory requirement for reevaluation. Fishing is one of the six priority public uses outlined in the Refuge System Improvement Act of 1997. The Service supports and encourages priority uses when they are appropriate and compatible on national wildlife refuge lands.

Furthermore, 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 would promote one of the priority public uses of the Refuge System and providing opportunities for visitors to hunt would promote stewardship of our natural resources and increase public appreciation and support for the refuge.

The waters outside of the refuge and in the seasonally closed areas at Blackwater NWR have State-owned water bottoms. The Service does not have jurisdiction over the water bottoms; therefore, we do not regulate fishing or other water-based activities within the navigable waters in these areas. However, we do provide access to these activities from refuge lands and conduct enforcement of rules and regulations at six fishing/crabbing areas.

Availability of Resources

Resources involved in the administration and management of the use are primarily maintenance and visitor services staff and equipment. Refuge maintenance staff maintain fishing access sites through routine mowing and visitor services staff assist with angler-related signs and social media posts. Maintenance and Visitor Services also create and maintain the parking lots at 335 and Key Wallace, provide assistance and oversight at the Youth Fishing Derby at Eastern Neck NWR, and family fishing and mentored events at Blackwater NWR. Law enforcement, assisted by the MDDNR, provide routine patrols. The proposed changes would not result in additional staff or funds needed to administer the fishing program.

Anticipated Impacts of the Use

Potential impacts of a proposed use on the refuge's purpose(s) and the Refuge System mission

Impacts of fishing to refuge resources, whether adverse or beneficial, are those that are reasonably foreseeable and have a reasonably close causal relationship to the use. This CD includes the written analyses of the environmental consequences on a resource only when the impacts on that resource could be more than negligible and therefore considered an "affected resource." Some of the impacts addressed in this CD include those from both hunters and anglers, as the CD was developed in connection with the Environmental Assessment for the Hunting and Fishing Plan.

Short-term impacts

Habitat and Vegetation
Small motorboats could potentially affect the submerged aquatic vegetation, could create limited shoreline erosion from their wakes, and could potentially increase turbidity if there were sufficient numbers of visits. Zieman stated, "In shallow waters the most common form of rhizome disturbance is from the propellers of motorboats" (1976). Most anglers remain close to the Blackwater River channel where depths are greater and scouring of the water bottom is less likely. Because of the higher salinity and constant wind-generated turbidity of the silt-laden refuge waters, submerged aquatic vegetation (SAV) is almost nonexistent. In addition, fishing from kayaks has been increasingly popular in recent years, which has resulted in minimal impacts to habitat and aquatic vegetation.

People fishing or crabbing from the shore may also inadvertently damage plants (e.g., via trampling or equipment use) while fishing. Trampling, damage, and killing of vegetation from walking off-trail is also a possibility as a result of this use (Kuss 1986; Roovers et al. 2004).

It is unlikely that further introduction of lead into the soils on refuge lands that could be taken up by plants would occur once the non-lead requirement takes effect on September 1, 2026. Until the regulation takes effect, it is estimated the additional lead entering the environment from these activities will not reach a level that will negatively impact vegetation or habitat on the refuge by 2026. As current lead levels from fishing activities are likely not sufficient to negatively impact

plants or their habitats over the long term, the proposed action would prevent future lead levels in the soil from becoming high enough to potentially negatively impact plants or habitat reducing that future risk of impact or cumulative impacts even more.

Wildlife
Fishing and crabbing at Blackwater NWR, if authorized during the fall and winter, would have a negative impact on the migratory waterfowl and nesting bald eagles. Therefore, Blackwater NWR will continue to be closed to fishing and crabbing on refuge waters October 1 to March 31, except for roadside fishing only along the Key Wallace Drive causeway. The soft launch off Key Wallace Drive will also be closed from October 1 to March 31 to prevent disturbance to waterfowl from kayaks and boats.

Studies on boating disturbance to nesting waterfowl (Atkinson-Willes 1969; Bouffard 1982; Cook 1987; Coulter and Miller 1968) and migratory waterbirds (Erwin 1989) indicate that boating causes flushing of nesting birds and possible disturbance to nesting. However, Hartman found the wood duck, a prominent nesting waterfowl at Blackwater NWR, quietly swam away instead of flushing (1972). Speight determined that the effects of waterfowl disturbance depended more on frequency of human presence than number of people present at one time (1973).

Fishing should benefit non-target species since the invasive snakehead is the primary target for most anglers on Blackwater NWR. According to the most recent study that examined fish communities pre and post snakehead, white perch, black crappie, and brown bullhead were evenly distributed and dominated, but after snakeheads, the surveys were dominated by common carp and gizzard shad (Newhard and Love 2019). Trash, fishing line, and other debris may impact wildlife through entanglement.

Lost fishing tackle may harm waterfowl, eagles, and other birds externally by catching and tearing skin. Fishing line may also become wrapped around legs or wings and hinder movement, around bills which impairs feeding or cause constriction with subsequent reduction of blood flow and tissue damage. An object above or below the water surface may snag entangled animals, from which they are unable to escape. Nineteen percent of loon mortalities in Minnesota were attributed to entanglement in fishing line (Ensor et al. 1992). Entanglement in fishing line has also caused mortality in bald eagles. Birds may also ingest sinkers, hooks, floats, lures, and fishing line. The best available science indicates that lead ammunition and tackle may have negative impacts on wildlife and the environment (Golden et al. 2016, Hanley et al, 2022. Slabe et al, 2022). To move towards reduction and future elimination of this threat on the refuge, we will be eliminating the use of lead tackle over a 3-year period to educate and work with anglers on the use of non-lead alternatives. The transition to non-lead tackle for fishing will minimize the inadvertent exposure and subsequent lethal or sub-lethal impacts to bald and golden eagles, as well as other fish and wildlife.

The concern, therefore, is if these disturbances are sufficient to adversely affect the subject purposes for which the refuge was established. Since fishing and crabbing are seasonally limited when aggregations of migratory waterfowl are not present, and are further limited by access,

weather, infestation of insects, and shallow water which limits watercraft size and type, it is not likely that fishing will negatively impact wildlife species on the refuge.

Hydrology and Water Resources
Pollutants from human waste and litter have the potential to have negative impacts on water quality. Additionally, paths (both on-trail and off-trail) used by anglers can affect the hydrology of an area, primarily through alteration of drainage patterns. It is anticipated that existing trails would continue to influence hydrology regardless of pedestrian travel. Some anglers may walk off-trail to access a fishing area, thereby creating new trails and therefore new drainage patterns. We expect those impacts to be minimal considering anglers are not using the same paths repeatedly. Refuge staff has observed only negligible or minor problems with erosion, incision, or stream alteration to date. Therefore, current and projected participation in these uses is not expected to increase these minor issues.

Motorized and non-motorized boats can access refuge-regulated waters and navigable waters adjacent to Service lands via several soft launches, as well as partner-managed and off-refuge public boat ramps. The vast majority of boating activity is non-motorized due to the shallow nature of these waters. The Service-owned portion of the Blackwater River at Blackwater NWR is seasonally closed to motorized and non-motorized boats from October 1 through April 1. Access to the Key Wallace Drive soft launch at Blackwater NWR and Ingleside Recreation Area soft launch at Eastern Neck NWR is only available from April 1 to September 30 while all other boat access points are available year-round. The use of boats by anglers has the potential to affect water quality negatively by increasing erosion, stirring up bottom sediments, or introducing pollutants into waterways. The impacts from boating are expected to continue to be minor and short-term, as no evidence exists that current fishing activity at either Blackwater or Eastern Neck NWR degrade water quality on or around waterways associated with refuge properties.

Fish Species
Recreational fishing by the public can have negative impacts on fish populations if it occurs at high levels or is not managed properly. Potential impacts from fishing include direct mortality from harvest and catch-and-release, injury to fish caught and released, changes in age and size class distribution, changes in reproductive capacity and success, loss of genetic diversity, altered behavior, and changes in ecosystems and food webs (Lewin et al. 2006, Cline et al. 2007). In addition, recreational fishing may lead to the accidental or deliberate introductions of non-native fish that may negatively affect native fish, wildlife, or vegetation. The addition of a refuge law enforcement officer will help supplement State enforcement and help reduce the potential for non-native introductions.

These impacts are often disproportionate among fish species, sizes, ages, sexes, and based on other behavioral traits because anglers selectively catch fish based on these factors (Lewin et al. 2006). In general, anglers tend to target larger and older fish. The selective removal of larger and older fish can have a variety of impacts of fish population dynamics. First, it can decrease the age and size class distribution in fish populations. Second, larger and older fish tend to have greater reproductive capacity because they are better able to compete for spawning areas and

generally have higher egg outputs. Because of this, their selective removal may reduce the population's overall reproductive success. Depending upon the species, anglers may also be more likely to catch males (e.g., some male largemouth bass are more aggressive towards lures) or females (e.g., in some species females grow faster). Also, fish that are more active during the day are often more vulnerable to being caught (Lewin et al. 2006).

The likelihood of mortality is related to the type of fishing gear used, where the fish is hooked, how the fish is handled, angler experience, and environmental conditions. In general, circle hooks tend to cause less damage than barbed hooks. Also, fish hooked in the lips or jaws tend to have minimal mortality as compared to fish hooked in the gills, esophagus, intestine, or eyes. Fish caught and released with nonlethal injuries may also be exposed to parasites and bacterial or fungal infections. Individuals that are caught and then handled may also experience stress, which can lead to changes in physiology and behavior which can in turn impact their growth, reproduction, and immune system (Lewin et al. 2006).

Since fishing generally removes individuals from a population, it can lead to reduced population sizes and loss of genetic diversity at high levels. The loss of genetic diversity can ultimately reduce a population's fitness, resilience, and ability to adapt to environmental changes and stressors, such as climate change. The higher the fishing mortality, the greater these types of impacts will be (Lewin et al. 2006).

The expansion of fishing access could result in as much as a 50 percent increase in participation. Opening additional areas to fishing access may have minor or negligible impacts on resident fish species. While fishing does remove individuals from a population, we do not anticipate increased fishing opportunities will affect fish populations as a whole. Northern snakehead is the most popular target species for anglers on Blackwater NWR. Increasing harvest pressure is one of the few tools available for managing impacts of this invasive species. Anglers must abide by the State's seasons, catch limits, and regulations, which were designed to protect fish populations.

Federal and State Endangered Species

Northern long-eared bats

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. There are no known hibernacula anywhere on the eastern shore of Maryland. We allow fishing and crabbing only from April 1 through September 30, from legal sunrise to legal sunset in refuge waters. As we do not allow night fishing, and the fishing we do offer is via the roadside or by boat, there is no access through any forested areas, where bats are more likely to occur.

The potential for lead impacts to bats through bioaccumulation is discountable due to Northern long-eared bats' diet and foraging habits. 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 seems likely that bats that occur on refuges will not consume lead derived from ammunition fired by hunters or tackle from anglers 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 activities are not likely to adversely affect the NLEB.

Eastern Black Rails

Despite dedicated surveys by refuge staff and the Maryland DNR in recent years, black rails have not been found on Blackwater NWR since 2016. At Eastern Neck NWR, one black rail was last detected in 2019. It is unlikely that black rails are present on the two refuges, and if they are, the numbers are extremely low.

If black rails are present, there is the potential that hunters and anglers may disturb birds by traversing through their habitat, creating noise, or damaging plants in the rail's habitat. However, these effects are highly unlikely to occur given that rails are typically found in the interior of marshes while fishing is conducted in open water. In the unlikely event that a bird was disturbed, the bird would walk or fly away as a normal behavioral response that is typical for any routine disturbance without any long-term effects, so any potential impacts are expected to be insignificant.

Fishing activities would occur well away from the remote marsh habitat where black rails may occur. Bank fishing would take place from the Key Wallace Drive causeway and two farm ponds. These locations do not have black rail habitat along the shoreline, and fishing these areas is highly unlikely to disturb this species. Anglers can also fish from boats that might be adjacent to black rail habitat. Black rails are not known to frequent open water shorelines and an occasional disturbance would result in the bird flying to the interior of the marsh, a normal and routine response to typical disturbances without any long-term effects.

The potential for lead impacts to black rails is discountable because of the bird's preferred habitat. Black rails likely eat mostly small invertebrates and seeds, but because they are rarely seen, little is known about their feeding habits. To forage, they walk among plants in the shallows, and sometimes in the deeper parts of marshes, and glean insects and other invertebrates from the ground, water or vegetation. Because of the federal ban already in place requiring the use of non-lead ammunition for waterfowl hunting, and that hunting with lead ammunition primarily occurs in upland areas, and because we would require the use of non-lead fishing tackle and ammunition for hunting all species on the refuge at the beginning of the fall 2026-2027 hunting season, impacts from lead are not likely to adversely affect black rails

In summary, the potential for overlap between black rails and hunters and anglers is very low. Expected impacts to rails, even if there is overlap, are insignificant since the potential for lead impacts are discountable and it's highly unlikely that the two refuges even host black rails anymore, the proposed hunting and fishing activities are not likely to adversely affect the Eastern black rail.

Monarch butterflies

Monarchs use the refuge grasslands, wetlands, old fields, agricultural margins, and roadsides during spring and fall migration, as well as during the spring and summer breeding season. Hunters and anglers 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 and anglers 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 or anglers 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 which is a normal behavior response that does not result in long-term effects. Furthermore, hunting and fishing 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. Additionally, all fishing and crabbing is from April 1 through September 30, and only available via the roadside or by boat; thus, any potential impact would be unlikely, concentrated, minimal, insignificant, and leave plenty of available nectar sources on other areas of the refuge and unit.

The potential for lead impacts to monarchs is discountable due to their diets. 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. Given that hunters and anglers 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 that bioaccumulation through plants into caterpillars or butterflies is discountable, the proposed activities are not likely to jeopardize the monarch butterfly.

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. Hanley et al, 2022. Slabe et al, 2022). 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, and lost fishing tackle. The use of non-lead tackle will initially be voluntary, and we would require non-lead tackle for all activities starting September 1, 2026 (after a 3-year transition period). This transition period will ensure continuity of visitor opportunities as anglers understand the changes and become more familiar with the availability and use of non-lead alternatives.

The bioaccumulation of lead is a potential concern, but it does not likely present a significant issue on this refuge as: (1) the refuge strongly encourages use of non-lead alternatives for fishing for the next 3 years; (2) we would require the use of non-lead fishing tackle on the refuge beginning September 2026; (3) we will educate anglers and the public to the potential adverse impacts of lead; and (4) the updated fishing activities are not likely to introduce substantially more lead into the environment over existing amounts with the current or proposed programs. As a result, the proposed fishing activities are not likely to adversely affect any of the above listed species.

We understand that re-initiation 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.

A more detailed discussion of threatened and endangered species, and the potential impacts of the proposed hunting activities to those listed species, can be found in the Intra-Service Section 7 Biological Evaluation (Appendix C).

Visitor Uses and Experiences
Interpretive signs, maps, and inflatable buoys to mark the paddling trails will be provided to increase safety and prevent physical impacts by allowing the fisherman/boater to follow the channel instead of getting lost in the unmarked shallow water at Blackwater NWR. The continued closure of boating October 1 to March 31 at Blackwater NWR would have a positive impact on the environment primarily by avoiding disturbance to waterfowl. Preventing parking along the Key Wallace causeway maintains a safe experience for more anglers while not impeding local traffic. A drop-off zone at the soft launch is marked to allow drop-off of kayaks and equipment at the far end of the causeway, which is approximately a quarter mile away.

Long-term impacts

Cumulative impacts on the environment result from incremental impacts of a proposed action when these are added to other past, present, and reasonably foreseeable future actions. While cumulative impacts may result from individually minor actions, they may, viewed as a whole, become substantial over time.

The potential for adverse impacts to human health due to the inadvertent consumption of lead in individual animals that are successfully harvested with lead tackle would still exist during the next 3 years; however, it will likely be reduced as some anglers adopt early use of non-lead alternatives. As non-lead requirements take full effect on September 1, 2026, health impacts to fish and wildlife species from discarded lead in the environment and the potential for adverse human health impacts decreases substantially and becomes negligible. Lead from previous hunting or fishing activities will still be present in the environment and may impact species, however, the impact is likely negligible given the likely low amount of lead currently present and availability in the environment from hunting or fishing activities and minor adverse risk of bioaccumulation.

The Service believes that fishing on the refuge will not have a significant impact on local, regional, or other populations because the percentage likely to be taken on the refuges, though possibly additive to existing takes, would be a tiny fraction of the estimated populations. Economic impacts to anglers due to required use of non-lead tackle will be mitigated by a

transition approach and outreach programs.

The best available science indicates that lead ammunition and tackle may have negative impacts on wildlife and the environment (Golden et al. 2016, Hanley et al, 2022, Slabe et al, 2022). 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, and lost fishing tackle. The use of non-lead tackle will initially be voluntary, and we would require non-lead tackle for all activities starting September 1, 2026 (after a 3-year transition period). This period will ensure continuity of visitor opportunities as anglers understand the changes and become more familiar with the availability and use of non-lead alternatives.

The bioaccumulation of lead is a potential concern, but it does not likely present a significant issue on this refuge as: (1) the refuge strongly encourages use of non-lead alternatives for fishing for the next 3 years; (2) we would require the use of non-lead fishing tackle on the refuge beginning September 1, 2026; (3) we will educate anglers and the public to the potential adverse impacts of lead; and (4) the updated fishing activities are not likely to introduce substantially more lead into the environment over existing amounts with the current or proposed programs.

Public Review and Comment

This Compatibility Determination (CD) is part of the Chesapeake Marshlands NWR Hunting and Fishing 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 websites, and social media. A total of 24 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 E of the 2022 EA).

Determination

Is the use compatible? Yes

Stipulations Necessary to Ensure Compatibility

To ensure compatibility with refuge purpose(s) and Refuge System mission, fishing can occur at Blackwater NWR in accordance with State and Federal regulations, and special refuge-specific restrictions to ensure that wildlife and habitat management goals are achieved, and that the program is providing a safe, high-quality fishing experience for participants. This fishing 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:

1. We allow fishing and crabbing from April 1 through September 30 during daylight hours only.

2. We restrict fishing and crabbing to boats and the Key Wallace roadway across the Little Blackwater River.

3. We prohibit boat launching from refuge lands except for the soft launch located near the Blackwater River Bridge on Route 335 and the soft launch on Key Wallace Drive, which is open April 1 to September 30. Public boat ramps are available at Bestpitch Ferry, Shorter's Wharf, and Smithville Bridge.

4. Anglers must not clean their catch or dispose of carcasses on refuge lands or in refuge waters and must carry all litter off the refuge.

5. We prohibit the use of airboats on refuge waters.

6. Non-lead tackle will be required for fishing beginning September 1, 2026.

Justification

The Refuge System Improvement Act of 1997 identifies fishing as a priority public use. Priority public uses are to receive enhanced consideration when developing goals and objectives for refuges if they are determined to be compatible. Providing fishing opportunities will promote public appreciation and support for the refuge. This activity would not conflict with any of the other priority public uses or adversely affect biological resources. Therefore, through this planning process, we have determined that recreational fishing and crabbing at Blackwater NWR, 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 the refuge.

Signature of Determination
Refuge Manager Signature and Date

Signature of Concurrence
Assistant Regional Director Signature and Date

Mandatory Reevaluation Date
Delete this text and insert year for reevaluation

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COMPATIBILITY DETERMINATION

Refuge Use Category

Fishing

Refuge Use Type(s)

Fishing (non-commercial). The harvest of fish, shellfish, or other aquatic organisms for recreational purposes and/or personal consumption (includes collection of bait for personal use).

Refuge Name

Eastern Neck National Wildlife Refuge

Refuge Purpose(s) And Establishing and Acquisition Authority(ies)

- "…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. § 715d (Migratory Bird Conservation Act);

National Wildlife Refuge System Mission

The mission of the National Wildlife Refuge System, otherwise known as 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 (Pub. L. 105-57; 111 Stat. 1252).

Description Of Use

The use is recreational/sport fishing and crabbing at Eastern Neck NWR. Fishing 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.

Is this an existing use?

Yes. This compatibility determination reviews and replaces the 2010 compatibility determination (CD) for fishing.

What is the use?

The use is fishing. It is a priority public use of the Refuge System under the NWRSAA of 1966 (16 U.S.C. 668dd-668ee) and the Refuge System Improvement Act of 1997 (Public Law 105–57).

Is the use a priority public use?

Yes

Where would the use be conducted?

The use will occur at the entrance bridge, Tundra Swan Boardwalk, Duck Inn Trailhead at Chester River, Boxes Point Trailhead at Chester River, Ingleside Recreation Area soft launch, and Bogle's Wharf boat launch (Figure B-2). Special event freshwater fishing will be at the Headquarters' Pond only during the Youth Fishing Derby. No other access to refuge regulated waters will be allowed.

When would the use be conducted?

The entrance bridge and Bogle's Wharf will be open during hours set by Maryland Department of Natural Resources (MDDNR). Fishing at Tundra Swan Boardwalk, Boxes Point Trail and Duck Inn Trail will be from dawn to dusk year-round. The use at Ingleside Recreation Area will be from April 1 through September 30 from dawn to dusk. Special Event freshwater fishing at the Headquarters' Pond will be conducted only during the Youth Fishing Derby, which is usually held in June. Species-specific regulations are regulated by the State.

How would the use be conducted?

Fishing and crabbing will be conducted with no staff involvement except during the Youth Fishing Derby. During the Youth Fishing Derby, staff and volunteers will monitor the participants and provide a variety of partner-led activities. The Friends of Eastern Neck coordinates the fish stocking and provides refreshments and prizes for participants. Other staff involvement includes general maintenance of the fishing access sites and routine law enforcement patrols. Based on the Refuge Annual Performance Plan data from 2020, approximately 10,000 people used Eastern Neck NWR for fishing.

The use of non-lead tackle for fishing will initially be voluntary and would be required after a 3-year transition period beginning in fall 2026. This period will allow anglers time to adapt to the new regulations without diminishing fishing opportunities on the refuge. The refuge staff will provide information to assist in this transition that benefits fish and wildlife.

Key species are striped bass, white perch, yellow perch, spot, Atlantic croaker, channel catfish, blue catfish, and blue crab. The refuge is not authorized to regulate fishing or other waterborne activities within the navigable waters of the State or within areas where water bottoms are State-owned. Therefore, the compatibility of recreational fishing will be evaluated only according to effects on the purpose(s) for which these tracts were acquired, and where refuge-owned land provides access to these waters. The construction of associated facilities, boat ramps, parking areas, and boardwalks/piers will be assessed in reference to their respective tracts.

Why is this use being proposed or reevaluated?

This use is a priority public use and being reevaluated to meet the 15-year mandatory requirement for reevaluation. Fishing is one of the six priority public uses outlined in the Refuge System Improvement Act of 1997. The Service supports and encourages priority uses when they are appropriate and compatible on national wildlife refuge lands.

Furthermore, 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 would promote one of the priority public uses of the Refuge System and providing opportunities for visitors to hunt would promote stewardship of our natural resources and increase public appreciation and support for the refuge.

The waters surrounding Eastern Neck NWR have State-owned water bottoms. The Service does not have jurisdiction over the water bottoms; therefore, we do not regulate fishing or other water-based activities within the navigable waters in these areas. However, we do provide access to these activities from refuge lands and conduct enforcement of rules and regulations at fishing/crabbing areas.

Availability of Resources

Resources involved in the administration and management of the use are primarily maintenance and visitor services staff and equipment. Refuge maintenance staff maintain fishing access sites through routine mowing and visitor services staff assist with angler-related signs and social media posts. Maintenance and Biology staff maintain water levels in the Eastern Neck NWR Headquarters' Pond for Youth Fishing Derby, provide assistance and oversight at the Youth Fishing Derby at Eastern Neck NWR, and family fishing and mentored events at Blackwater NWR. Law enforcement, assisted by the Maryland DNR, provide routine patrols. Maryland DNR or a private company stock Headquarters' Pond at Eastern Neck NWR for the Youth Fishing Derby (Table B-1). The proposed changes would not result in additional staff or funds needed to administer the fishing program.

Anticipated Impacts of the Use

Potential impacts of a proposed use on the refuge's purpose(s) and the Refuge System mission

Impacts of fishing to refuge resources, whether adverse or beneficial, are those that are reasonably foreseeable and have a reasonably close causal relationship to the use. This CD includes the written analyses of the environmental consequences on a resource only when the impacts on that resource could be more than negligible and therefore considered an "affected resource." Some of the impacts addressed in this CD include those from both hunters and anglers, as the CD was developed in connection with the Environmental Assessment for the Hunting and Fishing Plan.

Short-term impacts

Habitat and Vegetation
Small motorboats could potentially affect the submerged aquatic vegetation, could create limited shoreline erosion from their wakes, and could potentially increase turbidity if there were sufficient numbers of visits. Zieman stated, "In shallow waters the most common form of rhizome disturbance is from the propellers of motorboats" (1976). Fishing from kayaks has been increasingly popular in recent years, which has likely reduced impacts to habitat and aquatic vegetation.

People fishing or crabbing from shore may also inadvertently damage plants (e.g., via trampling or equipment use) while fishing. Trampling, damage, and killing of vegetation from walking off-trail is also a possibility as a result of this use (Kuss 1986; Roovers et al. 2004).

It is unlikely that further introduction of lead into the soils on refuge lands that could be taken up by plants would occur once the non-lead requirement takes effect on September 1, 2026. Until the regulation takes effect, it is estimated the additional lead entering the environment from these activities will not reach a level that will negatively impact vegetation or habitat on the refuge by 2026. As current lead levels from hunting and fishing activities are likely not sufficient to negatively impact plants or their habitats over the long term, the proposed action would prevent future lead levels in the soil from becoming high enough to potentially negatively impact plants or habitat reducing that future risk of impact or cumulative impacts even more.

Wildlife
Fishing and crabbing at Eastern Neck NWR, if authorized during the fall and winter, would have a negative impact on the migratory waterfowl and nesting bald eagles. At Eastern Neck NWR, Ingleside will continue to be closed to public use from October 1 to March 31.

Studies on boating disturbance to nesting waterfowl and migratory waterbirds indicate that boating causes flushing of nesting birds and possible disturbance to nesting (Atkinson-Willes 1969; Bouffard 1982; Cook 1987; Coulter and Miller 1968; Erwin 1989). However, Hartman found the wood duck, a prominent nesting waterfowl at Eastern Neck NWR, quietly swam away instead of flushing (1972). Speight determined that the effects of waterfowl disturbance depended more on frequency of human presence than number of people present at one time (1973).

Lost fishing tackle may harm waterfowl, eagles, and other birds externally by catching and tearing skin. Fishing line may also become wrapped around legs or wings and hinder movement, around bills which impairs feeding or cause constriction with subsequent reduction of blood flow and tissue damage. An object above or below the water surface may snag entangled animals, from which they are unable to escape. Nineteen percent of loon mortalities in Minnesota were attributed to entanglement in fishing line (Ensor et al. 1992). Entanglement in fishing line has also caused mortality in bald eagles. Birds may also ingest sinkers, hooks, floats, lures, and fishing line. The best available science indicates that lead ammunition and tackle may have negative impacts on wildlife and the environment (Golden et al. 2016, Hanley et al, 2022, Slabe

et al, 2022). To move towards reduction and future elimination of this threat on the refuge, we will be eliminating the use of lead tackle over a 3-year transition period to educate and work with anglers on the use of non-lead alternatives. The transition to non-lead tackle for fishing will minimize the inadvertent exposure and subsequent lethal or sub-lethal impacts to bald and golden eagles, as well as other fish and wildlife.

The concern, therefore, is if these disturbances are sufficient to adversely affect the subject purposes for which the refuges were established. Since fishing and crabbing are seasonally limited when aggregations of migratory waterfowl are not present, and are further limited by access, weather, infestation of insects, and shallow water which limits watercraft size and type, it is not likely that fishing will negatively impact wildlife species on the refuges.

Hydrology and Water Resources
Pollutants from human waste and litter have the potential to have negative impacts on water quality. Additionally, paths (both on-trail and off-trail) used by anglers can affect the hydrology of an area, primarily through alteration of drainage patterns. It is anticipated that existing trails would continue to influence hydrology regardless of pedestrian travel. Some anglers may walk off-trail to access a fishing area, thereby creating new trails and therefore new drainage patterns. We expect those impacts to be minimal considering anglers are not using the same paths repeatedly. Refuge staff has observed only negligible or minor problems with erosion, incision, or stream alteration to date. Therefore, current and projected participation in these uses is not expected to increase these minor issues.

Motorized and non-motorized boats can access refuge-regulated waters and navigable waters adjacent to Service lands via several soft launches, as well as partner-managed and off-refuge public boat ramps. The vast majority of boating activity is non-motorized due to the shallow nature of these waters. Access to Ingleside Recreation Area soft launch at Eastern Neck NWR is only available from April 1 to September 30 while all other boat access points are available year-round. The use of boats by anglers has the potential to affect water quality negatively by increasing erosion, stirring up bottom sediments, or introducing pollutants into waterways. The impacts from boating are expected to continue to be minor and short-term, as no evidence exists that current fishing activity at either Blackwater or Eastern Neck NWR degrade water quality on or around waterways associated with refuge properties.

Fish Species
Recreational fishing by the public can have negative impacts on fish populations if it occurs at high levels or is not managed properly. Potential impacts from fishing include direct mortality from harvest and catch-and-release, injury to fish caught and released, changes in age and size class distribution, changes in reproductive capacity and success, loss of genetic diversity, altered behavior, and changes in ecosystems and food webs (Lewin et al. 2006, Cline et al. 2007). In addition, recreational fishing may lead to the accidental or deliberate introductions of non-native fish that may negatively affect native fish, wildlife, or vegetation. The addition of a refuge law enforcement officer will help supplement State enforcement and help reduce the potential for non-native introductions.

These impacts are often disproportionate among fish species, sizes, ages, sexes, and based on other behavioral traits because anglers selectively catch fish based on these factors (Lewin et al. 2006). In general, anglers tend to target larger and older fish. The selective removal of larger and older fish can have a variety of impacts of fish population dynamics. First, it can decrease the age and size class distribution in fish populations. Second, larger and older fish tend to have greater reproductive capacity because they are better able to compete for spawning areas and generally have higher egg outputs. Because of this, their selective removal may reduce the population's overall reproductive success. Depending upon the species, anglers may also be more likely to catch males (e.g., some male largemouth bass are more aggressive towards lures) or females (e.g., in some species females grow faster). Also, fish that are more active during the day are often more vulnerable to being caught (Lewin et al. 2006).

The likelihood of mortality is related to the type of fishing gear used, where the fish is hooked, how the fish is handled, angler experience, and environmental conditions. In general, circle hooks tend to cause less damage than barbed hooks. Also, fish hooked in the lips or jaws tend to have minimal mortality as compared to fish hooked in the gills, esophagus, intestine, or eyes. Fish caught and released with nonlethal injuries may also be exposed to parasites and bacterial or fungal infections. Individuals that are caught and then handled may also experience stress, which can lead to changes in physiology and behavior which can in turn impact their growth, reproduction, and immune system (Lewin et al. 2006).

Since fishing generally removes individuals from a population, it can lead to reduced population sizes and loss of genetic diversity at high levels. The loss of genetic diversity can ultimately reduce a population's fitness, resilience, and ability to adapt to environmental changes and stressors, such as climate change. The higher the fishing mortality, the greater these types of impacts will be (Lewin et al. 2006).

The expansion of fishing access could result in as much as a 50 percent increase in participation. Opening additional areas to fishing access may have minor or negligible impacts on resident fish species. While fishing does remove individuals from a population, we do not anticipate increased fishing opportunities will affect fish populations as a whole. Anglers must abide by the State's seasons, catch limits, and regulations, which were designed to protect fish populations.

Federal and State Endangered Species

Northern long-eared bats

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. There are no known hibernacula anywhere on the eastern shore of Maryland. We allow fishing and crabbing only from April 1 through September 30, from legal sunrise to legal sunset in refuge waters. As we do not allow night fishing, and the fishing we do offer is via the roadside or by boat, there is no access through any forested areas, where bats are more likely to occur.

The potential for lead impacts to bats through bioaccumulation is discountable due to Northern long-eared bats' diet and foraging habits. 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 seems likely that bats that occur on refuges will not consume lead derived from tackle from anglers on the refuge.

Because the potential for overlap in time or space between anglers 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 activities are not likely to adversely affect the NLEB.

Eastern Black Rails

Despite dedicated surveys by refuge staff and the Maryland DNR in recent years, black rails have not been found on Blackwater NWR since 2016. At Eastern Neck NWR, one black rail was last detected in 2019. It is unlikely that black rails are present on the two refuges, and if they are, the numbers are extremely low.

If black rails are present, there is the potential that anglers may disturb birds by traversing through their habitat, creating noise, or damaging plants in the rail's habitat. However, these effects are highly unlikely to occur given that rails are typically found in the interior of marshes while fishing is conducted in open water. In the unlikely event that a bird was disturbed, the bird would walk or fly away as a normal behavioral response that is typical for any routine disturbance without any long-term effects, so any potential impacts are expected to be insignificant.

Fishing activities would occur well away from the remote marsh habitat where black rails may occur. Bank fishing would take place from the Key Wallace Drive causeway and two farm ponds. These locations do not have black rail habitat along the shoreline, and fishing these areas is highly unlikely to disturb this species. Anglers can also fish from boats that might be adjacent to black rail habitat. Black rails are not known to frequent open water shorelines and an occasional disturbance would result in the bird flying to the interior of the marsh, a normal and routine response to typical disturbances without any long-term effects.

The potential for lead impacts to black rails is discountable because of the bird's preferred habitat. Black rails likely eat mostly small invertebrates and seeds, but because they are rarely seen, little is known about their feeding habits. To forage, they walk among plants in the shallows, and sometimes in the deeper parts of marshes, and glean insects and other invertebrates from the ground, water, or vegetation. Because we would require the use of non-lead fishing tackle on the refuge starting September 1, 2026, impacts from lead are not likely to adversely affect black rails

In summary, the potential for overlap between black rails and anglers is very low. Expected impacts to rails, even if there is overlap, are insignificant since the potential for lead impacts are discountable and it's highly unlikely that the two refuges even host black rails anymore, the proposed fishing activities are not likely to adversely affect the Eastern black rail.

Monarch butterflies

Monarchs use the refuge grasslands, wetlands, old fields, agricultural margins, and roadsides during spring and fall migration, as well as during the spring and summer breeding season. Anglers 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 anglers 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 anglers 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 which is a normal behavior response that does not result in long-term effects. Furthermore, hunting and fishing 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. Additionally, all fishing and crabbing is from April 1 through September 30, and only available via the roadside or by boat; thus, any potential impact would be unlikely, concentrated, minimal, insignificant, and leave plenty of available nectar sources on other areas of the refuge and unit.

The potential for lead impacts to monarchs is discountable due to their diets. 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. Given that hunters and anglers 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 that bioaccumulation through plants into caterpillars or butterflies is discountable, the proposed activities are not likely to jeopardize the monarch butterfly.

All species

The best available science indicates that lead tackle may have negative impacts on wildlife and the environment (Golden et al. 2016. Hanley et al, 2022. Slabe et al, 2022). Animals can be poisoned by lead in a variety of ways including ingestion of, and lost fishing tackle. The use of non-lead tackle will initially be voluntary, and we would require non-lead tackle for all activities starting September 1, 2026 (after a 3-year transition period). This period will ensure continuity of visitor opportunities as anglers understand the changes and become more familiar with the availability and use of non-lead alternatives.

The bioaccumulation of lead is a potential concern, but it does not likely present a significant issue on this refuge as: (1) the refuge strongly encourages use of non-lead alternatives for fishing for the next 3 years; (2) we would require the use of non-lead fishing tackle on the refuge beginning September 2026; (3) we will educate anglers and the public to the potential adverse impacts of lead; and (4) the updated fishing activities are not likely to introduce substantially more lead into the environment over existing amounts with the current or proposed programs. As a result, the proposed fishing activities are not likely to adversely affect any of the above listed species.

We understand that re-initiation 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.

A more detailed discussion of threatened and endangered species, and the potential impacts of the proposed hunting activities to those listed species, can be found in the Intra-Service Section 7 Biological Evaluation (Appendix C).

Visitor Uses and Experiences
Impacts on non-fishing public uses are minimal. Public use facilities are unaffected by fishing activities. No parts of the refuge are closed to other activities to provide for angling. The continued closure of the Ingleside Recreation Area from October 1 through March 31 would benefit wildlife by avoiding disturbance to wintering waterfowl. There would be no cultural or historical resource impacts expected.

Long-term impacts

Cumulative impacts on the environment result from incremental impacts of a proposed action when these are added to other past, present, and reasonably foreseeable future actions. While cumulative impacts may result from individually minor actions, they may, viewed as a whole, become substantial over time.

The potential for adverse impacts to human health due to the inadvertent consumption of lead in individual animals that are successfully harvested with lead tackle would still exist during the next three years; however, it will likely be reduced as some anglers adopt early use of non-lead alternatives. As non-lead requirements take full effect on September 1, 2026, health impacts to fish and wildlife species from discarded lead in the environment and the potential for adverse human health impacts decreases substantially and becomes negligible. Lead from previous hunting or fishing activities will still be present in the environment and may impact species, however, the impact is likely negligible given the likely low amount of lead currently present and availability in the environment from hunting or fishing activities and minor adverse risk of bioaccumulation.

The Service believes that fishing on the refuge will not have a significant impact on local, regional, or other populations because the percentage likely to be taken on the refuges, though possibly additive to existing takes, would be a tiny fraction of the estimated populations. Economic impacts to anglers due to required use of non-lead tackle will be mitigated by a transition approach and outreach programs.

The best available science indicates that lead tackle may have negative impacts on wildlife and

the environment (Golden et al. 2016, Hanley et al, 2022, Slabe et al, 2022). The use of non-lead tackle will initially be voluntary, and we would require non-lead tackle for all activities starting September 1, 2026 (after a 3-year transition period). This transition period will ensure continuity of visitor opportunities as anglers understand the changes and become more familiar with the availability and use of non-lead alternatives.

The bioaccumulation of lead is a potential concern, but it does not likely present a significant issue on this refuge as: (1) the refuge strongly encourages use of non-lead alternatives for fishing for the next 3 years; (2) we would require the use of non-lead fishing tackle on the refuge beginning September 2026; (3) we will educate anglers and the public to the potential adverse impacts of lead; and (4) the updated fishing activities are not likely to introduce substantially more lead into the environment over existing amounts with the current or proposed programs.

Public Review and Comment

This Compatibility Determination (CD) is part of the Chesapeake Marshlands NWR Hunting and Fishing 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 websites, and social media. A total of 24 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 E of the 2022 EA).

Determination

Is the use compatible? Yes

Stipulations Necessary to Ensure Compatibility

To ensure compatibility with refuge purpose(s) and Refuge System mission, fishing can occur at Eastern Neck NWR in accordance with State and Federal regulations, and special refuge-specific restrictions to ensure that wildlife and habitat management goals are achieved, and that the program is providing a safe, high-quality fishing experience for participants. This fishing 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:

1. We allow fishing and crabbing from April 1 through September 30 during daylight hours at Ingleside Recreation Area.

2. Anglers must not clean their catch or dispose of carcasses on refuge lands or in refuge waters and must carry all litter off the refuge.

3. Non-lead tackle will be required for fishing beginning September 1, 2026.

Justification

The Refuge System Improvement Act of 1997 identifies fishing as a priority public use. Priority public uses are to receive enhanced consideration when developing goals and objectives for refuges if they are determined to be compatible. Providing fishing opportunities will promote public appreciation and support for the refuge. This activity would not conflict with any of the other priority public uses or adversely affect biological resources. Therefore, through this planning process, we have determined that recreational fishing and crabbing at Eastern Neck NWR, 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 the refuge.

Signature of Determination
Refuge Manager Signature and Date

Signature of Concurrence
Assistant Regional Director Signature and Date

Mandatory Reevaluation Date
Delete this text and insert year for reevaluation

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Figures

Figure B-1. Fishing access locations at Blackwater NWR

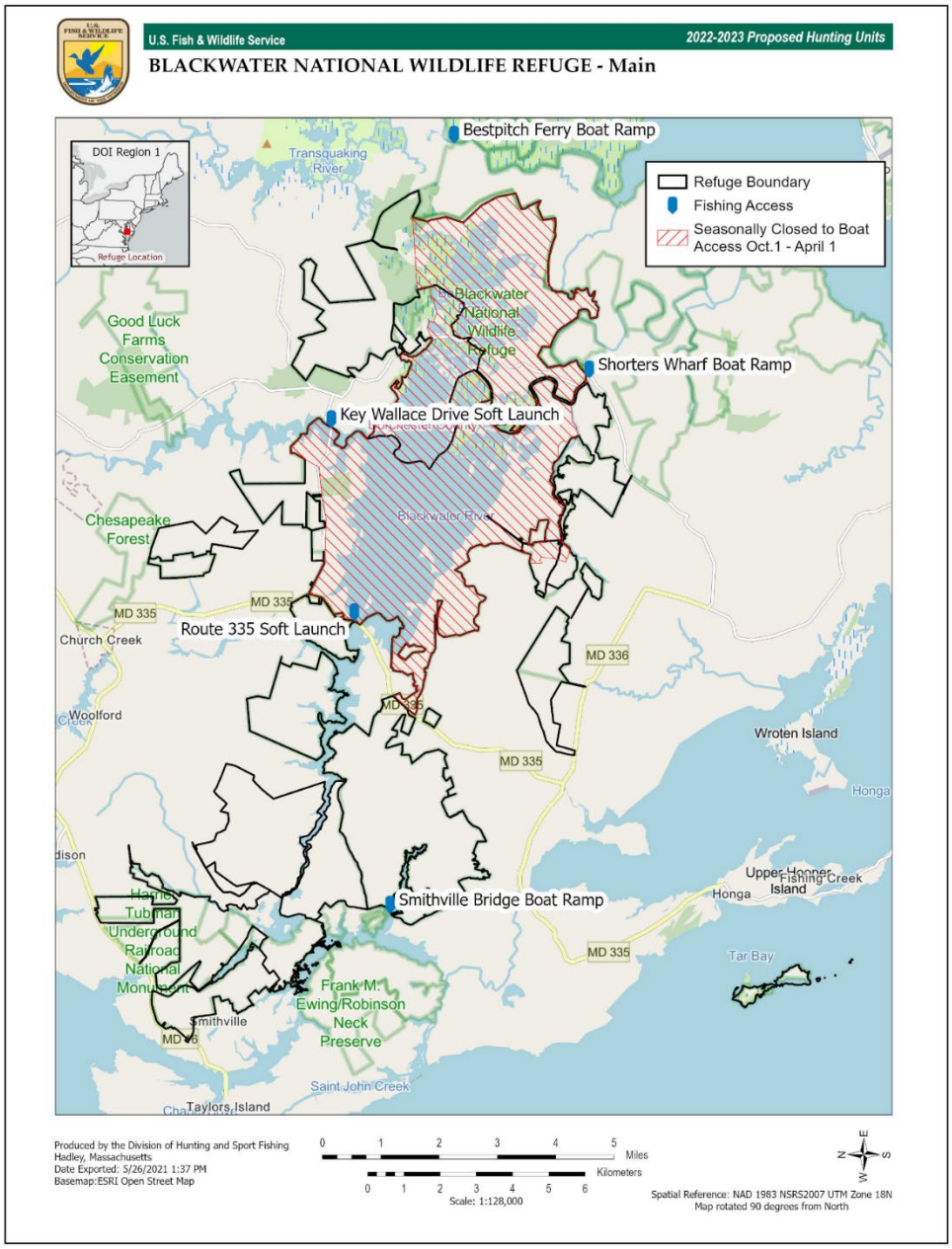

Figure B-2. Fishing access locations at Eastern Neck NWR

Tables

Table B-1. Annual funding and staffing requirements to administer the fishing program at Blackwater and Eastern Neck NWR.

Requirement	**Costs**
Interpretive programs (45 hrs. $50/hr.)	$2,250
Fishing events (three events at 12 hrs./event and $50/hr.)	$1,800
Preparation of signs, maps, trails, info (120 hrs. $50/hr.)	$6,000
Law enforcement (70 hrs. $50/hr.)	$3,500
Brochures	$7,500
Signs	$7,500
Support cost (fuel and travel expenses)	$600
Maintenance of facilities (140 hrs. $50/hr.)	$7,000
Total	**$36,150**

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CHESAPEAKE MARSHLANDS NATIONAL WILDLIFE REFUGE COMPLEX HUNTING AND FISHING 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.

Chesapeake Marshlands National Wildlife Refuge Complex (CMNWRC, Complex) is made up of four refuges: Blackwater National Wildlife Refuge (NWR, refuge), Eastern Neck NWR, Martin NWR, and Susquehanna NWR. Of those refuges, this document will serve as a management plan for hunting and fishing activities on Blackwater NWR and Eastern Neck NWR. The remaining refuges of the Complex will not be addressed in this plan.

Blackwater NWR was established by the Migratory Bird Conservation Act (MBCA) (16 U.S.C. 715-715d, 715e, 715f-715r); the Federal Property and Administrative Service Act of 1949 (40 U.S.C. 471-535), as amended; Fish and Wildlife Coordination Act of 1934 (16 U.S.C. 661-666c), as amended; Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j Stat. 1119), as amended; the Act of May 19, 1948, Public Law 80-537 (16 U.S.C. 667b-667d; 62 Stat. 240), as amended; and the National Wildlife Refuge System Administration Act (NWRSAA) of 1966 (16 U.S.C. 668dd-668ee), as amended.

The Migratory Bird Conservation Commission originally authorized the establishment of Blackwater NWR on December 3, 1931, as Blackwater Migratory Bird Refuge, the first and largest of the CMNWRC units. Blackwater NWR is currently over 30,000 acres and is a showplace for the Refuge System. The refuge's extensive marshes, moist-soil impoundments, and variety of croplands form the favorable trio of habitats most essential to thousands of migrating and wintering waterfowl. Its forests provide important habitat for a variety of migratory birds, including bald eagles, and other forest dependent wildlife, such as the Delmarva Peninsula fox squirrel.

In order to meet specific refuge and other broader Service directives, the following purposes were established for Blackwater NWR:

- "for use as an inviolate sanctuary, or for any other management purpose, for migratory birds...." 16 U.S.C. § 7J5d (Migratory Bird Conservation Act of 1929).

- "to conserve (A) fish or wildlife which are listed as endangered species or threatened species...or (B) plants..." 16 U.S.C. § 1534 (Endangered Species Act of 1973).

- "for incidental fish and wildlife-oriented recreation; the protection of natural resources; and the conservation of endangered species or threatened species..." 16 U.S.C. § 460K-1

(Refuge Recreation Act of 1962).

- "to protect, enhance, restore, and manage an appropriate distribution and diversity of wetland ecosystems and other habitats for migratory birds and other fish and wildlife in North America..." 16 U.S.C. § 4401–413. (North American Wetlands Conservation Act)

- "to protect, enhance, restore, and manage wetland ecosystems and other habitats for migratory birds, endangered and threatened species, and other wildlife." 16 U.S.C. § 668ddb (Refuge Administration Act of 1966).

Eastern Neck NWR was established by Executive Order on December 27, 1962. The primary purpose for Eastern Neck NWR is "for use as an inviolate sanctuary, or for any other management purpose, for migratory birds... "16 U.S.C. § 7J5d (Migratory Bird Conservation Act of 1929).

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

Blackwater NWR is located in Dorchester and Wicomico Counties in Maryland and receives approximately 180,000 visitors annually. Most of this visitation is focused on the refuge's visitor center, wildlife drive, and public hiking and water trails. Most of the hunting units are closed to public access for much of the year and are open to the public only for hunting purposes. In Fiscal Year 2021, the refuge issued 4,732 permits for hunting sika and white-tailed deer and 141 for turkey hunting. The refuge also issued 220 permits for waterfowl hunting. In many cases, a hunter issued a permit may hunt the refuge multiple times or decide not to hunt the refuge at all. For waterfowl, up to four hunters can participate under one permit. While these permit numbers do not reflect the number of actual hunting occasions or participants, an estimated 13,200 hunt visits can be extrapolated. Approximately 24,000 fishing visits occurred in 2021.

Eastern Neck NWR is located in Kent County, Maryland and receives approximately 80,000 visitors each year. Visitors utilize the refuge for wildlife observation, photography, interpretation, hunting, fishing, and other uses. To ensure the safety of all participants, Eastern Neck NWR is closed to all other uses when hunting is permitted. There were approximately 598 hunt visits, and 10,000 fishing visits.

The Service proposes to adjust hunting and fishing opportunities at CMNWRC to better align with State programs where appropriate, while still meeting refuge wildlife and habitat objectives. In summary, we propose the following changes to the existing program:

1) Species Changes
    a) Blackwater NWR: Open to incidental coyote during deer season
    b) Eastern Neck NWR: Open to incidental coyote during deer season

2) Huntable Acreage Added
    a) Blackwater NWR: 723 acres total (641 acres in Wicomico County and 82 acres in Dorchester County)

3) Method of Take Changes
    a) Blackwater NWR: Open to rifle with use of straight-walled cartridges only
    b) Eastern Neck NWR: Open to rifle with use of straight-walled cartridges only

4) Season Dates
    a) Blackwater NWR: Add a primitive deer hunt in February
    b) Blackwater NWR: Add early season teal (September)
    c) Blackwater NWR: Add youth, veteran and active-duty military members

waterfowl dates
   d) Blackwater NWR: Align our youth deer hunt with State date(s)
   e) Eastern Neck NWR: Add primitive deer hunt in February

5) Permits
   a) Blackwater NWR: Offer a Sportsman's Pass through online portal that allows hunters to purchase one pass for all open deer hunt dates

6) Bag Limits
   a) Blackwater NWR: Align with State deer bag limits
   b) Eastern Neck NWR: Align with State deer bag limits

7) Ammunition
   a) Blackwater NWR: Non-lead ammunition only for big game and coyote required beginning September 1, 2026
   b) Eastern Neck NWR: Non-lead ammunition only for big game and coyote required beginning September 1, 2026

8) Fishing Tackle
   a) Blackwater NWR: Non-lead tackle only for fishing required beginning September 1, 2026
   b) Eastern Neck NWR: Non-lead tackle only for fishing required beginning September 1, 2026

9) Fishable Areas
   a) Blackwater NWR: Add bank fishing from Key Wallace Drive causeway
   b) Blackwater NWR: Add tract Howard (100m) and Tubman Pond (100ai) freshwater ponds for youth and mentored fishing events

II. Statement of Objectives

The objectives of the hunting and fishing programs at CMNWRC are to:

1. Provide the public with a quality recreational experience on refuge lands and waters and increase opportunities and access for consumptive and non-consumptive users of the refuge. The Refuge System Improvement Act of 1997 identified hunting and fishing, where compatible, as two of the six priority public uses on refuges;

2. Design hunting and fishing programs that are administratively efficient and manageable with existing staffing levels and in alignment with Maryland Department of Natural Resources (MDDNR) regulations when possible;

3. Implement hunting and fishing programs that are safe and enjoyable for all refuge users; and

4. Design a hunting program that aligns with refuge habitat management objectives.

Meeting the above objectives will also benefit wildlife resources and habitat. High deer densities have been shown to alter the understory of forests (Côté et al. 2004; White 2012) and negatively affect breeding songbirds (Chollet and Martin 2013; Tymkiw et al. 2013). In addition, agricultural crops that are vital to the refuge as a source of supplemental food for wintering waterfowl have been severely impacted in recent years due to deer depredation. Fishing for the exotic, invasive snakehead also helps remove individuals that outcompete native aquatic species.

Offering hunting and fishing opportunities at Blackwater and Eastern Neck NWRs also helps fulfill Objective 4.3.2 and Objective 4.3.3 of the Chesapeake Marshlands National Wildlife Refuge Complex Comprehensive Conservation Plan (CCP) (see USFWS 2006), which identify a need to provide expanded opportunities for high quality hunting and fishing experiences.

III. Description of Hunting and Fishing Program

A. Areas to be Opened or Changed to Hunting and Fishing

A total of 19,119 acres of Blackwater NWR are currently open to hunting for white-tailed deer, sika, wild turkey, and waterfowl. Under this proposed plan, 723 additional acres will be opened to hunting in Wicomico County for deer and turkey plus 7 miles of shoreline for waterfowl (Table D-1).

At Blackwater, bank fishing will be expanded along Key Wallace Drive causeway where it crosses the Little Blackwater River. Additionally, a fishing pier may be developed if feasible to improve the fishing opportunity in the area as a result of increased interest. This is dependent on finding a location and design that addresses all of our needs. These include water depth, substrate, proximity to sufficient parking, not impeding the flow of traffic, conflict with other uses in the area, trash removal, restroom facilities, as well as lack of disturbance to nesting eagles or heron rookeries. Given the location of low bridges surrounding the refuge, it will be difficult for a contractor to enter the refuge by water. Therefore, a floating dock may be a better option, but these issues still need to be addressed as well as cost, materials, American with Disabilities Act of 1990 (ADA) accessibility and overall maintenance.

At Eastern Neck NWR, a total of 1,985 acres is currently open to hunting for white-tailed deer and wild turkey. Under this hunt/fish plan, we are not proposing changes to the area currently open for hunting.

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

Blackwater NWR
The refuge will continue to administer existing hunts for white-tailed deer, sika, wild turkey, goose, and duck. The refuge will allow incidental coyote hunting concurrent with established refuge deer hunts to mitigate conflicts with other user groups and to conserve refuge personnel resources. Additionally, the refuge will allow early season teal, and a youth, veteran, and active-duty military waterfowl hunt will be added in alignment with the State. Primitive season deer hunt dates will be added in February and the youth deer hunt dates will

be shifted to align with the State hunt dates.

The refuge will now allow rifle hunting using straight-walled cartridges only. Beginning in the 2020-2021 season, MDDNR allowed the use of straight-walled cartridges in shotgun-only counties, the ballistics of which are similar to those of shotgun slugs yet are slower and have less range than typical rifle (bottleneck) cartridges. The main advantage to straight-wall cartridges over shotgun slugs is improved accuracy while still maintaining the approximate range of shotguns for safety.

Hunting will be conducted in 39 units with addition of several new units (Figures A-1thru A-3 in Appendix A). Hours of access to the refuge for hunts can be found on the refuge website, which may vary based on hunt type and State regulations. Legal shooting hours are in accordance with State regulations for respective species. During the spring turkey and deer archery seasons, hunters may walk in from existing designated parking areas, and all vehicle access will be prohibited. During the firearms seasons, vehicles will be restricted to designated roadways and existing parking areas. Waterfowl hunt units are accessible by boat only. There will be no off-road vehicles or all-terrain vehicle (ATV) use allowed during any hunting season, except for persons with permanent disabilities in designated areas. Boat access may be allowed for big game hunting, at the manager's discretion, where it does not conflict with areas closed for the protection of wintering waterfowl. Sections of Wildlife Drive and some refuge trails may be closed for designated periods of time during the muzzleloader and/or shotgun hunts to allow for the harvest of white-tailed deer and sika. There are specific areas of the refuge designated for hunters with permanent disabilities, currently Q2 and U1. Any changes to unit locations will be reflected on the refuge website.

Fishing will be allowed daily from dawn to dusk (daylight hours only) April 1 to September 30 from the Key Wallace Drive soft launch, unless there is a conflict with a management activity or extenuating circumstance that would necessitate deviations from these procedures. The Route 335 soft launch is open year-round.

Eastern Neck NWR
Hunting will remain open for white-tailed deer and wild turkey. To minimize waterfowl impacts and for safety reasons, the refuge will be closed to non-hunters during hunts, which will be limited to a maximum of 8 days from September to February. The refuge will allow incidental coyote hunting concurrent with established refuge deer hunts to mitigate conflicts with other user groups and to conserve refuge personnel resources. Hunt seasons are set annually by the MDDNR. Refuge hunting will occur during State seasons but may include additional restrictions on season dates and times. Hunt dates at the refuge often fall outside of State hunt season in order to minimize any conflict with migrating waterfowl, and the State approves these dates annually. Primitive season deer hunt dates may be added in February.

Special mentored hunts for turkey are allowed during the spring season. A youth mentored hunt with the National Wild Turkey Federation (NWTF) has been held for 22 years over the course of 2 days per year. These will continue as well as other potential mentored hunt opportunities. Special hunts allow limited access and control and contribute to State recruitment, retention, and reactivation (R3) goals. Fishing is permitted from dawn to dusk in areas open to fishing.

C. Hunter and Angler Permit Requirements

Deer Hunting: Hunters are required to obtain the necessary State licenses. Additionally, hunters on Blackwater and Eastern Neck NWRs need to purchase and possess a refuge hunting permit. Discounted permits are offered to permanently disabled hunters and senior citizens (62 years of age or older). Refer to "Hunter Permit Application, Selection, and/or Registration Procedures" below.

Hunting brochures, hunting application procedures, seasons, bag limits, methods of hunting, maps depicting areas open to hunting, and the terms and conditions under which we issue hunting permits are available on the refuge's website and *www.recreation.gov*.

Coyote Hunting: Hunters may harvest coyote as incidental species while deer hunting on Blackwater and Eastern Neck NWRs. Deer hunters need to purchase and possess a refuge hunting permit. Refer to "Deer Hunting" paragraph above.

Mentored Deer and Turkey Hunting: All persons participating in a mentored hunt on Blackwater and Eastern Neck NWRs are required to obtain the necessary State licenses. Mentored deer and turkey hunts will be administered by the refuge, MDDNR, and conservation partners at Blackwater NWR and no refuge-specific permit is required. Potential mentees must apply and be selected to participate. NWTF administers the youth turkey hunt at Eastern Neck and the youth hunters are required to use the standard refuge hunt permit (Big/Upland Game Hunt Application OMB control number 1018-0140).

Waterfowl Hunting: Waterfowl hunters are required to obtain the necessary Federal and State licenses and stamps. They are also required to purchase and possess a refuge hunting permit. Discounted permits are offered to permanently disabled hunters and senior citizens (62 years of age or older). Refer to "Hunter Permit Application, Selection, and/or Registration Procedures" below.

Administrative fees will be charged for the refuge-issued hunt permits. Fees will be utilized to administer the hunt, which includes, but is not limited to, maintaining roads, parking areas, gates, and signs.

Recreational Fishing: There is no refuge-specific permit for fishing, but anglers must have in their possession a valid fishing license as outlined by State regulations.

D. Consultation and Coordination with the State

Refuge staff meets at least annually with MDDNR representatives to discuss current issues, status of hunts, and any proposed changes to regulations. Hunting opportunities on the refuge are generally designed to comply with State regulations. In some instances, the refuge hunt may deviate from State seasons to meet refuge wildlife population, public use, and public safety goals, or in an attempt to increase harvest and reduce white-tailed deer and/or sika herd size. Any deviations from State regulations are developed in coordination with State partners.

Consultations with the MDDNR regarding hunt plans, opportunities, and management were conducted during the development of the refuge's CCP and Environmental Assessment finalized in 2006. All Compatibility Determinations are reviewed and renewed at their respective 10- or 15-year interval, depending on type of use. The refuge also participates in the MDDNR's biannual hunt regulations meetings as a stakeholder, participates in the 10-year deer management plan review as appropriate, and reviews current hunt programs annually with the appropriate State biologist.

E. Law Enforcement

Enforcement of refuge regulations normally associated with management of a NWR is the responsibility of commissioned Service law enforcement officers. Other refuge officers, special agents, and State game wardens may assist Federal wildlife officers (FWOs) in investigations of both Federal and State law occurring within the refuge.

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

- Boundaries will be clearly posted;
- The Service will provide an annual brochure outlining hunting rules and regulations as well as a map depicting areas open to the lawful take of game;
- FWOs will check hunters to ensure compliance with Federal and State laws, as well as refuge-specific hunting regulations, including compatibility stipulations;
- FWOs will coordinate with Maryland Natural Resources Police (MNRP) and other law enforcement agencies; and
- Information will be made available on the Blackwater NWR website and at *www.recreation.gov*.

Procedures for obtaining law enforcement assistance are based on legal jurisdiction, pending where the incident occurred. FWOs have developed good working relationships with other State, local and Federal law enforcement agencies to develop enforcement strategies and coordinate investigations and operations as appropriate.

F. Funding and Staffing Requirements

Annual hunt administration costs for CMNWRC, including salaries and vehicle maintenance, total approximately $103,010 annually (Table D-2). Funding for the hunt programs is not specifically allocated but will be taken from station base funds and refuge hunt permit fees on an annual basis. Funding is expected to continue to be sufficient to continue the hunting and fishing programs at CMNWRC in the future.

From fall 2020 to winter 2021, the deer hunts at Blackwater NWR generated $99,043 in

permit fees, with a 5-year average of $80,944.60. In 2020-2021, 4,732 permits were sold, and the 5-year average for permits is 4,765. The deer hunts at Eastern Neck NWR generated $6,247 during the same timeframe with 627 permits sold. The 2021 spring turkey hunt at Blackwater generated $1,429.

IV. Conduct of the Hunting Program

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

All deer, waterfowl, and turkey hunt permits are available on *www.recreation.gov*. There is a $6 non-refundable reservation service fee per permit that the vendor charges and retains. Permits can include groups of up to four individuals.

Blackwater NWR Deer:
Deer Hunt Permits typically become available to the public in early July and are available up to 10:00 AM on the day of the hunt, depending on availability. These permits are available on a first-come, first-served basis.

Archery Hunt Permits cost $20 per season and cover all dates when archery is available for hunting. Up to 1,500 archery permits are available for the season.

Both Limited Muzzleloader Permits and Limited Shotgun Permits are available for $10 per single day. These hunts are limited because they only allow a certain number of hunters per unit. The calculation for the unit is one person per 20 acres. The hunters are distributed in this way to strategically maximize the area covered by hunters both for deer management and safety.

Muzzleloader Hunt Permits generally cost $20 for 4-day clusters. They are open permits; in that they allow the permittee to hunt in any open hunt unit on the refuge.

Recreation fees are reduced by half for all Federal Senior Pass or Access Pass holders. Pass number must be provided when applying for your permit.

First Shot mentored hunt program:
Started in 2018 with the NWTF and MDDNR, First Shot is a mentored hunt program offered on Blackwater NWR and neighboring private lands that helps new adult hunters learn to hunt. Mentors volunteer their time, skills, and equipment to help their mentee with everything involved in hunting deer or turkey, ranging from scouting, tracking, setting stands, sighting in, harvesting, and even cooking. Since the first hunt in 2018, over 90 participants have been selected to take part in the deer and turkey hunts. Units that are normally not open to hunting are dedicated to these hunts to provide them with the most opportunity to learn and harvest an animal. Since these are so tightly controlled, the mentored hunts are an effective way to manage deer in areas otherwise not hunted, such as public trails or small units, while at the same time controlling access for safety.

Freedom Hunters mentored hunt partnership:

Freedom Hunters is a 501(c)3 military outreach program dedicated to honoring those who protect our freedoms. Volunteers take active duty and combat veterans, families of fallen heroes, children of the deployed, as well as those wounded, on outdoor adventures with the help of partners such as Blackwater NWR. In 2018, Freedom Hunters partnered with Blackwater NWR to offer limited, special access hunts for deer to wounded warriors on the new Owen's Creek tract along the Nanticoke River. This is a very small tract at just over 100 acres, surrounded by a few concerned farmers. The area had previously been hunted by a club, and neighbors were concerned about trespassing and poaching now that the area was not occupied. By allowing Freedom Hunters access to this small tract, poaching and trespassing were discouraged, deer continued to be managed, and the immediate neighbors took pride in helping the veteran non-profit organization. Since then, they have hunted several days each year for deer and turkey with over 125 participants and will pilot a waterfowl hunt in 2021. The refuge may expand this partnership to access other small satellite parcels in the Nanticoke Division where all-access public hunting would likely cause conflicts with neighboring landowners and not be feasible to effectively patrol with law enforcement due to the distance from the main refuge. This also allows the deer population to be managed and to offer additional hunting opportunities.

Blackwater NWR Waterfowl: All hunt permits are available at *www.recreation.gov*. There is no refuge permit fee for waterfowl hunting. There is a $6 service fee for each reservation. Reservations can be made beginning at 10:00 AM on the Monday of the week prior to the week of the hunt, and up to two units per week can be reserved by a participant. Each waterfowl permit allows up to four individuals to hunt in that unit.

Blackwater NWR Turkey: The Blackwater NWR Turkey Hunt is a lottery. There is a $6 non-refundable service fee for each reservation that *www.recreation.gov* retains, as well as a $10 Recreation Fee for the Turkey Hunt Permit if awarded. Recreation fees (not reservation fees) are reduced by half for all Federal Senior Pass and Access Pass holders. Pass number must be provided when applying for your permit.

There is one unit designated for use by disabled hunters and six other units available for turkey hunting. Hunters apply at *www.recreation.gov* with their preferred dates and if selected, they pay the $10 recreation fee and the $6 service fee. Any unclaimed lottery hunts are released after 10 days post-notification and are available to the public as first-come, first-served.

Eastern Neck NWR: All Deer Hunt Permits are available at *www.recreation.gov*. There is a $6 non-refundable reservation service fee per permit. Permits can include groups of up to four individuals. Deer Hunt Permits typically become available to the public in early July and are available until 10:00 AM on the day of the hunt depending on availability. These permits are available on a first-come, first-served basis. Recreation fees are reduced by half for all Federal Senior Pass or Access Pass holders. Pass number must be provided when applying for your permit.

B. Refuge-Specific Hunting and Fishing Regulations

To ensure compatibility with refuge purposes and the mission of the Refuge System, hunting and fishing must be conducted in accordance with State, Federal, and refuge-specific regulations. The refuge-specific regulations that pertain to hunting and fishing on Blackwater and Eastern Neck NWRs as of the date of this plan are summarized here. These regulations may be modified as conditions change or if refuge expansion continues or occurs.

Hunting:

- We require hunters to obtain a deer, turkey and waterfowl hunting permit generated by *www.recreation.gov*. Hunting brochures, hunting application procedures, seasons, bag limits, methods of hunting, maps depicting areas open to hunting, and the terms and conditions under which we issue hunting permits are available on the refuges' website and at *www.recreation.gov*.

- Hunters must possess on their person at all times while on refuge property: a valid Maryland hunting license and all required State and Federal stamps, a valid form of government-issued photo identification, and a printed valid hunting permit issued by *www.recreation.gov*.

- We only allow portable or temporary tree stands and blinds while hunting. All stands and blinds must be removed at the end of the hunt day except for U1. We require hunters to mark the stand or blind in plain site with the hunter's DNR ID. We prohibit hunting from a permanently constructed tree stand or blind. We do not allow screw-in steps, spikes, or other objects that may damage trees. All marking devices such as flagging or bright eyes must be removed by the last day of their hunt. Stands, blinds, or any other personal property may not be left unattended or overnight (except in U1, where tagged with permit number and year), and any left in a hunt area will be seized and impounded (50 CFR 27.93).

- We prohibit organized deer drives, unless otherwise authorized by the refuge manager on designated hunt days.

- Hunters must notify and receive permission from a Service law enforcement officer, refuge manager, or designee if they need to enter a refuge closed area or another hunting area for which they do not possess a valid permit to retrieve game.

- We prohibit shooting a projectile from a firearm, muzzleloader, bow, or crossbow from, down, or across any refuge road. A refuge road is any road that is traveled by vehicular traffic.

- Hunters must make a reasonable effort to retrieve all wounded or killed game and include it in their daily bag limit. We prohibit leaving deer or turkey entrails or other waste within 50 feet (15.2 meters) of any road, parking area, trail, or structure on the refuge.

- Hunters must adhere to the State bag limits set forth annually and must be recorded and checked with the State. Deer harvested on the refuge must be checked pursuant to the refuge hunt in which they are taken, regardless of the weapon used or corresponding State season.

- We prohibit the use of rimfire or centerfire rifles and all handguns including muzzleloading pistols for hunting. We allow rifle for hunting only with the use of straight-wall cartridges.

- Hunters are encouraged to voluntarily use non-lead ammunition when hunting. Starting on September 1, 2026, we will eliminate all lead ammunition on Eastern Neck and Blackwater NWRs for deer, sika, coyote, and turkey hunting.

Fishing:
Blackwater NWR: We allow sport fishing and crabbing on designated areas of the refuge subject to the following conditions:

- We allow fishing and crabbing only from April 1 through September 30 from legal sunrise to legal sunset in refuge waters, unless otherwise authorized by the refuge manager.

- We allow fishing and crabbing by boat in the Big Blackwater and the Little Blackwater River.

- Anglers are encouraged to voluntarily use non-lead tackle when fishing. Starting September 1, 2026, we will eliminate use of all lead tackle on Blackwater NWR for fishing.

Eastern Neck NWR: We allow sport fishing and crabbing in designated areas of the refuge subject to the following conditions:

- We allow fishing and crabbing from designated shoreline areas located at the Ingleside Recreation Area from legal sunrise to legal sunset, April 1 through September 30.

- We allow fishing from designated shoreline areas located at the Chester River end of Boxes Point and Duck Inn Trails from legal sunrise to legal sunset.

- Anglers are encouraged to voluntarily use non-lead tackle when fishing. Starting on September 1, 2026, we will eliminate use of all lead tackle on Eastern Neck NWR for fishing.

C. Relevant State Regulations

The refuge conducts its hunting and fishing programs within the framework of State and Federal regulations. Hunting and fishing at the refuges 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, and summarized above in Section IV, subsection B.

D. Other Refuge Rules and Regulations for Hunting

- Commercial guiding is not authorized as part of this plan.
- We allow the use of marking devices, including flagging or tape, but it must be removed by legal sunset of the date established annually by the refuge manager. We prohibit paint or any other permanent marker to mark trails.
- We prohibit the use of bicycles, airboats, boats, ATVs, motorized off-road vehicles, and amphibious vehicles or Argos to access the refuge except as authorized by the refuge manager, within certain hunt areas, on designated days, routes of travel, waterways, and launch sites.
- We prohibit parking in front of any gate. Parked vehicles may not impede road traffic.

V. Public Engagement

A. Outreach for Announcing and Publicizing the Hunting and Fishing Programs

The refuge maintains a mailing list of local newspapers, social media, podcasts, radio, and websites for news release purposes. Special announcements and articles may be released in conjunction with hunting seasons. Additionally, information about the hunt will be available on the refuge's website and social media accounts.

B. Anticipated Public Reaction to the Hunting and Fishing Programs

Hunting and fishing are two of the six priority public uses required by the Refuge Improvement Act to receive enhanced consideration on refuges. These are popular and traditional activities in the area. Hunting and fishing provide means to increase public participation on the refuge and hunting serves as a management tool to help maintain healthy, sustainable wildlife populations. Hunting on public lands has become more popular as private lands have become less available for hunting. Fishing has increased in popularity at Blackwater NWR because of the increased desire to fish the invasive snakeheads.

Based on the comments received during the CCP (see USFWS 2006 and USFWS 2010) and since deer hunting has occurred on Eastern Neck and Blackwater NWRs for decades, little negative public reaction is expected in regard to continuing hunting and fishing programs on the Complex. However, the refuge anticipates some public concern about obtaining non-lead ammunition and tackle given the removal of lead use on the refuge. It is for this reason that the requirement to use non-lead ammunition and tackle will not be put into place until September l, 2026, providing hunters and anglers time to transition their supplies.

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

General information regarding hunting, fishing, and other wildlife-dependent public uses, dates, forms, hunting unit directions, maps, and information will also be available at the refuge websites:
https://www.fws.gov/refuge/Blackwater/ and *https://www.fws.gov/refuge/eastern_neck/,* and at the refuge hunt permit websites:

Blackwater Deer Hunt: https://www.recreation.gov/permits/5121212
Blackwater Waterfowl Hunt: https://www.recreation.gov/permits/5151515
Blackwater Turkey Hunt: https://www.recreation.gov/permits/5141414
Eastern Neck Deer Hunt: https://www.recreation.gov/permits/5131313

VI. Compatibility Determination

Hunting and all associated program activities proposed in this plan are compatible with the purposes of the refuges. See attached Hunting Compatibility Determinations and Fishing Compatibility Determination.

VII. Literature Cited

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

Côté, S.D., T.P. Rooney, J-P Tremblay, C. Dussault, and D.M. Waller. 2004. Ecological Impacts of Deer Overabundance. Annual Review of Ecology and Systematics 35:113-147.

Chollet, S. and J. Martin. 2013. Declining woodland birds in North America: should we blame Bambi? Diversity and Distributions 19:481-483.

Tymkiw, E.L., J.L. Bowman, and W.G. Shriver. 2013. The effect of white-tailed deer density on breeding songbirds in Delaware. Wildlife Society Bulletin 37:714-724.

U.S. Fish and Wildlife Service. 2006. Chesapeake Marshlands National Wildlife Refuge Complex, Comprehensive Conservation Plan, USFWS Region 5, Hadley, MA.

U.S. Fish and Wildlife Service. 2010. Eastern Neck National Wildlife Refuge, Comprehensive Conservation Plan, USFWS Region 5, Hadley, MA.

White, M.A. 2012. Long-term effects of deer browsing: composition, structure and productivity in a northeastern Minnesota old-growth forest. Forest Ecology and Management 269:222-228.

Table D-1. Hunt units at Blackwater NWR. (X[1] - *Hunting permitted but total acreage not calculated.)*

Unit	Acres	Deer	Waterfowl	Turkey
A	804	804	0	0
B1	367	367	0	367
B2	81	81	0	0
B3	321	321	0	0
Barren Island North	0	0	X[1]	0
Barren Island South	0	0	X[1]	0
Beaverdam Creek East	0	0	X[1]	0
Beaverdam Creek West	0	0	X[1]	0
Bishop's Head East	0	0	X[1]	0
Bishop's Head West	0	0	X[1]	0
Blackwater River Central	0	0	X[1]	0
Blackwater River East	0	0	X[1]	0
Blackwater River West	0	0	X[1]	0
D1	72	72	0	0
D2	295	295	0	0
D3	194	194	0	0
D4	107	107	0	0
E	1,890	1,890	0	0
Goose Dam Creek North	0	0	X[1]	0
Goose Dam Creek South	0	0	X[1]	0
M1	1,063	1,063	0	1,063
M2	1,911	1,911	0	1,911
Mentored Hunt Area	966	966	0	966
N	698	698	0	698
Nanticoke	1,147	0	1,147	0
Owens Creek	212	212	212	212
Q1	665	665	0	0
Q2	136	136	0	0
R	1,152	1,152	0	1,152
S	1,490	1,490	0	1,490
Spring Island East	0	0	X[1]	0
Spring Island West	0	0	X[1]	0
T	1,275	1,275	0	1,275
U	1,909	1,909	0	1,909
U1	203	203	0	0
W	724	724	0	724
X	1,437	1,437	0	0
TOTAL Acreage	19,119	17,972	1,359	11,767

Table D-2. Annual Funding and Staffing Requirements to Administer the Hunt Program at Blackwater and Eastern Neck National Wildlife Refuge

Requirement	**Cost**
Salaries (online hunt programming) 100 hrs., $45/hr.	$4,500
Mowing hunt roads	$6,150
Regular maintenance of 1-mile of road/year	$6,000
Road overhaul of 2.7 miles road/year	$75,195
Parking lots (replacing a 100X100 parking lot- 1/year)	$4,435
Replace three gates/year	$1,200
Maintain three disabled hunt blinds	$1,030
Replace three hunt signs/year	$4,500
Total annual cost of hunt program for Chesapeake Marshlands National Wildlife Refuge Complex	**$103,010**