

DRAFT Environmental Assessment

Elizabeth Hartwell Mason Neck National Wildlife Refuge Impounded Wetland Restoration Plan

November 2024

Prepared by
U.S. Fish and Wildlife Service
Potomac River National Wildlife Complex
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This Environmental Assessment: \$20,000*

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Environmental Assessment for Impounded Wetland Restoration

Date: November 6, 2024

Introduction

The U.S. Fish and Wildlife Service (Service, USFWS) is a federal agency whose primary mission is conserving and enhancing the Nation's fish and wildlife populations and their habitats for the American public. Although the Service shares this responsibility with other federal, state, tribal, local, and private entities, the Service has specific legally mandated responsibilities for migratory birds, federally listed threatened and endangered species, and certain anadromous fish and marine mammals. Service efforts over the last 100 years to protect wildlife and their habitats have resulted in a network of protected units that constitute the National Wildlife Refuge System (Refuge System). This network of protected lands and waters is the largest and most diverse in the world. Refuge System lands provide essential habitat for numerous fish and wildlife species, wildlife-dependent recreational opportunities for the public, and a variety of benefits to local communities.

This Environmental Assessment (EA) has been prepared to evaluate the effects associated with the Service's proposed action to restore tidal freshwater flow and drainage within two areas of Elizabeth Hartwell Mason Neck National Wildlife Refuge (NWR, Refuge). This EA complies with the National Environmental Policy Act (NEPA) in accordance with Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR] 1500–1509) and Department of the Interior (43 CFR 46; 516 Departmental Manual [DM] 8) and U.S. Fish and Wildlife Service (550 Fish and Wildlife Service Manual [FW] 3) regulations and policies. The National Environmental Policy Act requires examination of the effects of proposed actions on the natural and human environment. Appendix A outlines the laws and executive orders evaluated through this EA.

This EA provides information to the Service's Responsible Official in order to determine whether an environmental impact statement (EIS) or a finding of no significant impact (FONSI) can be prepared (40 CFR 46.300). An EIS would be prepared if significant environmental impacts are anticipated as a result of the Service's decision to restore tidal freshwater flow and drainage to High Point Creek and Little Marsh Creek impoundments. As such, this EA addresses only those resources or features that have the possibility to be significantly impacted and are important to the decision-making process. Resources or other aspects of the natural and human environment that would be only negligibly impacted and, therefore, not important to the decision-making process are not addressed in this EA.

Proposed Action

The Service proposes to restore tidal freshwater flow and natural drainage to the High Point

Creek and Little Marsh Creek impoundments on Elizabeth Hartwell Mason Neck National Wildlife Refuge (Mason Neck NWR) (Figures 1 and 2). The Service proposes to remove 300 linear feet of dike that created the 66 acre High Point Creek impoundment and place rip rap at the cut slopes, where earth was originally removed to accommodate the dike. In addition, the Service proposes to remove the existing Little Marsh Creek impoundment (1.7 acres) water control structure upstream and replace the structure with a concrete arched culvert and repurpose the rip rap for bank stabilization (Figure 3). The proposed project's intent is for the restored areas to mimic hydrologic conditions found in the adjacent forested wetlands and Great Marsh.

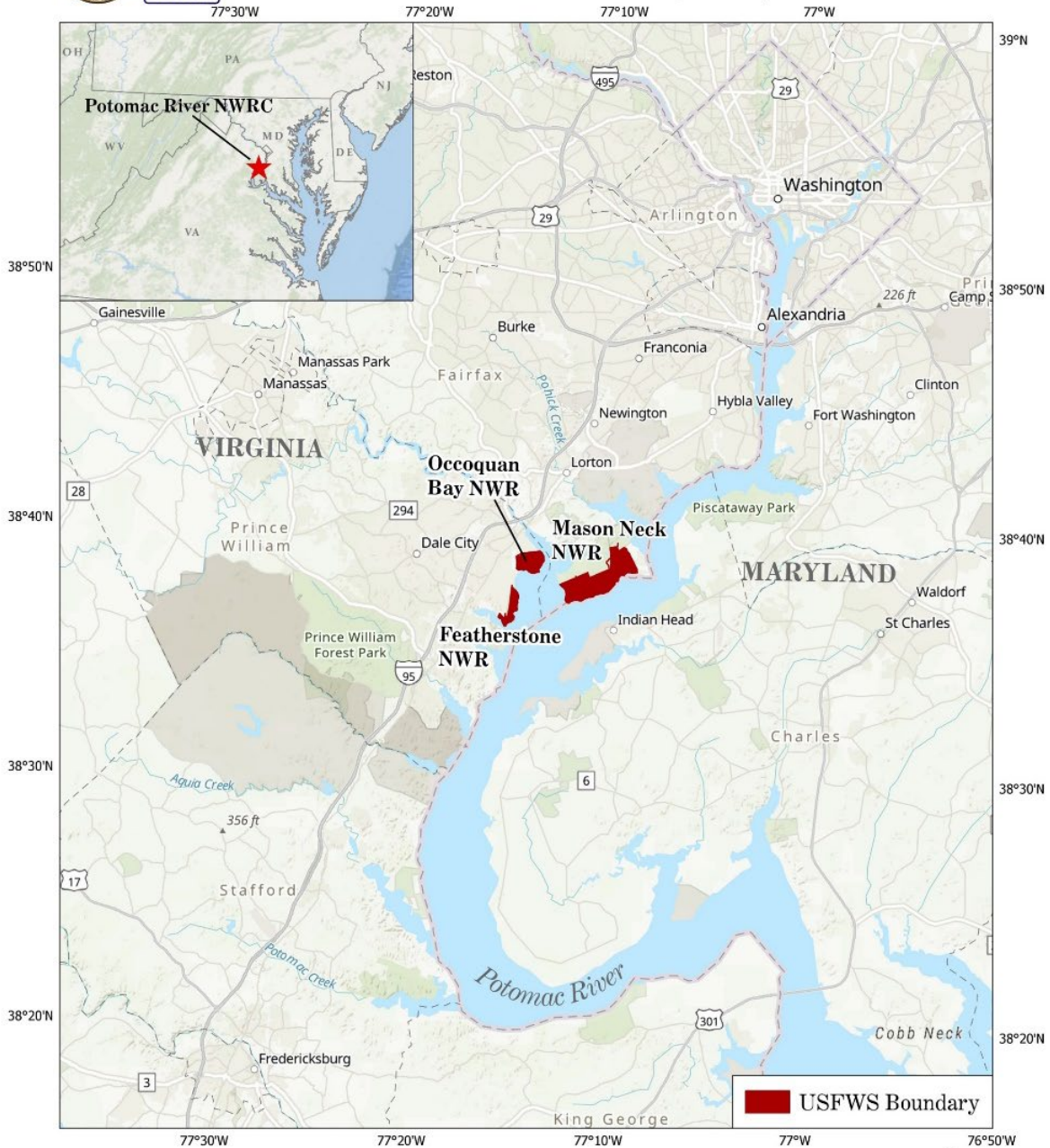
A proposed action may evolve during the NEPA process as the Service refines its proposal and gathers feedback from the public, tribes, and other agencies. Therefore, the final proposed action may be different from the original. The proposed action will be finalized at the conclusion of the public comment period for the EA.



U.S. Fish & Wildlife Service

Potomac River National Wildlife Refuge Complex

Reference Map



Produced in the Division of Natural Resources and Conservation Planning
 National Wildlife Refuge System, Hadley, MA.
 The USFWS makes no warranty for use of this map and cannot be held liable for actions or
 decisions based on map content. This map is designed for refuge management. It is not
 intended for use as a land survey or as a representation of land for conveyance or tax purposes.
 File: Refuge_HMP_Maps
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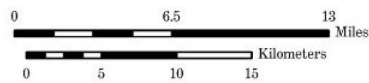


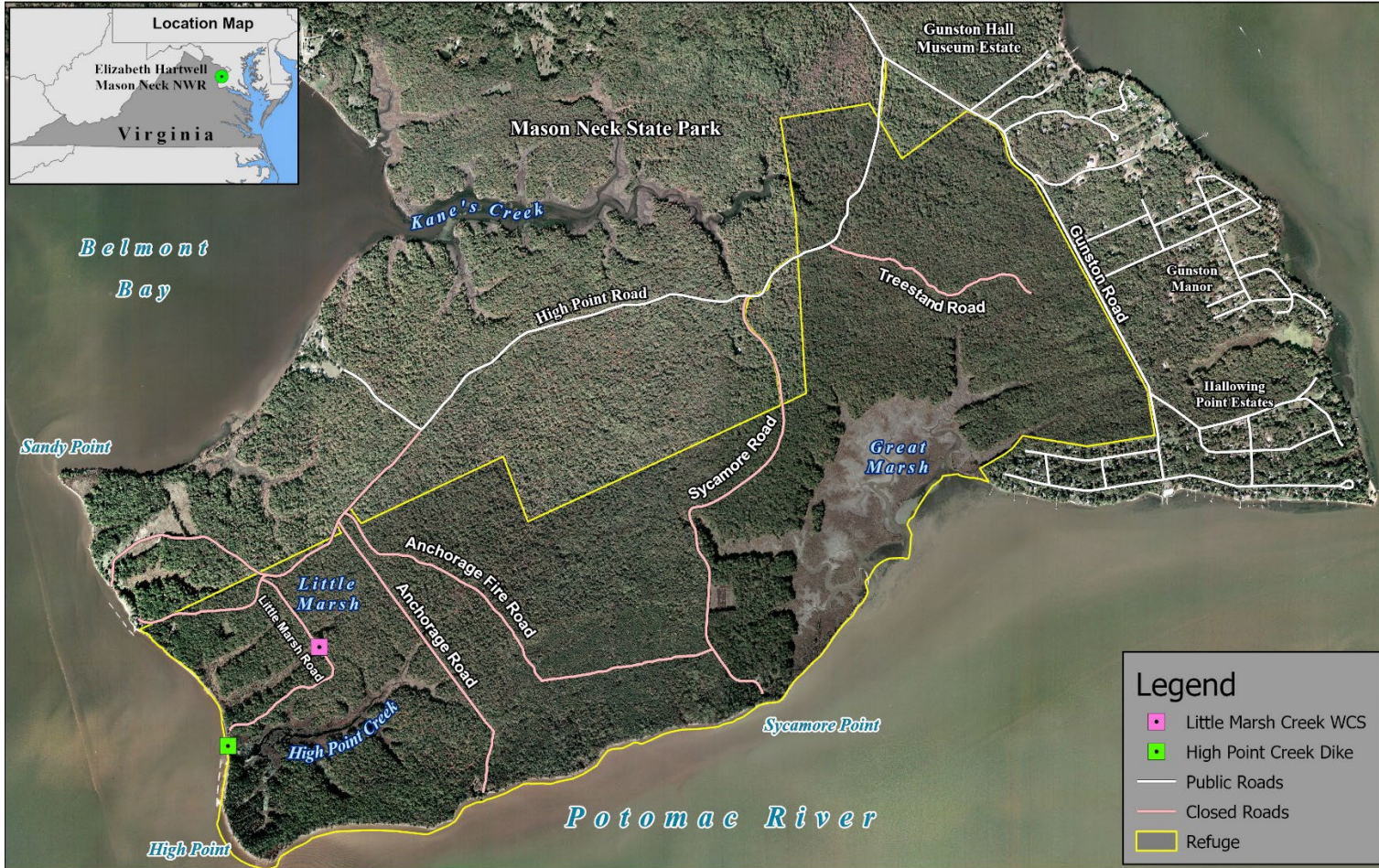
Figure 1 Potomac River National Wildlife Refuge Complex, Lorton, Virginia.



U.S. Fish and Wildlife Service

Elizabeth Hartwell Mason Neck National Wildlife Refuge
Refuge Boundary and Existing Features

Environmental Assessment



Data Sources:
 USFWS, VADCR, USGS
 Map prepared for Mason Neck NWR
 Environmental Assessment. July 2024.
 Not to be used for legal purposes.



Figure 2 Elizabeth Hartwell Mason Neck NWR Boundaries, Infrastructure, and Features.

Background

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

The Elizabeth Hartwell Mason Neck National Wildlife Refuge is part of the Potomac River National Wildlife Refuge Complex (Complex). The Complex is comprised of three individual refuges. Each refuge is established under specific legislation. Similarly, each refuge has one or more specific legal purposes for which it was established. The 1969 establishing legislation and purposes for the Elizabeth Hartwell Mason Neck NWR are as follows:

- Endangered Species Act (16 U.S.C. § 1534) “... to conserve (A) fish or wildlife which are listed as endangered species or threatened species Or (B) plants ...”
- Refuge Recreation Act (16 U.S.C. § 460k-1) “... 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 “... the Secretary ... may accept and use ... real ... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors ...”
- An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes (16 U.S.C. § 667b) “... particular value in carrying out the national migratory bird management program.”
- Migratory Bird Conservation Act (16 U.S.C. § 715d) “... *for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.*”

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

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

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

- Provide for the conservation of fish, wildlife, and plants, and their habitats within the NWRS;
- Ensure that the biological integrity, diversity, and environmental health of the NWRS

are maintained for the benefit of present and future generations of Americans;

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

The US Fish and Wildlife Service is the primary Federal agency responsible to conserving wildlife species for present and future generations of Americans. Therefore, it is a priority of the Service to fulfill the refuge purposes of managing a sanctuary for migratory birds, to maintain the biological integrity, diversity, and environmental health of the Refuge System, and to meet other Service priorities and mandates.

Purpose and Need for the Action

The purpose of this proposed action is to decommission a dike and water control structure to restore tidal freshwater flow and drainage to High Point Creek and Little Marsh Creek impoundments. The impoundments once functioned as natural tidally influenced wetlands and drainage systems (Figure 3). At refuge establishment, remnants from a low dam, or weir, were discovered at High Point Creek, most likely created to hold water and attract waterfowl for hunting purposes (USFWS 1985, 1990). In 1989 Service staff repaired and improved upon the weir by constructing a dike and installing two water control structures to manage water levels to promote waterfowl breeding and wintering habitats (Figure 4). Additionally, staff installed a water control structure beneath Little Marsh Creek Road in the adjacent forested wetlands to create Little Marsh Creek Impoundment.

The impoundments were designed to generate habitat for waterfowl by holding water on a specific area for a predetermined amount of time throughout the year. An impoundment is a body of water confined within an enclosure often by a dike at the mouth of a natural stream. A dike refers to a ridge constructed of compacted soil, loose gravel, stone, or crushed rock that intercepts and prevents tidal flow from entering the creek and diverts or directs the water to a controlled or stabilized drainage outlet. Water control structures are tools utilized to raise and lower impounded water levels. Staff believed if managed as scheduled, impoundment water levels would reach optimum depths to promote plant diversity in support of waterfowl breeding. As new science became available, the Service recognized that most waterfowl populations breed in the prairie pothole regions of Canada and the mid-west United States (USFWS 2023a). Mason Neck NWR's impoundment management focus then shifted to benefit migratory shorebirds, wintering waterfowl, and other waterbirds.

Desired water level conditions are difficult if not impossible to reach given the current state of the High Point Creek and Little Marsh Creek impoundments. When the Service impounded the areas, tidal influence ceased. Without tidal influx, the impoundments did not receive natural regularly occurring sediment deposits causing the marsh to subside or drop below the two water control structures within the dike at High Point Creek. Therefore, water can no longer be drained to reach the shallow depths required to promote desired plant species growth. Sinkholes have developed in the High Point Creek dike further exacerbating staff's lack of control over water levels and rendering the area unsafe for heavy equipment used to maintain the dike. The pipes within the water control structures have deteriorated and begun to buckle and cave. Coupled with sea level rise, there is a heightened risk of catastrophic or unplanned dike failure. Rising river levels and storm surges have caused water from the Potomac River to overtop the dike during intense storm events weakening and eroding infrastructure (NOAA 2023). Regular high tide cycles are predicted to begin overtopping the dike in 2030 with increased frequency thereafter (USFWS 2019a). More frequent heavy rainfall episodes lead to

extreme drainage events which create intense water pressure on the impounded side of the dike and water control structures (Allen and Allen 2019, Dollan et al. 2022, Runkle et al. 2022). Storm debris frequently blocks water control structures on the impounded and river sides of the dike, limiting water ingress and egress, requiring staff time and heavy equipment to repeatedly remove material. There are also two points of under-seepage through the dike which can exacerbate dike erosion and lead to instability.

The proposed action would greatly reduce or eliminate the risk of failure by removing 300 ft of the dike and the associated failing water control structures (Figure 5). If the water control structures fail, water could infiltrate the material making up the dike causing sinkage or wash out, making it unsafe for mowing equipment and other maintenance activities. The water within the impoundment would then cease draining through the water control structures, causing the water level to rise, deepening the bottom of impoundment due to increasing pressure. Rising water levels would also drown the wetland vegetation on the edges of impoundment.

Persistent challenges in managing the impoundments, including aging and deteriorating structures and sediment subsidence have prevented the refuge from achieving desired biological objectives. The risk of a catastrophic dike failure during a storm surge, ongoing maintenance issues, and the value of tidal freshwater marsh has prompted the refuge to pursue decommissioning the impoundments.

The Service has been evaluating the pros and cons of maintaining the impoundments in perpetuity since 2018. We considered the consequences of both keeping the impoundments and restoring them to tidal flow, addressed uncertainties through research and modeling, and consulted with Ducks Unlimited, NOVA Parks, hydrologists and restoration biologists on issues related to the impoundments.



U.S. Fish and Wildlife Service

Elizabeth Hartwell Mason Neck National Wildlife Refuge
Existing Broad Habitat Types

Environmental Assessment

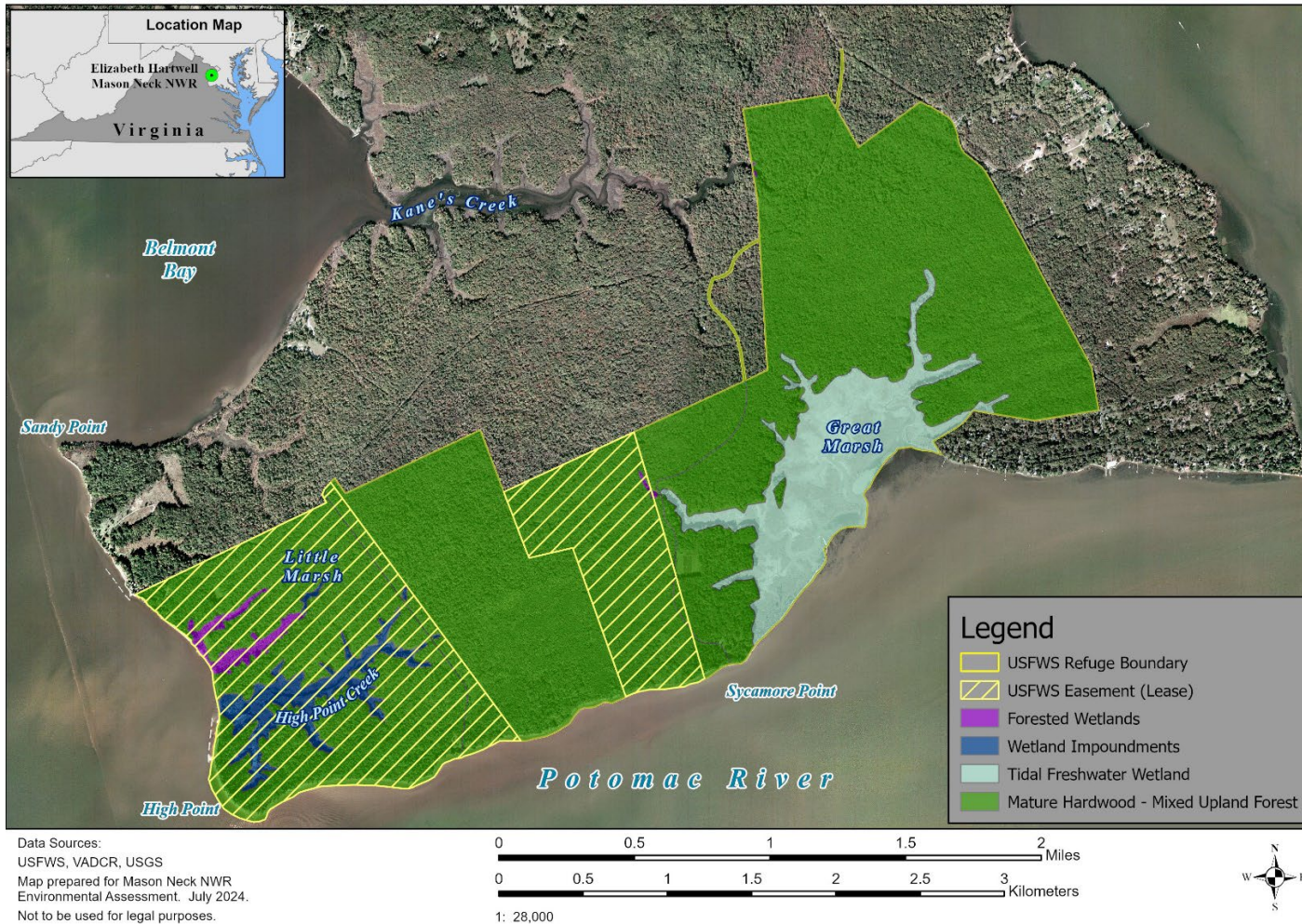
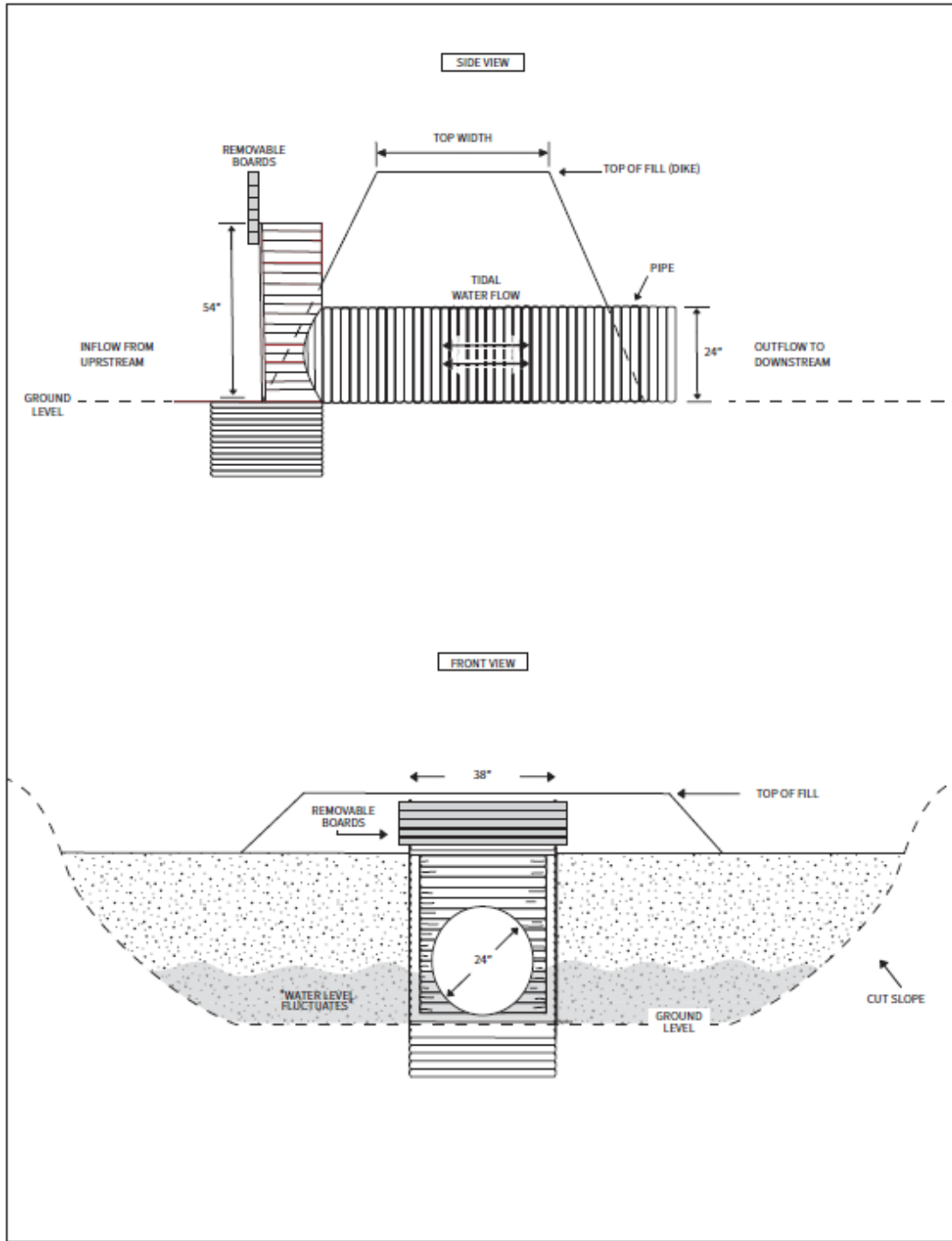


Figure 3: Elizabeth Hartwell Mason Neck NWR Broad Habitat Types



U.S. DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

Figure

POTOMAC RIVER NATIONAL WILDLIFE REFUGE
COMPLEX

Figure 4: Drawing of Water Control Structure Type on Little Marsh and High Point Creeks.

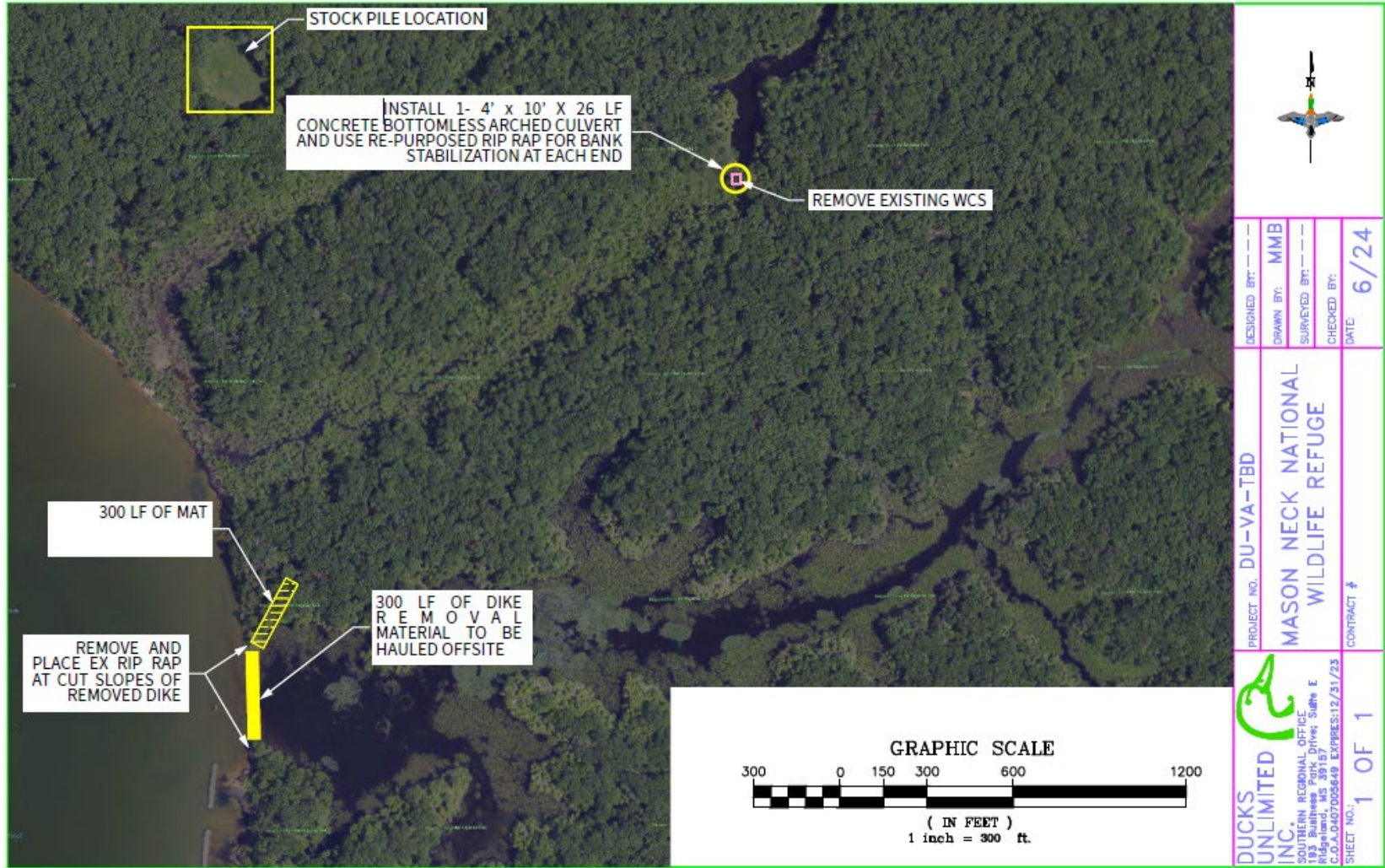


Figure 5: Proposed Elizabeth Hartwell Mason Neck NWR impoundment restoration project sites. This figure shows the proposed removal of the High Point Creek Dike as well as the removal and replacement of the water control structure at Little Marsh Creek

Alternatives

This EA evaluates two alternatives: the no-action alternative (Alternative A), and proposed action alternative (Alternative B, the preferred alternative).

Alternative A – No Action Alternative

The No Action Alternative is carried forward in this EA in accordance with 40CFR 1502.14(d) to represent the environmental baseline against which to compare the impacts of the Proposed Action. The No Action Alternative represents a continuation of existing management strategies as described in the 2011 E.H. Mason Neck NWR Comprehensive Conservation Plan (USFWS 2011). Under this alternative, staff will continue to maintain impoundment infrastructure to the best of their ability by keeping the water control structures at High Point Creek and Little Marsh Creek clear of vegetation and debris while managing water depth and surface area of both impoundments in attempt to provide habitat for breeding water birds and migrating waterfowl (USFWS 2011, 2019b).

Alternative B – Proposed Action Alternative

The preferred alternative is to restore approximately 67.7 acres of historic tidal wetlands of the High Point Creek and Little Marsh Creek impoundments through the removal of a dike and associated water control structures at High Point Creek and replacing a water control structure with a bottomless arched culvert at Little Marsh Creek. The proposed actions would only occur on Refuge lands.

Following restoration, the affected acreage would be managed under the following CCP objectives (USFWS 2011):

- Objective 1.3: Heron Rookery,
- Objective 2.2: Little Marsh Creek Management,
- Objective 2.3: Shoreline Protection, and
- Objective 2.4: Aquatic Habitat and Water Quality.

The CCP objectives include descriptions of desired future habitat attributes as well as strategies that would be applied to achieve the objectives.

Under the Proposed Action, we emphasize maintaining the health of wetland ecosystems and restoring natural process where they have been altered such as restoring hydrology to impounded units. This strategy will enhance habitat for wildlife by allowing natural habitat to be resilient and adapt to future climate stressors.

The Service proposes that proactive restoration of these impoundments to tidal flow prior to catastrophic failure of the dikes is a responsible and prudent action.

Proposed Actions on the High Point Creek Impoundment under the Preferred Alternative

Dike and Water Control Structure Removal

The entirety of the dike, spanning 300 linear feet by 35 feet, which separates the High Point Creek impoundment from the Occoquan Bay, will be dismantled. This dike has an average elevation of 5 feet above sea level according to the North American Vertical Datum of 1988 (NAVD88), is primarily constructed from rip rap, on-site soils, and two water control structures with associated pipes. The removal process will entail the installation of a temporary dam and turbidity curtain and excavating approximately 2,756 cubic yards of material. This excavated material will then be transported and staged off High Point Road, located approximately one mile from the dike site (Figure 5). Following removal, the rip rap will be repurposed to aid in bank stabilization. Additionally, the water control structures, and associated pipes will be recycled. Any remaining earthen material will be retained at the stockpile location for other uses throughout the refuge as needed.

Proposed Actions on the Little Marsh Creek Impoundment under the Preferred Alternative

Water Control Structure Removal

A portion of Little Marsh Creek Road, marked as a service access road which is not open to the public, transverses Little Marsh Creek. This portion of the road contains a water control structure which allows water to flow under the road, between the Little Marsh Creek Impoundment and Little Marsh Creek. Under the preferred alternative, this water control structure, which is about 2 feet wide and primarily made up of concrete and steel, would be removed. The artificial materials would be recycled, and the soil from the excavation would be relocated to the staging area.

Concrete Arched Culvert Installation

After removing the water control structure, further excavation would take place to make room for a wider concrete bottomless arched culvert (Figure 5). Upon installation, the soil previously excavated will be used to restore the Little Marsh Creek Road to its required height, thus maintaining the functionality of both the water level within the impoundment and Little Marsh Creek Road.

Proposed Actions Common to Both Sites

Bank Stabilization

The rip rap gathered during the removal of the High Point Creek impoundment dike will be strategically positioned at both High Point Creek and Little Marsh Creek to bolster bank stabilization efforts. This placement aims to mitigate erosion and enhance the resilience of these areas against natural forces.

Avoidance and Minimization Measures

The proposed action would implement the following measures at both sites, as appropriate, to minimize adverse effects on the physical environment:

- a. All erosion and sediment control best management practices (BMPs) would be constructed and maintained in accordance with Federal and State requirements and guidelines, as well as professionally accepted wetland restoration standards and techniques to protect water quality and the ecological integrity of the proposed project site.
- b. All machinery would be cleaned using standard high-pressure or steam washing processes prior to entry onto Refuge lands to avoid contamination of the proposed project site and surrounding land and water from grease, oil, and other petroleum products, as well as the potential introduction of invasive plant seeds or plant materials, or other foreign objects or materials.
- c. Graveled construction entrances and/or track-out pads (e.g., 50-yard section of road with 3" to 6"-minus rock) to remove excess mud from tires and tracks would be installed at the entrance/exit and/or along the access routes, respectively, where trucks and excavators would be entering/exiting the proposed project site.
- d. To minimize the effects on anadromous fish survival caused by the mobilization of sediments, the Service would require staff, contractors, and sub-contractors to use silt trapping devices (e.g., turbidity curtains, weed-free straw wattles, etc.) during all in-water work, or whenever working where sediment could potentially enter the water (e.g., during the removal or lowering of High Point Creek dike or removal of the Little Marsh Creek water control structure). Service staff, contractors, and sub-contractors would ensure that sediment-control devices are installed and maintained correctly through daily inspection of the erosion control devices. Controls would be immediately repaired or replaced and/or additional controls would be installed, as necessary (e.g., installing mud mats to prevent equipment from sinking or creating ruts). Sediment that is captured in these controls may be disposed of on-site with the rest of the excavated spoils. Unintentional depressions caused by moving heavy equipment around the site will be rehabilitated by grading and contouring them to adjacent elevations.
- e. Disturbance to existing grades and vegetation would be limited to the bare minimum necessary to accomplish the proposed action. Project implementation would use existing disturbed areas, if possible, as well as existing staging areas, routes of ingress or egress, parking lots, etc. to further limit disturbances to the existing character and integrity of the proposed project site. At Little Marsh Creek, areas in the immediate project area that are disturbed above mean higher high water (MHHW) would be re-

seeded or re-planted with native vegetation to facilitate revegetation. Areas below MHHW would be allowed to naturally regenerate, as seeding would not be effective due to daily tidal inundation under existing and proposed conditions. Re-seeding would not be necessary at High Point Creek following construction. When possible, undisturbed existing vegetation on the project site would be retained to help minimize sediment movement on site.

- f. Disturbance to cultural resources would be avoided or minimized where possible by using matting for vehicle and equipment staging areas in areas with potential cultural resources. Heavy equipment will use Little Marsh Road to traverse between High Point Creek and deposit material area off High Point Road, about a mile in distance. Portion of Little Marsh Road overlaps an archaeological site identified by the State Historic Preservation Officer (SHPO). The road which is not paved and consists of gravel running through the identified archaeological site or soft areas will be overlain with construction matting made of composite materials, protecting the ground underneath during the construction period. The matting helps distribute the weight of heavy equipment passing through the protected areas, avoiding the further compaction of soil underneath the mats. The matting also will cover the soft portions of road between High Point Creek and deposit material area to protect them from further soil compaction.
- g. Service staff, contractors, and sub-contractors would exercise every reasonable precaution to protect species and their habitats from pollution due to fuels, oils, lubricants, and other hazardous or harmful materials. Bio-degradable hydraulic oil would be preferred of all heavy equipment operated on site and all equipment would be inspected for leaks, faulty hydraulic systems, etc. prior to entering the proposed project site.
- h. Vehicles and equipment that are used during the proposed action would be fueled and serviced in a designated staging area located at least 100 meters away from water with appropriate and adequate spill prevention, absorbance, and containment systems. Spills, leaks, and other problems of a similar nature would be resolved by the operator immediately to prevent unnecessary effects to species and habitats. Service staff, contractors, and sub-contractors would have a plan for the emergency clean-up of any spills of fuel or other material available on site (e.g., spill absorbance and containment system readily available on site).
- i. When feasible, construction activities would be isolated from existing channels or other waters by fish exclusion barriers or sediment exclusion methods, following BMPs.
- j. All construction material, wastes, debris, trash, fencing, portable toilets, etc. would be removed from the proposed project site once the proposed project has been

completed. Waste and other debris would be transported to an authorized disposal area, as appropriate, and per all federal, state, and local laws and regulations.

- k. The Service would implement best practices, as appropriate and practicable, described in the Region 1 Practices to Minimize the Introduction of Invasive Species by Service Activities (USFWS 2017) to prevent the colonization and spread of invasive plant species following the completion of the restoration work. Additionally, rigorous monitoring of soils extracted from dikes will be conducted upon their placement in the staging area to mitigate any potential spread of invasives.

Cultural Resources Protection

Cultural resources on refuges receive protection and consideration in accordance with Federal cultural resources laws, Executive orders, regulations, and policies and procedures established by the Department of the Interior and the Service. Actions with the potential to affect cultural resources undergo a thorough review before being implemented, as is consistent with the requirements of cultural resource laws. All ground-disturbing projects undergo a review (including, but not limited to, archeological surveys) under Section 106 of the National Historic Preservation Act (NHPA).

To comply with the above, the Refuge submits a description of the proposed actions to the Service's Regional Historic Preservation Officer (RHPO). The RHPO helps to identify potentially affected cultural resources. Additionally, throughout planning and implementation, the Refuge and RHPO coordinates and consults with the State Historic Preservation Office (SHPO) and tribes.

The existence of cultural resources cannot be predicted with certainty. If cultural resources are discovered during implementation of the proposed action, work would cease in the vicinity of the discovery and the RHPO would be notified.

Alternative(s) Considered, But Dismissed from Further Consideration

The refuge completed a hydrologic modeling study of High Point Creek to better understand the impounded area and how the creek would react to restored tidal flow. Biologists collected topographic and hydrographic data throughout High Point Creek and the adjacent shoreline in the Occoquan Bay. Water level loggers were deployed on the impounded side and Potomac River side of the High Point Creek dike to capture natural tide cycle water levels. Hydrologists created a digital elevation model (DEM) of the High Point Creek area using the data collected along with Light Detection and Ranging or LiDAR-derived elevations. A DEM is a 3D computer graphic representation of elevation data that represents the contours of the Earth's surface. Using hydraulic calculations, hydrologists ran modeling scenarios for 20-ft, 50-ft, 100-ft, and 300-ft dike breaches at mean water (0.02 ft) and mean high water (0.87 ft) tidal levels.

The modeling scenarios helped determine how much of the dike would need to be removed to restore tidal flow to the creek as well as what aquatic infrastructure could be utilized. Results indicated a breach greater than 50 ft wide could restore tidal connections in High Point Creek. Thus, the 20-ft and 50-ft dike removal scenarios were dismissed from further consideration.

Model results indicated both a 100-ft and 300-ft breach would generate tidal conditions in High Point Creek. However, the wider breach option more closely mimics the historic opening that occurred at the site. The model also predicted that a 300-ft breach would be more conducive to water drainage during low tides and lead to improved sediment transportation into the impoundment basin. If a 100-ft breach was created, the remaining sections of dike would be exposed to stronger currents as tides move in and out of the opening whereas the velocity of those currents would be slightly lower with the 300-ft opening. Therefore, refuge staff dismissed the 100-ft breach option in favor of the 300-ft breach option.

In addition to modeling various potential breach lengths, hydrologists modeled the effects of lowering the dike to heights at the mean water (0.02 ft) and mean high water (0.87 ft) tidal levels. Simulations indicated that if the dike was lowered to a height of 0.87 ft, the removal would have limited impacts on hydrologic conditions in impounded area. To generate a wider range of water level fluctuations that will more closely mimic tidal conditions in the Potomac, the dike needs to be lowered to the mean water level. Lowering the dike to the mean water level of 0.02 ft will generate larger water level fluctuations in the tributaries leading to the expansion of vegetation adapted to periodic inundation and occasional drying in the tributary arms. Based on the model results, refuge staff proposed to lower the dike to the mean water height of 0.02 ft and dismissed the option of lowering the dike to the 0.87 ft mean high water level from further consideration.

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 and (2) the effects and impacts of the proposed action and any alternatives. The effects and impacts of the proposed action considered here are changes to the human environment, whether adverse or beneficial, that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives. This EA includes the written analyses of the environmental consequences for a resource only when the impacts on that resource could be more than negligible and therefore considered an “affected resource.” Any resources that will not be more than negligibly impacted by the action have been dismissed from further analyses.

Mason Neck NWR consists of approximately 2,277 acres (20 sq. mi.) in Fairfax County, Virginia. The refuge is a part of a contiguous 6,000-acre land management area including Mason Neck

State Park, Gunston Hall, Bureau of Land Management's Meadowood Recreational Area and Pohick Bay Regional Park. Mason Neck NWR is comprised primarily of mature hardwood-mixed upland forest habitat in addition to forested wetland, tidal freshwater wetland, and impounded wetlands (Figure 3) (USFWS 2019b). The proposed action is located within the High Point Creek and Little Marsh Creek impoundments. Mason Neck NWR's diverse habitats host over 211 bird species, more than 300 plant species, 31 mammal species, and 40 species of reptiles and amphibians (USFWS 2019b). Common species observed include bald eagle (*Haliaeetus leucocephalus*), wood thrush (*Hylocichla mustelina*), white-tailed deer (*Odocoileus virginianus*), groundhog (*Marmota monax*), and wood duck (*Aix sponsa*) (USFWS 2019b).

For more information regarding the affected environment, please refer to the Mason Neck NWR Comprehensive Conservation Plan and Habitat Management Plan which can be found here: <https://www.fws.gov/refuge/elizabeth-hartwell-mason-neck/library>

Natural Resources

Terrestrial Wildlife and Aquatic Species

Affected Environment

Description of Affected Environment for the Affected Resource

The High Point Creek and Little Marsh Creek impoundments provide bald eagles (*Haliaeetus leucocephalus*), great blue heron (*Ardea herodias*), and other water birds with a relatively secluded wetland, surrounding mature hardwoods and conifers, and an abundance of food in close proximity, critical for supporting nestlings and fledglings. The impoundments are home to several birds of conservation concern known to breed on Mason Neck Refuge, including prothonotary warbler (*Protonotaria citrea*), Louisiana waterthrush (*Parkesia motacilla*), bald eagle, wood duck (*Aix sponsa*), hooded merganser (*Lophodytes cucullatus*), least bittern (*Ixobrychus exilis*), black-crowned night-heron (*Nycticorax nycticorax*), great blue heron, and green heron (*Butorides virescens*).

The High Point Creek impoundment is also inhabited by an active North American beaver (*Castor canadensis*) population, resulting in the obstruction of water control structures (WCSs) due to the accumulation of debris, halting water flow. To mitigate this issue, the Refuge Biologist undertakes bi-weekly removal of debris to maintain visibility and functionality of the WCSs from the dike. During drawdown periods in which water levels are lowered, daily debris removal becomes imperative to ensure the impoundment reaches the targeted low water level. At high tide, if the WCS is blocked by debris from beaver activity, there is a risk of water entering the impoundment through the WCS pipe, necessitating vigilant maintenance efforts.

Description of Cumulative Impacts, Environmental Trends, and Planned Actions

Housing developments and additional single-family homes are a constant threat to the rural area surrounding the project site. It is expected to increase in the foreseeable future. These developments will reduce available wildlife habitat for terrestrial wildlife species such as deer and birds.

The proposed action combined with additional development will not reduce habitat availability, nor impact terrestrial wildlife and aquatic species because the proposed action will not have long term impacts to trees or habitats of the aforementioned species. Directly northeast of the project areas are 3,888 acres of natural forested wetland habitat for the aforementioned species.

Tidal wetlands, like Little Marsh Creek and High Point Creek, exist at and above sea level and can adapt to slow sea level changes. However, if the sea level rises too fast, tidal wetlands may not be able to persist in their current locations. Sea level rise (SLR) has two main effects on tidal wetlands. On the upslope edge, wetland plant communities may move to areas of higher elevations as they become increasingly inundated with water. On the downslope side, tidal wetlands may convert to mudflats or other non-vegetated habitats once inundation becomes too frequent and too deep for vegetation to survive. These actions combine for an upslope migration of tidal wetlands.

Impacts on Affected Resource

Alternative A – No Action Alternative

Under the No Action Alternative, impacts to terrestrial wildlife and aquatic species would remain consistent with current management activities. The current conditions of muted tidal flow on the High Point Creek and Little Marsh Creek impoundments (e.g., reduced tidal range, inundation frequency, and exchange) reduces the quantity and quality of available habitat for tidal wetland-associated species.

Ongoing beaver activity poses a persistent challenge, as the animals frequently obstruct the High Point Creek impoundment water control structures with debris, leading to potential flooding in the impoundment area. To mitigate this, staff members routinely clear debris from the water control structures, yet the possibility of a collapse remains particularly concerning given the potential for increased water levels during high-intensity storm surges. Additionally, the dike serves as a barrier to natural sediment deposition in High Point Creek, further altering the ecosystem dynamics.

Significant long-term impacts would likely occur under the no action alternative as SLR and the continued activities of beavers would hasten the deterioration of dikes at High Point Creek and Little Marsh Creek by blocking the water control structures, and the reduced rate of tidal sediment accretion would lead to increased frequency, duration, and magnitude of tidal inundation in the project areas. These changes would lead to gradual conversions or loss of

vegetated wetland habitats.

Alternative B – Proposed Action Alternative

Under alternative B, avoidance and minimization measures defined in the Alternatives section above will be taken to prevent unnecessary impacts to terrestrial wildlife and aquatic species. There would be short-term, temporary adverse impacts to wildlife during the construction phase of the restoration. Potential impacts could include direct mortality of individuals, temporary changes in wildlife behavior, and construction noise disturbances (Cole 1990 and Cole and Knight 1990).

Temporary noise-related disturbance due to equipment operation and human activity may occur during the construction period. Types of impacts from noise on wildlife could include physiological damage, masking of communication, disruption of behavior, and displacement or dispersion (Marler et al. 1973) which can reduce habitat use and lower breeding success (Forman and Alexander 1998). Upon project completion, there will be no significant net increase in noise level and therefore, no significant long-term noise impacts on wildlife and their surrounding environments.

Direct, short-term, localized, minor impacts would be expected on benthic fauna and infauna such as clams, snails, and small crustaceans, which may be disturbed by sediment displacement during dike removal activities. Short-term, direct, adverse impacts to fish would be minimized by fish removal procedures and the use of BMPs to control erosion and sediment from entering the waterways. Measures to reduce sedimentation and contamination would minimize indirect effects associated with degraded water quality.

All adverse impacts to wildlife from the restoration work would be temporary, minimized through use of BMPs (e.g., fish entrapment prevention, sediment exclusion), and would have minor impacts on terrestrial wildlife and aquatic species.

The proposed action will restore ecological function (natural tidal hydrology) to both High Point Creek and Little Marsh Creek and improve the ability to keep pace with sea level rise. Sediment accretion in High Point Creek may occur after restoration as a result of tidal influence allowing more vegetation to become established in shallow areas.

Alternative B will not negatively impact the Great Blue Heron rookery since similar habitats are present nearby and easily accessible. A great blue heron rookery is located south of High Point Creek impoundment. A heron rookery is a grouping of nests high in treetops. Aerial surveys of the rookery were conducted in 2019 and 2021. Researchers recorded 250 and 220 nesting heron pairs respectively (CCB, 2021). The rookery is located above the creek bed and outside of the proposed project's area of potential effect. Project hydrology models predicted low to no erosion near the current rookery site due to the flat and heavily vegetated nature of the creek. The restoration project also may benefit herons as low tides condense food resources in

shallow areas of the creek.

Following construction proposed under Alternative B, High Point Creek would be able to support wading birds like the great blue heron and forest dwelling bat species like the tri-colored bat (*Perimyotis subflavus*) or big brown bat (*Eptesicus fuscus*). Currently, the high water level within the impoundment prohibits fruit bearing woody plants such as winterberry (*Ilex verticillata*), possum-haw (*Viburnum nudum*), and fetterbush (*Eubotrys racemosus*) from growing throughout the impoundment. These plant species could establish within the impoundment following construction, providing food sources and preferred habitat for native birds and bats. Additionally, dike removal would eliminate the barrier currently preventing fish from entering High Point Creek from Occoquan Bay, providing fish with spawning habitat and birds with an additional food source.

In Little Marsh Creek, the replacement of the water control structure would encourage vegetation such as winterberry, possum-haw (*Viburnum nudum*), and fetterbush to provide additional habitat to wildlife. After replacing the current water control structure with a bottomless arched culvert, the water in Little Marsh Creek would flow more freely within the creek, restoring the natural hydrology and lowering the water level within the impoundment. Vegetation could then grow in edge areas of the impoundment that were previously submerged underwater.

Threatened and Endangered Species, and Other Special Status Species

Affected Environment

Description of Affected Environment for the Affected Resource

According to the Service Information for Planning and Consultation Tool (IPaC), species of special concern within the affected environment include Bald eagles (*Haliaeetus leucocephalus*), candidate monarchs (*Danaus plexippus*), proposed listed tricolored bat (*Perimyotis subflavus*), and the federally endangered Northern Long-eared Bat (*Myotis septentrionalis*).

The Northern Long-eared bat and tricolored bat were reclassified as federally endangered and proposed to be listed as federally endangered, respectively, in 2022 under the Endangered Species Act due to population declines and extinction possibilities caused by range-wide impacts of white-nose syndrome, a fungal disease (USFWS 2021; USFWS 2022a). Other possible factors affecting population declines include habitat loss or modification, destruction and disturbance, climate change, and wind energy-related mortality (USFWS 2021; USFWS 2022a).

Management strategies to protect these species include disease management, addressing wind turbine mortality, and hibernacula protection (USFWS 2021; USFWS 2022a). Northern long-eared bats are protected under the Endangered Species Act and are found in 37 states and eight provinces in North America while tricolored bats are proposed for protection and are

found in 39 states and four provinces. Both species typically spend winters hibernating in caves or mines, known as hibernacula, and spend the remainder of the year in forested habitats. These bats roost either individually or in colonies underneath bark, in cavities, or in crevices of both live trees and snags, or dead trees (USFWS 2015; USFWS 2021).

Bald eagle populations have rebounded since being designated as federally endangered in 1967. Through captive breeding programs, reintroduction efforts, law enforcement, and nest site production, the Service and partners were able to accelerate the pace of recovery for bald eagles. Although removed from the federal list of threatened and endangered species in 2007, the bald eagle remains one of the refuge's priority management concerns as an establishing factor. The refuge will continue to monitor the species' local population health, productivity, and any potential wintering and breeding habitat threats (USFWS 2011).

Bald eagles are numerous throughout the refuge complex and are protected by both the Migratory Bird Species Act and the Bald and Golden Eagle Protection Act. Their historic range was from Alaska and Canada, across the contiguous United States and down to northern Mexico (USFWS 2007). Bald Eagles can be found in a variety of habitats but require a reliable food base. They are mainly found near rivers, lakes, and marshes, but have also been increasingly found in drier areas farther from water sources such as farmland, urban, and suburban habitat (USFWS 2023b). Eagles breed and rear chicks from December 15 through July 15 (USFWS 2007; USFWS 2023b).

Monarch is a candidate species for protections under the Endangered Species Act. Listing was determined warranted after an extensive status assessment of the monarch butterfly but was precluded at that time by higher priority listing actions (USFWS 2020a). The two North American migratory populations of monarch have experienced significant population declines due to loss and degradation of habitat, continued exposure to insecticides, and effects of climate change.

Management strategies aimed at protecting monarchs focus on preserving, restoring, enhancing, and creating habitat conducive to their survival. Central to these efforts is the restoration and enhancement of milkweed and nectar resources, as monarchs rely on milkweed for oviposition and larval feeding, and nectar for sustenance during migration and at migration grounds (USFWS 2020a). Though Mason Neck NWR hosts both milkweed and nectar-bearing plants, critical elements of the monarch habitat, these elements are not present within the proposed project areas of High Point Creek and Little Marsh Creek.

Description of Cumulative Impacts, Environmental Trends, and Planned Actions

The same environmental trends that affect other wildlife species and habitats (development and land use; climate change and SLR) would also directly and indirectly adversely affect threatened and endangered species on the Refuge.

Impacts on Affected Resource

Alternative A – No Action Alternative

Under the No Action Alternative, impacts to federally threatened and endangered species or species of special concern would remain consistent with current conditions.

Alternative B – Proposed Action Alternative

The proposed action would likely have insignificant impacts on the monarch, bald eagle, tricolored bat, or northern long-eared bat as preferred habitat for these species does not exist in the project areas. However, negative short-term impacts could include temporary displacement or disturbance during construction periods.

Northern long-eared bats spend winters in hibernacula typically in the western part of the state. They typically hibernate most often in small crevices or cracks within various sized caves or mines with constant temperatures, high humidity, and no air currents (USFWS 2015). There are no known locations of hibernaculum and maternity roosting near Fairfax County; therefore, the proposed action is not expected to adversely affect this species (VDWR 2023). Furthermore, no mature trees are planned for removal on refuge lands as part of the proposed project. While the project will comply with Time of Year restrictions specific to Northern long-eared bats in Virginia (April 1 to November 14) for tree clearing as a precautionary measure, the need for tree removal is not anticipated. An ESA Section 7 determination found the proposed action would not likely adversely affect the Northern long-eared bat.

Tricolored bats spend winters in hibernacula in the western part of the state. They typically hibernate most often in small crevices or cracks within various sized caves or mines. Where caves are sparse, tricolored bats often hibernate in road-associated culverts, as well as sometimes in tree cavities and abandoned water wells (USFWS 2021). Summer roosting primarily occurs among live and dead leaf clusters of live or recently dead deciduous hardwood trees. Tricolored bats display high site fidelity, with numerous individuals returning annually to the same hibernacula, and females, in particular, returning to the same roosting area (USFWS 2021). The Virginia Fish and Wildlife Information Service lists the species as known or likely within Fairfax County (VAFWIS 2024), and it was detected on the refuge during bat acoustic surveys in 2018 (USFWS 2018). Additionally, there are no plans to remove mature trees on refuge lands as part of the proposed project. Although the project will adhere to Time of Year restrictions specific to Tricolored bats in Virginia (May 15 to July 31) for tree clearing as a precautionary measure, it is expected that no tree removal will be necessary. An ESA Section 7 determination concluded that the proposed action is not likely to adversely affect the tricolored bat (Appendix B).

Bald Eagles are highly sensitive to human disturbance during their breeding and nesting season (USFWS 2007). Under the proposed action, the Service would avoid potential adverse impacts

on bald eagles by strictly following the best management practice guidelines developed from the Bald and Golden Eagle Protection Act (16 U.S.C. § 668-668d). Guidelines include sight and distance setbacks from nest sites and concentration areas and time-of-year restrictions such as no construction activity occurring within 330 feet of known nesting sites and concentration areas (USFWS 2007). The proposed project areas are not within 330-foot of known nesting and concentration sites; therefore, construction activities are deemed likely to have little to no impact on the bald eagle (CCB 2024).

This project is not anticipated to impact monarch butterfly populations. Though Mason Neck NWR hosts both milkweed and nectar-bearing plants, critical elements of the monarch habitat, these elements are not present within the proposed project areas of High Point Creek and Little Marsh Creek.

Habitat and Vegetation (including vegetation of special management concern)

Affected Environment

Description of Affected Environment for the Affected Resource

Habitats on Mason Neck NWR consist of mature piedmont acidic oak-hickory forest, coastal plain piedmont seepage swamp, tidal freshwater wetlands, and impounded wetlands (Figure 3). The proposed project areas are predominantly situated within the impounded wetlands (USFWS 2019a). Dominant species include smartweeds (*Persicaria spp.*), buttonbush (*Cephalanthus occidentalis*), pickerelweed (*Pontederia cordata*), arrow arum (*Peltandra virginica*), common rush (*Juncus effusus*), three-way sedge (*Dulichium arundinaceum*), tussock sedge (*Carex stricta*), marsh St. John's-wort (*Triadenum virginicum*), spatterdock (*Nuphar advena*), and swamp rose mallow (*Hibiscus moscheutos*) (USFWS 2019b). Invasive plants including Chinese lespedeza (*Lespedeza cuneata*), mile-a-minute (*Persicaria perfoliata*), Japanese honeysuckle (*Lonicera japonica*), and Chinese silvergrass (*Miscanthus sinensis*), are present along the High Point Creek dike.

Description of Cumulative Impacts, Environmental Trends, and Planned Actions

Warming, whether it results from anthropogenic or natural sources, is expected to affect a variety of natural processes and associated resources. However, the complexity of ecological systems means that there is a tremendous amount of uncertainty about the actual impact of climate change.

It is possible the distribution of plant species will change due to warming temperatures and changes in rainfall and/or storm patterns. Species more abundant in southern regions may begin to prosper further north, with warming temperatures. Unfortunately, it is difficult to predict these changes. Regardless of the alternative, the refuge continues to monitor both biological and public use metrics and will adapt and mitigate as necessary to meet refuge objectives.

Impacts on Affected Resource

Alternative A – No Action Alternative

Under the no-action alternative, the High Point Creek and Little Marsh Creek impoundments would remain as muted tidal wetlands that receive limited tidal influence in the short-term. The existing habitat and vegetation would remain essentially unchanged.

The current conditions of muted tidal flow on the High Point Creek and Little Marsh Creek impoundments (e.g., reduced tidal range, inundation frequency, and exchange) reduces the quantity and quality of available habitat for tidal wetland-associated species. Significant long-term impacts would likely occur under the no action alternative as SLR and the continued activities of beavers would hasten the deterioration of dikes at High Point Creek and Little Marsh Creek by blocking the water control structures, and the reduced rate of tidal sediment accretion would lead to increased frequency, duration, and magnitude of tidal inundation in the project areas. These changes would lead to gradual conversions or loss of vegetated wetland habitats.

Alternative B - Proposed Action Alternative

The preferred alternative would provide long-term minor to moderate benefits to habitats and vegetation by restoring about 67.7 acres of historic tidal wetland within the current High Point Creek and Little Marsh Creek impoundments. This action would involve management of vegetation communities with the goal of restoring a diversity of native species and limiting invasive plant species.

The project areas are vulnerable to loss of vegetated wetland habitats due to SLR. Sediment transport from Occoquan River and subsequent accretion on High Point Creek and Little Marsh Creek impoundments has the potential to slow or prevent this habitat loss if the rate of accretion exceeds SLR. Actions proposed under this alternative would increase sediment accretion by re-introducing tidal flow and removing the High Point Creek dike and associated water control structures and replacing the water control structure in the Little Marsh Creek impoundment. The High Point Creek dike and Little Marsh Creek water control structure currently reduce sheet flow and associated Occoquan River sediment load from reaching the marsh surfaces during minor and moderate storm events.

Construction activities including dike removal, culvert replacement, and rip rap placement would temporarily impact localized vegetation and habitat. This removal and destruction of habitat would be minimized using BMPs. Since the overall goals of the proposed actions would be to restore historic tidal wetland habitat, the most frequently adversely impacted plants would not be native to the site or would be invasive species. Areas disturbed by project activities would be seeded or planted with native species.

The presence of machinery and additional people during the construction process could aid the

spread of species. However, invasive species spread would be mitigated by implementing BMPs, such as washing and cleaning all equipment prior to mobilization; removing nonnative materials encountered during excavation; replanting with weed-free native grasses, trees, and shrubs; and other practices, as appropriate and practicable, described in the Region 1 Practices to Minimize the Introduction of Invasive Species by Service Activities (USFWS 2017).

Geology and Soils

Affected Environment

Description of Affected Environment for the Affected Resource

The project areas are located within unconsolidated surficial swamp deposits dating back to the Holocene era. These deposits are predominantly composed of mud, muddy sand, and muck, interspersed with abundant decaying leaf and stem material, as well as tree trunks. Typically, these deposits form a thin layer, less than 3 meters (10 ft) thick, directly overlaying the alluvial fill of stream valleys.

In the project areas, the predominant soils are Honga peat at the High Point Creek impoundment and Hatboro silt loam at the Little Marsh Creek Impoundment (USDA 2019). Honga peat, characterized by very poor drainage and negligible runoff, consists primarily of organic material over loamy alluvium, with a thickness exceeding 80 inches. Situated in submerged upland tidal marshes, Honga peat experiences frequent flooding and ponding, typically maintaining a water table at surface level. Its minor component, Elkton, contributes to drainage ways within coastal plain hardwood swamps. Hatboro silt loam, derived from alluvium of igneous and metamorphic rock, exhibits poor drainage, negligible runoff, and a high-water transmission capacity. With a shallow depth to the water table (0 to 18 inches) and frequent flooding, Hatboro silt loam has a depth to restrictive features exceeding 80 inches and a moderate available water supply. This soil type is associated with the hydric riparian and swamp meadow-shrub-forest ecological sites (USDA 2019).

Diking of tidal wetlands for prolonged periods to create impoundments or for other uses often leads to changes in sediment accretion, soil organic content, soil density, and marsh surface elevation loss (subsidence). Dikes are a barrier to tidal inundation and suspended sediment movement. This reduces the flood delivery of inorganic sediment and lowers sediment accretion rates (e.g., Thom 1992). Elevation loss of up to one meter has been documented in various diked and newly restored tidal wetlands in the Pacific Northwest, although the extent of impacts may vary by geographic location and how long the wetland was diked (Frenkel and Morlan 1991, Brophy 2009, Brophy et al. 2017, Clifton et al. 2018, Poppe and Rybczyk 2021, Janousek et al. 2022). Subsidence of High Point Creek impoundment has impacted the dike as sinkholes have formed on the top of the dike.

Description of Cumulative Impacts, Environmental Trends, and Planned Actions

Many soil properties would be affected by the changes in temperature, precipitation regime, extreme events, and SLR associated with climate change. For example, increases in temperature may contribute to increasing the rates of soil biogeochemical property changes (e.g., organic matter decomposition, denitrification, methanogenesis). There is high uncertainty with downscaled predictions of precipitation change (Gerzelak et al. 2021); however, changes in precipitation and extreme weather events may affect water table level and the frequency and duration of saturated soils, which would affect biogeochemical processes (Trettin et al. 2019). Changes in flooding and salinity due to SLR will affect soil carbon and nutrient cycling, although whether these conditions would stimulate or inhibit the biochemical processes is highly dependent upon local conditions. Climate change may also have indirect impacts to soil processes through changing plant community composition (Janousek et al. 2017).

No known planned actions by nearby municipalities, state government, tribal government, other federal agencies, or other parties are likely to cause significant adverse effects to geologic or soil physical characteristics relevant to the proposed High Point Creek and Little Marsh Creek impoundment restoration project areas.

Impacts on Affected Resource

Alternative A – No Action Alternative

The continued, long-term degradation of tidal wetland soils would be expected under current management, the no-action alternative. The presence of dikes and restrictive culverts would prevent or limit regular tidal inundation, lowering the amount of sediment delivery and accretion within the project areas. These factors, along with the draining of organic soils and soil compaction, would contribute to subsidence. With reduced potential for sediment accretion, the project areas would be less ecologically resilient to rising sea levels. Furthermore, the aging and deteriorating infrastructure, including failing water control structures and eroding dikes, would continue to pose risks of catastrophic failure during storm events, further disrupting the natural hydrological balance and exacerbating erosion and sedimentation issues.

Alternative B – Proposed Action Alternative

Under the preferred alternative, there would be long-term beneficial effects of restoring the natural processes of tidal inundation and sediment deposition to the proposed project areas. Dike removal at High Point Creek and culvert replacement at Little Marsh Creek would allow for improved conveyance of sediment. The likelihood of increased inundation through daily tides and seasonal flooding and the associated increase in tidal sediment deposition would cause an eventual rise in land elevation and return to anoxic, or oxygen poor, wetland soil conditions, which would promote the formation of productive wetlands and mudflats. Native tidal wetland vegetation is adapted to natural flooding and salinity regimes and following restoration, grows

quickly and dies back annually, adding large quantities of organic material to the marsh surface and below the surface via roots and rhizomes. Carbon accumulated in these soils is held there for centuries unless disturbed (i.e., carbon sequestration and storage), helping to mitigate anthropogenic climate change. Additionally, by improving hydrologic connectivity, sediment transport, and floodplain deposition processes, the preferred alternative would increase resilience of the project areas to SLR.

Adverse impacts to geology and soils under Alternative B would be direct and indirect, short-term, of minor to moderate effect, and localized to the project areas. These impacts stem from the use of heavy machinery and construction equipment and may include soil compaction, temporary grading, short-term downstream sediment deposition, and increased soil erosion and runoff in the immediate area of construction operations. Specific construction impacts such as compaction and erosion would be temporary and would be mitigated by utilizing BMPs, required regulations, and guidelines (Virginia Erosion and Sediment Control Regulations, Code of Virginia, 9 VAC 25-840) such as low ground pressure equipment and wood mats for tracked equipment to reduce rutting and compaction (USDA 2019). Exposed soils could erode at higher rates than under current conditions. At Little Marsh Creek, areas in the immediate project area that are disturbed above mean higher high water (MHHW) would be re-seeded or re-planted with native vegetation to facilitate revegetation. Areas below MHHW would be allowed to naturally regenerate, as seeding would not be effective due to daily tidal inundation under existing and proposed conditions. Re-seeding would not be necessary at High Point Creek following construction. Because of this and because the site is relatively flat, surface runoff after restoration would be low energy, and onsite erosion would be minimal.

Air Quality

Affected Environment

Description of Affected Environment for the Affected Resource

The air quality in the Washington D.C. metropolitan and surrounding area is experiencing gradual improvement, although excessive ozone and some particulates remain problematic (USFWS 2011). During the summer, high-pressure systems stagnate the area and cause occasional air pollution episodes. The Virginia Department of Environmental Quality (VDEQ) monitors levels of ozone and particle pollution from several stations in Virginia which may be viewed at <https://www.deq.virginia.gov/air/air-quality-monitoring-assessments/air-quality-reports>. Particle pollution is made up of particles found in soot, dust, smoke, and fumes. The burning of coal, oil, diesel, and other fuels produces these particles (VDEQ 2023). Vehicles emissions are a significant source of smog pollution in Northern Virginia (VDEQ 2023).

Particulate matter is directly emitted from motor vehicles through their tailpipes, as well as through normal brake and tire wear. In addition, vehicles cause dust from paved and unpaved

roads to be re-entrained, or re-suspended, in the atmosphere (USFWS 2011).

Activities on the refuge comply with all applicable federal, State, and local air pollution control requirements as specified in Section 118 of the Clean Air Act, as amended.

Description of Cumulative Impacts, Environmental Trends, and Planned Actions

No known environmental trends or planned actions by nearby municipalities, state government, tribal government, other federal agencies, or other parties are likely to cause significant adverse effects to air quality relevant to the proposed High Point Creek and Little Marsh Creek impoundment habitat restoration project areas.

Impacts on Affected Resource

Alternative A – No Action Alternative

There would be minimal negative impacts to air quality under Alternative A, as current conditions would be maintained.

The need for frequent inspections and water level management entails daily or twice daily trips, approximately 25 miles round trip, to access both the High Point Creek and Little Marsh Creek impoundments. These vehicle emissions contribute to local air pollution, particularly in an area already affected by vehicle-related smog pollution (VDEQ 2023). Furthermore, the repeated vehicle trips on both paved and unpaved roads can re-suspend particulate matter into the atmosphere, worsening air quality (USFWS 2011). The increased vehicular activity associated with monitoring the dike exacerbates emissions of pollutants such as nitrogen oxides and volatile organic compounds, which are precursors to ozone formation, thereby potentially contributing to higher levels of ozone pollution in the region (VDEQ 2023).

Alternative B - Proposed Action Alternative

Alternative B would cause direct, short-term, negligible to minor adverse impacts to air quality during construction or other on-the-ground activities. These impacts include exhaust emissions from off-road heavy equipment, on-road hauling, workers and employee commuting vehicles, and fugitive dust emissions from earthmoving activities. These impacts may extend beyond the project site.

These project areas must comply with Clean Air Act ozone NAAQS conformity mandates (EPA 2023). Measures to restrict emissions of VOCs (volatile organic compounds) and oxides of nitrogen (NOx) shall be implemented during the project. Construction vehicles shall be maintained to run efficiently and avoid excessive amounts of pollutant. Construction practices shall include provisions for control of fugitive dusts as outlined in Virginia's Emission Standards Code (9 VAC 5-50-60). Provided that these requirements are adhered to, the proposed project is not likely to adversely impact air quality.

We anticipate modest positive impact in air quality by limiting the routine and intensive

management currently required by the water control structures at both project areas. Eliminating the need for weekly water level management, annual or biannual mowing, and herbicide application reduces fossil fuel consumption used in equipment and vehicles.

Water Quality

Affected Environment

Description of Affected Environment for the Affected Resource

Water quality plays a critical role in shaping the ecological health and biodiversity of High Point Creek and Little Marsh Creek impoundments within Mason Neck National Wildlife Refuge. As integral components of the refuge's aquatic landscape, these impoundments provide crucial breeding, feeding, and refuge areas for a diverse array of plant and animal species. However, the quality of water within these habitats is susceptible to degradation from various anthropogenic activities.

In addition, direct water pollution from sources such as motor fuels and runoff from urban and agricultural areas further exacerbates the challenges faced by the High Point Creek and Little Marsh Creek impoundments (USFWS 2011). These pollutants introduce harmful chemicals and contaminants into aquatic habitats, potentially causing toxicity to aquatic organisms and disrupting the delicate balance of aquatic ecosystems (Wurtsbaugh et al. 2019). Such anthropogenic pressures underscore the urgent need for comprehensive management strategies to safeguard water quality and preserve the ecological integrity of Mason Neck NWR's aquatic ecosystems.

Description of Cumulative Impacts, Environmental Trends, and Planned Actions

No known environmental trends or planned actions by nearby municipalities, state government, tribal government, other federal agencies, or other parties are likely to contribute to compounding impacts on water quality relevant to the proposed High Point Creek and Little Marsh Creek impoundment habitat restoration project areas.

Impacts on Affected Resource

Alternative A – No Action Alternative

There would be no changes to the water quality since no changes would be made in the no-action alternative. The water quality would continue to be subjected to current management actions.

Degrading structures such as dikes and roads near wetlands, as well as shoreline erosion caused by wake-producing vessels along the Potomac River, pose significant threats to water quality in High Point Creek and Little Marsh Creek impoundments (USFWS 2011). The introduction of sediments and associated nutrients resulting from these activities can disrupt natural ecosystem processes, leading to increased turbidity, reduced light penetration, and altered nutrient dynamics, all of which can have negative long-term impacts on water quality and

ecosystem health (Wurtsbaugh et al. 2019).

Alternative B – Proposed Action Alternative

Beneficial long-term changes to water quality would result from the preferred alternative. Sediment would be conveyed more effectively from the creeks in the project areas through removal of topographic barriers (i.e., dikes) and via restored and enhanced tidal and floodplain channels. The restored marsh system would also improve drainage and flushing resulting in less ponding and stagnant water.

There would be the potential for some minor temporary impacts to water quality during restoration. Temporary impacts to water quality could result from exposure of soils during restoration. Exposed soils could erode at higher rates than under current conditions. Because the site is relatively flat, surface runoff after restoration would be low energy, and onsite erosion would be minimal. Therefore, the contribution of sediment to the local stream channels and the estuary from the proposed project are expected to be a less-than-significant adverse impact. Restoration activities would require the use of heavy equipment to move earth, disc the site, excavate the new culvert crossings and channels, and resurface the road. These activities pose the risk of water contamination from petroleum products. Implementation of BMPs and other measures associated with all construction activities would reduce the likelihood of contamination. All impacts to water quality would be temporary and long-term impacts would be minimal and/or positive from the restored tidal wetland system. BMPs, including placing rip rap on exposed slopes, for erosion and sediment control would minimize adverse impacts.

Floodplains

Affected Environment

Description of Affected Environment for the Affected Resource

According to the Federal Emergency Management Agency area flood maps (51059C0430E and 51059C0390E, both effective on 9/17/2010), the project areas are within the 100-year floodplain (FEMA, 2023). The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. For both sites, the base flood elevation is nine feet.

In late 2021, a regional hydrologist and two technicians conducted hydrology survey in High Point Creek. The purpose of this survey was to determine whether some portion of the dike or its entirety would need to be removed to restore the tidal connectivity between the creek and bay. The elevation data were used in the hydrological model to predict the tidal connectivity in 8 different scenarios of dike breach. The modeling found that tidal connections could be restored to the impoundment with a breach greater than 50 feet wide. It also found that

removing the dike and restoring tidal connectivity would allow sediment transport into the impoundment, increasing the elevations to natural levels.

Description of Cumulative Impacts, Environmental Trends, and Planned Actions

No known environmental trends or planned actions by nearby municipalities, state government, tribal government, other federal agencies, or other parties are likely to contribute to compounding impacts to floodplains relevant to the proposed High Point Creek and Little Marsh Creek impoundment habitat restoration project areas.

Impacts on Affected Resource

Alternative A – No Action Alternative

In the absence of the proposed restoration project, the floodplains of High Point Creek and Little Marsh Creek impoundments are likely to continue experiencing limitations in hydrological connectivity and geomorphological processes. The retention of the impoundment dike at High Point Creek would perpetuate barriers to water exchange between the floodplain and the main channel, hindering natural sediment redistribution and geomorphic evolution (USFWS 2022b).

This lack of connectivity may lead to stagnant water conditions and reduced habitat diversity within the floodplain ecosystem, potentially limiting the establishment and persistence of wetland vegetation communities. Additionally, the retention of the existing water control structure at Little Marsh Creek impoundment would maintain artificial drainage patterns, which could impact floodplain hydrology and habitat dynamics.

Alternative B – Proposed Action Alternative

The preferred alternative would restore about 67.7 acres of palustrine-associated habitat, reducing the acreage of muted tidal wetlands, and increasing the functionality of tidal wetlands within High Point Creek and Little Marsh Creek. Plant communities indicative of tidal wetlands are expected to become re-established in the project areas. The restoration actions in the preferred alternative would increase hydrologic complexity and connectivity resulting in a multi-flow path network which would increase flow capacity and, therefore, allow water to move throughout the wetland and floodplain system more readily and regularly. The restored tidal water levels would flood portions of the High Point Creek and Little Marsh Creek daily.

This resulting increased flow would increase sediment transport and nutrient exchange, improving the water quality and wetland habitat for aquatic organisms. The restored channel and wetland system would also improve drainage and flushing resulting in less ponding and stagnant water often used as mosquito breeding habitat. The hydrologic complexity and restored functional wetlands of preferred alternative would also provide resilience to climatic disturbances, such as SLR. Overall, in the long term, the relatively small scale of the (7% of historic estuary) preferred alternative would have minor to moderate long term beneficial effects to wetland functions.

The proposed restoration project within is expected to have beneficial impacts on the floodplains of High Point Creek and Little Marsh Creek impoundments. Removal of the impoundment dike at High Point Creek, which currently impedes water connectivity from the river, is anticipated to facilitate improved hydrological exchange between the floodplain and the main channel (USFWS, 2022).

This increased connectivity is likely to enhance sediment redistribution and promote natural geomorphological processes within the floodplain ecosystem (Poppe and Rybczyk, 2021). Additionally, the replacement of the existing water control structure at Little Marsh Creek impoundment with a concrete culvert is intended to mimic natural drainage patterns, potentially improving habitat conditions within the floodplain.

Visitor Use and Experience

Affected Environment

Description of Affected Environment for the Affected Resource

Mason Neck NWR is open to all six priority public uses: wildlife observation, photography, environmental education, interpretation, hunting, and fishing. Over 120,500 individuals visited the refuge in 2023. Most visitors accessed the refuge via High Point Road or three public hiking and biking trails (Figure 2). Staff hosts a three-day annual public deer hunt in conjunction with Mason Neck State Park typically in November and December. The public may access the Great Marsh for fishing via non-motorized boat. The immediate project areas of High Point Creek and Little Marsh Creek impoundments are not open to the public.

Description of Cumulative Impacts, Environmental Trends, and Planned Actions

No known environmental trends or planned actions by nearby municipalities, state government, tribal government, other federal agencies, or other parties are likely to cause significant adverse effects to Visitor Use and Experience relevant to the proposed High Point Creek and Little Marsh Creek impoundment habitat restoration project areas.

Impacts on Affected Resource

Alternative A - No Action Alternative

There would be negligible impacts to visitor use and experience under Alternative A, as the High Point Creek and Little Marsh Creek impoundments are closed to public use, and current conditions would be maintained.

Alternative B – Proposed Action Alternative

The proposed project will not increase visitation to the refuge. The proposed project site is closed to visitor use and located over 1.5 miles from the nearest public trail and road. Visitors may experience reduced traffic speeds and temporary delays along with visual and noise

disturbance on High Point Road as project materials and equipment are transported to and from the project site. Project activity will not occur on scheduled deer hunt dates. Therefore, the proposed action is anticipated to have little to no effect on visitor use and experience.

Cultural Resources

Affected Environment

Description of Affected Environment for the Affected Resource

Mason Neck NWR lies within the ancestral territory of the Tauxenent people, a tribe of the Algonquin Federation. Residing along the western bank of the Potomac River, encompassing modern Fairfax and Prince William counties in Virginia, the Algonquin-speaking Tauxenent established their larger settlements closer to the Potomac, while leading hunting expeditions and establishing seasonal camps near water bodies like the Occoquan River. Mason Neck NWR is also located within the Gunston Hall/Mason Neck Historic District. Encompassing approximately 5,100 acres along the Potomac River, this district features Gunston Hall, the former plantation home of George Mason IV. Constructed in the mid-18th century, Gunston Hall provides insight into colonial-era life and the Mason family.

The Mason Neck area has numerous archeological sites. To comply with the NHPA, the Service identified known historic properties within the Area of Potential Effect (APE) using the Virginia Cultural Resources Information System (VCRIS) and Service files. One site, 44FX1471, was determined to be within the APE (VCRIS 2023). Site 44FX1471 is a multicomponent site extending approximately 2.1 acres with evidence from the Late Archaic, Middle and Late Woodland time periods (Wilson 1988; Moore 1990). Numerous raw and worked materials have been found during archeological surveys.

Description of Environmental Trends and Planned Actions

No known environmental trends or planned actions by nearby municipalities, state government, tribal government, other federal agencies, or other parties are likely to cause significant adverse effects to cultural resources relevant to the proposed High Point Creek and Little Marsh Creek impoundment habitat restoration project areas.

Impacts on Affected Resource

Alternative A – No Action Alternative

Disturbance to archeological sites or adverse effects to existing known cultural resources would not change from current conditions under the No Action Alternative.

Alternative B – Proposed Action Alternative

Section 106 of the NHPA, as amended, requires the Service to evaluate the effects of any of its actions on cultural resources (historic, architectural, and archeological properties). The

proposed activity has been reviewed and concurred by the Service's Regional Historical Preservation Officer and Cultural Resource staff. The Virginia SHPO concurred with the determination that the project will not adversely affect site 44FX1471 due to the planned use of 300 linear feet of construction matting (Figure 5). Another site, 44FX0701, was determined to be outside of the project Area of Potential Effect. The SHPO's determination of no adverse impact to historic properties is conditional upon the outcome of tribal consultation.

Any future projects requiring ground disturbance or deviations from the proposed project areas will require clearances from the Service's Regional Cultural Resource program.

Refuge Management and Operations

Affected Environment

Description of Affected Environment for the Affected Resource

Refuge infrastructure includes a refuge shop compound, quarters, two impoundment areas, and two overlook observation platforms. The refuge also includes paved and gravel roads, trails, boardwalks, kiosks, interpretive signs, outdoor restrooms, and visitor parking lots. There are currently five permanent employees stationed at the Complex which oversees Mason Neck NWR including a Refuge Manager, Maintenance Professional, Wildlife Biologist, Visitor Services Specialist, and Budget Administrator.

Water levels in High Point Creek and Little Marsh Creek are regulated using water control structures. Throughout most of the year, the water level is kept high to control growth of undesirable woody vegetation and to provide winter habitat for waterfowl. In July, the marsh is drawn down (water level reduced) to promote the growth of preferred waterfowl vegetation around the perimeter and encourage concentrations of fish in the deeper channels which increases the availability of prey for fledgling eagles and herons.

Description of Cumulative Impacts, Environmental Trends and Planned Actions

No known planned actions by nearby municipalities, state government, tribal government, other federal agencies, or other parties are likely to have compounding effects on refuge management or operations relevant to the proposed project areas.

Impacts on Affected Resource

Alternative A – No Action Alternative

Under the no action alternative, the refuge would continue to expend staff and equipment resources to manage water levels and maintain infrastructure at both project locations. Staff will reduce water by timing drainage with the Potomac River's daily low tides, requiring two visits by staff per day. Vegetation on top of the High Point Creek dike will continue to be maintained by mowing at least once during growing season, for safety inspection and management of dike and water control structures. The sinkholes, where the structure is

collapsed, are periodically filled in with gravel to support the heavy equipment mowing the vegetation on dike.

Alternative B – Proposed Action Alternative

Minimal additional staff costs and time associated with refuge infrastructure and operations are anticipated. Staff will observe the project site during the construction and for invasive plant colonization post construction.

Socioeconomics

Affected Environment

Description of Affected Environment for the Affected Resource

Mason Neck NWR is located within Fairfax County, the most populous county in Virginia. As of July 2019, the population of Fairfax County was estimated at 1,170,000 people (Han et al. 2022). From 2017 to 2018, the median household income in Fairfax County grew from \$118,279 to \$122,227, a 3.34 percent increase. (USCB 2019). The Northern Virginia region has grown by more than 630,000 residents over the past decade. The Metropolitan Washington Council of Governments (2022) population forecast predicts a growth of 1.4 million individuals by 2045.

To understand the communities within the immediate geographic area of the proposed project, this section discusses demographic and economic characteristics for five U.S. Census Bureau tracts located in Fairfax County, VA. Mason Neck NWR and the state park are located entirely within Census tract, 4163. The four adjacent Census tracts to the refuge, state park, and project areas are 4162, 4221.01, 4221.02, and 4222.02. The data analyzed included: population estimates, age, education, income, poverty rates, and employment (Tables 1 and 2).

In addition, descriptions of the local and regional economy, revenue sharing, and expenditures and local communities are provided.

Table 1. Comparison of Fairfax County, Virginia, Census Tract Data (USCB 2022, a,b,c,d,e,f).

Census Category	Tract 4163 (Project Area)	Tract 4162 (Fort Belvoir)	Tract 4221.01 (Lorton I-95 East)	Tract 4221.02 (Lorton I-95 East)	Tract 4222.02 (Lorton I-95 West)
Area (sq mi)	13.9	7.3	0.9	2.6	3.3
Population	2,025	5,201	6,872	6,677	6,444
Median Age	50.9	17.5	35.7	36.2	36.8

High School Graduates, includes equivalency, # of persons 25 years+	213	230	1,013	557	548
B.A./B.S. Degree or Higher, # of persons 25 years+	753	1,219	2,431	1,982	2,554
Median Household Income	\$169,167	\$89,026	\$116,204	\$137,923	\$103,744
Per Capita Income	\$81,526	\$24,339	\$43,014	\$44,109	\$38,074
Population in poverty	5.6%	6.9%	10.5%	2.9%	7.6%

Demographics

Population

The project areas are located within Census tract 4163. The tract is not as populated as the adjacent Census tracts as most of the land is held in conservation by federal, state, county, and non-government organizations. Table 1 shows the total population for Census tracts 4163, 4162, 4221.01, 4221.02, and 4222.02. The most populated Census tract 4221.01, but it is not much larger than Census tracts 4221.02 or 4222.02.

Education

A review of the Census Bureau data from 2021 reveals that in all five of the tracts there are larger numbers of people who completed a bachelor's degree or higher than people with high school diplomas or the equivalent. (Table 1).

Employment

The civilian and armed labor force numbers range from 1,016 for Census tract 4163 to 4,056 for Census tract 4221.01 (Table 2). Much of the labor force is employed, and 2021 Census tract unemployment rates are all lower than 4.0%. Tract 4162 encompasses Army Fort Belvoir thus there is a higher number of people employed by the armed forces.

Table 2. Labor Force and Unemployment, Fairfax County, Virginia (USCB 2022g).

Employment	Tract 4163 (Project Area)	Tract 4162 (Fort Belvoir)	Tract 4221.01 (Lorton I-95 East)	Tract 4221.02 (Lorton I-95 East)	Tract 4222.02 (Lorton I-95 West)
Civilian labor force employed	994	762	3,804	3,529	3,454

Civilian Labor Force Unemployed	40	66	129	185	164
Armed Forces	22	990	252	107	296
Not in Labor Force	488	757	1,293	1,143	1,523
Percent Unemployed	2.6%	2.6%	2.4%	3.7%	3.0%

Civilian employment data by industry and Census tract is shown in Table 3. According to 2022 Census data, the top three civilian industry groups for all Census tracts are professional, scientific, management, administrative services; educational services, health, and social assistance; and public administration. Information and wholesale trade industry numbers were relatively low for all census tracts. The agriculture industry sector was not analyzed because data for all tracts totaled zero.

Table 3. Civilian Employment by Industry, Fairfax County, Virginia (USCB 2022h).

Civilian Employment Industries	Tract 4163 (Project Area)	Tract 4162 (Fort Belvoir)	Tract 4221.01 (Lorton I-95 East)	Tract 4221.02 (Lorton I-95 East)	Tract 4222.02 (Lorton I-95 West)
Agriculture, forestry, fishing, hunting, & mining	3	0	0	0	0
Construction	130	16	41	158	205
Manufacturing	20	0	159	30	26
Wholesale Trade	8	11	49	19	0
Retail Trade	92	153	428	446	347
Transportation, Warehousing, Utilities	11	0	274	284	98
Information	27	8	16	18	35
Finance, Insurance, Real Estate	47	29	84	285	99

Civilian Employment Industries	Tract 4163 (Project Area)	Tract 4162 (Fort Belvoir)	Tract 4221.01 (Lorton I-95 East)	Tract 4221.02 (Lorton I-95 East)	Tract 4222.02 (Lorton I-95 West)
Professional, Scientific, Management, Administrative Services	207	24	1,170	481	716
Educational Services, Health, Social Assistance	144	197	476	672	617
Arts, Entertainment, Recreation, Accommodation Food Services	113	124	310	271	227
Other Services, Except Public Administration	29	39	171	201	195
Public Administration	148	147	707	685	751

Refuge Visitor Spending

Spending associated with recreational visits to national wildlife refuges generates significant economic activity. The Service report *Banking on Nature: The Economic Benefits of National Wildlife Refuge Visitation to Local Communities*, estimated the impact of national wildlife refuges on their local economies (Carver and Caudill 2007). According to the report, more than 34.8 million visits were made to national wildlife refuges in FY 2006 which generated \$1.7 billion of sales in regional economies. Accounting for both the direct and secondary effects, spending by national wildlife visitors generated nearly 27,000 jobs, and over \$542.8 million in employment income. Approximately 82 percent of total expenditures were from non-consumptive activities, 12 percent from fishing, and 6 percent from hunting (Carver and Caudill 2007).

Revenue Sharing

The Service makes revenue sharing payments to counties (or towns and cities) for the lands that the Service administers. When the Act of June 15, 1935, was passed (now commonly referred to as the Refuge Revenue Sharing Act, or 16 U.S.C. 715s), 25 percent of the net receipts collected from the sale of various products or privileges from refuge lands were paid to

the counties in which they were located. However, if no revenue was generated from the refuge lands, the county received no payment. The Refuge Revenue Sharing Act was amended in 1964 to provide a payment of either 25 percent of the net receipts, or three-quarters of 1 percent of the adjusted purchase price of refuge land, whichever was greater. The lands that were reserved from the public domain for national wildlife refuge purposes continued to receive 25 percent of the net receipts. The revenue sharing payments during these early years could only be used for roads and schools, but all counties with refuge lands received a payment as a result of the 1964 amendments.

Expenditures and Local Communities

There are four categories of expenditures where people can spend money and affect the local economy. The four categories are food, lodging, transportation, and other. The food category consists of food, drink, and refreshments. Lodging includes motels, cabins, lodges, or campgrounds. There is a variety of types of transportation including: airplanes, buses, car rentals, and private vehicles. The other category has a variety of ways visitors spend money that includes guide fees, pack trip or package fees, public land-use or access fees, private land use or access fees (not including leases), and equipment rentals. In addition, recreational visitors make purchases from local businesses for items to pursue their recreational experience.

This type of spending supports economic activity throughout the local economy. This is only a small part of the benefits' visitors receive from traveling to a given area, but it is important to the local economy. It is important to separate spending by people from outside the refuge's local economic area from spending by those who live in the local area. Local visitors (resident visitors traveling less than 50 miles) would probably have spent their recreation money in the local economy with or without the refuge. If they could not go birding, they might go bowling. If the expenditure is from outside the local area i.e., from non-resident visitors who travel more than 50 miles, it generates increased economic activity. If expenditures are from within the local economy and they would have occurred in the area anyway, it does not increase economic activity, but it is important for local businesses.

Description of Cumulative Impacts, Environmental Trends, and Planned Actions

No known environmental trends or planned actions by nearby municipalities, state government, tribal government, other federal agencies, or other parties are likely to contribute to impacts to socioeconomics relevant to the proposed High Point Creek and Little Marsh Creek impoundment habitat restoration project areas.

Impacts on Affected Resource

Alternative A – No Action Alternative

There would be no changes to the local and regional land uses or economies with the no-action alternative. Current management would continue so the impacts would stay the same.

Alternative B – Proposed Action Alternative

The preferred alternative is not likely to significantly impact the local economy. If local labor and equipment (e.g., heavy equipment rentals) is used for implementing the restoration, the effects on local employment and income would be minor and beneficial in the short term, especially by providing labor and income opportunities for local communities and individuals. If a contract is awarded to a non-local contractor, there could be small, temporary increases in local hotel and restaurant use, as well as potential contracted or sub-contracted project work (i.e., day workers). While this local spending and labor income would be a positive effect to local communities, it would represent a negligible percentage of the overall economy and would be temporary.

Environmental Justice

Affected Environment

Description of Affected Environment for the Affected Resource

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

Low-Income Populations

In 2021, the median household income in Census tract 4162 was \$89,026 while the other four Census tracts reported median incomes greater than \$100,000 (Table 4). Census tract 4163 has the highest median household income, highest per capita income, and second lowest population in poverty.

Table 4. Median Household Income, Per Capita Income, and Poverty Rate, Fairfax County, Virginia (US Census Bureau 2021c,d,e).

US Census Tracts	Median Household Income	Mean Household Income	Per Capita Income	Population in Poverty
Tract 4163 (Project Area)	\$164,625	\$222,071	\$81,526	5.6%
Tract 4162 (Fort Belvoir)	\$102,375	\$116,611	\$24,339	6.9%
Tract 4221.01 (Lorton East I-95)	\$123,472	\$133,878	\$43,014	10.5%

US Census Tracts	Median Household Income	Mean Household Income	Per Capita Income	Population in Poverty
Tract 4221.02 (Lorton East I-95)	\$143,255	\$158,273	\$44,109	2.9%
Tract 4222.02 (Lorton West I-95)	\$112,472	\$135,823	\$38,074	7.6%

Underrepresented Populations

There were eight populations compared in five Census tracts that are described in Table 5. In Census tracts 4163 and 4162, the largest number for a race category was white (alone), both much larger than other race categories. In comparison, in Census tracts 4221.01, 4221.02, and 4222.02 the largest numbers for race category were Black or African American (alone). Asian (alone) and Hispanic or Latino (of any race) numbers are also of note in the Census tracts listed in Table 5.

Table 5. Comparison of Race, Fairfax County, Virginia (US Census Bureau 2021h).

Local US Census Tracts	White (alone)	Black or African American (alone)	American Indian and Alaska Native (alone)	Native Hawaiian & Other Pacific Islander (alone)	Hispanic or Latino (of any race)	Asian (alone)	Two or more races	Other race (alone)
Tract 4163 (Project Area)	1,581	90	6	1	165	99	193	55
Tract 4162 (Fort Belvoir)	3,143	827	28	37	833	178	766	222
Tract 4221.01 (Lorton East I-95)	1,847	2,244	53	9	1,475	1,179	807	733
Tract 4221.02 (Lorton East I-95)	1,502	2,499	36	4	1,313	1,225	715	696

Tract 4222.02 (Lorton West I-95)	1,531	2,127	4	28	747	1,686	15	316
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Description of Cumulative Impacts, Environmental Trends, and Planned Actions

The Environmental Justice implications of the proposed action were evaluated for potential impacts on populations located near the proposed project areas using data from the 2021 U.S. Census presented in Tables 4 and 5. This project is not expected to have effects on any populations.

Impacts on Affected Resource

Alternative A - No Action Alternative

The Service does not anticipate significant environmental justice concerns associated with environmental stressors that would result from selection of the No Action alternative.

Alternative B - Proposed Action Alternative

The Service has evaluated and determined there are no significant environmental justice concerns associated with the environmental stressors affected by selection of the proposed alternative within the project areas, Census Tract 4163, when compared to surrounding Census Tracts. The project area, Census Tract 4163, has the highest income levels, highest number of individuals who identify as white alone, second lowest population in poverty, and lowest number of unemployed individuals. All Census tracts surveyed had higher numbers of individuals with a B.A./B.S. Degree or higher than high school graduates or equivalency. The Service anticipates the short-term increase in noise and traffic to be minimal and temporary, and will not result in a significant environmental justice impact to the communities surrounding the proposed project areas as compared to the No Action alternative.

Monitoring

The Potomac River NWR Complex prepared an inventory and monitoring plan (IMP) to describe the current or expected inventory and monitoring (I&M) activities selected to help Refuge staff (1) evaluate and refine efficacy of resource management actions and (2) measure progress toward achieving resource management objectives identified in refuge planning documents (USFWS 2020b). Some surveys gather baseline data to develop practical and measurable objectives for restoration projects or provide baseline data on biological integrity of a refuge. The IMP also includes cooperative surveys addressing resource issues of the Service at larger landscape scales beyond the Complex (e.g., ecoregion, seascape) or needs of other agencies and organizations. For cooperative surveys, refuge lands are one of multiple sites, including other refuges, to address broad-scale resource information needs. Although the IMP identifies many surveys that would need to be conducted, the number of surveys implemented on an

annual basis is contingent upon multiple factors, including available funding and staffing as well as support from cooperators.

Refuge staff would conduct site visits during the construction and following completion of the proposed project (Alternative B) to monitor the project areas and document findings per the protocol in Inventory and Monitoring Plan (USFWS 2020b). Research biologists conduct aerial bald eagle nest surveys on a biannual basis. Staff will use data from the survey flights to determine if nests are within 330 ft of the project areas and manage the site accordingly.

The Service, U.S. Geological Survey, the States, Ducks Unlimited, and other non-governmental agencies participated in the Integrated Waterbird Management and Monitoring program at Mason Neck from 2012-2019, collecting waterbird population and habitat data to assess local habitat conditions and quantify wetland use by waterbirds during the non-breeding season (Loges et al. 2018, USFWS 2020b). Survey data from continued participation in this program will help show changes before and after the water control structure restoration at Little Marsh Creek and the dike removal at High Point Creek.

Summary of Analysis

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

Alternative A – No Action Alternative

Alternative A would not meet the purpose of and the need for action. As described above, under Alternative A, the Service would not restore 67.7 acres of palustrine-associated habitats within the High Point Creek and Little Marsh Creek impoundments, thereby limiting wetland functions such as the provision of quality fish and wildlife habitat and resiliency to sea level rise and other effects of climate change. The current conditions of muted tidal flow on the High Point Creek and Little Marsh Creek impoundments (e.g., reduced tidal range, inundation frequency, and exchange) reduces the quantity and quality of available habitat for tidal wetland-associated species.

Under the No Action alternative, the Service would not pursue the removal of the High Point Creek dike, Little Marsh Creek water control structure replacement, and associated rip rap placement at each project area. There would be no impacts to the refuge's operations, physical environment, wildlife populations, habitats, or visitors. There would be no change to the current public use and wildlife management programs on the refuge. The refuge would not increase its impact on the economy.

Alternative B – Proposed Action Alternative

Alternative B would restore 67.7 acres of palustrine-associated habitats to the High Point Creek

and Little Marsh Creek impoundments. Doing so would result in short-term, minor adverse environmental impacts and considerations, and modest long-term benefits—improved water quality, sediment transport, climate change resilience, and native resident and migratory species recovery. Adverse impacts would be minimized through the implementation of BMPs.

This alternative would help meet the purpose and needs of the Service as described above because it would restore palustrine-associated habitats that had been altered historically while increasing resiliency of new and existing tidal wetlands to climate change impacts and providing flood risk reduction. The proposed action would contribute to the biological integrity, diversity, and environmental health of coastal ecosystems. Native fish and wildlife would benefit from the improved quantity and quality of habitat. The Service has determined that the proposed action is compatible with the purposes of Mason Neck NWR and the mission of the Refuge System. The impacts of Alternative B would be less-than-significant.

Alternative B would not result in significant adverse effects to the human environment. Implementing Alternative B would not affect public health or safety; would not result in disproportionately high or adverse human health or environmental effects on minorities and low-income populations and communities; would not result in effects that are highly uncertain or involve unique or unknown risks; would not negatively impact cultural resources or species listed under the federal ESA; would not cause the destruction of significant scientific, cultural, or historical resources; nor would it violate federal, state, or local law or requirements imposed for the protection of the environment.

List of Sources, Agencies and Persons Consulted

Conference calls, video calls, emails, and personal interactions with the following persons from September 2020 through July 2024:

- Dan Miller, Hydrologist, USFWS Northeast Region
- Fred Wurster, Hydrologist, USFWS Headquarters Office
- Kris Houle, Restoration Biologist, USFWS Northeast Region
- Amy Wood, Historic Preservation Officer, USFWS Northeast Region
- Esther Westfall, Archaeologist, USFWS Northeast Region
- David Byrd, Partners for Fish and Wildlife Biologist, USFWS Virginia Field Office
- Mike DePue, Northern Virginia Regional Parks
- Lance Elzie, Park Manager, Mason Neck State Park
- Susanna Hopkins, Biologist-South Atlantic, Ducks Unlimited
- Ethan Massey, Regional Biologist, Ducks Unlimited

- Chelsea Jeffries, Architectural Historian, Virginia Department of Historic Resources
- Ben Lewis, Waterfowl Biologist, Virginia Department of Wildlife Resources
- Jordan Green, District Biologist, Virginia Department of Wildlife Resources

List of Preparers

- Christopher Wicker, Wildlife Biologist, Potomac River NWRC
- Kathryn Minczuk, Conservation Planner, USFWS Northeast Region
- Amanda Daisey, Project Leader, Potomac River NWRC
- Ethan Hammer, Wildlife Refuge Specialist, Cape May NWR
- Isaiah Thomas, Intern, Student Conservation Association

Determination

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

- The Service's action will not result in a significant impact on the quality of the human environment. See the attached "**Finding of No Significant Impact**".
- The Service's action **may significantly affect** the quality of the human environment and the Service will prepare an Environmental Impact Statement.

Northeast Regional Chief, National Wildlife Refuge System

Date:

References

- Allen, Michael J. and Allen, Thomas R. 2019. "Precipitation Trends across the Commonwealth of Virginia (1947 – 2016)," *Virginia Journal of Science*: Vol. 70: No. 1, Article 4. Accessed February 2024 at <https://digitalcommons.odu.edu/vjs/vol70/iss1/4/>
- Carver, E., and Caudill, J., 2007, *Banking on nature 2006—The economic benefits to local communities of National Wildlife Refuge visitation*: U.S. Fish & Wildlife Service, Division of Economics, Washington, D.C., Accessed August 2023.
<http://npshistory.com/brochures/nwr/banking-on-nature-2007.pdf>
- CCB (Center for Conservation Biology). 2024. CCB Mapping Portal, Virginia Eagle Nest Locator. Accessed July 2024 at <https://ccbbirds.org/maps/#eagles>.
- Center for Conservation Biology (CCB). 2021. Bald Eagle Nest and Great Blue Heron Rookery Surveys at Mason Neck, Occoquan Bay, and Featherstone National Wildlife Refuges. GIS data.
- Cole, D.N. 1990. Ecological impacts of wilderness recreation and their management. In J.C. Hendee, G.H. Stankey, and R.C. Lucas (Eds.), *Wilderness Management* (pp. 425–466). Golden, CO: North American Press.
- Cole, D.N. and R. L. Knight. 1990. Impacts of recreation on biodiversity in wilderness. *Natural Resources and Environmental Issues*, 0, 33-40.
- Dollan, I.J., V. Maggioni, and J. Johnston. 2022. Investigating Temporal and Spatial Precipitation Patterns in the Southern Mid-Atlantic United States. *Front. Clim.* 3:799055. doi: 10.3389/fclim.2021.799055
- EPA (Environmental Protection Agency). 2023. National Ambient Air Quality Standards (NAAQS): Scientific and Technical Information. Accessed February 2023 at: <https://www.epa.gov/naaqs>.
- FEMA (Federal Emergency Management Agency). 2023. FEMA Flood Map Service Center. Accessed April 2024 at: <https://msc.fema.gov/portal/home>
- Grzelak, J., K. Quion, and J. Shortridge. 2021. *Understanding Climate Change Projections in Virginia*. Virginia State University, Virginia Cooperative Extension. Accessed April 2024: https://ext.vt.edu/content/dam/pubs_ext_vt_edu/BSE/bse-342/BSE-342.pdf
- Han, X., F. Khaja, F. Carnes, and M. Anash. 2022. *Demographic Reports 2021, County of Fairfax, Virginia*. Economic, Demographic and Statistical Research, Department of Management and Budget, Fairfax County, Virginia. Accessed February 2023: <https://www.fairfaxcounty.gov/demographics/sites/demographics/files/assets/demographicreports/fullrpt.pdf>

- Loges, B. W., B. G. Tavernia, A. M. Wilson, J. D. Stanton, J. H. Herner-Thogmartin, T. Jones, and L. Wires. 2018. National protocol framework for the inventory and monitoring of nonbreeding waterbirds and their habitats, an Integrated Waterbird Management and Monitoring (IWMM) approach. Natural Resources Program Center, Fort Collins, CO.
- Lyttle P.T., J.N. Aleinikoff, W.C. Burton, E. A. Crider Jr., A.A. Drake Jr., A.J. Froelich, J.W. Horton Jr., G. Kasselas, R.B. Mixon, L. McCartan, A.E. Nelson, W.L. Newell, L. Pavlides, D.S. Powars, C.S. Southworth, and R.E. Weems. 2017. Geological Map of the Washington West 30' x 60' Quadrangle, Maryland, Virginia, and Washington D.C.. U.S. Geological Survey. Accessed February 2023 at: <https://pubs.usgs.gov/of/2017/1142/ofr20171142.pdf>.
- Marler, P., M. Lonishi, A. Lutjen, and M. S. Waser. 1973. Effects of continuous noise on avian hearing and vocal development. *Proceedings of the National Academy of Sciences of the United States of America* 70(5):1393-1396.
- Metropolitan Washington Council of Governments (MWCOG). 2022. Round 9.2 Growth Trends to 2045 Cooperative Forecasting in Metropolitan Washington. Accessed February 2023 at: file:///C:/Users/amandadaisey/Downloads/Round_9.2_Growth_Trends_080420221.pdf
- Moore, Larry E. (1990) "The Little Marsh Creek Site, Mason Neck National Wildlife Refuge, Lorton, Virginia." Detailed assessment prepared for the U.S. Fish & Wildlife Service
- NOAA (National Oceanic and Atmospheric Administration). 2023. Relative Sea Level Trends. National Ocean Service website. Accessed February 2023. <https://tidesandcurrents.noaa.gov/sltrends/>
- Paxton, Bart. Personal communications. April 29, 2021.
- Poppe KL, Rybczyk JM. 2021. Tidal marsh restoration enhances sediment accretion and carbon accumulation in the Stillaguamish River estuary, Washington. *PLoS ONE* 16(9):e0257244. <https://doi.org/10.1371/journal.pone.0257244>
- Runkle, J., K.E. Kunkel, L.E. Stevens, S.M. Champion, B.C. Stewart, R. Frankson, W. Sweet, and S. Rayne, 2022: Virginia State Climate Summary 2022. NOAA Technical Report NESDIS 150-VA. NOAA/NESDIS, Silver Spring, MD, 5 pp. <https://statesummaries.ncics.org/chapter/va/>
- Trettin, C.C., M.F. Jurgensen, and Z. Dai. 2019. "Chapter 9 – Effects of Climate Change on Forested Wetland Soils." *Developments in Soil Science* 36:171–188. <https://doi.org/10.1016/B978-0-444-63998-1.00009-4>
- USCB (U.S. Census Bureau). 2019. 2018 County and Metro Area Population Estimates. Accessed February 2023 at: <https://www.census.gov/newsroom/press-kits/2019/metro-county-pop-estimates.html>
- USCB. 2022a. S0101 Age and Sex. American Community Survey. Accessed May 2024.

<https://data.census.gov/table?t=Age+and+Sex&g=1400000US51059416200,51059416300,51059422101,51059422102,51059422201>

USCB. 2022b. S1501 Educational Attainment. American Community Survey. Accessed August 2023.
<https://data.census.gov/table?t=Educational+Attainment&g=1400000US51059416200,51059416300,51059422101,51059422102,51059422201>

USCB. 2022c. S1901 Income in the Past 12 Months (in 2021 Inflation Adjusted Dollars). American Community Survey. Accessed August 2023.
<https://data.census.gov/table?t=Income+and+Poverty&g=1400000US51059416200,51059416300,51059422101,51059422102,51059422201>

USCB. 2022d. B19301 Per Capita Income in the Past 12 Months (in 2021 Inflation Adjusted Dollars). American Community Survey. Accessed August 2023.
<https://data.census.gov/table?q=per+capita+2021&g=1400000US51059416200,51059416300,51059422101,51059422102,51059422202>

USCB. 2022e. S1701 Poverty Status in the Past 12 Months. American Community Survey. Accessed August 2023.
<https://data.census.gov/table?q=per+capita+2021&t=Poverty&g=1400000US51059416200,51059416300,51059422101,51059422102,51059422202&tid=ACSST5Y2021.S1701>

USCB. 2022f. DP03 Selected Economic Characteristics. American Community Survey. Accessed August 2023.
<https://data.census.gov/table?t=Employment+and+Labor+Force+Status&g=1400000US51059416200,51059416300,51059422101,51059422102,51059422201>

USCB. 2022g. S2403 Industry by Sex for the Civilian Employes Population 16 Years and Over. American Community Survey. Accessed August 2023.
<https://data.census.gov/table?t=Employment:Employment+and+Labor+Force+Status:Industry&g=1400000US51059416200,51059416300,51059422101,51059422102,51059422201>

USCB. 2022h. P1 Race Populations and People. American Community Survey. Accessed May 2024.
<https://data.census.gov/table?t=Populations+and+People&g=1400000US51059416200,51059416300,51059422101,51059422102,51059422201>

USDA (U.S. Department of Agriculture). 2019. Web Soil Survey. Natural Resources Conservation Science. Accessed February 2023 at:
<https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>

USFWS (U.S. Fish and Wildlife Service). 1985. Mason Neck National Wildlife Refuge 1985 Annual Narrative. Unpublished report to U.S. Fish and Wildlife Service, Woodbridge, Virginia.

USFWS. 1990. Mason Neck National Wildlife Refuge Marsh and Water Plan. Unpublished report

compiled 1/08/1990.

USFWS. 2007. National Bald Eagle Management Guidelines. United States Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, VA. Accessed February 2023 at <https://www.fws.gov/media/national-bald-eagle-management-guidelines>.

USFWS. 2011. Elizabeth Hartwell Mason Neck National Wildlife Refuge and Featherstone National Wildlife Refuge Comprehensive Conservation Plan, Hadley, Massachusetts.

USFWS. 2015. Northern Long-Eared Bat *Myotis septentrionalis*. Accessed February 2023 at https://www.fws.gov/sites/default/files/documents/508_NLEB%20fact%20sheet.pdf

USFWS. 2017. Region 1 Practices to Minimize the Introduction of Invasive Species by Service Activities. Department of the Interior, Fish and Wildlife Service, Portland, OR. 40 pp. <https://ecos.fws.gov/ServCat/Reference/Profile/132877>.

USFWS. 2018. Resident Bat Inventory Monitoring for Region 5 National Wildlife Refuges – Mason Neck NWR [dataset].

USFWS. 2019a. High Point Creek Dike Vulnerability Assessment, Mason Neck NWR. Unpublished Report.

USFWS. 2019b. Elizabeth Hartwell Mason Neck National Wildlife Refuge and Featherstone National Wildlife Refuge Habitat Management Plan, Hadley, Massachusetts.

USFWS. 2020a. U.S. Fish and Wildlife Service. 2020. Monarch (*Danaus plexippus*) Species Status Assessment Report. V2.1 96 pp + appendices.

USFWS. 2020b. Potomac River National Wildlife Refuge Complex Inventory and Monitoring Plan, Hadley, Massachusetts.

USFWS. 2021. Species Status Assessment Report for the Tricolored Bat, Hadley, Massachusetts.

USFWS. 2022a. Endangered and Threatened Wildlife and Plants; Endangered Species Status for Northern Long-Eared Bat. Federal Register 87(56):16442- 16452.

USFWS. 2022b. High Point Creek Impoundment Hydrologic Modeling Survey, Mason Neck NWR. Unpublished Report.

USFWS. 2023a. Waterfowl population status, 2023. U.S. Department of the Interior, Washington, D.C. USA.

USFWS. 2023b. "Bald Eagle". Accessed April 2023 at: <https://www.fws.gov/species/bald-eagle-haliaeetus-leucocephalus>

- Virginia Department of Environmental Quality (VDEQ). 2023. Air Quality Reports. Accessed February 2023 at: <https://www.deq.virginia.gov/air/air-quality-monitoring-assessments/air-quality-reports>
- Virginia Fish and Wildlife Information Service (VAFWIS). 2024. Occurrence chapter for Bat, tri-colored (050027). Accessed June 2024 at: https://services.dwr.virginia.gov/fwis/booklet.html?Menu=_.Occurrence&bova=050027&version=19891
- Virginia Department of Wildlife Resources VDWR. 2023. Northern Long-Eared Bat Winter Habitat & Roost Trees. Accessed February 2023 at: <https://dwr.virginia.gov/wildlife/bats/northern-long-eared-bat-application/>
- Wilson, John S., 1988. "Archaeological Survey: Mason Neck NWR Erosion Control Project, Lorton, VA" USFWS
- Wurtsbaugh WA, Paerl HW, Dodds WK. 2019. Nutrients, eutrophication and harmful algal blooms along the freshwater to marine continuum. WIREs Water; 6:e1373. <https://doi.org/10.1002/wat2.1373>

Appendix A

OTHER APPLICABLE STATUTES, EXECUTIVE ORDERS & REGULATIONS

Cultural Resources

- American Indian Religious Freedom Act, as amended, 42 U.S.C. 1996 - 1996a; 43 CFR Part 7
- Antiquities Act of 1906, 16 U.S.C. 431-433; 43 CFR Part 3
- Archaeological Resources Protection Act of 1979, 16 U.S.C. 470aa-470mm; 18 CFR Part 1312; 32 CFR Part 229; 36 CFR Part 296; 43 CFR Part 7
- National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470-470x-6; 36 CFR Parts 60, 63, 78, 79, 800, 801, and 810
- Paleontological Resources Protection Act, 16 U.S.C. 470aaa-470aaa-11
- Native American Graves Protection and Repatriation Act, 25 U.S.C. 3001-3013; 43 CFR Part 10
- Executive Order 11593 – Protection and Enhancement of the Cultural Environment, 36 Fed. Reg. 8921 (1971)
- Executive Order 13007 – Indian Sacred Sites, 61 Fed. Reg. 26771 (1996)

Fish and Wildlife

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

Natural Resources

- Clean Air Act, as amended, 42 U.S.C. 7401-7671q; 40 CFR Parts 23, 50, 51, 52, 58, 60, 61, 82, and 93; 48 CFR Part 23

Appendix B

SECTION 7 NO EFFECTS DETERMINATION CONCURRENCE



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Virginia Field Office
6669 Short Lane
Gloucester, VA 23061



Date: March 6, 2023

Self-Certification Letter

Project Name: Tidal marsh restoration in High Point Creek.

Dear Applicant: Christopher Wicker

Thank you for using the U.S. Fish and Wildlife Service (Service) Virginia Ecological Services online project review process. By submitting this letter, in conjunction with your project review package to our office for review, you are certifying that you have completed the online project review process for the project named above in accordance with all instructions provided, using the best available information to reach your determinations. From the date of receipt, our office has 60 days (50 CFR § 402.13(c)(2)) to review your project package. If we do not concur with the Section 7 determination(s) provided or if we have any questions/concerns regarding the information provided, you will be contacted. If you are not contacted during the 60-day review period, this letter and your project review package, complete the review of your project in accordance with the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended (ESA). This letter also provides information for your project review under the National Environmental Policy Act of 1969 (P.L. 91-190, 42 U.S.C. 4321-4347, 83 Stat. 852), as amended. A copy of this letter and the project review package must be submitted to this office for this self-certification letter to be valid. This letter and the project review package will be maintained in our records.

The ESA Section 7 Determination Table in the enclosed project review package summarizes your ESA analyses and determinations. These analyses resulted in a "no effect" and/or a "may affect, not likely to adversely affect" determination for proposed/listed species and/or proposed/designated critical habitat.

The use of the online project review process in strict accordance with the instructions provided as documented in the enclosed project review package resulted in reaching the appropriate determinations. Therefore, we concur with the not likely to adversely affect determination(s) for proposed/listed species and proposed/designated critical habitat provided in the ESA Section 7 Determination Table.

Should project plans change, surveys expire, or information on the distribution or status of proposed/listed species and/or proposed/designated critical habitat become available/change, this letter is no longer valid and you must submit an updated project package.

Note that under 50 CFR 402.12(e) of the regulations implementing Section 7 of the ESA, the accuracy of official species lists should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information.

Information about the online project review process including instructions and use, species information, and other information regarding project reviews within Virginia is available on our website (<https://www.fws.gov/office/virginia-ecological-services/virginia-field-office-online-review-process>). If you have any questions, please contact Troy Andersen of this office at (804) 824-2428.

Sincerely,

A handwritten signature in blue ink that reads "Cynthia A. Schulz". The signature is written in a cursive style and is centered on the page.

Cindy Schulz
Field
Supervisor
Virginia Ecological Services

Enclosures - project review package



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694



In Reply Refer To:
Project code: 2024-0048475
Project Name: Tidal marsh restoration in High Point Creek.

March 05, 2024

Federal Nexus: no
Federal Action Agency (if applicable): Department of Interior

Subject: Technical assistance for 'Tidal marsh restoration in High Point Creek.'

Dear Christopher Wicker:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on March 05, 2024, for 'Tidal marsh restoration in High Point Creek.' (here forward, Project). This project has been assigned Project Code 2024-0048475 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements are not complete.**

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project.

Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat Rangewide Determination Key (Dkey), invalidates this letter. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid.***

Determination for the Northern Long-Eared Bat

Based upon your IPaC submission and a standing analysis, your project is not reasonably certain to cause incidental take of the northern long-eared bat. Unless the Service advises you within 15 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the Action is not likely to result in unauthorized take of the northern long-eared bat.

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination for the northern long-eared bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

Monarch Butterfly *Danaus plexippus* Candidate

Tricolored Bat *Perimyotis subflavus* Proposed Endangered

You may coordinate with our Office to determine whether the Action may cause prohibited take of the animal species and/or critical habitat listed above. Note that if a new species is listed that may be affected by the identified action before it is complete, additional review is recommended to ensure compliance with the Endangered Species Act.

Next Steps

Coordination with the Service is complete. This letter serves as technical assistance. All conservation measures should be implemented as proposed. Thank you for considering federally listed species during your project planning.

We are uncertain where the northern long-eared bat occurs on the landscape outside of known locations. Because of the steep declines in the species and vast amount of available and suitable forest habitat, the presence of suitable forest habitat alone is a far less reliable predictor of their presence. Based on the best available information, most suitable habitat is now expected to be unoccupied. During the interim period, while we are working on potential methods to address this uncertainty, we conclude take is not reasonably certain to occur in areas of suitable habitat where presence has not been documented.

If no changes occur with the Project or there are no updates on listed species, no further consultation/coordination for this project is required for the northern long-eared bat. However, the Service recommends that project proponents re-evaluate the Project in IPaC if: 1) the scope, timing, duration, or location of the Project changes (includes any project changes or amendments); 2) new information reveals the Project may impact (positively or negatively) federally listed species or designated critical habitat; or 3) a new species is listed, or critical habitat designated. If any of the above conditions occurs, additional coordination with the Service should take place before project implements any changes which are final or commits additional resources.

If you have any questions regarding this letter or need further assistance, please contact the Virginia Ecological Services Field Office and reference Project Code 2024-0048475 associated with this Project.

Action Description

You provided to IPaC the following name and description for the subject Action.

Name

Tidal marsh restoration in High Point Creek.

Description

The following description was provided for the project 'Tidal marsh restoration in High Point Creek.':

The project involves removing the dike from the mouth of High Point Creek, restoring the natural tidal hydrology to the Creek.

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@38.627389949999994,-77.20108803584608,14z>



DETERMINATION KEY RESULT

Based on the answers provided, the proposed Action is consistent with a determination of “may affect, but not likely to adversely affect” for the Endangered northern long-eared bat (*Myotis septentrionalis*).

QUALIFICATION INTERVIEW

Does the proposed project include, or is it reasonably certain to cause, intentional take of the northern long-eared bat or any other listed species?

Note: Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

No

The action area does not overlap with an area for which U.S. Fish and Wildlife Service currently has data to support the presumption that the northern long-eared bat is present. Are you aware of other data that indicates that northern long-eared bats (NLEB) are likely to be present in the action area?

Bat occurrence data may include identification of NLEBs in hibernacula, capture of NLEBs, tracking of NLEBs to roost trees, or confirmed NLEB acoustic detections. Data on captures, roost tree use, and acoustic detections should post-date the year when white-nose syndrome was detected in the relevant state. With this question, we are looking for data that, for some reason, may have not yet been made available to U.S. Fish and Wildlife Service.

No

Does any component of the action involve construction or operation of wind turbines?

Note: For federal actions, answer ‘yes’ if the construction or operation of wind power facilities is either (1) part of the federal action or (2) would not occur but for a federal agency action (federal permit, funding, etc.).

No

Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

No

PROJECT QUESTIONNAIRE

IPAC USER CONTACT INFORMATION

Agency: Department of Interior Name: Christopher Wicker Address: 14050 Dawson Beach

Road City: Woodbridge

State: VA

Zip: 22191

Email christopher_wicker@fws.gov Phone: 5712600076

Endangered Species Act (ESA) Section 7 Determination Table

Project Name: Tidal marsh restoration in High Point Creek.

Date: February 14, 2024

Consultation Code: 2024-0048475

<p>Species / Resource Name <i>Insert name of species or resource as listed on Official Species List.</i></p>	<p>Habitat/Species Presence in Action Area <i>Indicate if suitable habitat and species are present in the Action Area (see examples in Step 5).</i></p>	<p>Sources of Info <i>Explain what info suitable habitat/species presence is based on.</i></p>	<p>ESA Section 7 Determination <i>Using reasoning and decision tables in Step 5, select determination for each species (e.g. no effect, not likely to adversely affect, or likely to adversely affect).</i></p>	<p>Project Elements that Support Determination <i>Explain which project elements may impact the habitat or individuals of each species and any Avoidance and Minimization Measures being implemented.</i></p>
<p>Northern Long-eared Bat (<i>Myotis septentrionalis</i>)</p>	<p>Suitable habitat present; species not present</p>	<p>VA DWR's NLEB Winter Habitat and Roost Trees website does not show its hibernaculum or maternity roosting areas near the Refuge, but it shows the nearest NLEB capture located in Prince William Forest Park or Quantico Marine Corps Base; Virginia Fish and Wildlife Service lists species as known or likely within Fairfax County. The species was not detected on the refuge during acoustic surveys for bats in 2018.</p>	<p>Not likely to adversely affect</p>	<p>The project will adhere to Time of Year restrictions (April 1 to November 14) for tree clearing as mitigation to support the species, although the project is expected not to have any tree removal.</p>
<p>Tricolored Bat (<i>Perimyotis subflavus</i>)</p>	<p>Suitable habitat present; species present</p>	<p>VA DWR's Little Brown & Tri Colored Hibernacula website (MYLU PESU Habitat mapping website) does not show its hibernaculum areas near the Refuge; Virginia Fish and Wildlife Information Service lists this species as known or likely within Fairfax County. The species was detected on the refuge during acoustic surveys for bats in 2018.</p>	<p>Not likely to adversely affect</p>	<p>The project will adhere to Time of Year restrictions (May 15 to July 31) for tree clearing as mitigation to support the species, although the project is expected not to have any tree removal.</p>
<p>Monarch Butterfly (<i>Danaus plexippus</i>)</p>				<p>This butterfly is a candidate species. The milkweed plant is not found in the project area.</p>