United States Fish and Wildlife Service

Elizabeth Hartwell Mason Neck
National Wildlife Refuge

Environmental Assessment

Public Drinking Water Connection to
E.H. Mason Neck NWR and
Mason Neck State Park Facilities

October 2023

Headquartered at:
Potomac River National Wildlife Complex
14050 Dawson Beach Road
Woodbridge, Virginia 22191

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This Draft Environmental Assessment is being prepared to evaluate the effects associated with the proposed action and complies with the National Environmental Policy Act in accordance with Council on Environmental Quality regulations (40 C.F.R. §§ 1500-1509) and Department of the Interior (43 C.F.R. § 46; 516 DM 8) and U.S. Fish and Wildlife Service (550 FW 3) regulations and policies. The National Environmental Policy Act (NEPA) requires examination of the effects of proposed actions on the natural and human environment.

Proposed Action

The U.S. Fish and Wildlife Service (Service) is proposing to connect facilities on Elizabeth Hartwell Mason Neck National Wildlife Refuge (Mason Neck NWR) to a drinking water source by partnering with Mason Neck State Park to install an underground watermain. Mason Neck NWR and Mason Neck State Park are experiencing ongoing water quality issues with the existing well-based water systems. A new water main will provide a reliable public water system that achieves safe drinking water standards. The Virginia Department of Conservation and Recreation (VDCR) completed an Environmental Impact Statement Report (EIS). This EA builds upon the VDCR EIS and focuses on potential project impacts to Mason Neck NWR.

A proposed action is often iterative and may evolve during the NEPA process as the agency 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.

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 (NWRSAA), 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 NWRSAA 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.

Therefore, it is a priority of the Service to cooperate with owners of land adjoining refuges such as Virginia Department of Conservation and Recreation (DCR) to provide a drinking water source which meets safety standards if compatible with the purposes for which the refuge was established and the mission of the NWRS.

Purpose and Need for the Action

The purpose of this proposed action is to provide a reliable water system that achieves drinking water standards. Mason Neck State Park, overseen by the Virginia DCR, experiences ongoing water quality issues with the existing well-based water system. Bacteria, manganese, and iron levels within the drinking water are of safety concern to the state park. Mason Neck NWR has experienced similar issues with drinking water wells at the maintenance shop and quarters facilities.

Alternatives

Alternative A – No Action Alternative

Under the No Action alternative, the Service would not connect refuge facilities to a safe drinking water source via an underground watermain. The Service and Virginia DCR would seek alternative safe drinking water solutions for the refuge and Mason Neck State Park.

Alternative B – Proposed Action Alternative

Under the Proposed Action Alternative, a new underground water main would be constructed and maintained at Mason Neck NWR. The proposed water main will be a 4-inch diameter line, outfitted with backflow preventors, an automatic flushing valve, and pressure reducing valves. The Service and Virginia DCR propose to replace the existing well-based supply system with a connection to the Fairfax County water supply system in two phases.

Phase I: The proposed Phase I water main route is approximately 2.79-mi long with 0.59-mi crossing Mason Neck NWR. This phase of the water main enters the refuge from Gunston Hall, a Virginia historic site, and ends at Mason Neck State Park (Figure 1). The area of potential effects is located along the northeastern edge of Mason Neck NWR. Construction will commence in a 16-ft wide by 0.59-mi area and will follow an existing overhead communications line ROW within the refuge. The project would impact 1.14 ac of refuge land previously cleared for an existing overhead communications line ROW. The anticipated installation and construction duration is three weeks. Work is expected to be conducted during normal hours of refuge operation or as otherwise approved by the Refuge Manager.

Phase II: The proposed water main route is approximately 1.25-mi long with 0.75-mi crossing Mason Neck NWR. The proposed construction will commence in a 16-feet wide and follow existing ROWs for overhead communications and power lines and an access road within the refuge and State Park (Figure 2). The project would impact 1.45 acres of refuge land previously cleared for existing utility ROWs and an access road. The anticipated installation and

construction duration is three weeks. When funding allows for Phase II to proceed, the Service will reapply for Section 7 and Cultural Resource Concurrence. Anticipate a similar construction timeline of three weeks.

The proposed Phase I and II routes are the least impactful to wildlife and the refuge as the project area will overlap with a preexisting overhead utility and road ROWs. Following the existing ROWs and roads eliminates the need to remove mature trees. To mitigate additional possible project effects, project work on refuge lands will not commence during forest breeding bird season, April 1 – July 15 nor within 330-feet of bald eagle nests during the breeding season window of December 15 – July 15. Additionally, the Service is requiring that ESA section 7 consultation recommendations for species of concern are adhered to (Appendix B). Furthermore, the Service concurs with the Virginia State Historic Preservation Office's condition that an archaeological monitor is present during the excavation of bore pits.

Phase I and II Construction Method: The underground water main will be installed using directional drilling. The directional drill is guided along a preplanned path to establish the pilot bore path and tracked using an electro-magnetic transmitter system to monitor the depth (typically 36 to 46-in below current grade), angle, rotation, direction, and drill temperature (Figures 3-6). Equipment will access the bore locations via the existing cleared overhead electric and communications line ROWs and roads; therefore, mature tree removal is not anticipated. The project will not remove soil and will not generate slurry ponds. Staging areas will be created and equipment will be stored off refuge lands. No hazardous materials will be used, produced, transported, or stored on federal lands. The average lifespan of the high-density polyethylene water main is 50-100 years with no maintenance requirements in the absence valve or equipment failure (Telfer 2022, Pers. comm).

This alternative fulfills the Service's mandate under the NWRSAA. The Service has determined that Alternative B is compatible with the purposes of Mason Neck NWR and the mission of the NWRS.

Alternative(s) Considered, But Dismissed from Further Consideration

Other project alternatives were considered but determined to be infeasible. Mason Neck State Park and Mason Neck NWR have replaced drinking wells and associated infrastructure several times over the past two decades. Installing a new drinking water well would be a temporary solution.

State Park and refuge staffs considered potential water main paths both outside and inside Mason Neck NWR boundaries. Suggested alternate routes traversed sensitive wetland areas and significant bald eagle breeding and wintering sites, the species integral to the establishment of both the refuge and state park.

Affected Environment and Environmental Consequences

This section is organized by affected resource categories and for each affected resource discusses both (1) the existing environmental and socioeconomic baseline in the action area for each resource and (2) the effects and impacts of the proposed action and any alternatives on each resource. The effects and impacts of the proposed action considered here are changes to the human environment, whether adverse or beneficial, that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives. This EA includes the written analyses of the environmental consequences on a resource only when the impacts on that resource could be more than negligible and therefore considered an "affected resource." 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 7) (USFWS 2019). The proposed action is located within two areas of the refuge's preexisting utility ROWs and roads (Figures 1 and 2).

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

Terrestrial Wildlife and Aquatic Species

Affected Environment

Mason Neck NWR's habitats host over 211 bird species, more than 300 plant species, 31 mammal species, and 40 species of reptiles and amphibians (USFWS 2019). Common species observed include bald eagle, wood thrush, white-tailed deer, groundhog, and wood duck (USFWS 2019). The Service, U.S. Geological Survey, the States, Ducks Unlimited, and other non-governmental agencies participate in the Integrated Waterbird Management and Monitoring program. Entities collect waterbird population and habitat data to assess local habitat conditions and quantify the use of wetlands by waterbirds during non-breeding season (Loges et al. 2018, USFWS 2020).

Impacts on Affected Resource

Alternative A – No Action Alternative

No impact to terrestrial wildlife and aquatic species on Mason Neck NWR.

Alternative B – Proposed Action Alternative

Potential impacts could include direct mortality of individuals, changes in wildlife behavior, construction noise disturbances, and changes in wildlife population structure, dynamics, and distribution patterns, (Cole 1990 and Cole and Knight 1990). The proposed project will occur within a preexisting overhead utility line ROW and roads eliminating the need to remove mature trees and significantly reducing the necessity to remove shrubs. Project equipment will be staged and stored off refuge lands also reducing the potential for grass disturbance.

Temporary noise-related disturbance due to equipment operation and human activity may occur during the construction period. Impacts of noise to wildlife 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. Due to the small size of the Phase I and II project areas and anticipated three-week construction period, impacts on terrestrial wildlife and aquatic species are anticipated to be minimal.

Threatened and Endangered Species, and Other Special Status Species

Affected Environment

According to the Service Information for Planning and Consultation Tool, species of special concern include federally endangered Northern Long-eared Bat (*Myotis septentrionalis*) and Bald eagles *(Haliaeetus luecocephalus*).

The Northern Long-eared bat was reclassified as federally endangered 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 2022a). Other possible factors affecting population declines include habitat loss or modification, destruction and disturbance, climate change, and wind energy-related mortality (USFWS 2022a). Management strategies to protect this species include disease management, addressing wind turbine mortality, and hibernacula protection (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. They 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).

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 2023). Eagles breed and rear chicks from December 15 through July 15 (USFWS 2007, 2023).

Impacts on Affected Resource

Alternative A – No Action Alternative

No impacts to federally threatened and endangered species or species of special concern on Mason Neck NWR.

Alternative B – Proposed Action Alternative

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). In addition, no mature trees will be removed on refuge lands as a part of the proposed project.

Bald Eagles are highly sensitive to human disturbance during their breeding and nesting season (USFWS 2007). We will 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 area is not within 330-foot of known nesting and concentration sites; therefore, construction activities are deemed likely to have little to no effect on the bald eagle (CCB 2023).

The proposed action would not likely negatively impact the bald eagle and northern long-eared bat as preferred breeding habitat does not exist in the project area. For more detail on Phase I impacts to threatened and endangered species, refer to the Intra-Service Section 7 Evaluation (Appendix B). When funding allows for Phase II, the refuge will initiate an Intra-Service Section 7 Evaluation for the proposed project area.

Habitat and Vegetation (including vegetation of special management concern)

Affected Environment

Habitats on Mason Neck NWR consist of mature piedmont acidic oak hickory forest, coastal plan piedmont seepage swamp, tidal freshwater wetlands, and impounded wetlands (Figure 7). The proposed project area is located within the forested habitat dominated by white, red, scarlet, and black oaks with mockernut, red, and pignut hickories (USFWS 2019). Understory tree and shrub species include American dogwood, holly, blackgum, and mapleleaf viburnum, downy arrowwood, lowbush blueberry, and deerberry (USFWS 2019). The refuge currently has two invasive plants of primary concern: Japanese stiltgrass and mile-a-minute. Management for invasive species at the refuge include preventing new introductions, eradicating localized occurrences, reducing the size of existing populations, and early detection and rapid response (USFWS 2011).

Impacts on Affected Resource

Alternative A – No Action Alternative

No impact to habitat and vegetation on Mason Neck NWR.

Alternative B - Proposed Action Alternative

Increased human activity related to the proposed project is not expected to significantly affect habitats and vegetation. The Phase I and II project timelines are three weeks, and only individuals associated with the project will enter the area. The project will be conducted on previously cleared and disturbed ROW areas and roads; therefore, no additional tree removal will occur (VDCR 2021). The spread of invasives may increase due to human movement by foot, vehicles, etc.; however, this can be avoided by following invasive species biosecurity protocols that include cleaning, treatment, and inspection of all project materials and personal items as well as considering additional measures such as maintaining good communication between workers and using low-risk sources of materials to and from project site (USFWS 2022b). Staff will monitor the area following project completion to ensure minimal to no establishment or spread of invasive plant species.

Geology and Soils

Affected Environment

The project area is in the Shirley Foundation (middle Pleistocene) and is described as underlain by medium- to coarse, light gray- to white sand, followed by light- to medium-gray sand with interbedded thin silt and clay beds with abundant wood fragments, followed by massive light-gray or greenish-gray sandy clay and silt (VDWR 2021). This is then followed by fine- to course, massive, orange-brown sand, which locally forms the uppermost part of the terrace (VDWR 2021). The geology of the project area consists of Coastal Plain sediments overlying granitic rocks of Paleozoic age (Lyttle et al. 2017).

The predominant soils occurring in the project area are Matapeake silt loam, Mattapex loam, and a Sassafras-Marumsco complex along with traces of Gunston silt loam, Sassafras sandy loam, Woodstown sandy loam, and Elkton silt loan (USDA 2019). Matapeake and Mattapex soils are well-drained with moderate-to-moderately slow permeability and moderate erosion potential (USFWS 2011). Elkton silt loam and Woodstown sandy loam both occur on nearly level landscapes in the lower Coastal Plain and both have low erosion potentials. Low areas of this Elkton silt loam, near larger streams, are within the floodplain. Elkton silt loam is poorly drained with slow-to-ponded surface runoff, while Woodstown sandy loam is moderately well-drained with slow-to-medium surface runoff and moderate permeability (USFWS 2011). Sassafras sandy loam occurs on hilltops and sideslopes on sandy Coastal Plain sediments. This soil is well-drained with slow to medium surface runoff, has moderate-to-moderately slow permeability, and a moderate erosion potential (USFWS 2011). The Sassafras-Marumsco complex, also known as Marine Clay, is a mixture of two soils—Sassafras sandy loam and Marumsco silt loam. This complex occurs along steeper slopes separating the high and low elevation areas of the Coastal Plain as well as along slopes bordering larger Coastal Plain streams; this soil is highly variable (DPWES 2013). Gunston silt loam occurs on flat portions of the Coastal Plain in Mason Neck (DPWES 2013). Although Mason Neck NWR has a variety of soils with different profiles and histories, they are all fertile, acidic soils with similar moisture capacity for growing coastal plain mixed hardwoods and conifers (McGlone and Lasher 2009).

Impacts on Affected Resource

Alternative A – No Action Alternative

No impact to geology and soils on Mason Neck NWR.

Alternative B – Proposed Action Alternative

Erosion and sediment control measures will be in accordance with the required regulations and guidelines (Virginia Erosion and Sediment Control Regulations, Code of Virginia, 9 VAC 25-840) and implemented to minimize impacts to nearby streams, rivers, and wetlands. Mitigation efforts include erosion and sediment controls and a reduction of ground disturbance through directional boring. Any soil encountered that is suspected of contamination of wastes that are generated will be tested and disposed of in accordance with applicable Federal, State, and local laws and regulations. Land disturbance will occur at bore pit sites which are located approximately 1000 feet apart along the proposed water line route (Figure 8). There is no land disturbance associated with directional drilling between bore pits.

Virginia DCR did not find evidence of mining, mineral resources, unusual geologic or palaeontologic resources, or geological hazards during a review of project area geological maps (VDCR 2021). Based on the method of construction (directional bore) and the lack of unusual geologic or palaeontologic resources found in the project area, the proposed action is not likely to have significant impacts on the geology and soils of Mason Neck NWR.

Air Quality

Affected Environment

The air quality in the Washington D.C. metropolitan and surrounding area is experiencing gradual improvement, although excessive ozone and some particulates remain a problem (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).

Impacts on Affected Resource

Alternative A – No Action Alternative

No impact to air quality on E.H. Mason Neck NWR.

Alternative B - Proposed Action Alternative

Construction activities can impact air quality through increased dust particulates in the atmosphere caused by grading, filling, removals, and other construction activities. Emissions from construction equipment and vehicles also play a role in increasing air pollution (Rahaman and Esa 2014). This project area 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 and given the three week estimated construction timelines for both Phase I and II, the proposed project is not likely to adversely impact air quality.

Water Quality

Affected Environment

Water quality has a substantial influence on the ability of aquatic habitats to support the vast biodiversity found on the refuge. Aquatic habitats on Mason Neck NWR include tidal freshwater wetlands, impounded wetlands, and forested wetlands USFWS 2011, 2019). This vast diversity of aquatic habitats can be degraded by activities which introduce large amounts of sediments and associated nutrients. This could include poorly maintained trails and roads near wetlands or shoreline erosion from large number of wake-producing vessels along the Potomac River.

Direct water pollution such as motor fuels and runoff can be toxic to small or isolated water bodies.

Impacts on Affected Resource

Alternative A – No Action Alternative

No impact to water quality on Mason Neck NWR.

Alternative B – Proposed Action Alternative

The potential for soil erosion and risk to water quality during construction is greatest when vegetation is removed for initial clearing and grading activities exposes soil and makes it vulnerable to erosion (Rahaman and Esa 2014). The project area does not encompass any wetland or aquatic habitats on the refuge (Figures 1, 2 and 4). Construction practices will include silt fences and other measures to curb erosion from run-off to avoid impacts to any adjacent wetland. An erosion and sediment control plan will be prepared and approved prior to initiating any land disturbance activities at the project site. Mitigation measures will include establishing vegetative buffers and re-vegetated denuded areas, where applicable, and implementing erosion and sediment control measures (VDCR 2021).

Floodplains

Affected Environment

According to the Federal Emergency Management Agency area flood map (51059C0395E dated 9/17/2010), the project area is outside areas identified within the 100-year floodplain (FEMA 2023).

Impacts on Affected Resource

Alternative A – No Action Alternative

No impact to floodplains on Mason Neck NWR.

Alternative B – Proposed Action Alternative

Construction boring locations will not be located within mapped AE Flood Zones. The proposed project will not alter the existing topography of the land; therefore, proceeding with the proposed project is not likely to adversely impact the 100-year floodplain.

Visitor Use and Experience

Affected Environment

Mason Neck NWR is open to all six priority public uses: wildlife observation, photography, environmental education, interpretation, hunting, and fishing. Over 121,700 individuals visited the refuge in 2022. Most visitors accessed the refuge via High Point Road or three public hiking and biking trails (Figure 9). 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.

Impacts on Affected Resource

Alternative A - No Action Alternative

Visitor use and experience would not be affected at Mason Neck NWR.

Alternative B – Proposed Action Alternative

The proposed project will not increase visitation to the refuge. The proposed project site is closed to visitor use; however, the location is adjacent to High Point Road and Trail. Visitors may experience temporary delays on the road and trail as materials or equipment are transported to and from the project site. Visitors may experience visual and noise disturbance due to construction activities, though these disturbances will be temporary and only occur during the proposed three week construction phase. 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

The proposed project corridor passes near approximately five known archaeological resources. These sites will be avoided during construction and bore pit activities. No architectural resources were identified in the project area. The project area will take place on previously disturbed land and boring will place the water main infrastructure at least four feet below the ground surface. The presence of archaeological resources is considered unlikely within those areas.

Impacts on Affected Resource

Alternative A – No Action Alternative

No disturbance to archeological sites or adverse effects to existing known cultural resources would occur on Mason Neck NWR and Mason Neck State Park.

Alternative B – Proposed Action Alternative

Section 106 of the National Historic Preservation Act of 1966, as amended, requires the Service to evaluate the effects of any of its actions on cultural resources (historic, architectural, and archeological properties). The Phase I proposed activity has been reviewed and cleared by the Service's Regional Historical Preservation Officer and Cultural Resource staff. The Virginia Department of Historic Resources (DHR) stated the Phase I project will have a conditional no adverse impact on archeological resources. Virginia DHR requires Virginia DCR to have an archaeological monitor present during bore pit excavations.

Any future projects requiring ground disturbance or deviations from the proposed project area will require clearances from the Service's Regional Cultural Resource program. When funding allows for proposed Phase II construction, the Service would complete a Section 106 evaluation with the Regional and State Historical Preservation Officers and Cultural Resource staffs as appropriate.

Refuge Management and Operations

Affected Environment

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 four permanent employees stationed at the Complex which oversees Mason Neck NWR including a manager, maintenance professional, wildlife biologist, and budget administrator.

Impacts on Affected Resource

Alternative A – No Action Alternative

Refuge management and operations would not be affected at Mason Neck NWR.

Alternative B – Proposed Action Alternative

Minimal additional staff costs and time associated with refuge infrastructure and operations are anticipated. Staff will observe the project sites during the construction timelines for Phase I and II and for invasive plant colonization post installation.

Socioeconomics

Affected Environment

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 area are 4162, 4221.01, 4221.02, and 4222.02 (Figure 10). 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 (US Census Bureau 2021a,b,c,d,e).

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 area is 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 (US Census Bureau 2021f).

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 2021 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 (US Census Bureau 2021g).

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)
Construction	126	13	45	190	252
Manufacturing	27	0	107	73	113
Wholesale Trade	33	38	56	17	0
Retail Trade	70	114	472	352	502
Transportation, Warehousing, Utilities	8	0	281	220	158
Information	14	7	18	19	24

Finance, Insurance, Real Estate	50	12	56	246	46
Professional, Scientific, Management, Administrative Services	195	14	1,112	628	640
Educational Services, Health, Social Assistance	179	241	384	930	660
Arts, Entertainment, Recreation, Accommodation Food Services	110	129	349	227	221
Other Services, Except Public Administration	31	33	219	139	197
Public Administration	148	161	705	488	641

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

The proposed project would provide socioeconomic benefits for the local community and region. The beneficial direct impacts would be more job opportunities to improve household incomes and per capita incomes. Having more jobs available also could decrease the poverty rate. There would be temporary socioeconomic benefits during the proposed project construction period. This could be economically beneficial to local businesses.

Impacts on Affected Resource

Alternative A - No Action Alternative

Although the "no action" alternative itself would not incur socioeconomic impacts, it would also not address the need to provide a reliable drinking water source.

Alternative B – Proposed Action Alternative

There may be a small increase in population, employment, and construction jobs. There would likely be no change in education because of this alternative.

Environmental Justice

Affected Environment

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)	$169,167	$216,880	$81,526	5.6%
Tract 4162 (Fort Belvoir)	$89,026	$98,100	$24,339	6.9%
Tract 4221.01 (Lorton East I-95)	$116,204	$125,152	$43,014	10.5%
Tract 4221.02 (Lorton East I-95)	$137,923	$144,944	$44,109	2.9%
Tract 4222.02 (Lorton West I-95)	$103,744	$121,163	$38,074	7.6%

Minority 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	715	316

Impacts on Affected Resource

Alternative A - No Action Alternative

Although the "no action" alternative itself would not incur environmental justice impacts, it would also not address the need to provide a reliable source of drinking water. The Service does not anticipate potential 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 potential short term environmental justice concerns associated with the environmental stressors affected by selection of the proposed alternative (preferred action) within the project area, 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./BS Degree or higher than high school

graduates or equivalency. The Service anticipates the short-term increase in noise and traffic, and the potential disturbance to wildlife species present on the refuge near the ROW, 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.

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 area using data from the 2021 U.S. Census presented in Tables 4 and 5. Minimal impacts are expected. Census tract 4163 which encompasses the project area has a significantly higher population of white (alone) than minority populations with a 5.6% poverty rate. Census tract 4162 has a slightly higher white (alone) population than minority population and a poverty rate of 6.9 %. There is a significantly higher percentage of minorities than whites (alone) in Census tracts 4221.01, 4221.02, and 4222.02 and an average poverty rate of 7.0 %.

Monitoring

Refuge staff will conduct site visits during the proposed construction phases as a part of normal management operations. Aerial bald eagle nest surveys are conducted on a biannual basis. Staff will use data from the flights to determine if nests are within 330 ft of the project area and manage the site accordingly. Staff will also monitor the area post construction as a part of invasive plant species mapping and treatment efforts. The Complex Inventory and Monitoring Plan (IMP) was approved in September 2020. Virginia DHR requires Virginia DCR to have an archaeological monitor present during bore pit excavations.

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

Under the No Action alternative, the Service would not pursue construction and maintenance of an underground watermain to Mason Neck State Park and refuge facilities. Virginia DCR and the Service would seek alternative safe drinking water solutions. 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

Under the Proposed Action Alternative, construction and maintenance of a new underground water main would commence through Mason Neck Sate Park and Mason Neck NWR. Virginia DCR and the Service propose to replace their respective existing well-based supply systems with a connection to the Fairfax County water supply system. As described above, the proposed

project route is the least impactful route to wildlife and habitat as the project area will overlap with a preexisting overhead communication and electric lines and access roads. The Service has determined that the proposed action is compatible with the purposes of Elizabeth Hartwell Mason Neck NWR and the mission of the NWRS. The applicable Compatibility Determination is attached in Appendix A.

List of Preparers

Potomac River National Wildlife Refuge Complex

- Layne Houk, Refuge Operations Intern, Student Conservation Association
- Amanda Daisey, Wildlife Refuge Manager
- Christopher Wicker, Wildlife Biologist

State Coordination

Conference calls, video calls, emails, and personal interactions with the following state employees and contractors starting in September 2021 through present day:

- Reinhardt Gray, Mason Neck State Park Manager, Retired
- Lance Elzie, Mason Neck State Park Manager
- Glenn Telfer, Retired Project Lead, TRC Companies, Contracted by Virginia DCR
- Mustafa Mahmoodzada, Project manager, TRC Companies, Contracted by Virginia DCR
- Edward Hoffman, TRC Companies, Contracted by Virginia DCR
- Laura Ayers, TRC Companies, Contracted by Virginia DCR
- John Small, Virginia Department of Conservation and Recreation

Phase I Tribal Consultation

The following federally recognized resident and interested Tribal Nations were invited to review and comment on the Phase I compatibility determination via phone, email, and/or hard copy:

Tribal Nation	Response: December 2022 – February 2023
Absentee Shawnee Tribe of Oklahoma	Invitation to consult confirmed received, no further response
Catawba Indian Nation	No immediate concerns, request halt in project progress and notification if artifacts or human remains are discovered.
Cherokee Nation of Oklahoma	Phone conversations, emails, voice mail messages, Fed Ex Delivered
Chickahominy Indian Tribe	Invitation confirmed as received, no further response
Chickahominy Indian Tribe - Eastern Division	No response to date: FedEx Delivered, emails not returned, phone number listed does not have voicemail capability
Delaware Nation, Oklahoma	Determined no adverse effect, request halt in project progress and notification if artifacts or human remains are uncovered
Delaware Tribe of Indians	Determined project to be outside ancestral territory, deferred to resident tribes
Eastern Band of Cherokee Indians	Invitation to consult confirmed received, no further response
Eastern Shawnee Tribe of Oklahoma	Determined no adverse effect, request halt in project progress and notification if artifacts or human remains are uncovered.
Monacan Indian Nation	Determined project to be outside ancestral territory, request halt in project progress and notification if artifacts or human remains are uncovered.
Nansemond Indian Tribe	Declined consultation
Pamunkey Indian Tribe	Invitation to consult confirmed received, no further response
Rappahannock Tribe	Determined project to be outside ancestral territory, request halt in project progress and notification if artifacts or human remains are uncovered
Shawnee Tribe	Determined project to be outside ancestral territory
Tuscarora Nation	No response to date: FedEx Delivered, phone messages and emails not returned
United Keetoowah Band of Cherokee Indians in Oklahoma	No response to date: FedEx Delivered, phone messages and emails not returned
Upper Mattaponi Tribe	No response to date: FedEx Delivered, phone messages and emails not returned

Phase I and II Tribal Consultation:

The following federally recognized resident and interested Tribal Nations were invited to review and comment on the Environmental Assessment via phone, email, and/or hard copy:

Tribal Nation	Response: Sept - TBD 2023
Absentee Shawnee Tribe of Oklahoma	
Catawba Indian Nation	
Cherokee Nation of Oklahoma	
Chickahominy Indian Tribe	
Chickahominy Indian Tribe - Eastern Division	
Delaware Nation, Oklahoma	
Delaware Tribe of Indians	Determined project to be outside ancestral territory, deferred to resident tribes
Eastern Band of Cherokee Indians	
Eastern Shawnee Tribe of Oklahoma	
Monacan Indian Nation	
Nansemond Indian Tribe	
Pamunkey Indian Tribe	
Rappahannock Tribe	
Shawnee Tribe	Determined project to be outside ancestral territory
Tuscarora Nation	
United Keetoowah Band of Cherokee Indians in Oklahoma	
Upper Mattaponi Tribe	

Public Review and Comment

The draft compatibility determination will be available for public review and comment for 14 days. The public will be made aware of this comment opportunity through posting at refuge headquarters, refuge trail heads, posting on refuge website, and refuge partners email list. A hard copy of this document will be posted at the refuge headquarters located at 14050 Dawson Beach Road, Woodbridge, Virginia 22191. An electronic version will be made available on the

refuge website https://www.fws.gov/refuge/elizabeth-hartwell-mason-neck Please contact the Project Leader if you need the documents made available in an alternative format. Concerns expressed during the public comment period will be addressed in the final document.

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.

Signatures

Submitted By:

_____ _____

Project Leader Date

Concurrence:

_____ _____

Refuge Supervisor Date

Approved:

_____ _____

Northeast Regional Chief, National Wildlife Refuge System Date:

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Applicable Statutes, Regulations, and Executive Orders

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

Figures

Figure 1: Phase I proposed watermain installation, Mason Neck Peninsula, Virginia.

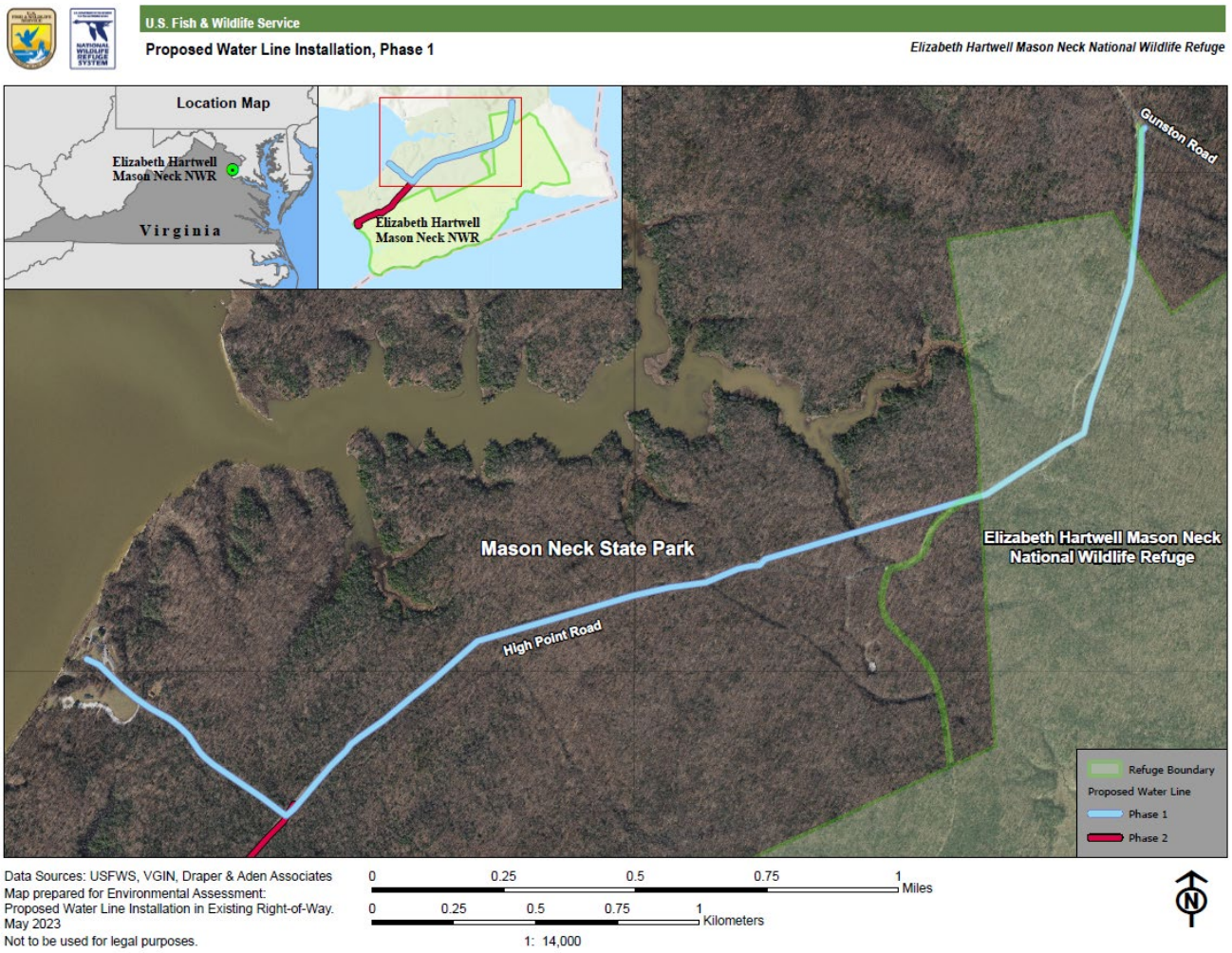


Figure 2: Phase II proposed watermain installation, Mason Neck Peninsula, Virginia.

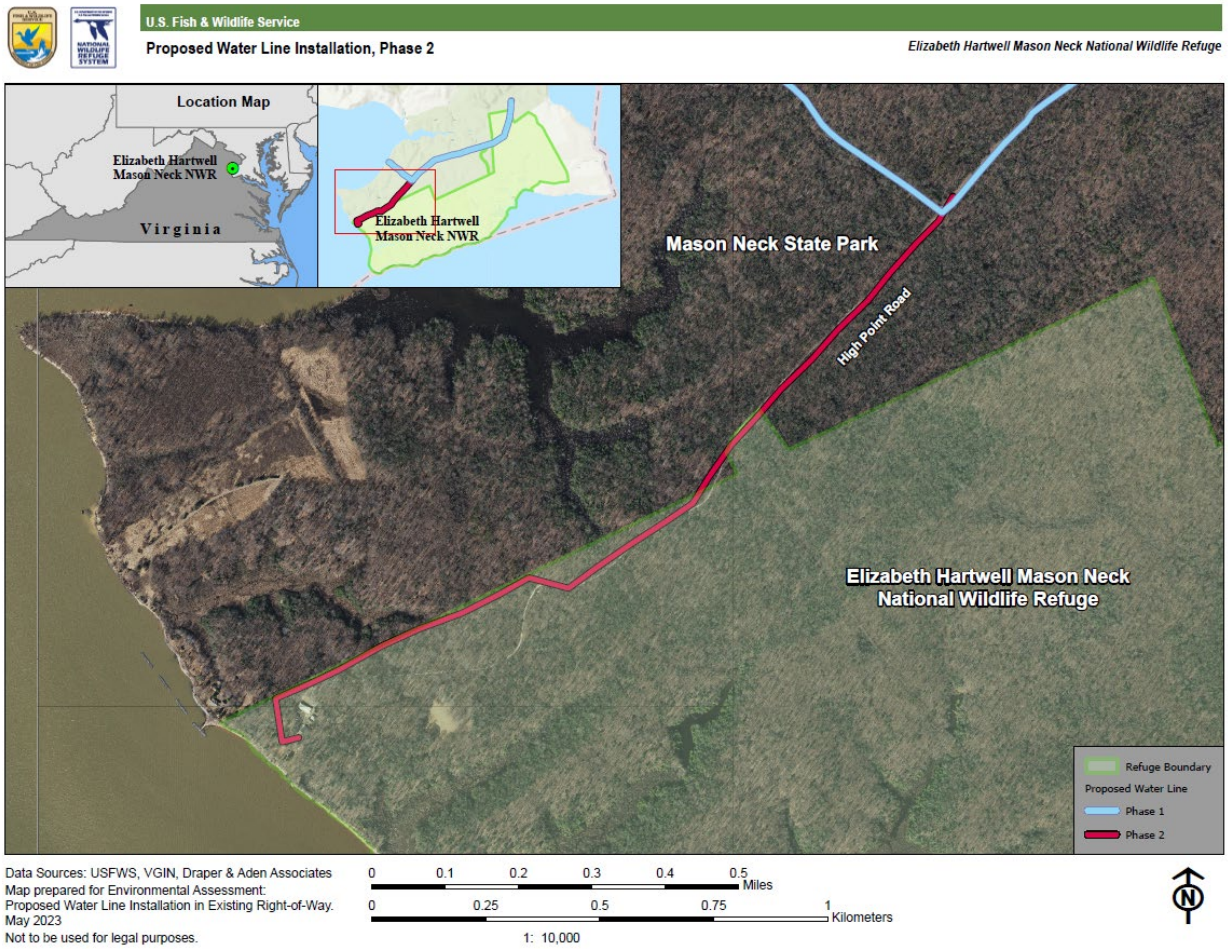


Figure 3. Phase I proposed watermain plats, Mason Neck Peninsula, VA.

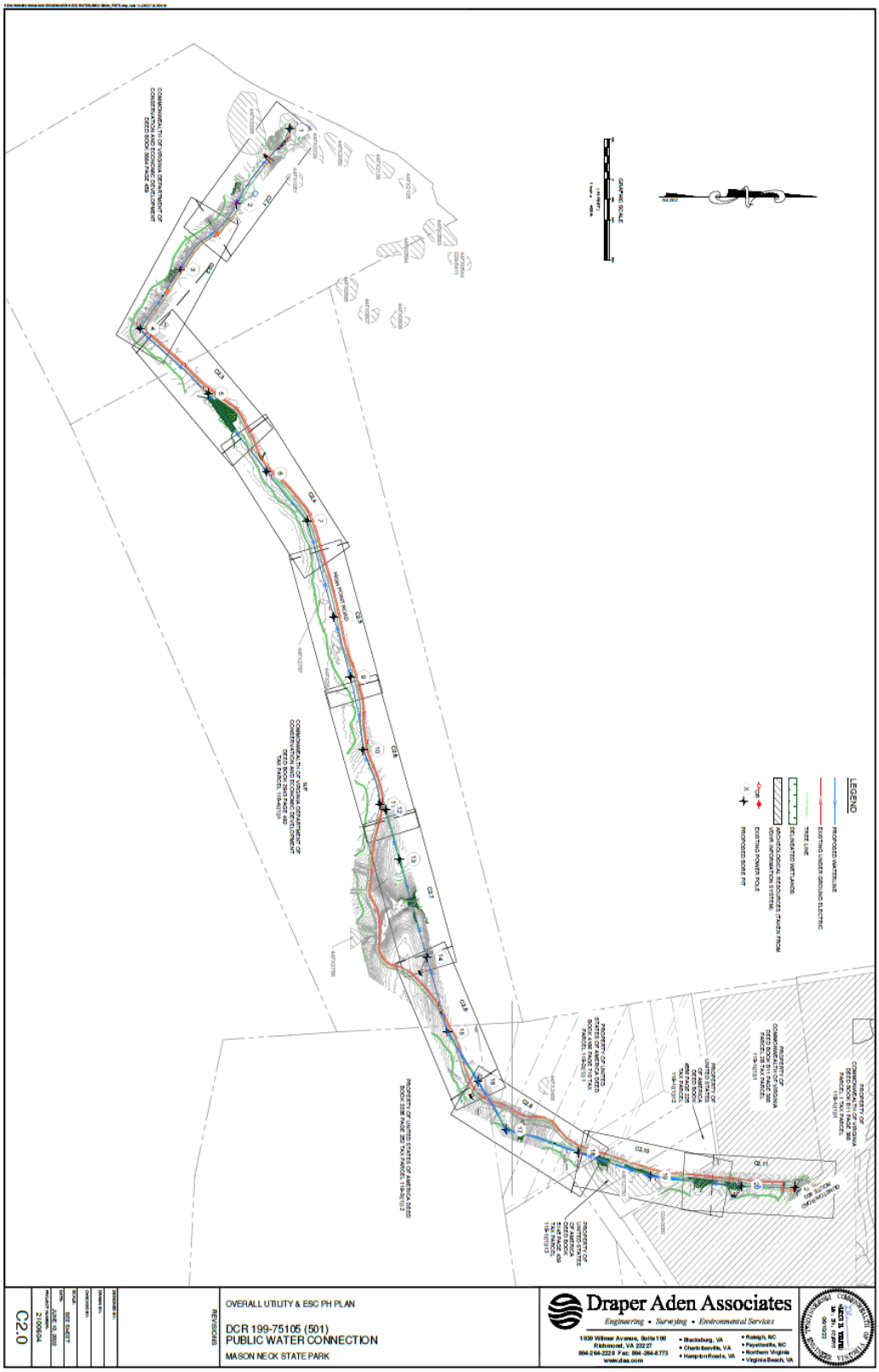


Figure 4. Phase I proposed watermain plats station 97 to station 111, Mason Neck Peninsula, VA.

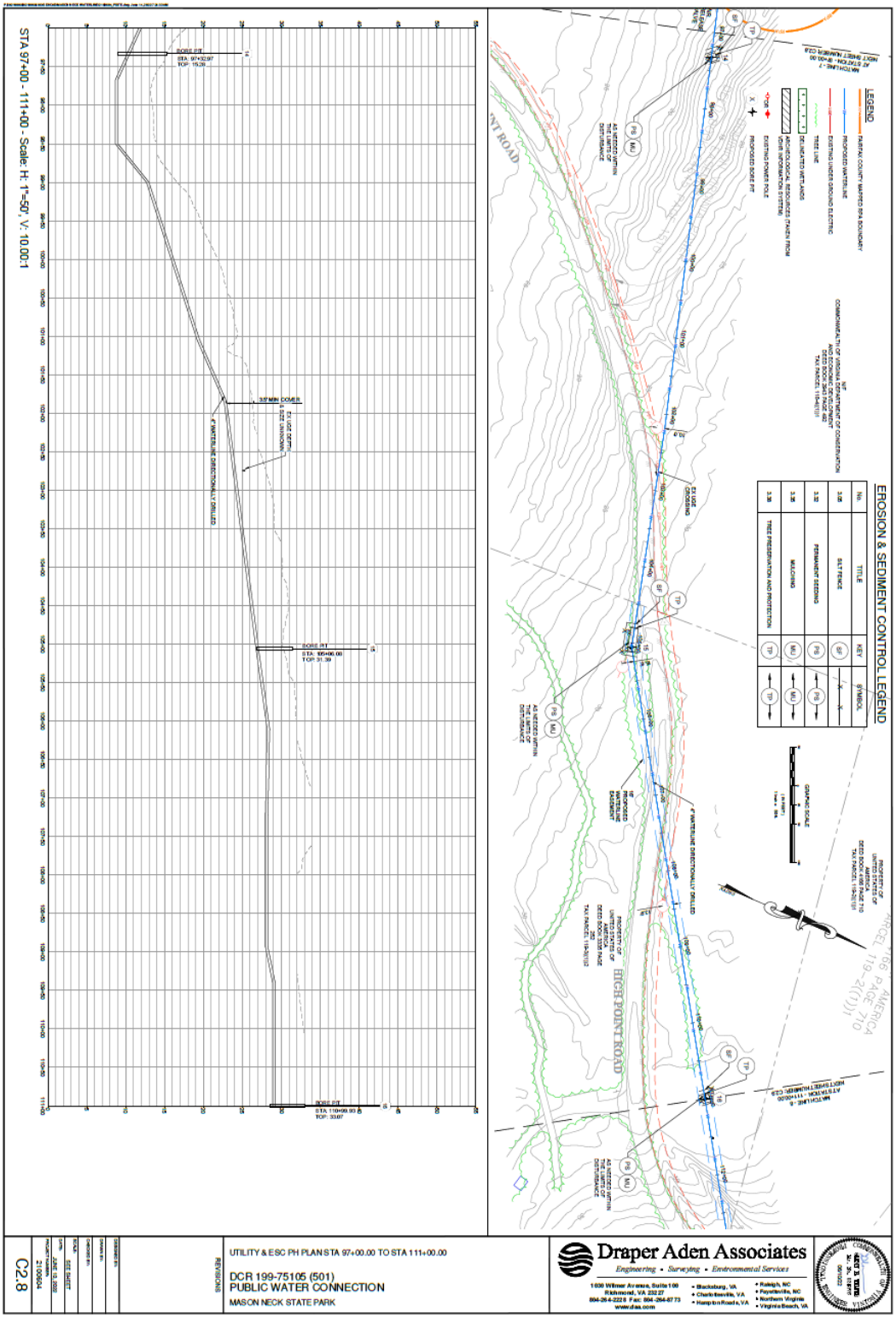


Figure 5. Phase I proposed watermain plats station 111 to station 125, Mason Neck Peninsula, VA.

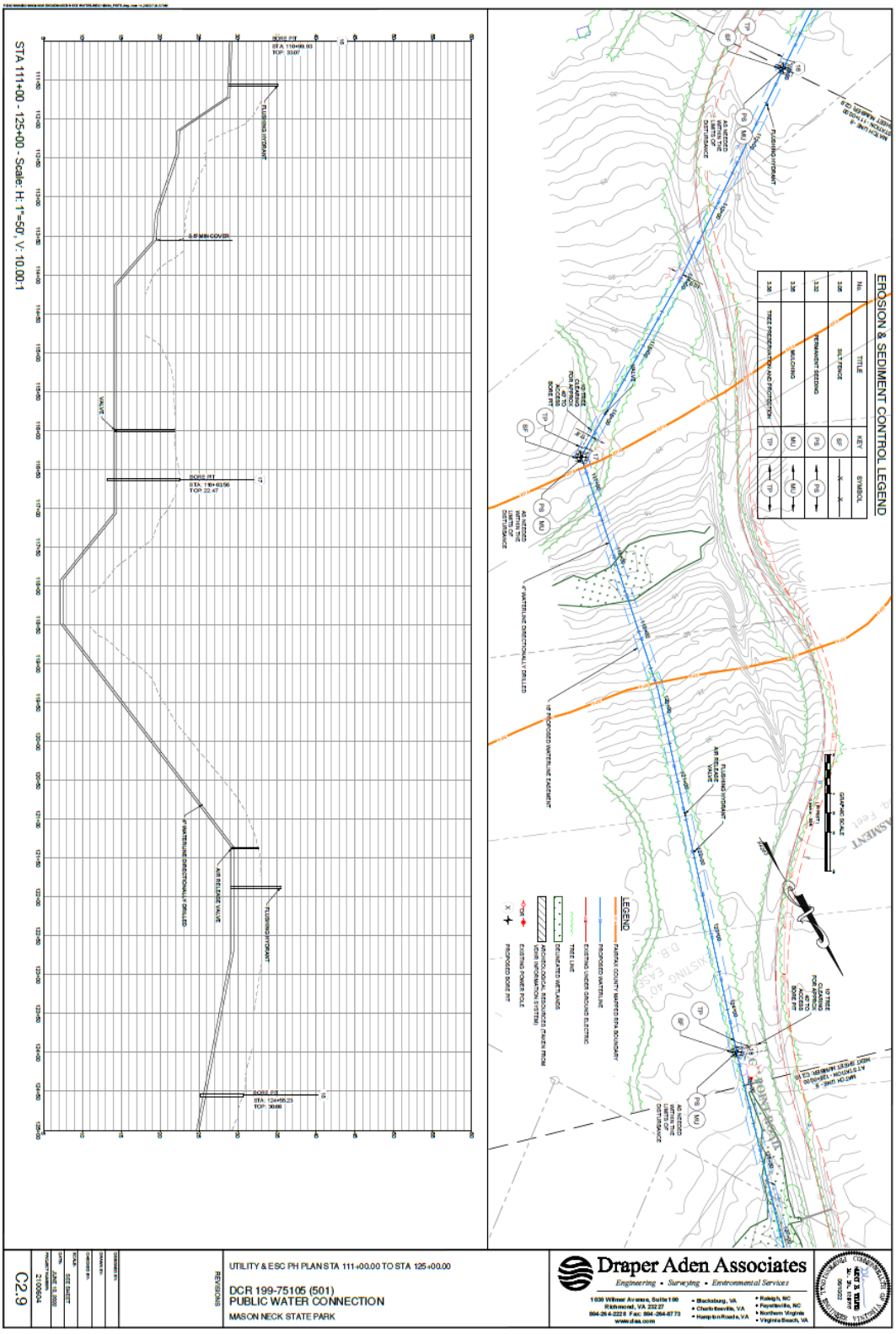


Figure 6. Phase I proposed watermain plats station 125 to station 139, Mason Neck Peninsula, VA.

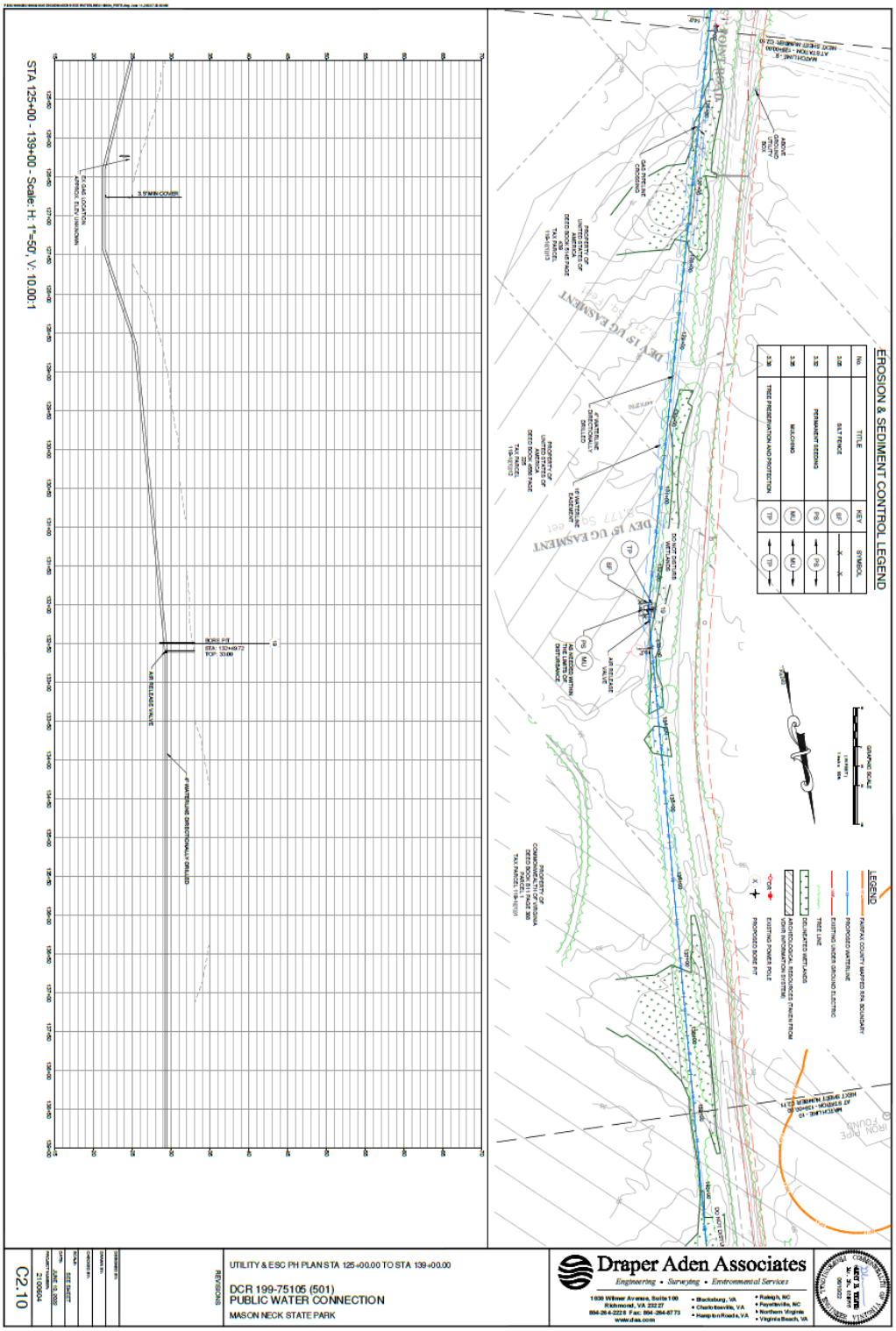


Figure 7. E. H. Mason Neck National Wildlife Refuge broad habitat types.

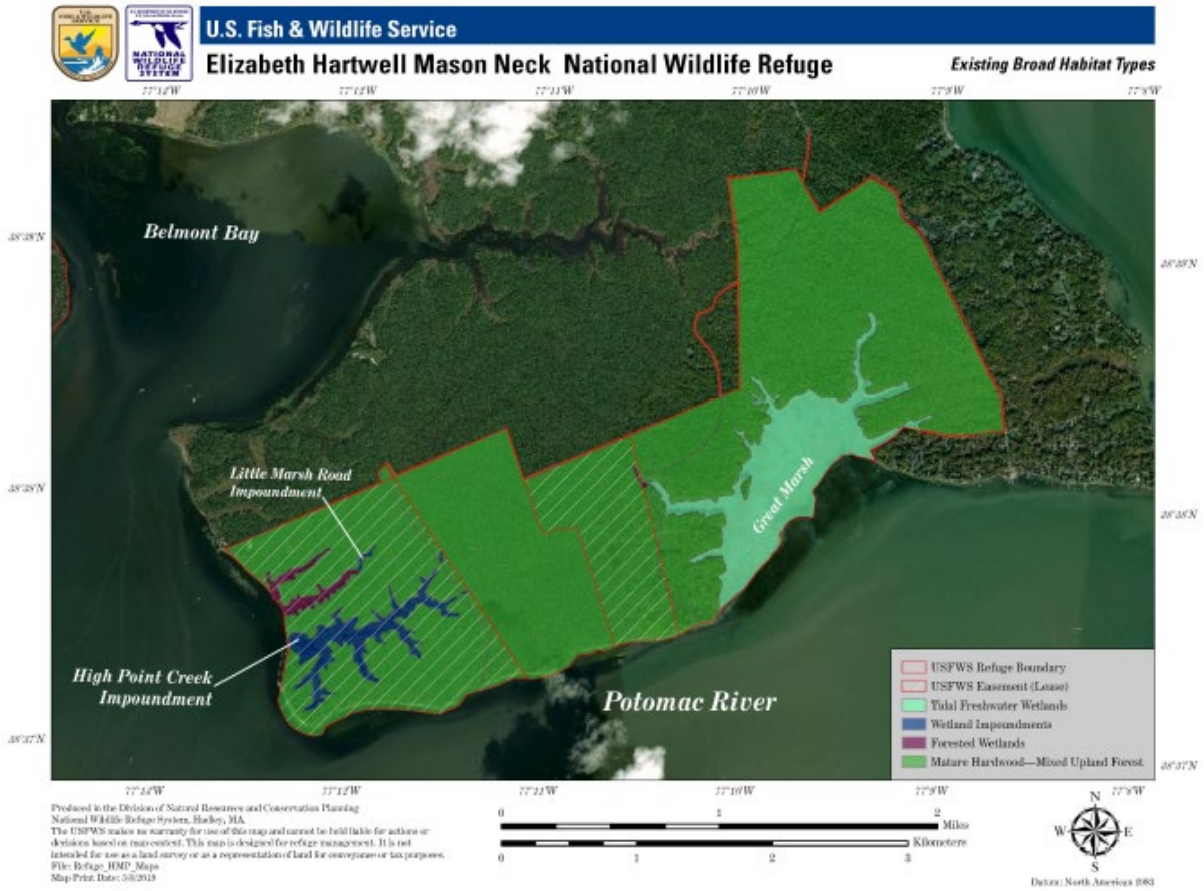


Figure 8. Proposed watermain installation bore pit locations.

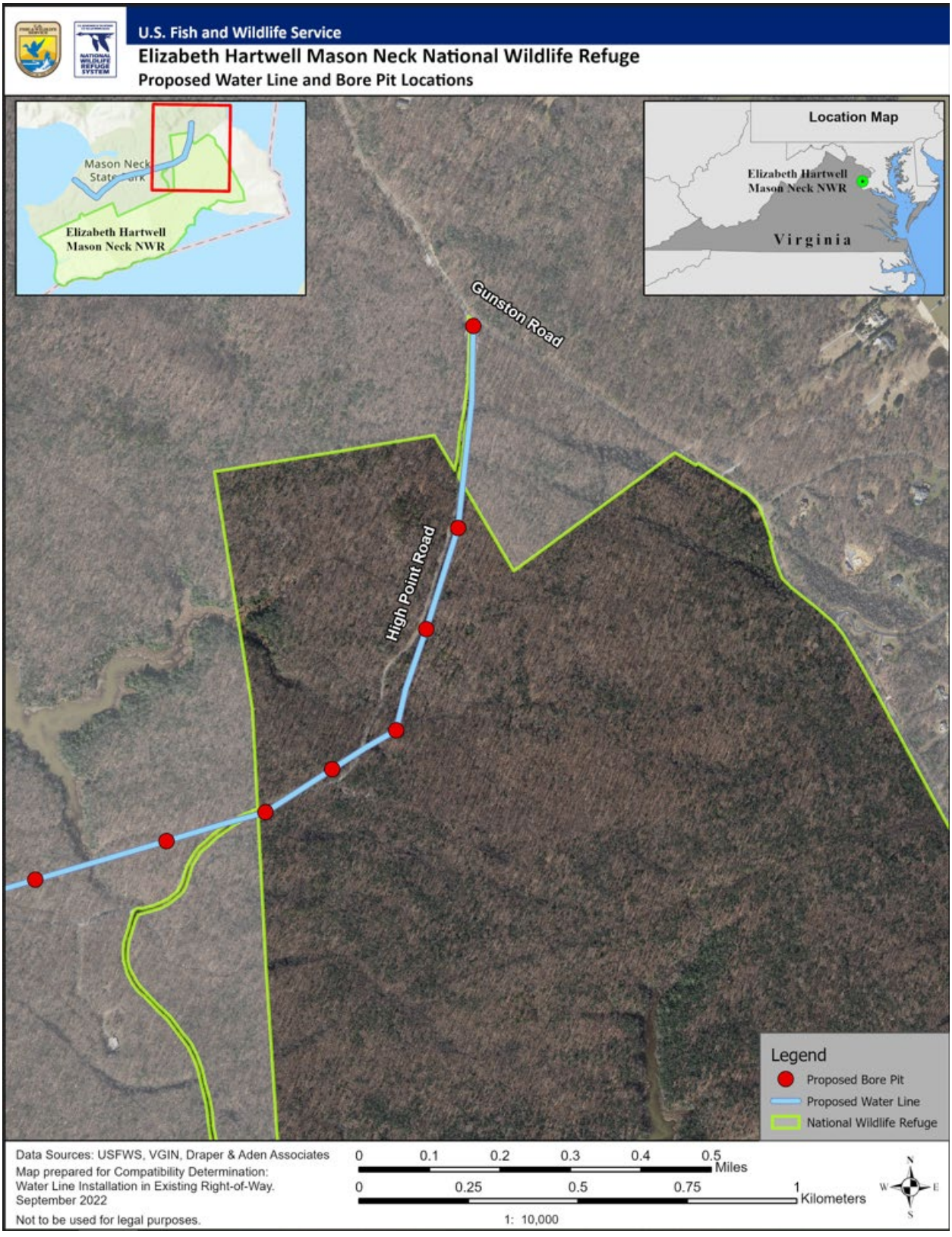


Figure 9: E.H. Mason Neck NWR recreation map.

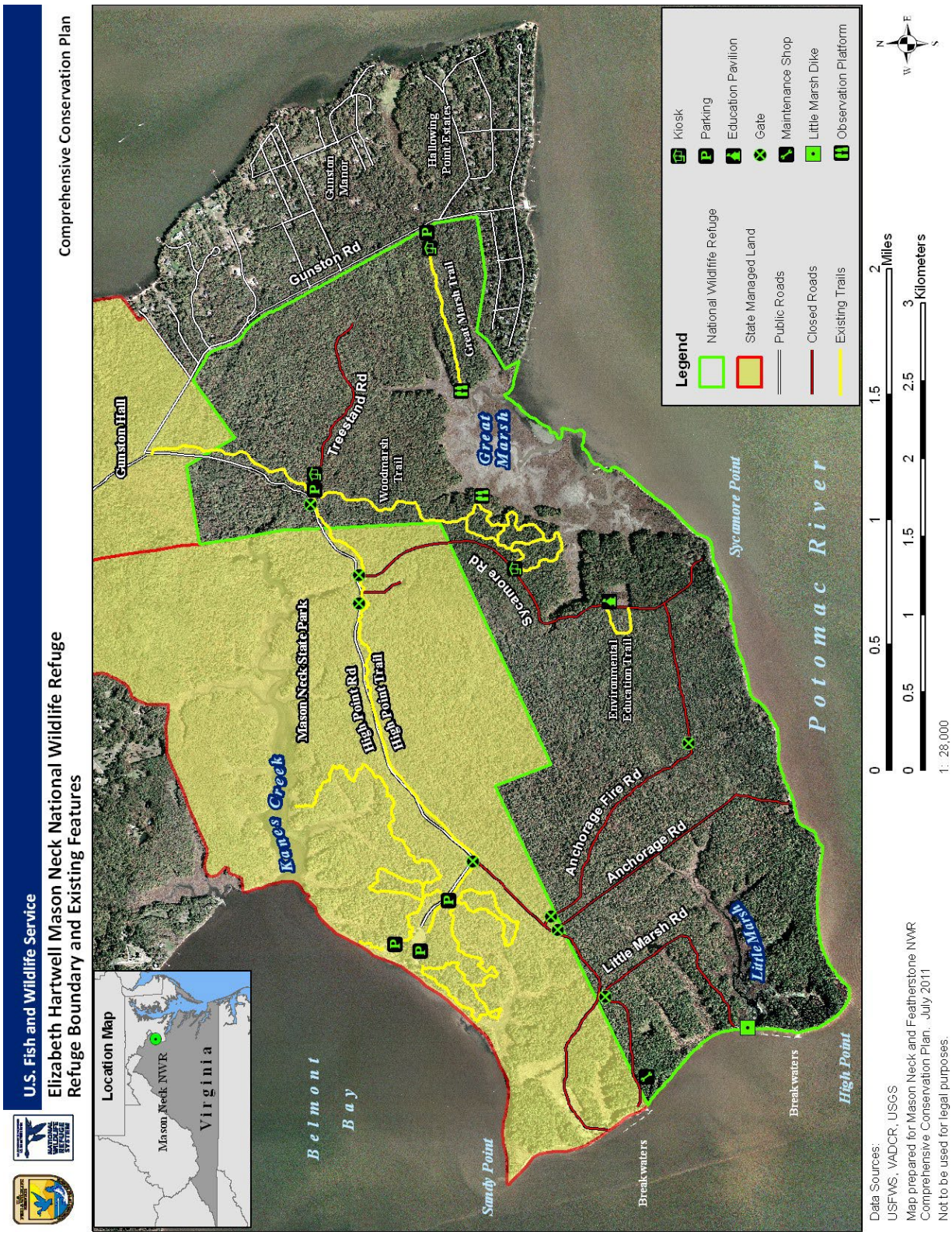
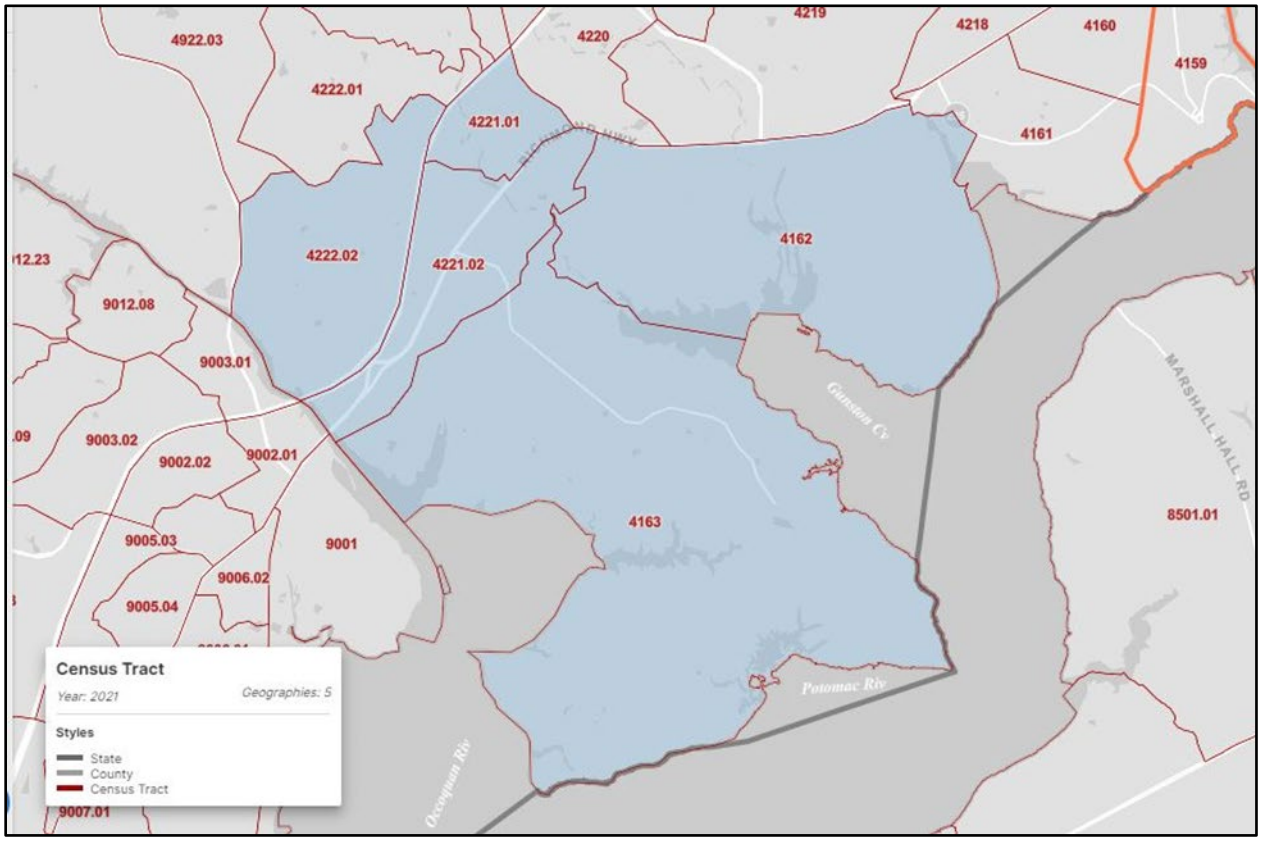


Figure 10: US 2021 Census Bureau Tracts analyzed, Fairfax County, Virginia.



Appendix A: Compatibility Determination

Draft Compatibility Determination

Title

Draft Compatibility Determination for Public Drinking Water Connection to E.H. Mason Neck National Wildlife Refuge and Mason Neck State Park Facilities.

Refuge Use Category

Rights of Way and Rights to Access

Refuge Use Type(s)

Rights-of-way (utility)

Refuge

Elizabeth Hartwell Mason Neck National Wildlife Refuge

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

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

"... 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 ..." 16 U.S.C. § 460k-2 (Refuge Recreation Act (16 U.S.C. § 460k-460k-4), as amended).

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

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

National Wildlife Refuge System Mission

The mission of the National Wildlife Refuge System, otherwise known as Refuge System, is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife,and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (Pub. L. 105-57; 111 Stat. 1252).

Description of Use

Is this an existing use?

No

What is the use?

The U.S. Fish and Wildlife Service (Service) is proposing to connect facilities on Elizabeth Hartwell Mason Neck National Wildlife Refuge (Mason Neck NWR) to a drinking water source by partnering with Mason Neck State Park to install an underground water main. Mason Neck NWR and Mason Neck State Park are experiencing ongoing water quality issues with the existing well-based water systems. A new water main will provide a reliable public water system that achieves safe drinking water standards. The Virginia Department of Conservation and Recreation (VDCR) completed an Environmental Impact Statement Report (EIS). This CD builds upon the VDCR EIS and accompanying Service EA.

A new underground water main would be constructed and maintained at Mason Neck NWR. The proposed water main will be a 4-inch diameter line, outfitted with backflow preventors, an automatic flushing valve, and pressure reducing valves. The Service and Virginia DCR propose to replace the existing well-based supply system with a connection to the Fairfax County water public supply system in two phases.

Is the use a priority public use?

No

Where would the use be conducted?

Phase I: The proposed Phase I water main route is approximately 2.79-mi long with 0.59-mi crossing Mason Neck NWR. This phase of the water main enters the refuge from Gunston Hall, a Virginia historic site, and ends at Mason Neck State Park (Figure 1). The area of potential effects is located along the northeastern edge of Mason Neck NWR. Construction will commence in a 16-ft wide by 0.59-mi area and will follow an existing overhead communications line ROW within the refuge. The project would impact 1.14 ac of refuge land previously cleared for an existing overhead communications line ROW.

Phase II: The proposed water main route is approximately 1.25-mi long with 0.75-mi crossing Mason Neck NWR. The proposed construction will commence in a 16-feet wide and follow existing ROWs for overhead communications and power lines and an access road within the refuge and State Park (Figure 2). The project would impact 1.45 acres of refuge land previously cleared for existing utility ROWs and an access road.

When would the use be conducted?

The anticipated installation and construction duration is three weeks per phase, a total of six

weeks. Work is expected to be conducted during normal hours of refuge operation or as otherwise approved by the Refuge Manager. Project work on refuge lands will not commence during forest breeding bird season window of April 1 – July 15, nor within 330-feet of bald eagle nests during the breeding season window of December 15 – July 15, nor during the annual public deer hunts (contact refuge staff for sepcific dates).

How would the use be conducted?

The underground water main will be installed using directional drilling. The directional drill is guided along a preplanned path to establish the pilot bore path and tracked using an electro-magnetic transmitter system to monitor the depth (typically 36 to 46-in below current grade), angle, rotation, direction, and drill temperature (Figure 3). Equipment will access the bore locations via the existing cleared overhead electric and communications line ROW and roads; therefore, mature tree removal is not anticipated. The project will not remove soil and will not generate slurry ponds. Staging areas will be created and equipment will be stored off refuge lands. No hazardous materials will be used, produced, transported, or stored on federal lands. The average lifespan of the high-density polyethylene water main is 50-100 years with no maintenance requirements in the absence valve or equipment failure (Telfer 2022, Pers. comm).

Why is this use being proposed or reevaluated?

The purpose of this proposed action is to provide a reliable public water system that achieves drinking water standards. Mason Neck State Park, overseen by the Virginia DCR, experiences ongoing water quality issues with the existing well-based water system. Bacteria, manganese, and iron levels within the drinking water are of safety concern to the state park. Mason Neck NWR has experienced similar issues with drinking water wells at the maintenance shop and quarters facilities.

Other project alternatives were considered but determined to be infeasible. Mason Neck State Park and Mason Neck NWR have replaced drinking wells and associated infrastructure several times over the past two decades. Installing a new drinking water well would be a temporary solution.

State Park and refuge staffs considered potential water main paths both outside and inside Mason Neck NWR boundaries. Suggested alternate routes traversed sensitive wetland areas and significant bald eagle breeding and wintering sites, the species integral to the establishment of both the refuge and state park.

Availability of Resources

The resources necessary to provide and administer these uses are available within current and anticipated refuge budgets. Staff time associated with administration of these uses are related to preparation of this Compatibility Determination (CD) and coordination with other offices, Section 7 consultation, public involvement, and site monitoring for compliance.

Anticipated Impacts of the Use

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

The effects and impacts of the proposed use to refuge resources, whether adverse or beneficial, are those that are reasonably foreseeable and have a reasonably close causal relationship to the proposed use of Rights-of-way (utility). This CD includes the written analyses of the environmental consequences on a resource only when the impacts on that resource could be more than negligible and therefore considered an “affected resource.” Resources that will not be more than negligibly impacted by the action have been dismissed from further analyses.

Overall, we anticipate that this project will only have negligible impacts on refuge resources and will not materially detract from the refuge's purposes. DCR conducted an Environmental Impact Report for the water main project site which addresses potential impacts of the use (VDCR 2021).

Short-term impacts

Temporary disturbance and displacement of wildlife during construction, trampling, and removal of on-site vegetation, and brief increases in noise could create short-term impacts to visitors and wildlife. The anticipated route to facilitate water main installation has the potential to disturb wildlife outside the immediate area (Trails and Wildlife Task Force 1998, Miller et al. 2001). Workers accessing the area by foot have the potential to impact migratory birds during the migration, wintering, and nesting seasons. Birds avoided places where people were present and when visitor activity was high (Burger 1981, 1986; Klein et al. 1995). Noise caused by made-made activity resulted in increased levels of disturbance (Burger 1986, Klein et 1993, Burger and Gochfeld 1998). Miller et al. (1998) found bird abundance and nesting activities (including nest success) increased as distance from a recreational trail increased in both grassland and forested habitats. Nest predation was also found to be greater near trails (Miller et al. 1998).

Long-term impacts

Minimal to no long-term or cumulative impacts are anticipated to occur. The use is a one-time installment of a water main, and installation is expected to occur in three weeks or less. Routine maintenance is not required; however, maintenance would be required in the case of valve and air release valve failure. The manufacturer’s estimated lifespan of the water main is

50-100 years. Disturbance to native vegetation would be minimal and vegetation would re-establish quickly. Beal (2007) and Berger (2010) found that wildlife displaced due to temporary construction activity return to use of the area when activities cease; therefore, we anticipate minimal to no long-term or cumulative impacts to wildlife from this action. There are no anticipated long-term impacts to recreational uses, environmental education, wildlife photography, wildlife observation, or wildlife interpretation.

Public Review and Comment

The draft compatibility determination will be available for public review and comment for 14 days. The public will be made aware of this comment opportunity through posting at the refuge headquarters, posting on the refuge website, and via a letter sent to the refuge email list. The State and Tribes have been asked to review and comment on the draft compatibility determination. A hard copy of this document will be posted at the Refuge Headquarters or Visitor Center located at 14050 Dawson Beach Rd. Woodbridge, VA 22191. It will be made available electronically on the refuge website *https://www.fws.gov/masonneck/*. Please contact the Refuge Manager if you need the documents made available in an alternative format. Concerns expressed during the public comment period will be addressed in the final document.

Determination

Is the use compatible?

Yes

Stipulations Necessary to Ensure Compatibility

The Service has worked with DCR staff to ensure that this new ROW will be established, operated, and maintained in accordance with 50 CFR § 29.21, as well as the refuge purposes. To ensure compatibility with National Wildlife Refuge System and Mason Neck NWR goals and objectives, as well as to avoid or minimize adverse impacts as described above, the use may occur under the following stipulations:

1. DCR complies with all terms, conditions, and stipulations listed in the 50-year ROW permit.
2. Access for installation, maintenance and repair of the underground and overhead electrical power line will be restricted to the legally defined ROW (Figures 1 and 2).
3. DCR will notify the Refuge Manager or his/her designee one (1) week prior to commencing with on-the-ground activities, including construction, excavation, vegetation management, and maintenance to avoid conflicts with refuge programs.
4. Resource damage caused by the water main installation, or its maintenance will be reported to the Refuge Manager and on-site mitigation measures will be cooperatively

developed.

5. Upon completion of any maintenance within the ROW, DCR will restore the area to its original condition. Any native seed mix and plant species must be approved by the Refuge Manager prior to restoration.
6. No herbicides, pesticides, solvents, equipment, or fuel storage tanks may be stored on the ROW.
7. Should previously unrecorded cultural resources or human remains be discovered on Service land, activities shall be halted immediately at that location. The USFWS Regional Federal Historic Preservation Officer and Refuge Manager are to be contacted at once.

Justification

The stipulations outlined above would help ensure that the use is compatible at Elizabeth Hartwell Mason Neck NWR. Rights-of-way (utility), as outlined in this compatibility determination, would not conflict with the national policy to maintain the biological diversity, integrity, and environmental health of the refuge. Based on available science and best professional judgement, the Service has determined that the Rights-of-way (utility) at Elizabeth Hartwell Mason Neck NWR, in accordance with the stipulations provided here, would not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purpose of the Elizabeth Hartwell Mason Neck NWR.

Signature of Determination

_____ _____

Refuge Manager Signature Date

Signature of Concurrence

_____ _____

Assistant Regional Director Signature Date

Mandatory Reevaluation Date

2033

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Figures

Figure 1: Phase I proposed watermain installation, Mason Neck Peninsula, Virginia.

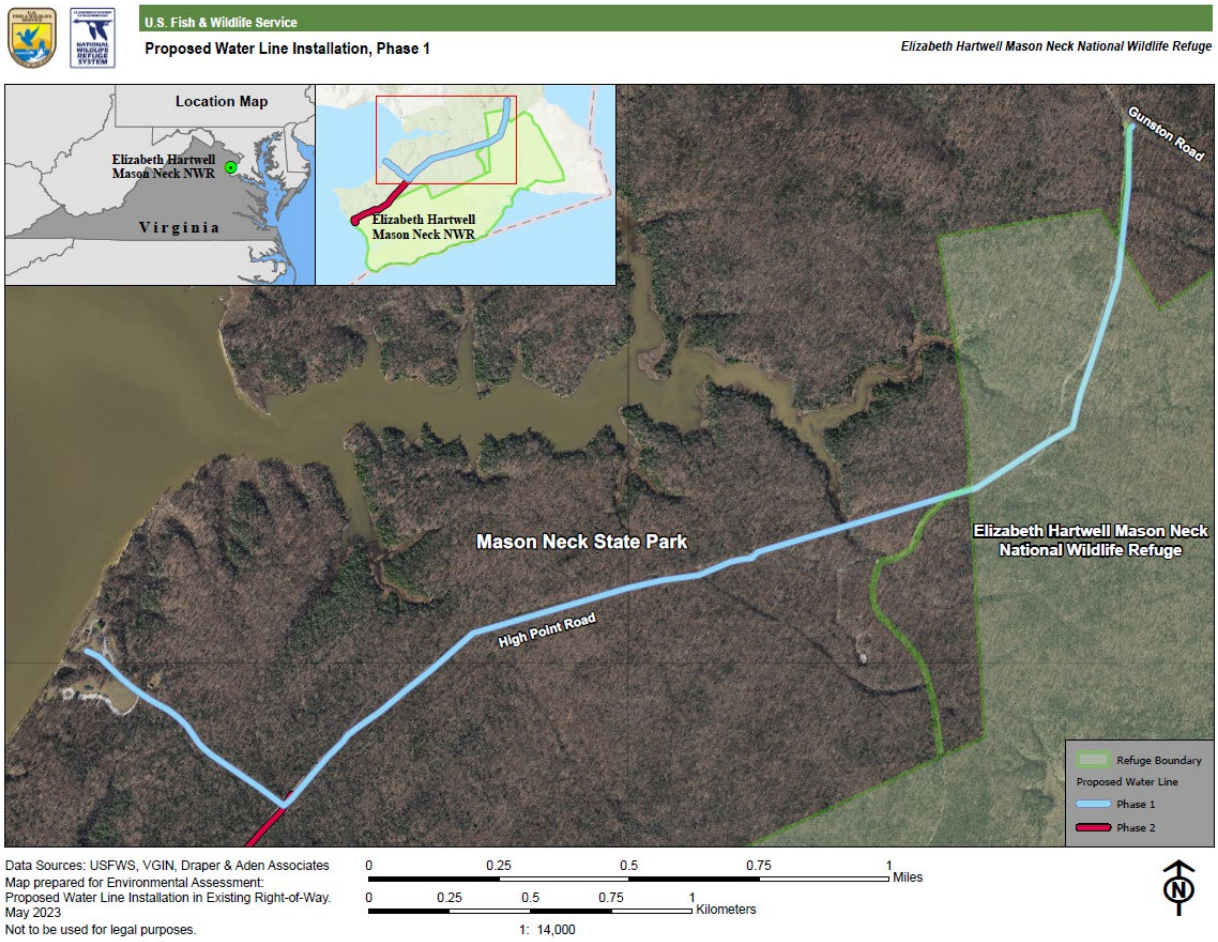
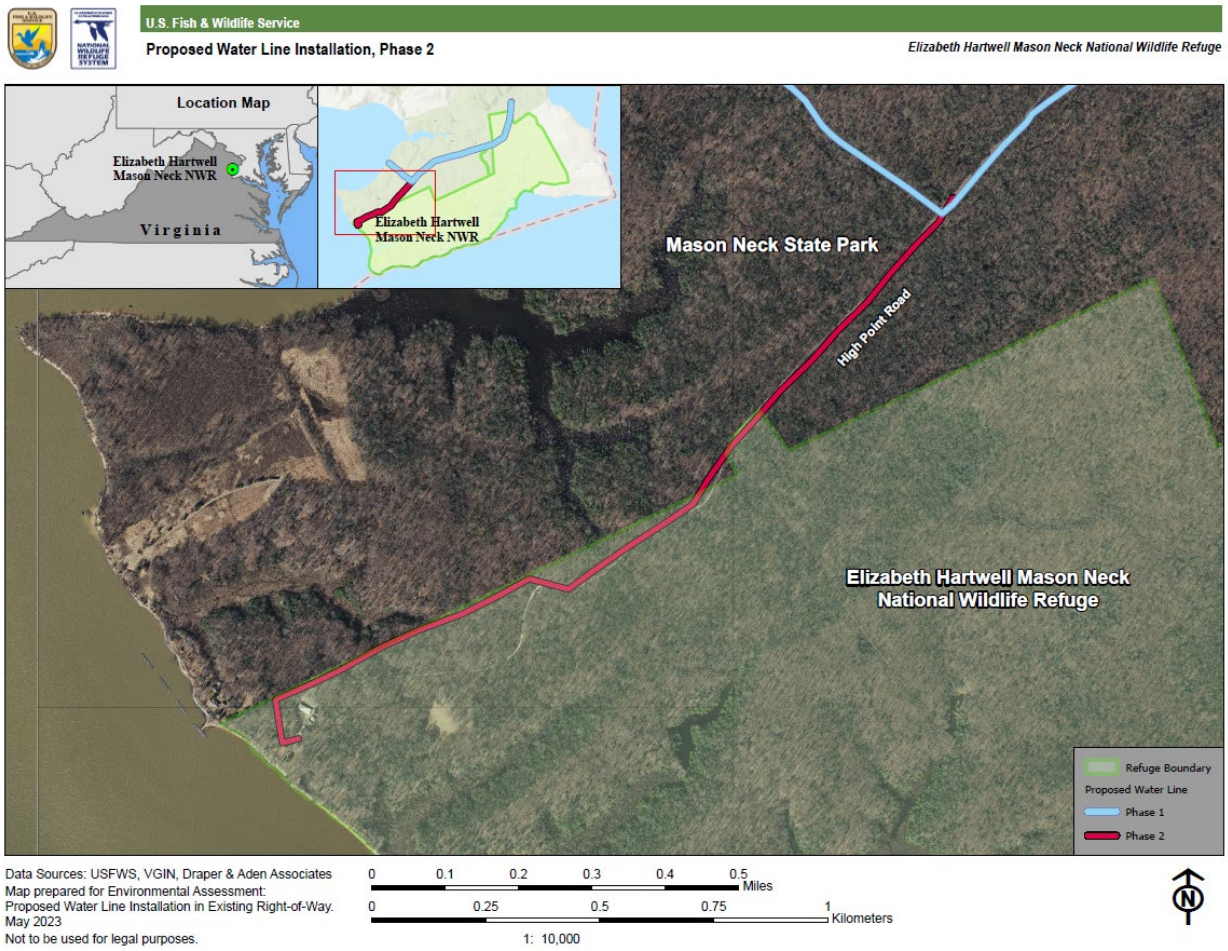


Figure 2: Phase II proposed watermain installation, Mason Neck Peninsula, Virginia.



Appendix B: Section 7 Evaluation