

**STATEMENT OF FINDINGS
FOR
EXECUTIVE ORDER 11990 WETLAND PROTECTION**

**Construct Cape Hatteras Lighthouse
Multi-Use Path**

Cape Hatteras National Seashore
Buxton, North Carolina

Recommended:

Superintendent, Cape Hatteras National Seashore Date

Certification of technical adequacy and servicewide consistency:

Chief, Water Resources Division Date

Approved:

Regional Director, Interior Region 2, South Atlantic Gulf Date

INTRODUCTION

The National Park Service (NPS) has prepared this Statement of Findings for Wetlands (SOF) in compliance with Executive Orders (EO) 11990, *Protection of Wetlands*. NPS would undertake the construction of a multiple use pathway within the legislated boundary of Cape Hatteras National Seashore (often abbreviated the “Seashore” or “park” in this document), in Buxton North Carolina (Figures 1 and 2).

The purpose of the proposed project is considering construction of a new multiple use (otherwise known as multi-use) pathway along Lighthouse Road, in the Hatteras District of the seashore. This action was identified in the Park’s 1984 General Management Plan (GMP) which presented the need for a “bikeway” within the seashore and included Lighthouse Road as the location for this path. The GMP identified a 4-foot-wide bicycle path on both sides of the road from NC Highway 12 (NC 12) to the Cape Point Campground. It has been over 38 years and the seashore consistently receive requests from the public to construct a pathway along the road shoulder. A multi-use path master plan was recently developed to identify existing conditions and to create a concept for a new pathway to be constructed in three segments along Lighthouse Road from NC 12 to Cape Point Campground (NPS 2022). Segments I and II are presented and analyzed in this document. Segment III would be designed and analyzed as a component of a future design project to elevate Lighthouse Road from the Buxton Ranger Station to Ramp 43.

A new pathway would finally provide users originating in the village of Buxton with a resilient, safe, and accessible non-motorized route to many of the seashore’s key visitor use areas including the Cape Hatteras Lighthouse, Visitor Center and Museum of the Sea, Old Lighthouse parking and beach area and new Buxton Beach Access area at the former US Navy/Coast Guard area. This pathway should meet the needs of today’s park visitors and would include educational opportunities via interpretive messaging along the route, wayfinding information, and benches for resting and viewing the area. This paved pathway would accommodate different types of non-motorized uses including biking and reduce maintenance by using sustainable construction techniques and minimizing facility operations.

The NPS prepared an Environmental Assessment (EA) to evaluate one action alternative to meet the purpose and need of this project, as well as a No Action Alternative. Among impact topics evaluated in the EA are wetlands. As noted above, EO 11990 requires the NPS and other federal agencies to evaluate the potential impacts of actions in wetlands, respectively. The objective of EO 11990 is to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetland, and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative. This Statement of Findings was written in accordance with Director’s Order #77-1: *Wetland Protection* and associated Reference Manuals, which provide NPS policies and procedures for complying with the executive orders.

PROPOSED ACTION

The preferred action alternative, Alternative B, would consist of the construction of a 1.6 mile long 10-12-foot-wide paved multi-use pathway in two segments. The project would include wayfinding signage, safety messages, benches, bollards, and the reconfiguration of the Seashore entrance including intersection improvements and connections to local sidewalks. It would feature three trailheads and one plaza, all complete with interpretive installations.

Segment I of the multi-use pathway would be 1.4 mile (7,333 linear feet) and begin on the west side of Lighthouse Road at the intersection of NC 12. A trailhead plaza would be constructed at the beginning of the pathway with wayfinding signage and benches.

The pathway would continue southward along the west side of Lighthouse Road until it crosses the roadway approximately 3,700 feet south of NC 12 at a mid-block crossing. This crossing location

Figure 1: Project Location



Figure 2: Proposed Action



was identified because it provides over 500 feet of visibility to motorists approaching in each direction. The speed limit along this stretch of Lighthouse Road may be reduced to 25 mph and speed tables may be added along with flashing signal lights to increase drivers' awareness of the crossing.

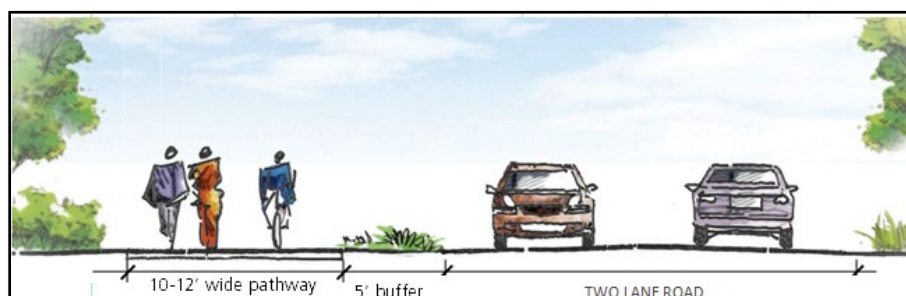
The pathway would continue southward along the eastern side of Lighthouse Road for approximately 400 feet before it veers eastward in the direction of the new Buxton Beach Access area. Along this stretch of the alignment, the pathway would meander along the tree line to towards the beach parking lots.

An interpretive plaza with trailhead signs, bike racks, pedestrian seating, a picnic pavilion, and comfort station would be located at the intersection of the pathway and the Old Lighthouse Beach parking areas. An interpretive exhibit that provides an overview of the Seashore, with a focus on beach recreation activities, would provide context for the activities available at the beach recreation area. From the interpretive plaza, the pathway would cross the Old Lighthouse Beach Road and continue along the Lighthouse move path towards Lighthouse and the Visitor Center. Branching off the pathway, an exhibit detailing the logistics and engineering accomplishment of moving the lighthouse 2,900 feet would be presented at an interpretive location. The pathway would be constructed within the move path and enter the woods around the septic field and continue along the existing sidewalk south of the Lighthouse parking lot. Where the pathway exits the woods adjacent to the parking lot sidewalk, an interpretive exhibit would be constructed, detailing the lighthouse move within the move path viewshed. The pathway would be constructed parallel to the existing sidewalk and separated with a bollards and rope, a standard delineation around Seashore parking areas. A pedestrian connection from the pathway to the sidewalk would be provided that allows pedestrians to access the Visitor Center, Lighthouse, Keepers Quarters and Museum.

A cul-de-sac would be constructed at the end of Segment I south of the Keepers of the Light Amphitheater that is sized to allow bicyclists to turnaround safely without conflicting with the pedestrians exiting the pathway.

The width of the pathway throughout Segment I would vary from 10 to 12 feet, reducing to 10 feet in order to minimize impacts to the adjacent wetlands. The American Association of State Highway and Transportation Officials (AASHTO) provides guidelines for two-directional shared use paths for both bicycles and pedestrians and state they should be a minimum of 10 feet. Approximately 4,700 linear feet of 10-foot-wide pathway would be located along the west side of Lighthouse Road and approximately 1701 linear feet would be located along the eastern stretch of the alignment. The width of the pathway from the interpretive plaza to the end of Segment I at Lighthouse parking lot would be 12 feet to accommodate more users along this stretch of the pathway and would be 1929 linear feet. A standard width of a 5-foot landscape buffer strip would be maintained between the edge of the paved roadway and the pathway in all locations as recommended by AASHTO (Figure 3).

Figure 3: Conceptual multiuse pathway design



Segment II of the pathway would be about 0.2 miles (992 linear feet) and begin at the Old Lighthouse Parking area. After the interpretive plaza, the pathway would continue along the western side of the parking lot adjacent to the parking lot and pond. The alignment would follow the existing paved access drive east of the pond and through an existing clearing in the brush. An overlook platform with seating would be constructed at the edge of the pond with easy access to the pathway. An exhibit detailing sea level rise and natural coastal processes as the reasoning for moving the Lighthouse and Keepers Quarters would be located at the former Keepers Quarters site.

From the pond, the pathway would continue northward along the water bodies to keep the alignment as far away from the coastline as possible. Segment II would end at the former US Navy/Coast Guard area where a trailhead with signage, benches, and bike racks would be provided. This area is currently used as a parking lot that is accessed from Old Lighthouse Road. Throughout Segment II the pathway would be 10 feet wide.

No equestrian use would be allowed on the paved multi-use path, but equestrian use could continue on the opposite side of the road on the wide grassy shoulder. Some electric assisted modes of transportation may be permitted along the pathways, such as motorized wheelchairs. Electric bicycles or otherwise known as e-bikes, would be allowed on the pathway.

INVESTIGATION OF ALTERNATIVES

Two alternatives in addition to the preferred alternative and No Action alternative were considered but dismissed from further analysis and are summarized below and include: Alternative A (No Action Alternative), Create a 4 feet wide sidewalk on each side of Lighthouse Road, Widen Lighthouse Road).

Alternative A: No Action Alternative

Alternative A would result in a continuation of existing management. Under the no action alternative, a multi-use pathway would not be constructed along Lighthouse Road. Pedestrians and bicyclists would continue to use the existing road or road shoulder to access the park's popular use areas from NC Highway 12. Extensive mowing along the road shoulder would continue. There would be no additional non-motorized connectivity to additional park facilities and attractions that may be served by the pathway either directly or via spur trails, to the Cape Hatteras Lighthouse, Hatteras Island Visitor Center and museum, Cape Hatteras Lighthouse historic original location, and the new Buxton Beach Access Area at the end of Old Lighthouse Road (formerly a US Navy/Coast Guard station base).

Create 4 feet wide sidewalks on each side of Lighthouse Road.

This alternative was dismissed because it does not fully meet the purpose and need of providing a safe pathway for various non-motorized users along Lighthouse Road. Although NPS approved this alternative in the 1984 General Management Plan for Cape Hatteras National Seashore and this alternative is still supported by the public as documented during the public scoping period in June 2022, this width does not allow for safe two-directional use by both bicycles and pedestrians. Although the 4' wide pathways are still recommended as acceptable for bicycle lane dimensions according to AASHTO Guide for the Development of Bicycle Facilities, this design would result in conflicts when bicyclists and pedestrians meet on the pathway, and each user group would have to move off the narrow pathway onto uneven surfaces to continue along intended directions. Lighthouse Road has significant pedestrian use which warrants a wider than 4 feet of pathway width.

In addition, this alternative would impact both sides of Lighthouse Road, which would be more environmentally damaging than the proposed action by creating impervious surfaces on both sides

of the road instead of just one side. Since equestrian use would not be permitted on the new pathway, one side of the road must remain available to those user groups as well.

Widen Lighthouse Road.

This alternative was dismissed because it does not fully meet the purpose and need of creating a safe accessible pathway for all users and is not supported by the public, as documented during the public scoping period in June 2022. By widening the shoulder of the road only, the project would not create a safe pathway for pedestrian users.

In addition, this alternative would not connect a safe, resilient pathway to all the key visitor areas, since this alternative would only expand the existing road, therefore, this alternative would not connect the Old Lighthouse beach area to the new Buxton Beach Access area. This alternative would provide only two trailheads and no pull-off areas for additional interpretive signs.

SITE DESCRIPTION – WETLANDS

Relationship of Compliance Procedures

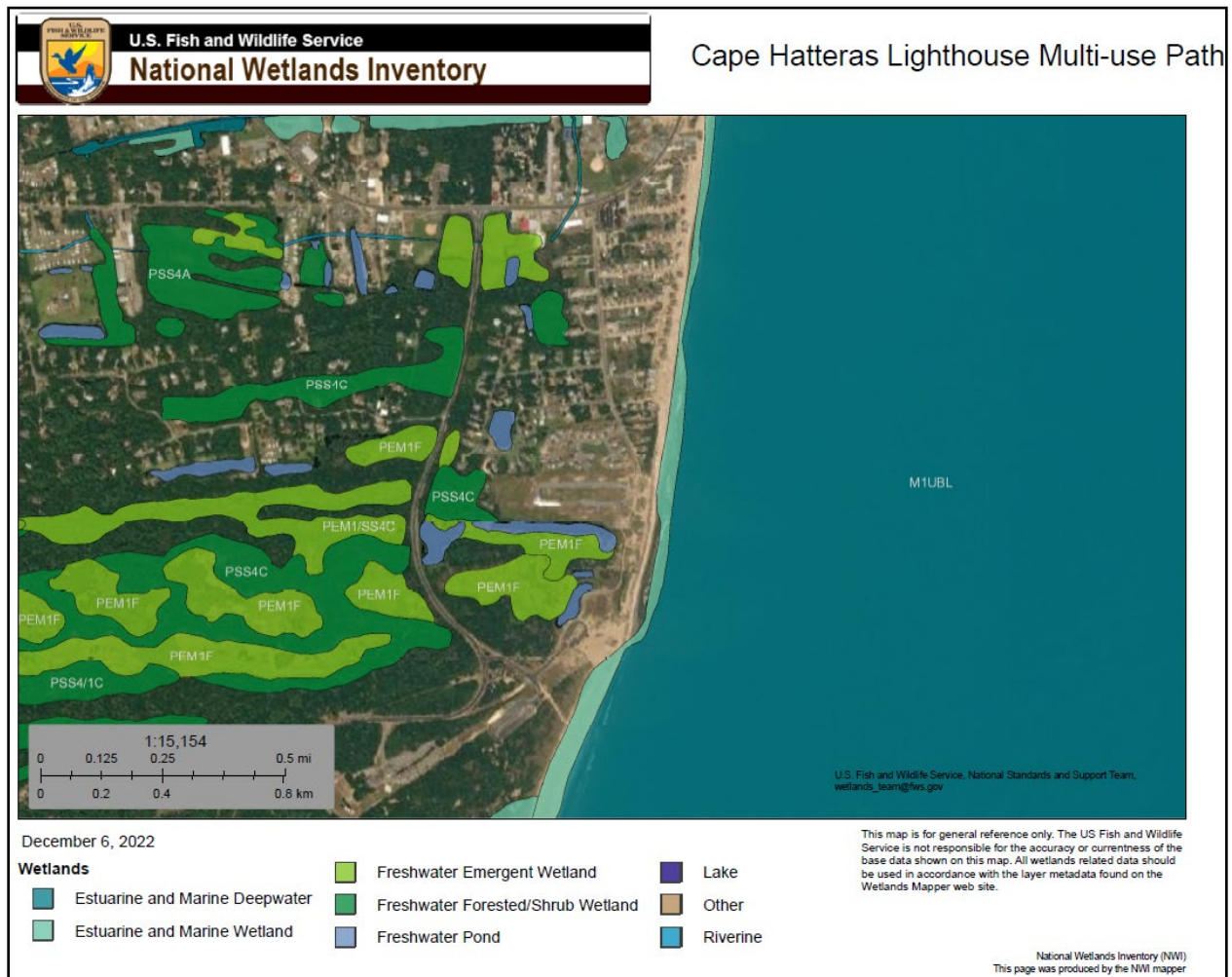
Wetlands within the project area are subject to oversight by multiple federal agencies, including the NPS and US Army Corps of Engineers (USACE). Executive Order (EO) 11990 *Protection of Wetlands* requires federal agencies to avoid, where possible, adversely impacting wetlands and all NPS activities that have the potential to have adverse impacts on wetlands be conducted in a manner consistent with the goal of “no net loss of wetlands”. NPS policies for wetlands, as stated in 2006 Management Policies and Director’s Order (DO) 77-1 *Wetlands Protection*, strive to prevent the loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. In accordance with DO 77-1 *Wetlands Protection*, proposed actions that have the potential to adversely affect wetlands must be addressed in this Statement of Findings for wetlands. The study area was established as 100 feet on either side of the centerline of Lighthouse Road, parking areas and unpaved roads. On June 22-24, 2021, wetland ecologist Byron Tsang (NPS Interior Region 2 Science and Natural Resources Management Division) and environmental protection specialist Sabrina Henry (Cape Hatteras National Seashore) conducted a wetland delineation site visit to Lighthouse Road and areas surrounding the Cape Hatteras Lighthouse in Buxton, NC.

Fifteen jurisdictional wetland resources were identified within the survey limits of Segment I and II project areas, including 13 wetlands and two open water ponds (Attachment 1).

The NPS uses the Cowardin classification system (Cowardin *et al.* 1979) as the standard for defining, classifying, and inventorying wetlands subject to NPS oversight. This definition relies on the presence of one of three criteria – wetland hydrology and hydrophytic vegetation or hydric soils – to classify areas as wetlands. The Cowardin classification system is also the basis for the National Wetland Inventory (NWI) maps of wetlands and waters prepared by the U.S. Fish and Wildlife Service (USFWS) for the entire United States. The NWI mapped wetlands within the project area are shown on Figure 4. The pathway the following four wetland classifications:

- Palustrine, Fresh Water, Emergent Wetland (PEM1/SS4Cd)
- Palustrine, Fresh Water, Forested/Shrub Wetland (PSS4C)
- Palustrine, Fresh Water, Emergent Wetland (PEM1F)
- Palustrine, Unconsolidated Bottom, Permanently Flooded, Excavated (PUBH)

Figure 4: NWI Wetlands Map of Project Area



After reviewing information collected during the delineation, the Cowardin mapped wetland areas found in Attachment 1 closely matched those mapped on the NWI map in Figure 4. The project area crossed multiple wetland habitats including:

- Palustrine, Emergent, Persistent, Forested, Seasonal Flooding (PEM1/SS4C)
- Palustrine, Emergent, Persistent, Forested, Seasonal Flooding (PEM1/FO1C)
- Palustrine, Forested/Scrub-Shrub, Seasonally Flooding (PSS4C)
- Palustrine, Emergent, Persistent/Forested, Semipermanently Flooded (PEM1/FO1F)
- Palustrine, Forested, Broad-Leaved Deciduous/Scrub-Shrub, Broad-Leaved Deciduous Semipermanently Flooded (PFO1/SS1F)
- Palustrine, Emergent, Persistent, Semipermanently Flooded (PEM1F)
- Palustrine, Emergent, Persistent, Seasonally Flooded (PEM1E)
- Palustrine, Unconsolidated Bottom, Permanently Flooded, Excavated (PUBHx)

Hatteras Island is a naturally occurring barrier island with typical coastal landforms consisting generally of long beaches backed by sandy dunes and a large complex of dune-and-swale wetlands.

Along the project corridor, these long, linear dune ridges have an east-west orientation, which is parallel to the shoreline along Hatteras Bight on the south edge of the island (see Attachment 1). This complex topography is typical for undeveloped coastal wetlands and is indicative of the gradual advancement of the barrier island southward as older dunes subside into the marsh. Soils at this site are comprised of freely draining sand on the dune ridges and permanently saturated sandy soils with a strong organic muck component in the lower wetland swales. Lighthouse Road is a two-lane asphalt paved road with mowed turf grass shoulders. The road runs generally north-south, crossing the dune-and-swale wetland complex roughly perpendicularly to the dune ridges. The roadbed is constructed atop a graded fill berm to elevate the pavement above the surrounding wetland. Park staff report that this road rarely floods. Where the road shoulder abuts wetland swales, the upland-wetland transition typically coincides with the edge of the maintained turf grass shoulder, where the graded elevation meets the water table.

Outside of the developed areas along the road and surrounding park facilities, vegetation at the project location appears generally undisturbed and is typical of coastal barrier island dune systems in this region. Two primary vegetation communities occur within the survey area: mature upland dune forest and emergent marsh/scrub-shrub wetland. The upland dune forest habitat occurs along the higher elevation dune ridges and is characterized by dry sandy soils conditions, with moderately dense hardwood canopy and a mixed herbaceous and shrub understory. Dominant species include live oak (*Quercus virginiana*) wax myrtle (*Morella cerifera*) *Juniperus virginiana* (eastern red cedar), yaupon holly (*Ilex vomitoria*), cabbage palmetto (*Sabal palmetto*). The wetlands present are an emergent marsh/scrub-shrub habitat which occurs in the lower elevation swales between the dune ridges and covers larger open expanses of marsh land where the dune ridges are less prominent. This wetland habitat is characterized by a heterogeneous patchwork of shrub- and small tree-dominant vegetation (scrub-shrub wetland) interspersed with stands of saltmarsh grasses and other wetland herbaceous species (emergent saltmarsh). Dominant species include black willow (*Salix nigra*) swamp bay (*Persea palustris*), stiff dogwood (*Cornus foemina*), and wax myrtle (*Myrica cerifera*) in the canopy, and sturdy bulrush (*Bolboschoenus robustus*), eastern marsh fern (*Thelypteris palustris*), three-square bulrush (*Schoenoplectus pungens*), and Jamaica swamp sawgrass (*Cladium mariscus*) in the understory.

The project area is adjacent to the area known as Jennette Sedge which is a large open-water wetland complex bordering Buxton village homes along their southern boundary. Water within the wetlands is connected through a series of culverts along the Lighthouse Road which flows north into Pamlico Sound (Attachment 2). There is no headgate or other method to control the amount of water that can flow into the culverts and flow is dependent on the elevation of the water surface in Jennette Sedge (NPS 2003). There are also four ditches located along the northwest side of Buxton and these ditches help convey water from sedges on the north side of the island through the culverts to Pamlico Sound. These ditches generally drain sedges that are only on private lands and are not connected to Jennette Sedge (NPS 1993). These wetlands serve as freshwater storage and recharge reservoirs that receive subsurface lateral discharge from adjacent uplands during and shortly after rain events (Gregory and Morgan 1996). These drainage ditches lessen the period of inundation and can be considered an unnatural influence of the natural hydrologic system and the therefore these wetlands may be considered to be of low quality.

Two open freshwater pond areas are within or adjacent to the project area and are a registered Natural Heritage Area with the state of North Carolina for the presence of state rare plant species. One pond is located next to the parking area for the old lighthouse site. This pond, known as Lighthouse Pond, was created in the 1960's or 70's by dredging sand for the placement of sediment in front of the Cape Hatteras Lighthouse as a shoreline protection measure. Lighthouse Pond is bordered to the east by a parking lot and a flat surface with weedy vegetation, which looks like it

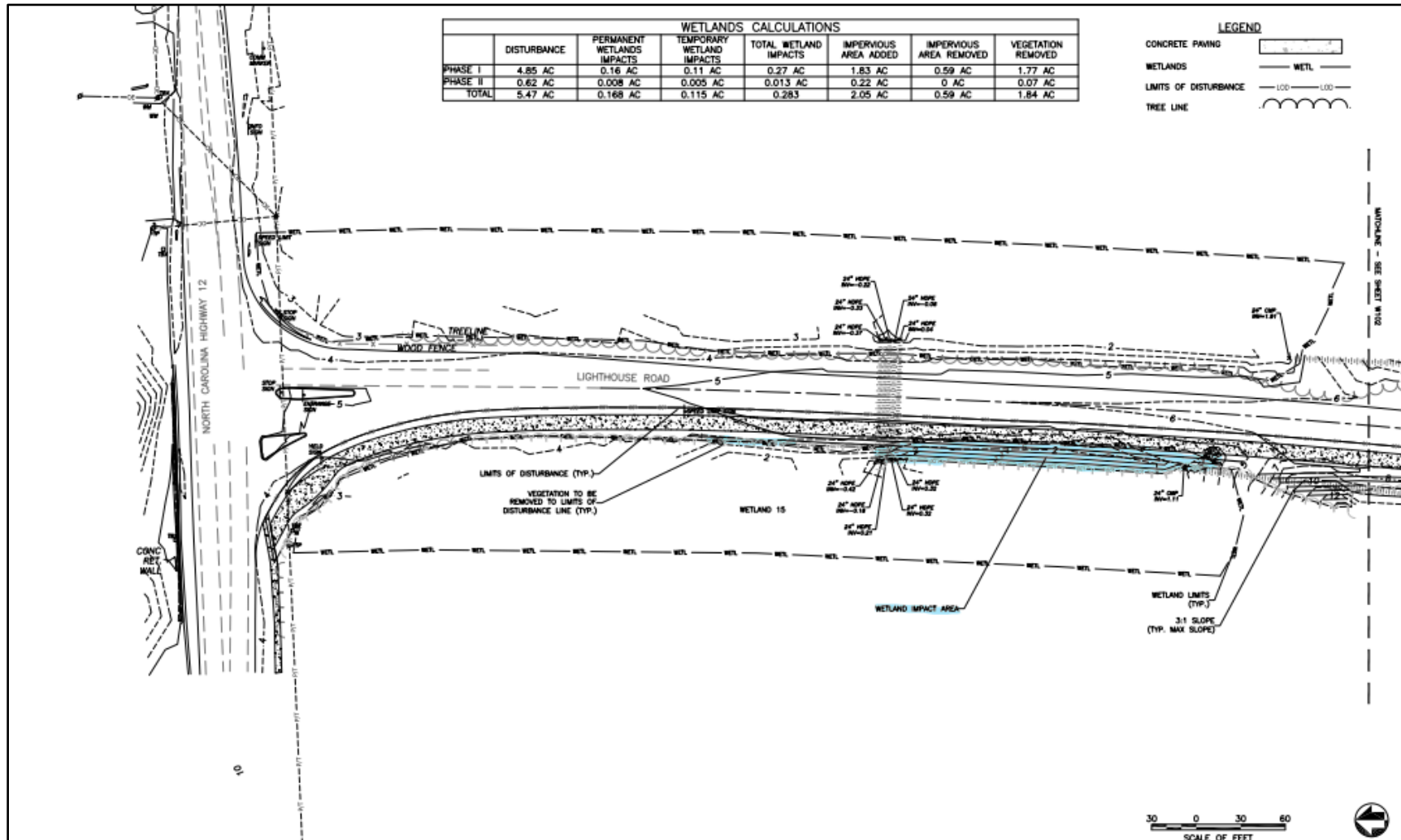
was graded in the past. According to a trip report in 1993 by Larry Martin, an NPS hydrologist, the drawdown zone of the pond is dominated by wetland species such as creeping frogfruit (*Phyla nodiflora*) or spikerush (*Eleocharis sp.*) Marshy areas containing Olney's threesquare (*Schoenoplectus americanus*), Monnier's water-hyssop (*Bacopa monnieri*), dune water-pennywort (*Hydrocotyle bonariense*), large saltmeadow cordgrass (*Spartina patens*), and exotic Bermuda grass (*Cynodon dactylon*) occur in patches along the edge.

The other pond, called Turtle Pond, is north of Lighthouse Pond and runs east towards Lighthouse Road. Turtle Pond is large, has an irregular shape, and follows the trend of the primary dune swales to the west. It is deeper at the two ends and shallow in the middle. There is not obvious evidence of excavation however, its north shore on the east end adjoins the area where the US Navy/Coast Guard base was, and this edge is clearly modified. This pond was constructed by the US Navy in the 1940's as a borrow site for sediment to place along the shoreline. A large population of the Significantly Rare Illinois pondweed (*Potamogeton illinoensis*) was identified as present in floating mats and in the drawdown zone along the southern side of Turtle Pond in 2014. The remaining open water contains patches of Wigeon-grass (*Ruppia maritima*). These ponds, though mainly Turtle Pond, are suitable habitat for many freshwater animals, such as fishes, reptiles, and amphibians. Small numbers of waterfowl occur on the ponds in winter, especially when very cold weather prevails for several days.

PROPOSED IMPACTS TO WETLAND FUNCTION AND VALUES

Under the preferred alternative, total land disturbance for both Segment I and II would be approximately 5.6 acres. The construction of the new pathway would adversely impact approximately 0.286 acres of the fringe edge of palustrine wetlands (Figures 5-9 below). These impacts include both 0.118 acres of temporary impacts from construction limits of disturbance and 0.168 acres of permanent impacts from fill required to create a 2-foot buffer with 3:1 slope on one side of the pathway along Lighthouse Road. Mitigation measures and best management practices would be implemented during pathway construction to reduce the adverse impacts of impacting wetlands, including using silt fencing, use of wooden construction pallets, sediment bags for any dewatering needs, salvaged topsoil and native vegetation, in all restoration efforts, phragmites treatments, and monitoring the success of restoration efforts.

Figures 5-9: Wetland Impact Area Highlighted in Blue



The construction of new multi-use pathway and trailhead and plaza facilities would primarily occur on well-drained soils or modified soils within developed areas. This alternative was designed to minimize impacts to wetlands as best as possible. The construction of a 10-foot-wide pathway would involve filling of some areas where wetlands are present. Culvert repairs would have minor negative impacts under the proposed action. Specifically installing the headwall and removing the culvert that goes to nowhere would have temporary minor impacts to fringe wetlands from turbidity effects while working within the wetland edge. The other culvert location would not have wetland impacts.

Following construction of the pathway, trailheads, interpretive plaza, disturbed areas would be revegetated with NPS approved native plant species. Overall functions of the wetlands are not likely to be noticeably altered because of the generally small area of fill and vegetation and ground disturbance in relation to the total acres of wetlands present in the project area; approximately 7.03 acres of wetlands within the project area, accounting for 96% of total wetlands, would remain undisturbed. Some pockets of wetland vegetation would be removed along some sections of the road to place fill to extend the standard 2-foot vegetative buffer next to the paved pathway (Figures 5-9). Remaining adjacent wetlands would continue to filter and convey precipitation and provide an important wetland habitat for vegetation and wildlife.

Under the action alternative, the design of the pathway for storm management would be to allow any accumulated rain to sheet flow across the pathway. No new storm pipes or low areas are identified in the design. The actions proposed under the proposed action would not be expected to impact the long-term viability of wetlands or water resources in the project area.

BIOTIC FUNCTIONS

The preferred alternative would result in minor, localized, direct, long-term impacts on aquatic species and habitats. Under the action alternative, the design of the pathway for storm management would be to allow any accumulated rain to sheet flow across the pathway. No storm pipes or low areas are identified in the design. The concrete pathway would result in minor recurring impacts from runoff that enters the adjacent wetlands during significant rain events.

The most significant impacts to wetland biotic function would be the permanent loss of 0.168 acres due to fill in the wetlands. Loss of habitat or foraging area provided by the wetlands would be minimal due to the proximity of the wetlands to the existing road and associated baseline anthropogenic impacts. These impacts are unavoidable due to the requirements for the placement of the pathway. Additional indirect impacts (0.118 acre) to wetland vegetation could occur due to site access, use of heavy equipment, and construction vehicles. The proposed project location was selected based on the availability of constructable upland area and highest available elevation. This site is wider than the other side and represents the best possible location for wetland avoidance. The proposed impacts represent the minimum possible impact while satisfying the park's facility requirements. Five percent of wetlands would be impacted from the preferred alternative. Other alternatives would have resulted in significantly greater wetland impacts.

No adverse effects to protected or special-status species are expected to occur. Several federal or state protected plant and animal species occur on Hatteras Island, primarily sea turtles and shorebirds but the habitat for these species area outside of the project area. No occurrence of protected species has been documented within the project limit area. The NPS determined that the proposed project would have no effect to protected species.

HYDROLOGIC FUNCTIONS

No significant changes to wetland hydrology are proposed. Grading for pathway installation may have permanent long-term impacts to surface water drainage patterns. Proposed new pathways would be concrete and would directly restrict surface water drainage or infiltration within this impermeable surface. However, all surface water would sheet flow across the pathway and would drain directly into adjacent land areas. Because the hydrology of the modified wetlands almost exclusively driven by tidal processes and rainfall inundation, these minor changes to surface water drainage would have a negligible effect on the hydrologic function of the adjacent unimpacted wetlands.

CULTURAL VALUES

There are no known archeological resources considered eligible for the National Register identified within the proposed project area. However, a portion of the project would traverse through the move corridor boundary which has been identified as a non-contributing but compatible feature to the relocation of Cape Hatteras Lighthouse. The move qualified the light station for Criteria Consideration B of the National Register. The integrity of the landscape is good and conveys the period of significance with both historic architecture and landscape features. The construction of a new multi-use pathway and signage would occur adjacent to the cultural landscape and would result in noticeable changes to the “move corridor” associated with the Cape Hatteras Lighthouse move, would be both beneficial and adverse. Beneficial impacts would result from providing interpretive messaging on the move corridor would enhance the story of why and how the move corridor was created and why its preserved. The construction of the pathway would have long-term direct adverse impacts to the view of the move corridor. Visually from the lighthouse one would see this new pathway but on the ground this very low-profile path would not detract nor change the openness of the corridor.

RESEARCH/SCIENTIFIC VALUES

Although there are numerous scientific and research projects associated with the barrier island habitat of Hatteras Island, there are no known studies that specifically occur within the project area. Most scientific studies in the vicinity focus on protected species and their habitat along the beach shoreline. The proposed project would have no significant effect to such large-scale studies. The construction of the proposed new multiuse pathway and associated loss of wetland and upland vegetation would not significantly affect the developed and impacted environment in the immediate vicinity. This disturbance is relatively small in comparison to Hatteras Island as a whole.

ECONOMIC VALUES AND RECREATION AND VISITOR EXPERIENCE

Visitation to the Seashore contributes to the local economy in several ways. First, it provides jobs to park employees, including seasonal, term, and permanent full- or part-time positions. Seashore employees spend their income and wages in local communities, which support additional jobs and income in these communities. The Seashore may also support the local economy if local vendors are utilized, through contracted construction services or purchases of supplies and materials, for example. Seashore visitors also spend their money in local gateway communities, which supports jobs, income, sales and tax revenues in those communities. Although, project activities would enhance connection to and from Buxton by way of the multi-use pathway, the project would not change visitation or use

patterns nor how visitors are spending their money. Residents of Buxton still would have to travel down Lighthouse Road or Old Lighthouse Road to access the Seashore. Both these access routes are where the multi-use pathway is proposed to be constructed and therefore use patterns would not change measurably under the preferred alternative.

ITERATIVE PROCESS FOR WETLAND PROTECTION

Avoidance

While the majority of the pathway would not impact wetlands, some portions of the project require filling of wetlands. The location of the expansion was located primarily on the west side of the road in order to minimize wetland impacts. Other avoidance measures will be taken during construction to limit the project's construction footprint and extent of fill impacts and can be found in the best management practices section (appended). Furthermore, no equipment would be driven, or located, in any wetlands at any time. Staging of equipment would occur on upland areas only.

Minimization

The location and design of the pathway helped to minimize impacts to wetlands. In addition, impacts would be minimized by the construction techniques utilized. The proposed pathway would be constructed immediately adjacent to the Lighthouse Road as a concrete path and mostly in areas where no wetlands occur, and only minimal vegetation removal would be required. In areas where wetland and vegetation impacts would occur for the construction of the pathway in certain impacts would be as minimal as possible.

Protection Measures

Effects on other natural resources and water quality would be minimized to the maximum extent practicable by implementation of best management practices (BMPs), such as the implementation of silt fencing during construction and the use of wooden construction pallets to protect wetlands from vehicle impacts. The full list of BPM's and Project design criteria (PDC) can be found in Attachment 3.

COMPENSATORY MITIGATION

A total 1.11 acres of *Phragmites australis* will be eradicated (at a 4:1 ratio) to compensate for the total impacts to 0.286 acres of wetland. The proposed on-site mitigation, defined as wetland restoration, serves to rehabilitate the native vegetative cover and habitat diversity within the Turtle Pond Natural Heritage Area by reducing or eliminating exotic invasive *Phragmites* cover. Post-rehabilitation (herbicide application) monitoring will be conducted biannually for a minimum of three years following biannual restoration efforts with an initial target of decreased *Phragmites* cover documented from year to year with a more aggressive target of <10% total *Phragmites* cover after 3 years of treatment efforts. Monitoring of the vegetation within the treatment areas will be implemented towards the end of the summer season (August through September) following herbicide application, but prior to fall changes in vegetative cover which would confuse documentation of treatment response.

Qualitative evaluations will be carried out, consisting of photographic documentation of the progress of the treatments from predetermined photopoint locations and a walk-through evaluation documenting total cover of *Phragmites australis* within the mitigation area. For consistent future

photographic documentation, photopoints will be field located with a GPS unit at edges or boundaries of treatment areas with multiple locations throughout the mitigation area.

Control of exotic plant infestations within the Seashore is an NPS priority, to encourage native plant cover, and to combat the reduced vegetative diversity and subsequent reduced favorable wildlife habitat documented in areas with significant exotic cover. In 2022, NPS mapped 1.11 acres of *Phragmites australis* infestation adjacent to the multi-use pathway project area and along Lighthouse Road. The NPS treatment plan for restoration of this area will follow procedures established in *A Guide to the Control and Management of Invasive Phragmites, 2nd Edition* published by the Michigan Department of Natural Resources which recommends herbicide treatment in mid-late summer, followed by prescribed fire prior to spring or during the summer before subsequent herbicide spot-treatments. The NPS is currently updating Cape Hatteras National Seashore's Fire Management Plan (FMP) which is expected to be complete before the first prescribed fire treatment would be implemented for this project's adaptive mitigation efforts. Restoration of wetland mitigation areas would be carried out biannually with alternating herbicide and prescribed fire treatments as is practicable. Any potential impacts of utilizing prescribed fire shall be evaluated separately in the aforementioned FMP and would only be utilized as is practicable and ecologically beneficial such that impacts to concurrent flora and fauna are minimized and impacts to visitor use and experience are minimized.

Annual summaries of treatment efforts, lessons learned and plans for the subsequent year will be prepared near the end of the calendar year to document restoration success and inform adaptive management decision making.

NPS Procedural Manual 77-1 states that wetland compensation is required if a project's adverse impacts on wetlands total 0.1 acres or more (NPS 2016). For this project, mitigation is required as temporary and permanent impacts on the wetlands associated with the action alternative result in 0.286 acres of impact. Total mitigation implemented will meet regulatory requirements associated with obtaining the NPS standard 4:1 mitigation ratio for use of out-of-kind, non-native, invasives removal as compensation for the loss of low-quality wetlands.

The Seashore would commit to the eradication of invasive, non-native-plant species to offset the potential adverse impacts to wetlands resulting from the proposed multiuse pathway. In accordance with the NPS goal of "no net loss of wetlands" and with established wetland protection policies, permanent loss of wetlands from project actions would be offset by active restoration and management of wetland habitat. This proposed mitigation sites area along and adjacent to the project area along Lighthouse Road within the Hatteras District at approximately 35.255650°N, - 75.523255°W.

The NPS has identified the rehabilitation of approximately 1.11 acres of wetland within the 'Turtle Pond' registered State Natural Heritage Area (SNHA) as the priority site for the proposed on-site mitigation of wetland impacts (NCDENR 2013). This SNHA lies on the east side of the Buxton Woods-Cape Hatteras complex and includes Turtle Pond running eastward from Lighthouse Road, Lighthouse Pond adjacent to the old lighthouse site, and an additional unnamed small pond between the two. A low sand ridge and wet swales make up the rest of the site. In 2022, the NPS mapped *Phragmites* cover within the Turtle Pond SNHA and along Lighthouse Road. (Attachment 4). Seashore staff and/or the Southeast Coast Network Integrated Pest Management Team will chemically treat exotic invasive common reed (*Phragmites australis*) within the mitigation sites to restore 1.11 acres (5.5:1 ratio) of wetlands.

Phragmites sp. is a tall perennial grass which can attain heights of up to 4.5 m (USACE 2005), significantly greater than that of native marsh species, such as *Spartina alterniflora*, *Spartina patens*, *Juncus roemarianus*, and *Typha latifolia*. Although it is a prolific seed producer, *Phragmites* most often spreads locally through vigorous growth of rhizomes and stolons, which can grow up to 2 m per year (Batterson and Hall 1984). The European genotype of *Phragmites* is an exotic species and occurs in large pockets in the pond and smaller pockets along the edge of the project area, in habitats once occupied by the genotype native to the United States. Population decline and local extinctions of the native genotypes may be a result of competitive displacement by the exotic genotype and/or anthropogenic disturbance. Approximately 900 acres of marsh are infested by the exotic *P. australis* throughout the entire Seashore (NPS 2022).

While the observed effect on populations of native fish, benthic infauna, aquatic invertebrates, and decapod crustaceans has been variable (Posey et al. 2003, Hanson et al. 2002, Able and Hagan 2000, Fell et al. 1998), the shift in habitat from native low marsh vegetation to monotypic stands of *Phragmites* has demonstrated a more consistent effect on bird populations.

The NPS will use chemical application and burning for the removal of *Phragmites*. Chemical controls include herbicide application, typically in combination with some form of physical control for well-established infestations in large areas. Chemical control of *Phragmites* has been achieved most frequently with a foliar application of imazapyr or glyphosate, a non-selective herbicide, (Mozdzer et al, 2008). Herbicide application followed by burning has shown to be relatively effective and may stimulate the native plant community recovery (Boone et al, 1987).

JUSTIFICATION FOR USE OF THE WETLANDS

The purpose of the proposed project is expansion of public access and recreational opportunities within the jurisdiction of the Cape Hatteras National Seashore. A new pathway would provide users originating in the village of Buxton with a resilient, safe, and accessible route to many of the Seashore's key visitor use areas including the Cape Hatteras Lighthouse, Visitor Center and Museum of the Sea, Old Lighthouse parking and beach area and new Buxton Beach Access area at the former US Navy/Coast Guard area. This pathway would also be enhanced with wayfinding, interpretive messaging, and benches.

The National Park Service has determined that implementing the proposed project in conjunction with the proposed mitigations would not result in significant loss of wetlands or wetland function and values. While the preferred alternative does not avoid the maximum amount of wetland impact possible when considering all viable alternatives, the amount of wetland affected is small (0.286 acres) and to offset the permanent loss of wetlands (with low quality overall functional value) associated with the construction of the proposed action a wetland mitigation site of approximately acres has been identified, yielding a net increase of wetland area and a 4:1 mitigation ratio. Best management practices described in this document would be implemented to minimize impacts. Planned mitigations would further enhance the ecological value of the wetlands in this area through removal of invasive species and restoration of native habitat.

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Attachments

Attachment 1. Wetland Delineation

Attachment 2. Lighthouse Road Culvert Locations

Attachment 3. Best Management Practices

Attachment 4. Compensatory Mitigation Treatment Areas

Attachment 1



Attachment 2



Attachment 3

Project Phase	Project Design Criteria (PDC) and Best Management Practices (BMP)
General (applies to all phases of project)	<ul style="list-style-type: none"> • The pathway shall be designed and constructed using natural topography to create grade reversals or rolling dips to provide adequate drainage. • All equipment and vehicle washing operations would be performed off-site. • Erosion control structures (silt fencing, coir logs, etc.) must be maintained throughout project activities and removed upon project completion when appropriate. • All utilities (power, fiber, water, sewer, etc.) would be properly marked prior to construction activities by local utility companies. If any utility shutdowns are expected, due to project activities, then notification to park management and district staff is required. • Parking of personal vehicles would be within designated areas only. • The project shall include a pre-construction meeting and a final inspection meeting, in addition to regularly scheduled project meetings and site visits. • To minimize the amount of ground disturbance, staging and stockpiling areas shall be in previously disturbed sites, away from visitor use areas to the greatest extent possible. • A public information program to warn of temporary closures, delays, and road hazards during construction shall be implemented. This program would help convey appropriate messages to the public and aid in mitigating potential impacts on visitors' expectations and experiences. • A project schedule would be provided to the public as soon as it is known. • To the extent practical, work shall be scheduled to avoid construction activity and construction related delays during peak visitation times. No holiday or nighttime work shall be allowed. Weekend work (Friday through Sunday) shall not be allowed unless authorized in writing by the park's Superintendent. • No amplified artificial music (stereos, smartphones, etc.) would be allowed while conducting construction activities within visitor use areas such as the Cape Hatteras Lighthouse. • To reduce noise and pollution emissions, construction equipment would not idle any longer than is necessary for safety and/or mechanical reasons.
Pre-Construction	<ul style="list-style-type: none"> • Army Corps Engineers may issue 404/401 permit for project actions. NPS to submit a pre-construction notification to USACE district engineer prior to commencing for use of the Nationwide 14. • NPS to identify wetland compensatory projects for wetland restoration efforts to comply with DO-77: Wetland Protection. NPS to pay for wetland mitigation credits for impacts to jurisdictional wetlands as requirement of 404 permit.

	<ul style="list-style-type: none"> • NPS is required to seek a Sediment Control Erosion Permit, a Construction Stormwater Permit and a Post-Construction Stormwater Permit from the North Carolina Sedimentation Control Act of 1973 requires that anyone who has a project which has more than one acre of land disturbed must submit a Sediment Control Erosion Plan to the North Carolina Department of Environmental Quality. • The park's Public Affairs Team shall be notified at least two weeks in advance of scheduled work and/or when start date has been established by contract, so that a news release may be prepared and sent to the public. • Contractor to verify groundwater conditions and evaluate dewatering requirements prior to construction. • Survey points and monuments (water, boundary) shall be surveyed prior to the start of construction to verify their accuracy and to ensure the monuments are protected from damage during construction activities. • The project administrator shall inspect all off-road equipment prior to entering NPS lands to ensure that they are free of soil, seeds, vegetative matter, or other debris that could contain or hold noxious weed seeds. "Off-road equipment" includes all construction machinery, except for trucks, service vehicles, water trucks, pickup trucks, cars, and similar vehicles. • Measures must be employed to prevent or control spills of fuels, lubricants, or other contaminants from entering the waterway or wetland. • Clearing limits and wetland limits shall be adequately buffered and marked in the design and marked with silt fencing within the project area. • Prior to commencement of any earthwork, project area must be flagged/staked or fenced to ensure that machine-operated activity is focused within the limits of disturbance. • Tree Preservation Plan should be developed and should identify "Leave/Save trees" along pathway design. Critical Root Zone, (1 foot radius protect for every 1" dbh) of marked trees must be fenced for protection and avoided. Trees adjacent to the pathway design, should have a no cut zone (6'-10' of a mature (24" dbh) identified, if possible. Cutting within this radius can destabilize the tree and cause the tree to become a hazard after the pathway has been constructed. If root zones surfaces would be impacted by project activities, mats or fill must be placed on top of root zones to reduce compaction impacts, and hand excavation must occur. • NPS would only carry out tree/limb removal outside of avian nesting season (April 1 through August 31).
During Construction	<ul style="list-style-type: none"> • Project areas would be re-surveyed by NPS resource staff to ensure any undocumented threatened, endangered, proposed, or candidate species or nesting species or milkweed plants are noted and avoided within the project area prior to or during project implementation. • If undocumented historic or archeologic resources are located during ground-disturbing activities or planning activities associated with approved construction activities, all construction in the immediate vicinity shall cease

	<p>and properties shall be treated as specified in 36 CFR Part 800, Protection of Historic Properties. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) would be followed.</p> <ul style="list-style-type: none"> • Stumps in the pathway tread and pathway clearance corridor shall be ground down or cut as low as possible to the ground to avoid safety hazards. • All construction activities shall be confined to daylight hours, excluding emergencies. • Construction materials staging areas would be restricted to previously disturbed sites in upland areas. • Equipment must be free of any fluid leaks (fuel, oil, hydraulic fluid, etc.) upon arrival to the work site and would be inspected at the beginning of each shift for leaks. Leaking equipment would be removed off site for necessary repairs before the commencement of work. • Runoff from stockpiled material must be controlled with silt fencing, filter cloth, coir wattles or other appropriate means to prevent reentry into waterways or wetlands. • Sediment filter bags would be used for dewatering operations. • Contractor must be required to maintain silt fence lines once they have been installed and/or repaired. • Construction activities would be halted while the ground is saturated following large rain events to avoid damage to soils and vegetation. • Care must be taken to avoid any rutting caused by vehicles or equipment during construction activities. • No equipment will be driven outside the established limits of disturbance. Wooden construction mats will be used when equipment must be driven in wetlands to minimize soil and plant root disturbance and to preserve preconstruction elevations. • All hazardous waste materials such as oil filters, petroleum products, and equipment maintenance fluids would be stored in structurally sound and sealed containers in the hazardous materials storage area and segregated from the other non-waste materials. Additionally, all hazardous materials would be disposed of in accordance with federal, tribal, and state regulations. • Any waste generated would be properly disposed of in a contract provided trash bin located in approved site and hauled off promptly at project completion. • Construction equipment and maintenance materials would be stored at approved staging areas. • All major equipment and vehicle fueling, and maintenance would be performed offsite or on non-pervious surfaces such as concrete or asphalt or deploy a spill containment pad. Absorbent, spill cleanup materials and spill kits would be located at the staging area. All equipment receiving maintenance and vehicles and equipment parked overnight would have drip pans placed beneath them.
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	<ul style="list-style-type: none"> • No work would occur outside of the limits of disturbance without NPS approval.
Post-Construction	<ul style="list-style-type: none"> • Ground surface treatment would include grading to natural contours, topsoil and topsoil mantle replacement, seeding, and planting. Pathway edges would be promptly revegetated with NPS approved seed mixes upon completion of pathway construction. All mulch used in re-vegetation efforts shall be certified to be free of weed species. This work would occur as soon after the completion of construction as possible. Soil and fill material must be weed-free and from a source approved by the National Park Service. • Remove all flagging and fencing and soil erosion structures (after vegetation established). • All staging and stockpiling areas shall be returned to pre-construction conditions following construction. • All pathway segments shall have appropriate signage to prevent user conflicts. A sign plan shall be reviewed and approved prior to installation of signage. • Some of the slash generated from tree-removal operations may be mulched, and the mulch applied to the surface of disturbed areas for both temporary and permanent stabilization. Invasive vegetation shall not be mulched and spread when it is in seed. • Downed woody debris resulting from construction activities should not be left in place in a pile due to concerns about fuel loading and potential for wildfire impacts. Woody debris should be cut up and scattered or mulched and applied on site. • Annual pathway maintenance shall include monitoring and maintenance of drainage features, as necessary. Monitoring of these features shall also occur during construction to ensure that impacts are minimized, and drainage management is implemented. • Pathway shall have appropriate signage to inform users of permitted activities and reduce user conflicts. • Monitor and treat invasive and exotic plant species. Herbicides must be approved through the Pesticide Use Proposal System (PUPS). Application of herbicides shall be by licensed applicators and certificates must be issued to the park IPM coordinator. At completion of annual work, a pesticide use log must be submitted to the park and entered into PUPS prior to next year's herbicide treatments. • Restoration of wetland mitigation areas would be carried out biannually with alternating herbicide and prescribed fire treatments as is practicable. • Annual summaries of restoration treatment efforts, lessons learned and plans for the subsequent year will be prepared near the end of the calendar year to document restoration success and inform adaptive management decision making.

Attachment 4

