

National Park Service
U.S. Department of the Interior

Jean Lafitte National Historical Park and Preserve
Southeast Region



Trail Improvements at Barataria Preserve

Environmental Assessment

March 2024



How to Comment on this Environmental Assessment

This environmental assessment will be open for public review for 30 days. If you wish to comment on this environmental assessment, you may submit your comments using several methods:

1. Submit comments online at the project website, at https://parkplanning.nps.gov/BARA_trails
2. You may send comments by mail, email, or fax to:

Superintendent
Attn: Barataria Trails EA
National Park Service
419 Decatur Street
New Orleans, LA 70130

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. You can ask us to withhold your personal identifying information from public review, but we cannot guarantee that we will be able to do so.

ON THE COVER

Bayou Coquille Trail “Flooded Forest”, Barataria Preserve. Photo Credit: J Williams, March 2022.

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1. Purpose and Need

The National Park Service (NPS) proposes to repair hurricane-related damage to the trail network within the Barataria Preserve of Jean Lafitte National Historical Park and Preserve and to rebuild a subset of the boardwalk trails, so they are resilient to future storm impacts. The NPS action is needed to repair boardwalks of the Preserve damaged by Hurricane Ida, which made landfall on August 29, 2021, as a Category 4 storm with maximum sustained winds of 150 mph and its accompanying storm surge. In the wake of storm damage and flooding and in consideration of future impacts of subsidence, sea level rise, and increasing frequency of strong storms, the NPS proposes to sustainably rehabilitate the Barataria Preserve trail network.

1.1 Introduction

Jean Lafitte National Historical Park and Preserve was created in 1978 and has six units in southern Louisiana. The Preserve was created “in order to preserve for the education, inspiration, and benefit of present and future generations significant examples of natural and historical resources of the Mississippi Delta region and to provide for their interpretation in such manner as to portray the development of cultural diversity in the region” and to preserve and protect fresh water drainage patterns, vegetative cover, the integrity of ecological and biological systems, and water and air quality of the Barataria Preserve.

The Barataria Preserve (Preserve) of the Jean Lafitte National Historical Park and Preserve, located 17 miles south of New Orleans, is comprised of over 26,000 acres of Louisiana wetlands that include bottomland hardwood forest, cypress swamp, freshwater and intermediate (between freshwater and brackish) marshes, bayous, and canals (Figure 1). The network of boardwalks and walking trails within the Preserve (Figure 2) allows visitors to access the wild places of the Preserve to observe alligators, snakes, native plants, and over 200 species of birds. Each year over 450,000 visitors enjoy the Preserve’s trails, waterways, and programs that inspire stewardship of the natural and cultural resources of southern Louisiana and the many challenges they face.

Hurricane Ida caused extensive damage to Barataria Preserve’s trails and boardwalks. The Preserve’s existing 9-mile trail network is comprised of 2.96 miles of boardwalks and 6.05 miles of minimally developed dirt or gravel trails. This project is to repair and improve, to include demolition and replacement, of some of the boardwalks within the existing trail prism as well as horizontally align and raise boardwalk elevations. As a result, the trails would have greater resiliency for future hurricane and storm impacts and subsidence. The replacement of the damaged boardwalks with more resilient materials would allow the trails to be able to withstand and rapidly recover from disruption from future hurricane and storm impacts, subsidence, and sea level rise, while allowing for their continued use.

The NPS prepared this Environmental Assessment (EA) for public review. Under all action alternatives, the NPS would rebuild 1.32 miles of boardwalks at a higher elevation, demolish 0.16 miles of boardwalk turnouts, and abandon 2.07 miles of minimally-developed trail that is continually flooded. Areas where boardwalk segments are removed would be allowed to return to a natural state. The proposed alternatives vary on how to manage the remaining 1.35 miles of boardwalk: whether to use as is or demolish and restore. Appropriate trail elevation was determined by 50-year sea level rise and land subsidence projections and is

designed to be roughly 1.5 feet above the existing boardwalk levels.

The EA was prepared to analyze the potential impacts of two action alternatives and the no action alternative. The focus of this EA would be to prioritize the repair of existing boardwalks in response to Hurricane Ida. The secondary objective is to address trail infrastructure resilience to climate change. Enormous challenges exist in maintaining the existing boardwalks given increasing storm frequency and intensity and relative sea level rise in the Mississippi Delta. The NPS proposes to have a smaller percentage of the trail system on boardwalks and, over time, transition to more of the trails being located on natural surfaces and on the higher ground within the Preserve.

The EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality (CEQ) regulations to implement NEPA (40 Code of Federal Regulations Parts 1500-1508), U.S. Department of the Interior (DOI) regulations implementing NEPA (43 CFR Part 46), NPS Director's Order #12: Conservation Planning, Environmental Impact Analysis and Decision-Making, and the accompanying NPS NEPA Handbook (2015).

Project Vicinity Map

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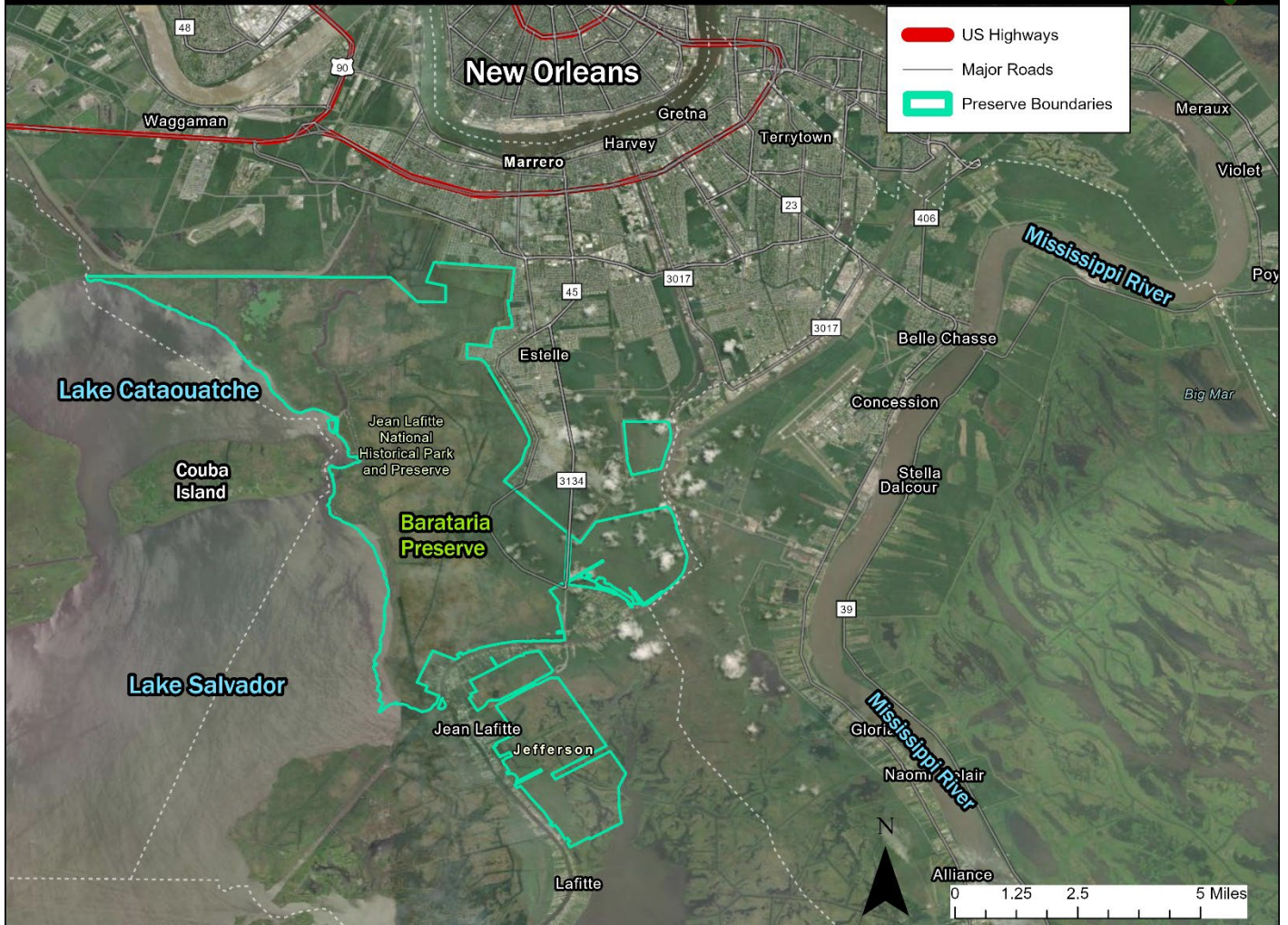


Figure 1. Project Vicinity

Barataria Preserve Trails

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 Jean Lafitte National Historical Park
 and Preserve

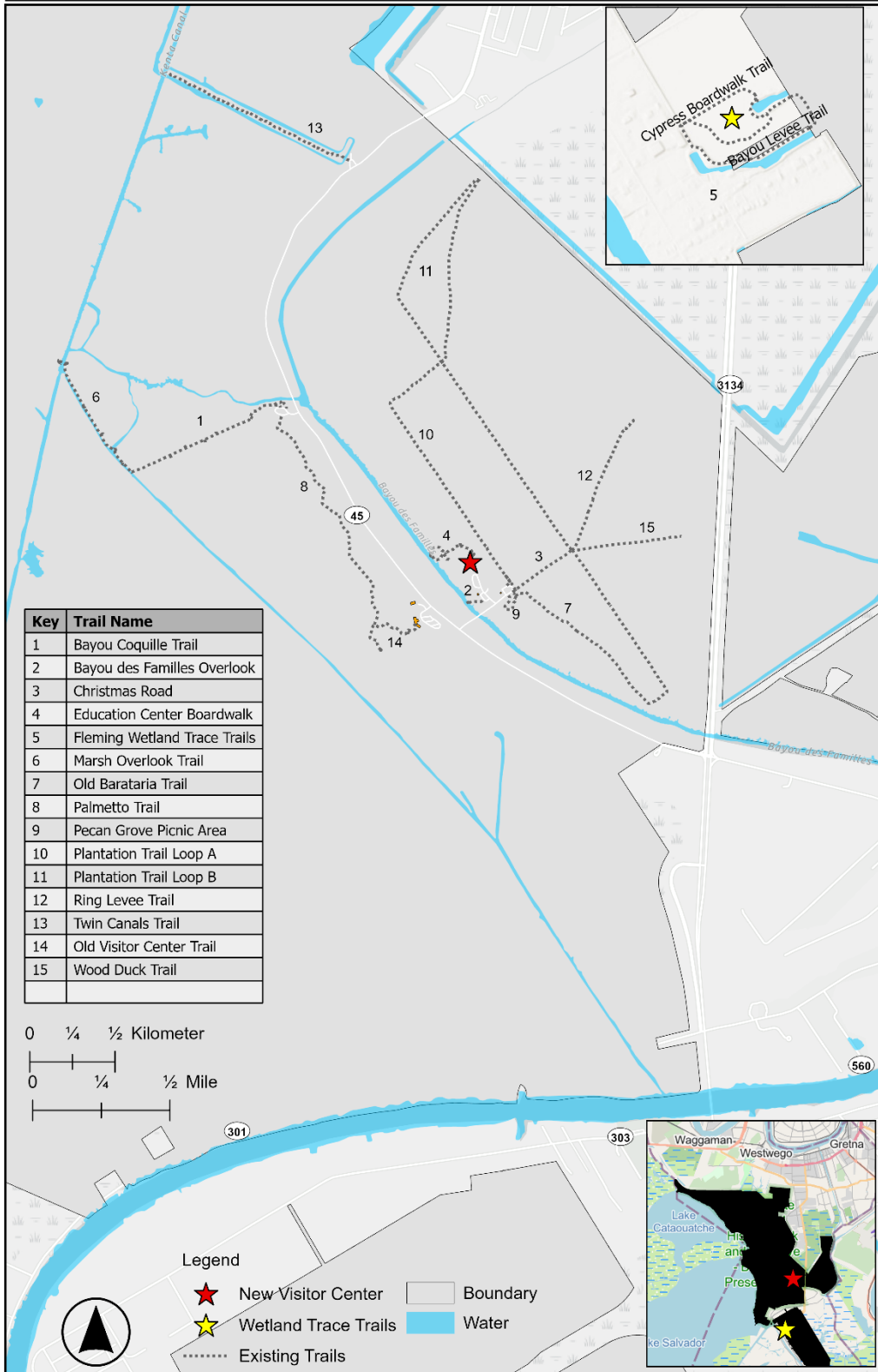


Figure 2. Preserve Trails

1.2 Purpose and Need

The purpose of the project is to improve accessibility and visitor experience, including visitor safety, by repairing damaged boardwalks and rebuilding with more resilient¹ materials. The NPS action is needed to repair boardwalks of the Preserve damaged by Hurricane Ida, which made landfall on August 29, 2021, as a Category 4 storm with maximum sustained winds of 150 mph and its accompanying storm surge.

Rebuilding with more resilient¹ materials would allow the trails to be able to withstand and rapidly recover from disruption from future hurricane and storm impacts, subsidence, and sea level rise, while allowing for their continued sustainable² use.

The objectives of the action are to:

- Enhance visitor experience and safety while using the trail system in the Preserve
- Enhance infrastructure resiliency to periodic flooding and storm events
- Promote long term sustainability of the trail infrastructure

¹Resilience is defined as the ability to adapt to changing conditions and withstand and rapidly recover from disruption due to emergencies. (NDRF – National Disaster Recovery Framework – Glossary | FEMA.gov).

²Sustainability is defined as meeting the needs of the present without compromising the ability of future generations to meet their own needs. (NDRF – National Disaster Recovery Framework – Glossary | FEMA.gov)

1.3 Background and Relationship of this Proposal to Previous Park Planning

Preserve trail system concepts were presented in both the General Management Plan (GMP) (NPS 1982) and the Amendment to the General Management Plan (NPS 1995). The development of the NPS trail system followed previous and existing land use of roads and canal spoil banks, which facilitated interpretation of the history of plantation agriculture, logging, and oil and gas exploration activities prior to the establishment of the Preserve. The 1982 planning was largely implemented with the establishment of the current trail network. The canoe trails in the waterways were originally planned in the 1982 GMP for non-motorized boat use and were intended to link with each other, and a few docks on selected walking trails. Over the past decades floating aquatic vegetation increased and limited opportunities for non-motorized boat use in a number of areas, including the areas indicated in the past as canoe trails. Replacement of boat docks was considered in light of these changing conditions.

One boat tour currently operates in the Preserve through a commercial use authorization as swamp tour, and several other swamp tours operate adjacent to and outside of the Preserve boundaries. The Preserve swamp tour offers visitor boat access to additional areas of the Preserve beyond the Preserve's managed trail system. Visitors are asked to remain on trails and motorized and non-motorized boaters can access the majority of the Preserve in designated waterways – this information is published on the Preserve website in the Superintendent's Compendium (www.nps.gov/jela/learn/management/superintendents-compendium.htm).

Current Trails

The existing trail network consists of approximately 9.0 miles, with 6.05 miles of minimally developed trails, and 2.96 miles of boardwalks and hardened trails that vary in width from 3.5 to 6 feet (Figure 2) (All distances are approximate and based on GIS data). Segments of hiking trails were largely established on the Old Barataria Road, the Christmas Plantation roads, and roads associated with past gas and oil exploration activity (Williamson 2023).

The existing 2.96 miles of boardwalks are located at the Education Center (0.32 mi), Bayou Coquille (0.68 mi), Marsh Overlook (0.51 mi), Visitor Center (0.3 mi), Palmetto (0.82 mi), Ring Levee (0.28 mi), and the Bayou des Familles Overlook (0.065 mi) Trails. The Visitor Center Trail has the lowest elevation of existing boardwalk and frequently floods on high tides and during storm events. The 6.05 miles of existing earthen trails are: Plantation Loops A and B (3.03 mi), Christmas Road (0.23 mi), Old Barataria (1.17 mi), Pecan Grove (0.13), Twin Canals (0.69 mi), Lafitte Wetland Trace (0.22 mi) (on NPS lands), Wood Duck (0.35 mi), and both Bayou Coquille and Ring Levee Trails have earthen sections of trail without boardwalk (Figure 2, Appendix A). During episodes of seasonal heavy rains, the eastern legs of Plantation Loops A and B and the southern portion of Old Barataria Trails are saturated, hold water, and/or have areas that are inundated and are difficult at times without waterproof boots. These conditions resulted in social trail and mud holes and trail closures over the past several years. During high tides and storm events, earthen portions of Bayou Coquille Trail also become inundated and would require more frequent closures in the future if not improved. Approximately 2.07 miles of minimally developed trails (Plantation A East trail, Plantation B East trail, and Old Barataria South Loop) have already returned to nature because of past extensive flooding.

Potential Future Trails

Future trails considered but not included in this plan include some concepts from the 1982 GMP (NPS 1982), such as the extension of Plantation Trail across Bayou des Familles at Bayou Coquille, and a trail and fishing dock on the shoreline of Bayou Barataria/GIWW at Jones Point. Those two GMP concepts have potential in the creation of new earthen loop trails on existing higher ground; these trails were out of scope for this planning and compliance process as the purpose and need of this effort is focused on consolidation of the existing trails. Other trail concepts considered include shortening Old Barataria Trail Loop, and the creation of a larger loop along Hwy 45 by expanding a trail on natural ridges to connect Twin Canals trail to the V-Levee and via Plantation B West to the Education Center. A roadside trail in the future could possibly go from the Education Center to Bayou Coquille and Twin Canals. These concepts and new trail development is beyond the scope of this project and the storm funding to repair storm damaged infrastructure.

1.4. Relative Sea Level Rise

An exceptionally rapid rate of relative sea level rise (rSLR) impacts this project and the Preserve, and it is the reason for raising the elevations of the rebuilt boardwalks. The proposed boardwalk design elevations were determined by measuring the existing typical boardwalk height or elevation above sea level as +2.67 feet NAVD88. The design team incorporated future water level projections from an expert report that utilized twelve scenarios running two different models: the Integrated Compartment Model (ICM) developed by State of Louisiana for Coastal Master Plan and refined in the vicinity of the Preserve, as well as a MIKE 21-

Flexible Mesh Hydrodynamic model to project future conditions. Ultimately, they recommended raising any new boardwalk constructed to a height of +4.0 feet NAVD88 or approximately 1.3 feet higher than the existing boardwalks. The proposed elevation is projected to remain above the mean water levels for next 30 years (through 2055), the design life of the project (Waldron 2023).

Sediment compaction, the channelization of the Mississippi River, and other geological and human activities contribute to rapid subsidence in this deltaic region, leading to the highest rates of rSLR in North America . The sinking position of the Preserve’s wetlands in relation to ambient sea level leads to increasing water levels across the landscape. Lying less than 2 meters above sea level, the Preserve’s natural levee ridges are its highest terrain, and much of the landscape is less than half a meter above the level of the estuarine Lake Salvador on its western boundary. The entire area is experiencing increased flooding frequency, duration, and depth. To plan and to inform the management of natural and cultural resources, the Preserve seeks site-specific understanding of subsidence rates and flooding regime across the Preserve landscape and at key infrastructure locations.

As a part of ongoing planning efforts for sustainability in a dynamic environment, NPS engaged the services of Moffat and Nichol hydrodynamic engineering experts to conduct a study of future conditions for the Preserve. This study resulted in the report entitled, “JELA Barataria Preserve Future Conditions Modeling Study Modeling Report” (Moffatt and Nichol 2022). The Future Conditions analysis used two different models: the Integrated Compartment Model (ICM) developed by State of Louisiana for its Coastal Master Plan downscaled for this study to represent variation across of the Preserve, and a MIKE 21-Flexible Mesh Hydrodynamic model run each decade in the study period based on annual ICM results to calculate water level dynamics (e.g. daily to annual water levels driven by tidal and seasonal forces). The ICM is a landscape model for long-term change in which the spatial domain is segmented into compartments where the key processes shaping landscape change are calculated to determine land and water surface elevations (WSE) for each time step in the simulation period for each compartment. The MIKE21 FM HD model is a hydrodynamic model that was run using water levels calculated by the ICM model for the last year of each decade to complement the results of the ICM model by calculating daily to annual water and salinity levels across the Preserve landscape based on its hydrology. Each of the Climatic Scenarios represents a NOAA scenario that was used in the 2023 Louisiana Coastal Master Plan (NOAA 2022). Sea level rise rates were selected based on climate change modeling from NOAA and the Intergovernmental Panel on Climate Change (IPCC). Each of the Operational Scenarios represents a combination of the proposed Mississippi River Diversions either already slated for construction or evaluated for inclusion in the 2023 Coastal Master Plan, to include the Mid-Barataria Diversion and a sediment diversion near Ironton, Louisiana (Moffatt & Nichol 2022).

Trend

Long-term tide gauge records from Grand Isle (about 40 miles south of the Preserve) document rSLR in the range of 9 mm per year over the past 70 years, which is a rate of approximately 3 feet per 100 years. Multiple global and regional model scenarios project an additional 3 feet of relative sea level rise over the next 50 years, doubling the current rate of relative sea level rise. Sea level rise and local subsidence would rise another 3 feet in half the amount of time (NOAA 2022; NOAA 2024; Moffat & Nichol 2022).

1.5 Issues and Impact Topics Retained for Further Analysis

The NPS NEPA Handbook guides when an issue or impact topic should be carried forward for consideration. Specifically, it states that pivotal issues central to the proposal or of critical importance should be retained when: a detailed analysis of environmental impacts related to the issue is necessary to make a reasoned choice between alternatives; the environmental impacts associated with the issue are a big point of contention among the public or other agencies; or there are potentially significant impacts on resources associated with the issue. If none of these apply, an issue should be dismissed from further analysis.

Impact topics represent resources that could be affected, either beneficially or adversely, by implementing any of the proposed alternatives. The National Park Service used an interdisciplinary review process, existing studies and data, and public comments to determine which resources would likely be affected by this project. The following topics are carried forward for further analysis in this environmental assessment.

- *Archeology*
- *Wetlands*
- *Visitor Use and Experience*

1.6 Impact Topics Considered but Dismissed from Further Analysis

The following issues were not retained for further consideration as they did not meet the threshold described above:

Cultural Landscapes and Historic Districts

The Barataria Historic District (BHD) within the Preserve was listed on the National Register of Historic Places (NRHP) in 1989. The nomination included a total of sixty-three contributing resources, most being Native American sites. The historic district covers 1,855 acres centered around Bayou des Familles. Many of the contributing historic resources are Native American archeological sites clustered on the natural levees of Bayou des Familles and Bayou Coquille. There are also archeological resources dating from the colonial period and the nineteenth century and archaeology is carried through the document as an impact topic.

When the trail system was first established after the GMP (1982) trails were placed along existing oil and gas exploration roads (Bayou Coquille, Wood Duck, and Ring Levee Trails) and canal spoil banks (Marsh Overlook and Twin Canals), and they are not contributing elements to the Historic District. Palmetto and Visitor Center Trails were established largely within natural swamp and marsh areas and are also non-contributing (Table 1 and Figure 3). In a similar manner of re-use prior to the establishment of the Preserve, Plantation Trail A West was established in places on top of an old railroad bed and on top of an old land subdivision road established by the Jefferson Land Company. The Old Spanish Road, also known as the Chemin de Barataria or El Camino de Real, is the oldest road and trail in the Preserve and lies under portions of Plantation A East, and Old Barataria Trails. The Christmas Plantation continued the use of all these roads, and, in turn, the NPS continued the use of portions of Chemin de Barataria and the Christmas Plantation Roads resulting in the Plantation, Christmas Road, and Old Barataria Trails being contributing elements to the Historic District.

The Christmas Plantation Field System established a systematic irrigation system throughout the Big Woods with ditches established at regular intervals roughly in a north south orientation with several larger and deeper ditches running east west and connecting all the ditches to Bayou de Familles that likely was assisted by a windmill or other pump systems to flood and water the fields. The proposed access roads around the Education Center and the Education Center Boardwalk intersect several of the historic ditches of the Christmas Plantation Field System.

The project includes discontinuing the use of several portions of the Plantation and Old Barataria Trails that are frequently flooded when there are heavy rains and leaving these portions of trail and historic roads in their existing condition is not expected to impact these historic properties.

None of the boardwalks proposed to be rebuilt are identified as contributing elements to the historical features of the Cultural Landscape (Williamson, 2023) nor to the Historic District; therefore, these topics are dismissed from further consideration.

Table 1. Contributing and non-contributing elements to the Barataria Historic District cultural landscape (Williamson, 2023)

CONTRIBUTING elements to the cultural landscape:	
	Sections of Old Barataria Road/Chemin de Barataria, under Plantation Trail (A East, B West) and Old Barataria Trail (LCS ID: 065002)
	Section of Chemin des Coquilles under Barataria Boulevard / HWY 45
	Section of railroad bed under Plantation Trail (A West)
	Christmas Plantation Headquarters Road under entrance road and Christmas Road Trail
	Other Christmas Plantation roads, including field roads
	Third Road (Jefferson Land Company Subdivision Roads) under Plantation Trail (A West)
	Old Road (Jefferson Land Company Subdivision Road) under entrance road and Christmas Road Trail)
	Trails on alignment of historic roads (Plantation Trail, Christmas Road Trail, Old Barataria Trail)
MISSING Elements to the cultural landscape:	
	Other Jefferson Land Company subdivision roads
	Historic bridges over Bayou des Familles
Non-CONTRIBUTING elements to the cultural landscape:	
	Modern driveways and parking lots at Visitor Center
	Modern driveways and parking lots at Environmental Education Complex
	Modern driveways and parking lot at Bayou Coquille Trailhead
	Modern driveways, boat launch, and parking lot at Twin Canals Trailhead
	Twin Canals Trail
	Bayou Coquille Trail

	Marsh Overlook Trail
	Visitor Center boardwalk
	Palmetto Boardwalk
	Ring Levee Trail
	Wood Duck Trail

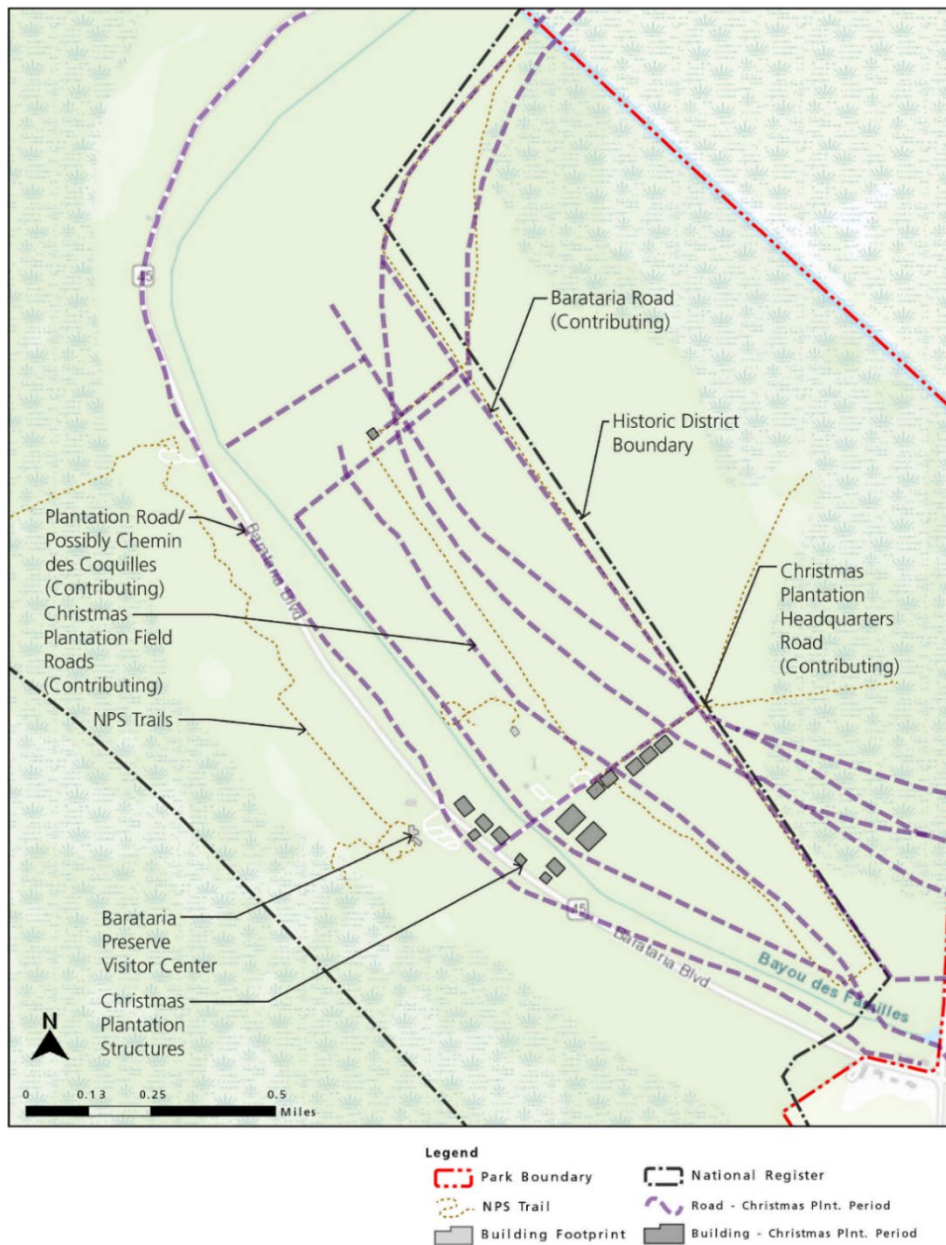


Figure 3. Roads from Christmas Plantation Period (Williamson 2023)

Environmental Justice

The existing trail system runs primarily through undeveloped areas of Jefferson Parish where few residents currently reside. Because the location of the trail system is in a relatively undeveloped area, the construction would not disproportionately effect minority or low-income populations or environmental justice areas. Although ingress and egress of construction equipment to the Preserve would be from Barataria Boulevard from Highway 3134 through the town of Marrero, the traffic and construction noise would not disproportionately effect minority or low-income populations or environmental justice areas. Although EJ tracts within the city of New Orleans are indicated as disadvantaged, the specific EJ tract within the Preserve containing the project is not indicated to be disadvantaged, therefore this topic is dismissed from further consideration.

Floodplains

No changes to the overall function of the floodplain would occur as a result of the proposed project. The project does not involve the further development or occupancy of floodplains and would not result in a significant impact to the floodplain. The project would reduce the trail footprint on the floodplain and therefore represents an improvement to floodplain resources and values over the long term. Because the project does not involve the further development or occupancy of floodplains and would not result in a significant impact to the floodplain, this topic is dismissed from further consideration.

Hydrology

The Big Woods area contains the majority of unimproved trails in the Preserve, and the area is largely impounded by the federal storm protection levee, state highway 3134, and the natural levee of Bayou de Familles. The west slope of the natural levee drains into Bayou de Familles, and Bayou des Familles also conveys storm surge to this area. The increased flooding depth and duration from road and levee construction in this area essentially drowns most tree species located east of the natural levee ridge and limits growth and survivorship of most terrestrial animals, woody plants, and many soil microbes (Figure 6). In other areas in the Preserve canal spoil banks and other tidal levees and roads present similar stresses to wetland systems by preventing water from moving regularly across the landscape. Sustained flooding decreases soil oxygen availability to the extent that even wetland plant roots and rhizosphere biota cannot metabolize. Seedlings of most tree species require at least a few months of dry soil conditions to grow tall enough to spread their leaves above water. Bald cypress is no longer regenerating naturally across much of its habitat in the Preserve. Sustained flooding decreases soil oxygen availability to the extent that even wetland plant roots and rhizosphere biota cannot metabolize. High mortality of the Preserve's bottomland hardwood forest trees is reducing the extent and health of that ecosystem. Bald cypress has not established in the areas of bottomland hardwood mortality, and it is no longer regenerating naturally across much of its habitat in the Preserve. These forested wetlands are further stressed by increasing frequency of wind disturbance (plus occasional storm surge salt deposition) from strong tropical storms. Their species richness, canopy height and spatial extent all have decreased substantially over the past 20 years. Bayou Coquille Trail may be higher in a few sections and could have modest to minimal impacts to water flows across the landscape. The hydrology of areas with the rebuilt boardwalks should improve as the trails should not restrict the movement of large woody debris and limbs. Further, sunlight will no longer be prevented from reaching areas below the boardwalks as the rebuilt boardwalks would have flow through decks. The hydrology of areas where the old trails have been removed should improve as the movement of large woody

debris and limbs would no longer be restricted. Further, sunlight would no longer be prevented from reaching areas below the trails. The project would not significantly alter the hydrology in the project area, and the size and number of gaps in the existing road under the Bayou Coquille Trail would be maintained; therefore, this topic is dismissed from further consideration.

Water Quality

The Preserve's water budget is dominated by precipitation with increasing marine influence and occasional Mississippi River influence during unusually high stage events. The balance of Gulf of Mexico, Mississippi River and precipitation sources shapes salinity conditions in Preserve channels and wetlands. Algal blooms, municipal runoff and treated effluent, and agricultural runoff likely also play roles in water chemistry. These water chemistry changes can affect plant and animal life within the Preserve and have the potential to significantly alter the landscape. Shifts in water temperature or salinity influence geochemistry and biological metabolism and shape community and ecosystem properties (Whitbeck 2023). Salt water from the Gulf of Mexico is slowly increasing salinity in the freshwater wetlands of the Preserve (Whitbeck 2023). Saltwater intrusion has the potential to negatively affect plants and animals that require low salinity conditions. In addition, salinity indirectly affects soil respiration via reducing root productivity, and potentially directly affects the soil microbial community (Krauss et al. 2012), which may shift decomposition processes and the integrity of – especially – the Preserve's extensive peat marshes. Historically, seaward marshes buffered the influx of saltwater from storm surges, but reductions in marsh area in the region have diminished their abilities to slow these acute intrusions (SEA 548 HSDRSS).

Sediment diversion projects outside of the Preserve that would bring freshwater diverted from the Mississippi River into the Barataria Basin would influence the salinity levels within the Preserve, sustaining more fresh conditions for at least a few decades. Lacking additional River diversion implementation, channel and wetland salinity in the Preserve would increase gradually over the next 30 to 40 years, and it is predicted to become significantly saltier under higher sea level rise climate scenarios (Moffatt & Nichol 2022). The recent, severe drought in the summer and fall of 2023 resulted in the highest salinity levels measured in the Preserve (> 10 ppt in some interior waterway channels) illustrating the increasing intensity of the stresses the Preserve landscape is currently experiencing given increased storm surge frequency combined with episodes of severe drought.

These effects to water quality are regional in scope and would not be caused by this project, therefore this topic is dismissed from further consideration.

Wildlife

The Preserve is located within the Barataria-Terrebonne estuary and this region is designated as an Important Bird Area by the National Audubon Society (National Audubon Society 2013). The Mississippi Alluvial Valley (MAV) supports the largest forested floodplain in North America and serves as important habitat for wintering waterfowl, wading birds, migrating shorebirds and other wildlife (Watson 2005). The Migratory Bird Treaty Act (1918) prohibits the take of migratory bird species protected by four international conservation treaties, such as the Bald and Golden Eagle Protection Act, the Neotropical Migratory Bird Conservation Act, and the Migratory Bird Conservation Act. Equipment noise and the presence of construction workers related to the removal and restoration of trails would temporally disturb wildlife.

Most of the trail alignment would stay the same in all considered alternatives. The proposed project would create acceptable, temporary disturbance during construction. There would be two new visitor access points around the Education Center that may be partially cleared of vegetation and staff would observe the area prior to construction.

Bald Eagles occur and nest in the Preserve and are protected under the Bald and Golden Eagle Protection Act (1940), as amended. To protect bald eagles, the project area would be surveyed by park staff and activities producing above ambient noise or visual disturbance would be restricted within 100 meters (330 feet) of any active eagle's nests during breeding season.

While there may be temporary and localized impacts to wildlife while these activities are underway, wildlife are expected to voluntarily leave the area while work is ongoing and return following completion of the work, and no work would occur at night; therefore, this topic is dismissed from further consideration.

Special Status Species

US Fish and Wildlife (USFWS) predicts in their Information for Planning and Consultation (IPAC) system that West Indian Manatee (*Trichechus manatus*) and Eastern Black rail (*Laterallus jamaicensis ssp. jamaicensis*) may be in the project area; however, Eastern Black rail (*Laterallus jamaicensis ssp. jamaicensis*) was not observed during fairly intensive surveys conducted over the past 5 years within the Barataria Preserve. West Indian Manatee (*Trichechus manatus*) are found in marine, estuarine, and freshwater environments and while their range is within Jefferson Parish, they are not known within the waterways of Barataria Preserve.

The tri-colored bat (*Perimyotis subflavus*) is not yet listed under the Endangered Species Act but is proposed as endangered wherever found. The species is known to be in the Preserve. Tricolored bats are found in forested habitats where they roost primarily among live and dead leaf clusters of live or recently dead trees and in southern portions of the range they may also roost in Spanish moss. There are no winter hibernaculum for tri-colored bat in Louisiana known since they are active year-round. Once a final listing has gone into effect for the species, the park would reinitiate consultation with USFWS (USFWS 2024).

The project does not occur within critical habit for the West Indian manatee, Eastern Black rail, or any other federally listed species. No critical habitat or threatened or endangered species were identified in the project area, and no currently federally designated threatened or endangered species are known to occur within the project area; therefore, this topic is dismissed from further consideration.

Vegetation

The Louisiana Department of Wildlife and Fisheries (LDWF) database indicates that a Live Oak Forest is located within the project area. This natural community, dominated by Live Oak (*Quercus virginiana*), is imperiled globally (G2) and is critically imperiled (S1) in Louisiana. Only 1-5% of the pre-settlement acreage of this habitat remains in Louisiana. Live Oaks are one of the species within the Preserve. Live Oak Forest provides habitat and acts as a staging/stopover site for Neotropical migratory birds.

Demolition and rebuilding of accessible trail boardwalks would require some ground vegetation, brush, and tree limb removal at the project site, and would include removal of select trees for construction access routes to the Education Center trail. The trees removed would be primarily water oak, maple, and sweetgum species. Live oaks, bald cypress and pecan trees would be preserved where possible. Limb removal would occur on a limited number of trees. A number of boardwalk and trail sections are proposed for complete removal, and those sites would be managed to return to native vegetation.

Although there would be minor impacts to individual trees and vegetation removed during access and construction, best management practices would effectively minimize impacts associated with removal of native vegetation, and there would be no significant impacts; therefore, this topic is dismissed from further consideration.

2. Alternatives

The proposed action would include demolition and rebuilding of the boardwalks within the existing trail prism and horizontal alignment. Increasing the elevation of sections of hardened trail and boardwalks would provide greater resiliency for future hurricane and storm events and continuing sea level rise and land subsidence. The NPS proposes to repair and improve the public trail system in the Preserve as funding allows by:

- Repairing hurricane related damage to specific boardwalks and trails.
- Rebuilding damaged boardwalks at a higher elevation with sustainable construction materials for greater resilience to flooding, sea level rise, and land subsidence.
- Removing trail segments that are often flooded, allowing these to naturally revegetate and return to a natural state.

Repairs would improve safety issues and meet Architectural Barriers Act Accessibility Standards (ABAAS). A more robust design would reduce the maintenance needed and therefore reduce total cost of facility ownership. Additionally, severely damaged trail sections and “turnouts and overlooks” have been identified for demolition without reconstruction.

The preferred alternative is Alternative C.

Table 2. Comparison of Alternatives and Changes in Mileage of Trail System

Alternative	Miles of Boardwalk	Miles of Minimally Developed Trail	Miles of Trail System
A	2.96	6.05	9.01
B	2.80	4.11	6.91
C	1.45	4.11	5.56

2.1 Alternative A- No Action

Under this alternative, NPS would maintain the existing conditions of the Preserve trail system. There would

be no change to the alignment, elevation, or materials of existing boardwalks or trails. The trail alignment would stay the same as depicted in the 2015 trail brochure (Figure B-1, B-2, B-3); however, the current trails brochure would be updated as it currently does not depict the acquired Fleming trails within the Town of Lafitte's Wetland Trace or the Education Center boardwalk.

The existing trail network consists of approximately 9 miles. Existing boardwalks are approximately 2.96 miles. Existing minimally developed trails, with dirt or gravel (or sidewalk) as a substrate are approximately 6.04 miles. (Table 2).

This alternative would include routine maintenance and cyclic repairs to all trails, with flooded segments closed for visitor safety as needed. Under the no action alternative, zero boardwalks would be rebuilt, and six boardwalks would be used as-is. Zero net change of impacts to the current boardwalk footprint, which would remain the same as existing conditions. Effects of rSLR on existing structures would result in negative impact from boardwalks in poor condition, would need more frequent repair, and would result in recurrent trail closures due to flooding.

The no action alternative is used as a basis to compare and evaluate the other alternatives.

2.2 Elements Common to All

Under both action alternatives, NPS would rebuild 1.32 miles of boardwalks at a higher elevation, demolish 0.16 miles of boardwalk turnouts, and abandon 2.07 miles of minimally developed trail which has already returned to nature due to past extensive flooding, described as follows:

The Education Center boardwalk would become the "new" Visitor Center boardwalk due to the relocation of the Visitor Center to the Education Center building. The Education Center trail consists of boardwalk only. The proposal is to rebuild the boardwalk and remove one turnout (Long Spur) and one unattached platform from the trail. Access routes (0.128 miles) prepared on upland areas for construction access to the Education Center boardwalk would remain after use during construction as primitive trails and connect to Plantation A West (Figure B-6). Rebuilt trail length with turnouts would be approximately 0.29 miles.

The Bayou Coquille Trail consists of boardwalks and hardened trail. The proposal is to rebuild the boardwalk and hardened trails and remove four trail turnouts from the trail (Trail Entrance, Midden, Spell of the Swamp, Abundance of Life). An existing service road would become the trail entrance and the existing trailhead would be eliminated to consolidate foot traffic and signage at a single trailhead (Figure B-7). Rebuilt trail length with turnouts would be approximately 0.59 miles.

The Marsh Overlook Trail consists of boardwalk only. The proposal is to rebuild the boardwalk and remove four trail turnouts (Kenta Canal Overlook, Sinkers Overlook, East Overlook, South Overlook) and one canoe launch with steps from the trail. The pedestrian bridge over the waterway of Bayou Coquille would be modified to be sturdy enough to support the weight of construction equipment, to include removing the existing deck, lift mechanism, and superstructure, then cutting the piles down to the elevation of the new proposed substructure, installing additional piles where required to support weight of construction equipment, and then constructing new support framing and deck atop them. No change would occur to the

Marsh Overlook Bridge or Platform (Figure B-7). Rebuilt trail length with turnouts would be approximately 0.45 miles.

Approximately 2.07 miles of minimally developed trails (Plantation A East trail, Plantation B East trail, and Old Barataria South Loop) would remain permanently closed as they are returning to nature because of continual flooding (Figure B-8).

The remaining 0.13 miles of boardwalks (Bayou des Familles, Ring Levee 2, Marsh Overlook Bridge and Platform) and 4.15 miles of minimally developed trails would have routine and cyclic maintenance.

2.3 Alternative B - Rebuild 3 Boardwalks and Use Other Boardwalks As-Is

Under alternative B, three boardwalks would be rebuilt in the same footprint as the existing conditions, and three boardwalks would be used as-is and would include routine maintenance and cyclic repairs with flooded segments closed for visitor safety as needed. . Under this alternative, in addition to actions common to all, NPS would leave approximately 1.35 miles of boardwalks in existing conditions to include the Visitor Center boardwalk (0.30 miles), the Palmetto Boardwalk (0.82 miles) and the Ring Levee 4 boardwalk (0.23 miles) (Figure B-4) (Appendix A). The three boardwalks not rebuilt may have to be abandoned over time as their substructures become unsafe and non-viable.

The trail network under this alternative would consists of approximately 6.91 miles. Boardwalks would be approximately 2.80 miles. Minimally developed trails, with dirt or gravel (or sidewalk) as a substrate would be approximately 4.11 miles (Table 2).

2.4 Alternative C- Rebuild 3 Boardwalks and Remove Other Boardwalks (Preferred Alternative)

Under alternative C, three boardwalks would be rebuilt in the same footprint as the existing conditions, and three boardwalks would be demolished and removed, and vegetation allowed to naturally restore. Under this alternative, in addition to actions common to all, NPS would demolish all or part of 1.35 miles of boardwalks to include the Visitor Center boardwalk (0.30 miles, the Palmetto Boardwalk (0.82 miles) and the Ring Levee 4 boardwalk (0.23 miles) (Figure B-5) (Appendix A).

The trail network under this alternative would consists of approximately 5.56 miles. Boardwalks would be approximately 1.45 miles. Minimally developed trails, with dirt or gravel (or sidewalk) as a substrate would be approximately 4.11 miles. (Table 2). This alternative would reduce the boardwalk length up to approximately 1.5 miles for a reduction of 50% of total boardwalk length at the Preserve.

2.5 Construction Methods and Materials Common to All

The construction methodology for the primary portion of the project (boardwalks) would be to support piles with substructure at each bent, bearing members spanning bents, decking, with handrails and guardrails included where required. These trails pass through sensitive wetland ecosystems, often with dense vegetation and forested cover. Due to these conditions, the reconstruction of boardwalk trails is planned to utilize “Top-down” Construction. Access to each trail for the “Top-down” Construction would vary from trail to trail.

2.5.1 Top-Down Construction

“Top-Down” construction methods are being proposed for all boardwalk rebuilding. Wetlands can be protected during the construction phase by designing the boardwalk to be installed from above. “Top-down” construction refers to the ability to install boardwalk piles to -20.0 feet depth and framing and decking using equipment operating on top of previously installed sections. Some areas where heavy equipment access is not feasible may require demolition using hand-operated tools instead. (Waldron, April 2023)

2.5.2 Pile Installation

The project would utilize top-down construction method during pile installation. Given this method of construction along with the limited access and remote nature of the trails, it is expected that the contractor would utilize smaller equipment like a skid-steer for installing the piles as traditional pile driving rigs mounted to crawler cranes would not be suitable for this construction method. In general, impact driving of the composite piles would be limited to the rate of 25 blows per foot using a hammer with 15,000 ft-lbs of energy. Given the smaller equipment expected to be used for pile installation, it is expected the contractor may use a smaller hammer with a lower energy which may require blow counts higher than 25 blows per foot. A vibratory hammer may be used but must apply the vibrations to the top of the pile only.

Based on geotechnical explorations performed at the site and the soil profile interpretations, piles would be installed in primarily soft to medium stiff clays and should be able to be driven with normal driving effort not exceeding the above limitations. The contractor would submit their proposed driving system for review which should include the type of equipment used, hammer type, and method of installation. (Waldron 2023).

2.5.3 Extraction Options to Remove Timber Piles

Cutting may require a pneumatic underwater chainsaw, shearing equipment, or other equipment to cut a pile by hand at ground level or the water surface at mean low tide. Piles would be cut at or just below the mudline. The cutting method is best choice for this project since it has the least impact to the environment and cultural resources as it does not require heavy machinery access. Any shavings, sawdust, woody debris (splintered wood, fragments, loose piling) on the water or sediment surface would be retrieved and removed by the contractor as practicable. Pilings may be cut into manageable lengths (4-foot or less) for transport on top of previously installed sections to the staging area and then to an approved disposal facility.

2.5.4 Materials

Boardwalk Assembly

The primary structural component of the trail system at the Preserve is Boardwalks. Selection of the boardwalk assembly was the largest component of the Value Analysis Workshop conducted in May 2023. The design elevation of newly constructed boardwalk is recommended at +4.0 feet NAVD88, which would be sufficient for elevated boardwalks to remain above the mean tidal levels for 30 years, the design life of the project (Figure 4).

The selected assembly for the boardwalk includes the following components:

- Composite pilings – 8” diameter, tip elevation at -20.0 feet NAVD88³
- Pressure treated substructure timber framing with CCA wood preservative.

- Fiber Reinforced Polymer (FRP) flow through decking.
- Stainless steel cable guardrails
- Thermally modified wood handrails

Hardened Trail Section

Bayou Coquille Trail is composed not just of boardwalks but also of hardened, earthen trail segments at an elevation from +2.0 feet NAVD88 to +2.5 feet NAVD88 (Figure 5). Where the terrain drops below +2.0 feet NAVD88 is typically boardwalk construction. Measured water levels collected by park staff determined an average water surface elevation in this vicinity could be as high as +2.67 feet NAVD88. The hardened trails segments on the Bayou Coquille Trail would be elevated to a minimum of +2.67 feet NAVD88.

³ All elevations are referenced to the North American Vertical Datum of 1988 (NAVD88) in U.S. survey feet. All horizontal coordinates are referenced to the North American Datum of 1983 (NAD83), Louisiana State Plane, South Zone, in feet.

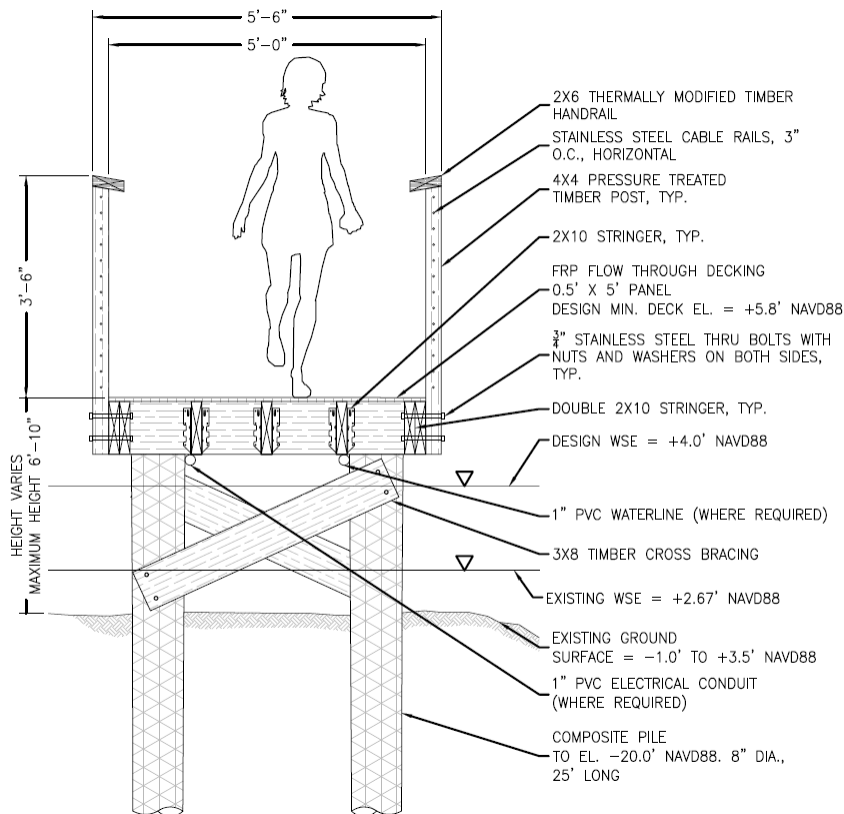


Figure 4. Boardwalk Typical Section

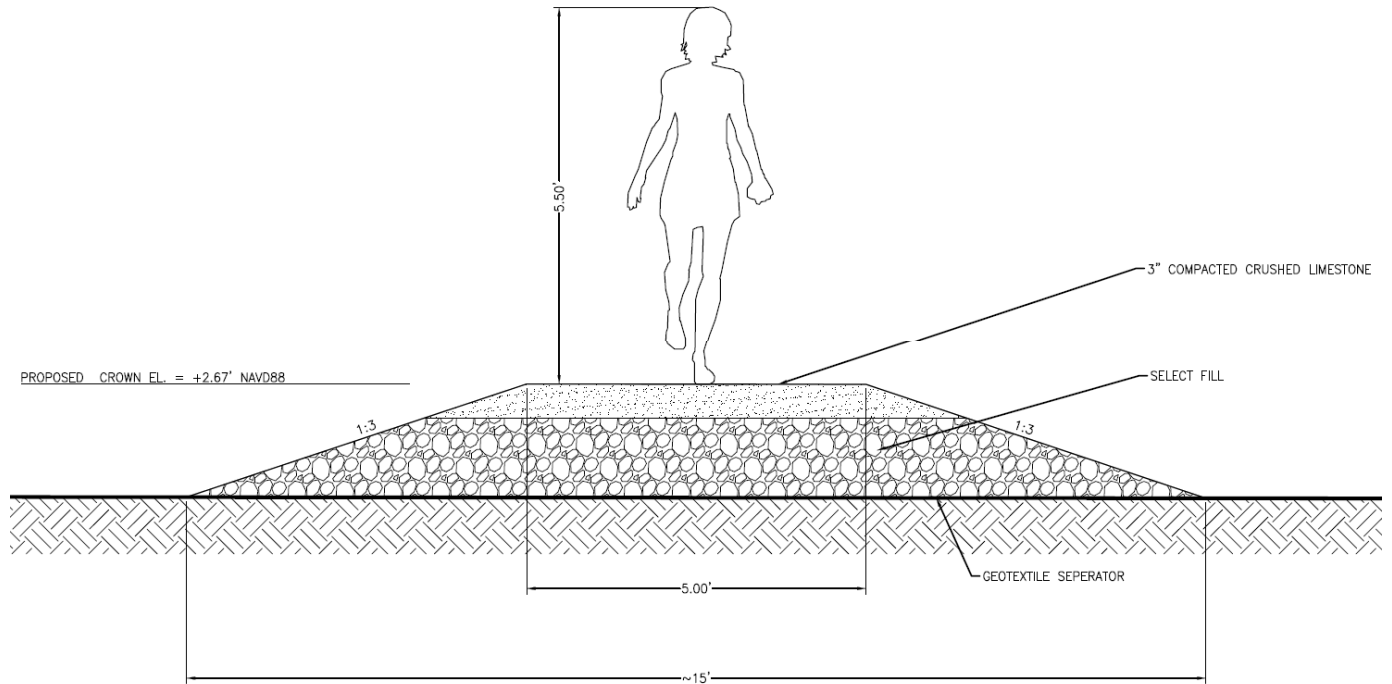


Figure 5. Hardened Trail Typical Section

Accessibility

A key goal of this project is to remain in compliance with the Architectural Barriers Act (ABA) Standards (2015). The Architectural Barriers Act Accessibility Standard, ABAAS, is the technical accessibility standard under the Architectural Barriers Act (ABA) of 1968, which requires that buildings and facilities be accessible to persons with disabilities. Compliance with ABA (particularly Section 1017 Trails) guided many of the design decisions. These decisions include:

- Slopes selected for any ramp portion (horizontal distance less than 30 feet) do not exceed 1:12.
- Due to the “Top-down” construction approach, clear widths are generally being held to a minimum of 60”, and this results in compliance for passing space without requiring dedicated passing segments.
- Decking surface would comply with the requirement that it would not allow the passage of a sphere more than 1/2 inch (13 mm) in diameter.

2.5.5 Access Routes and Staging Areas

Access to the boardwalk construction sites would be from existing roads with the exception of the Education Center boardwalk, and the staging areas would be in existing trailhead or building parking lots.

Access to the Education Center boardwalk would be two temporary access routes covered with either 6" shale/stone or mats - as follows (Figure B-6)

- From the triangle shaped deck of the boardwalk to the staging area in the Education Center parking lot.

- From the triangle shaped deck of the boardwalk to the Plantation Loop Trail, which connects to the staging area in the Pecan Grove parking Lot.

Access to the Bayou Coquille Trail would be from a staging area in the Bayou Coquille Trail parking lot via existing hardened surface vehicular maintenance access that would ultimately be converted into the new initial segment of the trail.

Access to Marsh Overlook would be via the Bayou Coquille Trail and use the same staging area in the Bayou Coquille Trail parking lot. The pedestrian bridge over the waterway of Bayou Coquille would be modified to be sturdy enough to support the weight of construction equipment, to include removing the existing deck, lift mechanism, and superstructure, then cutting the piles down to the elevation of the new proposed substructure, installing additional piles where required to support weight of construction equipment, and then constructing new support framing and deck atop them.

Special construction access would be required for the Visitor Center boardwalk because the boardwalk is attached to the deck of the Visitor Center building. Access to the Visitor Center boardwalk would be from a staging area in the Visitor Center parking lot via the existing 5-foot-wide timber access ramp, across the existing deck with approximately 18 feet clear between the two buildings located at the Visitor Center. Access to Palmetto Boardwalk would occur from the staging area in the Bayou Coquille parking lot and/or from the Visitor Center boardwalk from the staging area in the Visitor Center parking lot.

2.6 Mitigation Measures and Best Management Practices Associated with all Action Alternatives

NPS places a strong emphasis on avoiding, minimizing, and mitigating potentially adverse environmental impacts to preserve and protect natural resources. NEPA promotes efforts to prevent or eliminate environmental harm. Mitigation often plays a central role in the avoidance or minimization of adverse environmental impacts.

The CEQ regulations define mitigation as including:

- Avoiding an impact by not taking a certain action or parts of an action;
- Minimizing an impact by limiting the degree or magnitude of the action and its implementation;
- Rectifying an impact by repairing, rehabilitating, or restoring the affected environment;
- Reducing or eliminating an impact over time, through preservation and maintenance operations during the life of the action; and
- Compensating for an impact by replacing or providing substitute resources or environments

The following mitigation measures and best management practices (BMPs) would be included for the two action alternatives B and C.

2.6.1 General

- Trail crews would be educated about the importance of avoiding impacts on sensitive resources that have been flagged for avoidance, which may include natural and cultural resources. The resource management division would be notified and consulted when wildlife must be disturbed or handled.
- Construction zone limits and no disturbance areas would be demarcated with construction tape or some similar material prior to construction.
- Any required fill, rock, topsoil, or other earth materials would be sourced from park approved sites in or outside of the park. No foreign materials with the potential to introduce invasive plant species would be brought into the area. The source location of all materials would be identified in submittals. Any proposed materials would be reviewed on a case-by-case basis and the contractor shall minimize the use of off-site materials by coordinating with the Preserve about use of on-site materials.
- The contractor shall remove and properly dispose of all waste products generated by any operations on a daily basis and would be hauled from the park to an appropriate disposal location. The discharge of any water contaminated by waste products from cutting operations to the project area is prohibited. During construction, existing drainage facilities which receive runoff from the limits of each work area shall be cleaned as directed by the contracting officer representative.
- All construction vehicles and equipment are to be power washed prior to arrival to Preserve to remove soil and seeds from previous jobs. Power washing should include careful attention to undercarriage, tires, and wheel wells, as well as exterior of the vehicle. Vehicle cleanliness would be inspected by the contracting officer representative off-site prior to the vehicle being used.
- Contractor would comply with all permit conditions of Coastal Zone Consistency Determination C20230122 and the U.S. Army Corps of Engineers Wetland Permit MVN-2024-00241-ENP.

2.6.2 Cultural Resources

- Should construction unearth previously undiscovered cultural resources, work would be stopped in the area of discovery, and park managers would consult with the state historic preservation officer and the Advisory Council on Historic Preservation, as necessary, according to 36 CFR 800.13. In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (25 USC 3001) of 1990 and related implementing regulations at 43 CFR would be followed.
- Archeological resources would be left undisturbed and preserved in a stable condition to prevent degradation and loss of research values unless intervention could be justified based on compelling research, interpretation, site protection, or park development needs.
- To protect known or unknown archeological or historic resources, existing boardwalk piles would be cut flush to the existing grade during demolition and removal, and the subsurface portion of the pile would be abandoned in place to limit any additional ground disturbance or impacts. In areas subject to tidal fluctuation or in continuously wet areas an effort would be made to flush cut at mean low tide.

- To protect known or unknown archeological or historic resources, trees and other woody vegetation would be stump cut flush to the ground with stump grinding utilized where appropriate to reduce the stump at grade.

2.6.3 Natural Resources

- Impacts to mapped wetlands would be avoided or minimized to the extent possible. Areas along and outside the limit of proposed work are to be protected and maintained in their original condition. No activity is allowed outside the limits of work without written approval by the contracting officer representative. Any damage outside the limits shall be repaired and the area restored to its previous condition.
- Plant and wildlife surveys would be conducted by qualified biologists prior to any clearing of access routes, plant communities, sensitive wildlife, and important wildlife habitat. such as the tricolored bats hibernaculum and bald eagle nest trees.
- To the extent possible, the developed trail would follow the existing footprint and access trails would be situated to avoid the removal of Live Oak Trees and large trees, defined as greater than 18 inches diameter at breast height ($\geq 18''$ dbh).
- The access routes to the Education Center would be used during the dry season and/or heavy equipment “mats” would be laid down over wet areas to form a temporary access route above grade to avoid impacts to wetlands.
- To protect bald eagles, the project area would be surveyed by park staff and activities producing above ambient noise or visual disturbance would be restricted within 100 meters (330 feet) of any active eagle's nests during breeding season.
- Access trails would be completed and used to haul materials during dry season to maximum extent possible. Necessary tree trimming would be accomplished using accepted techniques that minimize long-term impacts to individual trees (e.g., limbs would be removed at the limb collar).

2.6.4 Visitor Use and Safety

- Construction and maintenance activities would be scheduled to minimize construction-related impacts on visitation. Areas not under construction would remain accessible to visitors as much as is safely possible.
- The trails inside construction areas would be closed to the public during construction. Contractor shall maintain “Trail Closed” signage and fencing barricade across entry in staging areas and at the beginning of project limits.

2.7 Alternatives and Elements Considered but Dismissed

The definition of a reasonable alternative, as defined by the CEQ 40 Questions (CEQ 1986), states, “Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant.” In addition, alternatives were eliminated that did not meet project objectives, resolve need, and alleviate potentially significant impacts on important resources. The following alternative was considered but dismissed.

Alternative to Rebuild All Boardwalks

Under this alternative, in addition to actions common to all, the NPS would also rebuild the Visitor Center boardwalk (0.30 miles), the Palmetto boardwalk (0.82 miles) and the Ring Levee 4 boardwalk (0.23 miles). approximately 1.35 miles of boardwalks. This alternative was considered but not analyzed further because the predicted change in sea level and widespread boardwalk failures along the current Visitor Center and Palmetto and Ring Levee 4 boardwalks indicate they would no longer viable to maintain as structures. In addition, enormous challenges exist in repairing and maintaining the existing boardwalks given increasing storm frequency and intensity. Therefore, NPS proposes to have a smaller percentage of the trail system on boardwalks and, over time, transition to more of the trails being located on natural surfaces and on the higher ground within the Preserve.

3. Affected Environment and Impact Analysis

The National Environmental Policy Act requires that environmental documents discuss the environmental impacts of a proposed federal action, feasible alternatives to that action, and any adverse environmental impacts that cannot be avoided if an action is implemented. This chapter begins with an explanation of methods, describes the existing conditions including existing resource trends and planned activities (affected environment) and analyzes the potential environmental consequences (impacts or effects) that would occur as a result of implementing the alternatives. This chapter assesses the potential impacts on the following topics.

3.1 Archeology

The Preserve is located on lands that are geologically young and the trails are largely located along a former outflow of the Mississippi River delta, an old distributary. The lands that formed were subjected to frequent flooding events that brought and deposited sediment - forming natural levees of earth along natural bayous throughout the Preserve, including Bayou des Familles and Bayou Coquille. The deltas that formed were active beginning about 5,000 years ago. Human efforts over the last three centuries seeking to control the flow and frequent flooding of the Mississippi river cut off the Barataria basin from the river.

Human populations were well established on the landscape by 700 B.C. These people lived along the natural levees and exploited the backwaters and marshlands from the high ground. Camps were established further afield and were in areas where people would have ready access to exploit the rich biotic diversity available to them. Evidence of these people is found in the numerous archeological sites located throughout the Barataria landscape. The sites include prehistoric shell middens and mounds and shell beaches. These sites are representative of human settlement, shellfish collection, or served as a social center.

Archeological investigations in the Preserve have documented the continuous span of human occupation within Louisiana's Mississippi Delta region from the Tchefuncte period (600–200 B.C.) to modern times. More than 80 prehistoric archeological sites have been discovered within the Preserve boundary, ranging from the earliest Tchefuncte, through the Marksville, Troyville, Coles Creek, Plaquemine, and Mississippian periods.

The Barataria Historic District (BHD) within the Preserve was listed on the National Register of Historic Places (NRHP) in 1989. The nomination included a total of sixty-three contributing resources. The historic district covers 1,855 acres centered around Bayou des Familles. Many of the contributing historic resources are Native American archeological sites clustered on the natural levees of Bayou des Familles and Bayou Coquille. There are also archeological resources dating from the colonial period and the nineteenth century.

The Area of Potential Effect (APE), or defined geographic area within which the construction, access, and staging of the project may affect cultural or historic properties, includes a 10-foot buffer on all sides from the construction areas of existing trails and boardwalks as well as areas needed for access and staging of equipment in existing parking lots. Two archeological sites are located within a 10-foot buffer of the existing trails with an additional site located within 35 feet of the APE. None of the boardwalks proposed to be rebuilt are identified as contributing elements to the historical features of the BHD.

Trend

Conditions of archeological sites in the project area are expected to remain stable. No new disturbance to archeological sites or historic properties would occur. Archeological resources would be left undisturbed and preserved in a stable condition to prevent degradation and loss of research values.

Impacts

No impacts to known archeology sites would occur during soil disturbance at the sites where trail boardwalks are demolished and rebuilt, and new pilings are installed. Existing pilings would be cut off even with the ground level and abandoned in place. No disturbance to archeological sites or historic properties would occur.

Under the no action alternative, zero boardwalks would be rebuilt, and six boardwalks would be used as-is. Existing boardwalk sections that are in poor condition are adjacent to three sites. No new disturbance to archeological sites or historic properties would occur.

Under alternative B, three boardwalks would be rebuilt, and three boardwalks would be used as-is. Soil disturbance would occur at the sites where trail boardwalks are rebuilt, and new pilings are installed. The current boardwalk footprint for the three boardwalks used as is would have the same impacts as the no action alternative. Existing boardwalk sections that are in poor condition are adjacent to three sites and would be demolished. To protect known or unknown archeological or historic resources, existing boardwalk piles would be cut flush to the existing grade during demolition and removal, and the subsurface portion of the pile would be abandoned in place to limit any additional ground disturbance or impacts. Installation of new piles would occur within the existing boardwalk footprint, and no new ground disturbance outside of the trail prism would occur. No new disturbance to archeological sites or historic properties would occur.

Under alternative C, three boardwalks would be rebuilt, and three boardwalks would be demolished and removed, and vegetation allowed to naturally restore. Soil disturbance would occur at the sites where trail boardwalks are rebuilt, and new pilings are installed. Existing boardwalk sections that are in poor condition are adjacent to three sites and would be demolished. To protect known or unknown archeological or historic resources, existing boardwalk piles would be cut flush to the existing grade during demolition and removal, and the subsurface portion of the pile would be abandoned in place to limit any additional ground disturbance or impacts. Installation of new piles would occur within the existing boardwalk footprint, and no new ground disturbance outside of the trail prism would occur. No new disturbance to archeological sites or historic properties would occur.

3.2 Wetlands

For regulatory purposes under the Clean Water Act, the term wetlands refer to “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” Wetlands include areas inundated or saturated by surface or groundwater for a sufficient length of time during the growing season to develop and support characteristic soils and vegetation. The NPS classifies wetlands based on the USFWS Classification of Wetlands and Deepwater Habitats of the United

States, or the Cowardin classification system. Based on this classification system, a wetland must have one or more of the following attributes (NPS 2005): the habitat at least periodically supports predominantly hydrophytic vegetation (wetland vegetation); the substrate is predominantly undrained hydric soil; or the substrate is non-soil and saturated with water or covered by shallow water at some time during the growing season.

More than 95% of the Preserve is classified as emergent and forested wetlands according to the 1992 USFWS National Wetlands Inventory (NWI) (Cowardin et al. 1979). The project would occur within the existing trail corridors over wetlands. Examples of wetlands along the existing trails are shown in Figures 6–10. On June 13–15, 2022, NPS staff conducted wetland delineation site visits to the proposed project locations in the Preserve. On February 13, 2023, follow up delineation work was conducted of wetland boundaries in the bottomland hardwood area around the Preserve’s Education Center boardwalk for construction access routes.

Wetlands around the Education Center boardwalk are palustrine broad-leaf deciduous forested wetlands which are seasonally flooded (Cowardin class PFO1E) and contiguous with the surrounding Barataria wetland complex (Tsang 2022).

Alternate construction access routes to the Education Center boardwalk were scouted, and on an old irrigation ditch spoil bank a linear land feature was identified that showed no signs of being a wetland. Small live oaks (*Quercus virginiana* Mill.), hackberry (*Celtis laevigata*), pecan (*Carya illinoensis*), and deciduous holly (*Ilex decidua*), water oak (*Quercus nigra*), and sweetgum (*Liquidambar styraciflua*), all facultative and upland species, were found along the transect from Plantation Trail (west leg) to the Education Center boardwalk’s triangle shaped deck (Ford 2023) (Figure 8).

Wetlands around the Bayou Coquille trail are palustrine broad-leaf deciduous forested wetlands which are semi permanently flooded (Cowardin class PFO1F). Beginning at the Bayou Coquille trailhead, the trail crosses bottomland forested wetland areas featuring mature stands of live oak (*Quercus virginiana*) and bald cypress (*Taxodium distichum*). At its western terminus, the Bayou Coquille trail becomes the Marsh Overlook trail. This trail follows the banks of the canal system through a transition from forested wetland to open emergent marsh, ultimately ending at the Marsh Overlook itself, which stands above an open expanse of emergent marsh vegetation (Tsang 2022).

Trends

Ecological succession and changes in wetland habitats would continue because of rising sea level and land subsidence and changes from freshwater to saline habitats in the next 50 years. Flooding extent and depth are projected to increase over time. Sea level rise is expected to continue to rise. This relative change could range from one to two feet in the next 50 years. (Waldron 2023). Information from the BARA 45 model was incorporated into the architectural and engineering design of raised elevations of the proposed action.

Wetland areas within the Preserve that used to be bottomland hardwoods (BLH) are retaining more water and causing mortality of the many tree species. Bottomland hardwood and cypress swamp habitats are also in transition from cumulative effects of altered hydrology, relative sea level rise, and storm disturbances.

For example, the end of the current Visitor Center boardwalk is located in an environment that is rapidly converting from a sheltered cypress swamp ecosystem into a more exposed marsh ecosystem with increased shrub cover in many areas. These and other changes are expected to continue with increased relative sea level rise and increased concentrations and frequencies of saline water expected to drive forested habitats to marsh and areas of open water.

Results from the Future Conditions Modeling effort show consistent trends for future water level and salinity conditions in the Preserve that vary according to climate or project scenario. Water levels for all simulations increase through time along with sea level rise, with shifting vegetation community dynamics that vary with changes in sea level and salinity. It is expected that relative sea level rise, salinity, hydrology, and disturbance events would rapidly drive change in wetland species composition and structure in the Preserve.

To plan and inform management of natural and cultural resources, the Preserve seeks site-specific understanding of subsidence rates and flooding regime across the Preserve landscape and at key infrastructure locations.

Impacts

The project would occur within the existing trail corridors over wetlands. Temporary impacts to wetland vegetation and soils would occur at the sites where trail boardwalks are demolished and rebuilt, and new pilings are installed. If boardwalks are elevated, less shading of wetland vegetation could occur, and water flow would be improved under the boardwalks. Existing pilings of boardwalks to be rebuilt or demolished would be flush cut off even with the ground level or at mean low water level and abandoned in place.

"Top-down" construction methods are being proposed for all boardwalk construction. Wetlands can be protected during the construction phase by installing the boardwalk from above. Top-down construction refers to the ability to install boardwalk piles, framing, and decking using equipment operating on top of previously installed sections. Materials and equipment would go in and out along the established trail and construction corridor.

Wetland vegetation and soils disturbance would occur at the sites where trail boardwalks are demolished and rebuilt, and new pilings are installed. When boardwalks are elevated, less shading of wetland vegetation could occur and water flow under the boardwalks could occur more easily. Table 3 shows the existing conditions of the existing boardwalks and the differences between existing trail footprints over wetlands and the new proposed rebuilds over wetlands in square feet and acres.

No Wetlands Statement of Findings (WSOF) is required as the wetland surveys and impact analysis are under the NPS mitigation threshold and is excepted from Statement of Findings procedures (DO 77-1 4.2.1). All permit conditions of Coastal Zone Consistency Determination C20230122 and the U.S. Army Corps of Engineers Wetland Permit MVN-2024-00241-ENP would be implemented.

Under the no action alternative, zero boardwalks would be rebuilt, and six boardwalks would be used as-is and existing pilings would remain in place and continued boardwalk repairs and trail maintenance would

occur in the same footprint of the existing trails and would cause no new disturbance to wetlands (Table 3, Table 3A).

Under alternative B, three boardwalks would be rebuilt, and three boardwalks would be used as-is. The rebuilt boardwalks would occur in the same footprint as the existing boardwalks with new pilings installed within the trail prism. Footprints of existing boardwalks over wetlands are listed in Table 3, with the differences indicated in square feet and acreage. Demolition and rebuilding of three boardwalks in the same footprint of the existing trails would cause very little new disturbance - less than 1/10 acre per boardwalk. Where not rebuilt, there would be no new disturbance to wetlands, however, the three boardwalks not rebuilt may have to be abandoned over time as their substructures become unsafe and non-viable. Approximately 0.08 acres of non-contiguous wetlands would be restored upon removal of select turnouts (Table 3, Table 3B).

Under alternative C, three boardwalks would be rebuilt, and three boardwalks would be demolished and removed, and vegetation allowed to naturally restore. Footprints of existing boardwalks over wetlands are listed in Table 3, with the differences indicated in square feet and acreage. Demolition and rebuilding of three boardwalks in the same footprint of the existing trails would cause very little new disturbance - less than 1/10 acre per boardwalk. The demolition of three boardwalks would occur within the existing footprint with the natural restoration of the vegetation would result in a net benefit to approximately 0.823 acres of wetlands, plus 0.08 acres of non-contiguous wetlands would be restored upon removal of select turnouts, for a total 0.90 acres of non-contiguous wetlands which would be restored (Table 3, Table 3C).



Figure 6. Example of Wetlands along Ring Levee trail



Figure 7. Example of Wetlands along Bayou Coquille Trail



Figure 8. Example of non-wetlands Education Center trail and Plantation Trail.



Figure 9. Example of Wetlands along Education Center trail.



Figure 10. Example of Wetlands at the end of Marsh Overlook trail.

Table 3. Wetlands Impacts

These sub-tables indicate the starting square footage (SF) to be demolished, the ending SF to be rebuilt, with differences in SF and acreage by Alternative.

ALTERNATIVE A (No Action Alternative)				
	Starting SF	Ending SF		
Name	Demo	Rebuild	Difference (SF)	Difference (Acreage)
Marsh Overlook	10459.54	10459.54	0.00	0.00
Bayou Coquille	8249.55	8249.55	0.00	0.00
ED Boardwalk	7564.38	7564.38	0.00	0.00
Palmetto	21910.76	21910.76	0.00	0.00
VC Boardwalk	8953.59	8953.59	0.00	0.00
Ring Levee 4 Boardwalk	5000.00	5000.00	0.00	0.00
ALTERNATIVE B				
	Starting SF	Ending SF		
Name	Demo	Rebuild	Difference (SF)	Difference (Acreage)
Marsh Overlook	10459.54	12105.43	1645.89	0.03778444
Bayou Coquille	8249.55	8251.87	2.32	0.00005326
ED Boardwalk	7564.38	9398.17	1833.79	0.04209803
Palmetto	21910.76	21910.76	0.00	0.00
VC Boardwalk	8953.59	8953.59	0.00	0.00
Ring Levee 4 Boardwalk	5000.00	5000.00	0.00	0.00
ALTERNATIVE C				
	Starting SF	Ending SF		
Name	Demo	Rebuild	Difference (SF)	Difference (Acreage)
Marsh Overlook	10459.54	12105.43	1645.89	0.03778444
Bayou Coquille	8249.55	8251.87	2.32	0.00005326
ED Boardwalk	7564.38	9398.17	1833.79	0.04209803
Palmetto	21910.76	0.00	(21910.76)	(0.50)
VC Boardwalk	8953.59	0.00	(8953.59)	(0.21)
Ring Levee 4 Boardwalk	5000.00	0.00	(5000.00)	(0.11)

3.3 Visitor Use and Experience

The Preserve is comprised of over 26,000 acres of Louisiana wetlands that include bottomland hardwood forest, cypress swamp, freshwater and intermediate marshes, bayous, and canals which contains the network of approximately 9 miles of boardwalks and walking trails which allows visitors to access the wild places of the Preserve to observe alligators, snakes, native plants, and over 200 species of birds. Each year over 450,000 visitors enjoy the Preserve’s trails, waterways, and programs that inspire stewardship of the natural and cultural resources of southern Louisiana and the many challenges they face.

The resources and surrounding natural landscapes of the Preserve provide significant opportunities for public recreational use. Approximately nine miles of walking trails provide Preserve visitors with an avenue

to explore forests, swamps, and marshes. Ranger-guided walks and environmental education programs are available, along with interpretive exhibits at the visitor center. The resources and surrounding natural landscapes of the Preserve provide many opportunities for public recreational use. Some of the most popular recreational uses include hiking, wildlife viewing, photography, canoeing, fishing, and hunting.

For visitors, there is also commercial swamp tour boat company that operates under a commercial use authorization in some of the canals in Bayou aux Carpes of the Preserve. The company is located immediately adjacent to the Preserve, and its boats are stored and operated in canals owned by the NPS.

Most recreational activities enjoyed by the public at the Preserve are compatible; however, to prevent confrontation among user groups the Preserve restricts some public uses and access in certain areas. In areas where bank fishing and canoeing are popular like along Twin Canals motorized boats are prohibited.

Included in the Preserve's enabling legislation are provisions for fishing, hunting, and trapping. Individuals wanting to hunt, and trap are required to apply for a free permit and are restricted to designated hunting and trapping zones. Hunting is prohibited within 500 feet of a roadway, trail, waterway, or structure to ensure visitor safety and to prevent user conflicts. Hunting is authorized by a park permit.

Fishing occurs in Preserve waterways and adjacent to the Preserve boundary in Lakes Salvador and Cataouatche. Hunting and trapping are managed through permitting, and trapping is focused on controlling the nutria population, a nonnative, invasive species. As outlined in the Superintendent's Compendium, visitors are permitted to legally take small quantities of certain plants, nuts, and fruits for personal consumption.

Visitors are prohibited to leave a designated trail or walkway in the Preserve, except hunters permitted to be off trail within designated hunt zones or by authority of a Special Use Permit issued by the Superintendent's office. Special Use Permits authorizing researchers to leave the trails may be granted by the Superintendent.

In order to protect fragile park resources, visitors must remain on designated trails in the undeveloped areas of the Preserve.

Public recreational opportunities were added to the Preserve when new lands were added by the Omnibus Public Land Management Act of 2009, Public Law 111-11, Title VII, Subtitle B, Section 7105, which transferred 3905 acres of federal lands in the vicinity of Bayou Segnette State Park and in Bayou aux Carpes from the U.S. Army Corps of Engineers and the Environmental Protection Agency, respectively, and authorized the future acquisitions of up to 5,000 acres in the Fleming Plantation, Lafitte, LA (<https://www.congress.gov/110/crpt/srpt352/CRPT-110srpt352.pdf>) (Figure B-1).

A trail was added to the Preserve, when in 2018, the NPS acquired 3445 acres of the 5000 authorized acres of the Fleming Plantation including a portion of the Town of Lafitte's Wetland Trace Levee Trail (Figure 1 and 2), and NPS continues efforts to acquire the remaining authorized acreage.

More public recreational opportunities were added to the Preserve with the 2009 addition of the Fleming

Plantation lands and sections of the Town of Lafitte's Wetland Trace (Figure B-1). The removal of the shell plug at the mouth of Bayou aux Carpes in 2021 allowed direct access into the bayou from the Gulf Intracoastal Waterway (GIWW) and boaters and adventurous paddlers have better access to this resource (USACE 2021).

This project is to repair and improve, to include demolition and replacement, of some of the boardwalks, within the existing trail prism, as well as horizontally align and raise boardwalk elevations. As a result, the trails would have greater resiliency for future hurricane and storm impacts and subsidence. The replacement of the damaged boardwalks with more resilient materials would allow the trails to be able to withstand and rapidly recover from disruption from future hurricane and storm impacts, subsidence, and sea level rise, while allowing for their continued use. Repairs would improve safety issues and rebuilt trails would meet Architectural Barriers Act Accessibility Standards (ABAAS). A more robust design would reduce the maintenance needed and therefore reduce total cost of facility ownership.

The NPS attempts to prevent unreasonable risks to visitors; however, as with activity anywhere there is some risk of injury. Increasing the height of newly constructed boardwalks would provide some additional separation between the public and wildlife. To reduce risk to visitors' safety information is included in most publications provided to visitors. Information on specific risks - for example, dangers of Preserve wildlife - is also published on the Preserve website to educate visitors on how to avoid risky behavior. Safety closures of trails that are flooded or boardwalks that have structural failures are also posted on the park's website. Safety notifications and policies are also included in most programs presented by Preserve staff and are posted at various visitor use sites throughout the Preserve.

Trends

Each year over 450,000 visitors enjoy the Preserve's trails, waterways, and programs that inspire stewardship of the natural and cultural resources of southern Louisiana and the many challenges they face. The NPS has invested in the renovation of visitor facilities and infrastructure at Preserve to enhance visitor use and experience. Visitor use and recreational activities, such as hiking and enjoying the Preserve's landscapes, are anticipated to continue in the project area in the long term.

It is expected that visitation would decrease or move to other areas during construction. Comments during civic engagement indicate the disappointment and dissatisfaction of visitors because the favorite boardwalks have not been repaired or are still closed due to safety concerns.

It is expected that once construction is complete and the rebuilt boardwalks are open, and the new visitor center is open, that visitor experience would improve.

Impacts

Enormous challenges exist in repairing and maintaining the existing boardwalks given increasing storm frequency and intensity. The reduction of total length of boardwalks would provide less opportunity for visitors in the short term but over time, the park plans to identify locations for trails that could be located on higher ground within and around the Preserve.

Improvement of the trail network would allow for improved traffic and pedestrian flow patterns. The new plan for trails would decrease their vulnerability to climate change and relative sea level rise. Because rebuilt trails would meet Architectural Barriers Act Accessibility Standards (ABAAS), visitors would gain access to previously mobility-impaired inaccessible wetland habitats, allowing the Preserve to broaden its interpretive effort.

Visitor experience and access to trails would be improved by this project through the separation of administrative and visitor use areas at the Preserve and the reduction of present frequent trail closures due to flooding and continually needed repairs. The objectives of the project are to enhance visitor experience and safety while using the trail system in the Preserve, increase infrastructure resiliency to periodic flooding, and promote long term sustainability of the trail infrastructure based on practical and achievable maintenance levels amid uncertain funding availabilities. Rebuilding the damaged boardwalks with more resilient materials would allow the trails to be able to withstand and rapidly recover from disruption from future hurricane and storm impacts, subsidence, and sea level rise, while allowing for their continued sustainable use in the present.

Temporary and localized noise associated with construction would occur in the boardwalk locations near roads and parking lots and may be experienced by the visitor.

Under the no action alternative, zero boardwalks would be rebuilt, and six boardwalks would be used as-is. The current boardwalk footprint would remain the same as existing conditions. Boardwalks would remain in poor condition with recurrent trail closures due to flooding. Impacts to visitor use and experience would be an increase in dissatisfaction because of an increase in frequency of long-term closures due to flooding and structure failures and unsafe access conditions, with no accessibility for mobility impaired Preserve visitors. Potentially dangerous wildlife interactions on boardwalks would be increased because the boardwalks would be at the water line or below. Due to flooding and maintenance closures, circulation patterns and the favorite loops would increasingly not be available. Overall trail system maintenance would suffer as needs increasingly outstrip the maintenance capacity of the park as rising waters overwhelm all boardwalks. When these boardwalks are closed for safety reasons because the project would not rebuild the boardwalks with more resilient and sustainable materials that would allow the boardwalks to resist climate change, a negative visitor experience would result. Permanent closures would be likely in the near future. Visitor experience would be impacted or less satisfactory because eventually all boardwalks would fail, and routine maintenance would not be enough to keep them safe or non-flooded for visitor access.

Under alternative B, three boardwalks would be rebuilt, and three boardwalks would be used as-is. Rebuilt boardwalks would be elevated allowing access when flooding after rainstorms occurs. Wildlife interactions on rebuilt boardwalks would be minimal but wildlife viewing would still be available. Rebuilt boardwalks would be built to be accessible for mobility impaired Preserve visitors. Reuse of construction access routes would allow visitor access between Plantation Trail and Education Center boardwalk. Continued use of three boardwalks in poor condition used as-is would be a negative visitor experience because of recurrent trail closures due to flooding and the three boardwalks not rebuilt may have to be abandoned over time as their substructures become unsafe and non-viable. However, the permanent improvements to boardwalks that are rebuilt with more resilient and sustainable materials would provide an improved visitor experience

because the new boardwalks would not flood and require safety closures. The temporary closures of the three boardwalks during reconstruction would be a temporary impact to visitor experience due to unavailability. In addition, there are approximately four miles of non-boardwalk trails that would remain open and accessible to visitors to provide a similar experience to use when trails are closed; therefore, the overall impact on visitor's ability to experience park trails is expected to be negligible/minor.

Under alternative C, three boardwalks would be rebuilt, and three boardwalks would be demolished. The project would result in permanent improvements to three boardwalks that are rebuilt with more resilient and sustainable materials. Rebuilt boardwalks would be elevated allowing access when flooding after rainstorms occurs. Wildlife interactions on rebuilt boardwalks would be minimal but wildlife viewing would still be available. Rebuilt boardwalks would be built to be accessible for mobility impaired Preserve visitors. Removal of three boardwalks in poor condition would be a negative visitor experience due to the decrease in boardwalks available for visitor use. However, the permanent improvements to boardwalks that are rebuilt with more resilient and sustainable materials would provide an improved visitor experience because the new boardwalks would generally not flood and require safety closures. The temporary closures of the three boardwalks during reconstruction would be a temporary impact to visitor experience due to unavailability. In addition, there are approximately four miles of non-boardwalk trails that would remain open and accessible to visitors to provide a similar experience to use when trails are closed, therefore the overall impact on visitor's ability to experience park trails is expected to be negligible/minor.

3.4 Cumulative Impacts

Cumulative impacts are effects that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such actions.

Below are listed projects that have occurred or would occur within the project area.

3.4.1 Past Actions

3.4.1.1 The project entitled Ring Levee Trail and Christmas Road Renovate Improved Trails within the Preserve of Jean Lafitte National Historical Park and Preserve was completed in January 2024, and consisted of adding gravel to Christmas Road and to two sections of the Ring Levee Trail and replacing the existing damaged boardwalk with an elevated boardwalk using resilient and sustainable materials. The terminus of Ring Levee Trail (Ring Levee 4 boardwalk) was not included in this project.

Comparison to Alternatives of the Trail Improvements at Barataria Preserve project:

- No action alternative: no cumulative impacts.
- Alternatives B and C:
 - Archeological Resources: This project had no effect to archeological resources.
 - Wetlands: This project had a minimal effect to wetland resources at the elevated boardwalk rebuild location. Permit conditions required observations of vegetation recovery one year later.
 - Visitor Experience: This project is having a beneficial effect to the visitor experience, since the reopening, because the improved and widened surfaces are now accessible and safe to walk on.

The elevated boardwalk provides a view of the adjacent wetland vegetation that was not present at the previous location.

- Summary: Although this project was located within the trails project area, there are no cumulative effects to add to resource impacts of the Trail Improvements at Barataria Preserve project.

3.4.2 Present Actions

None

3.4.3 Reasonably Foreseeable Future Actions

3.4.3.1 The project entitled Upgrade Wastewater Treatment Systems is planned. This project would include the upgrade and replacement of all components for both wastewater treatment systems within the Preserve. This project is a replace in kind of equipment at existing utilities of the Preserve.

Comparison to Alternatives of the Trail Improvements at Barataria Preserve project:

- No action alternative: no cumulative impacts.
- Alternatives B and C:
 - Archeological Resources: This project would have no effect to archeological resources, as this project is a replacement in kind of existing equipment and would not involve ground disturbance.
 - Wetlands: This project would have no effect to wetland resources, as this project is a replacement in kind of existing equipment.
 - Visitor Experience: This project would have a beneficial effect to the visitor experience, as restrooms are a necessary amenity for developed recreational areas within the Preserve.
- Summary: Although this project would occur within the developed area of the Preserve, the replacement of parts within existing utility systems would not occur within the trails project area. There are no cumulative effects to add to resource impacts of the Trail Improvements at Barataria Preserve project.

3.4.3.2 The project entitled Consolidate Staff at Barataria Preserve would consolidate staff to the developed area of the Preserve, the relocation of Visitor Center functions from the Visitor Center building to the Education Center Building, and the conversion of the current Visitor Center building to staff offices which would separate administrative and public use in the Preserve.

Comparison to Alternatives of the Trail Improvements at Barataria Preserve project

- No action alternative: no cumulative impacts
- Alternatives B and C:
 - Archeological Resources: This project would have no effect to archeological resources, as this project would remodel the interiors of two non-historic buildings. A planned option to widen the fenced Maintenance yard by 12 feet in width (1714 sf) would have minimal ground disturbance and would have no effect to known archeological sites.
 - Wetlands: This project would have minimal effect to wetland resources, as this project would remodel the interiors of two non-historic buildings. A planned option to widen the fenced

Maintenance yard by 12 feet in width (1714 sf) would have minimal ground disturbance and minimal effect within adjacent wetlands.

- **Alternative B:**
 - **Visitor Experience:** This project would have an initial negative effect to visitor experience, as the adjustment of where the visitor services center would be located might cause some initial confusion and anxiety, but with robust social media and communications, in time, this project would have a beneficial effect to the visitor experience. The relocated Visitor Center would be an improved visitor contact center with more exhibit space and interactive visuals with the outdoors.
 - The conversion of the Visitor Center building to staff offices would result in use of parking spaces by staff, boats, and heavy equipment. Under Alternative B, if the parking area remained as the Visitor Center trailhead, this would result in a negative impact for visitor use with the increased administrative use of portions of the parking lot.
- **Alternative C:**
 - **Visitor Experience:** This project would have an initial negative effect to visitor experience, as the adjustment of where the visitor services center would be located might cause some initial confusion and anxiety, but with robust social media and communications, in time, this project would have a beneficial effect to the visitor experience. The relocated Visitor Center would be an improved visitor contact center with more exhibit space and interactive visuals with the outdoors.
 - The conversion of the Visitor Center building to staff offices would result in use of parking spaces by staff, boats, and heavy equipment. Under alternative C, with the Visitor Center trail demolished, the need for the Visitor Center trailhead would be eliminated and administrative uses and functions would be separated from visitor use functions.
- **Summary:** Although this project would occur within the developed area of the Preserve, the reuse of these existing buildings would not occur within the trails project area. There are no cumulative effects to add to Archeological Resources and Wetlands resource impacts of the Trail Improvements at Barataria Preserve project. However, there may be cumulative effects to the impacts to Visitor Experience because of the location and use of visitor parking at trailhead parking in Alternative B of the Trail Improvements at Barataria Preserve project.

3.4.4 Summary

There are positive and negative cumulative effects associated with the planned consolidation of staff and administrative use, the relocation of the Visitor Center, and the Trail Improvements project at the Preserve. There are negative effects to visitor use from the loss of a section of trail and some aspects of a loss of interaction with some staff and the public in the currently shared visitor and public use area. There is the potential benefit to visitor use with the separation of the visitor from experiencing heavier administrative use: viewshed and noise associated with the storage and maintenance of boats, materials, and heavy equipment as well as the continual coming and going of staff when working would potentially be beneficial to both visitor use and work functions and safety at the Preserve.

4. Summary and Conclusions

Table 4. Effects of alternatives on potentially affected resources

Affected Resource	No Action Alternative	Alternative B	Alternative C
Archeological Resources	Existing boardwalk sections that are in poor condition are adjacent to three sites. No new disturbance to archeological sites or historic properties would occur.	Soil disturbance would occur at the sites where trail boardwalks are rebuilt, and new pilings are installed. Existing boardwalk sections that are in poor condition are adjacent to three sites and would be demolished. To protect known or unknown archeological or historic resources, existing boardwalk piles would be cut flush to the existing grade during demolition and removal, and the subsurface portion of the pile would be abandoned in place to limit any additional ground disturbance or impacts. Installation of new piles would occur within the existing boardwalk footprint, and no new ground disturbance outside of the trail prism would occur. No new disturbance to archeological sites or historic properties would occur.	Same as Alternative B
Wetlands	No action in the same footprint of the existing trails would cause no new disturbance to wetlands.	Demolition and rebuilding of three boardwalks in the same footprint of the existing trails would cause very little new disturbance - less than 1/10 acre per boardwalk. Where not rebuilt, there would be no new disturbance to wetlands. 0.08 acres of non-contiguous wetlands would be restored upon removal of select turnouts.	Demolition and rebuilding of three boardwalks in the same footprint of the existing trails would cause very little new disturbance - less than 1/10 acre per boardwalk. The demolition of three boardwalks would occur within the existing footprint with the natural restoration of the vegetation would result in a net benefit to approximately 0.823 acres of wetlands, plus 0.08 acres of non-contiguous wetlands would be

Affected Resource	No Action Alternative	Alternative B	Alternative C
			restored upon removal of select turnouts, for a total 0.90 acres of non-contiguous wetlands which would be restored.
Visitor Use and Experience	<p>Boardwalks would remain in poor condition with recurrent trail closures due to flooding. Impacts to visitor use and experience would be an increase in dissatisfaction because of an increase in frequency of long-term closures due to flooding and structure failures and unsafe access conditions, with no accessibility for mobility impaired Preserve visitors. Potentially dangerous wildlife interactions on boardwalks would be increased because the boardwalks would be at the water line or below. Due to flooding and maintenance closures, circulation patterns and the favorite loops would increasingly not be available. Overall trail system maintenance would suffer as needs increasingly outstrip the maintenance capacity of the park as rising waters overwhelm all boardwalks. When these boardwalks are closed for safety reasons because the project would not rebuild the boardwalks with more resilient and sustainable materials that would allow the boardwalks to resist climate change, a negative visitor experience would result. Permanent closures would be likely in the near future. Visitor experience would be impacted or less happy because eventually all</p>	<p>The project would result in permanent improvements to three boardwalks that are rebuilt with more resilient and sustainable materials. Rebuilt boardwalks would be elevated allowing access when flooding after rainstorms occurs. Wildlife interactions on rebuilt boardwalks would be minimal but wildlife viewing would still be available. Rebuilt boardwalks would be built to be accessible for mobility impaired Preserve visitors. Continued use of three boardwalks in poor condition used as-is would be a negative visitor experience because of recurrent trail closures due to flooding and the three boardwalks not rebuilt may have to be abandoned over time as their substructures become unsafe and non-viable. However, the permanent improvements to boardwalks that are rebuilt with more resilient and sustainable materials would provide an improved visitor experience because the new boardwalks would not flood and require safety closures. The temporary closures of the three boardwalks during reconstruction would be a temporary impact to visitor experience due to unavailability. In addition, there are</p>	<p>The project would result in permanent improvements to three boardwalks that are rebuilt with more resilient and sustainable materials. Rebuilt boardwalks would be elevated allowing access when flooding after rainstorms occurs. Wildlife interactions on rebuilt boardwalks would be minimal but wildlife viewing would still be available. Rebuilt boardwalks would be built to be accessible for mobility impaired Preserve visitors. Removal of three boardwalks in poor condition would be a negative visitor experience due to the decrease in boardwalks available for visitor use. However, the permanent improvements to boardwalks that are rebuilt with more resilient and sustainable materials would provide an improved visitor experience because the new boardwalks would not flood and require safety closures. The temporary closures of the three boardwalks during reconstruction would be a temporary impact to visitor experience due to unavailability. In addition, there are approximately four miles of non-boardwalk trails that would remain open and accessible to visitors to provide a similar experience to use</p>

Affected Resource	No Action Alternative	Alternative B	Alternative C
	boardwalks would fail, and routine maintenance would not be enough to keep them safe or non-flooded for visitor access.	approximately four miles of non-boardwalk trails that would remain open and accessible to visitors to provide a similar experience to use when trails are closed, therefore the overall impact on visitor's ability to experience park trails is expected to be negligible/minor.	when trails are closed, therefore the overall impact on visitor's ability to experience park trails is expected to be negligible/minor.

5. Consultation and Coordination

Public Review and Comments

NEPA requires that the NPS make a diligent effort to involve the interested and affected public on a proposal for which an EA is prepared.

The NPS conducted two Open House civic engagement information sessions on October 20, 2022 and September 14, 2023. The information sessions held in 2022 had 21 comments from 10 commenters. The information sessions held in 2023 had 11 comments from 8 commenters.

In addition, this EA would be available for public comment for a period of 30 days. Copies would be provided upon request to interested individuals and comments should be submitted back to the NPS prior to the end of the commenting period. All public comments would be reviewed following the closure of the review period and analyzed prior to release of the decision document. The NPS would incorporate responses to substantive comments received during this period and make editorial changes to the EA using an erratum, if necessary.

Tribes

Park managers would continue to consult with associated American Indian tribes to ensure that project actions are conducted in a way that respects the beliefs, traditions, and other cultural values of the tribes who have ancestral ties to park lands. Sensitive, sacred, or traditional use areas would be protected to the greatest extent possible by avoiding or mitigating adverse impacts to ethnographic resources, retaining site confidentiality as appropriate, and continuing to provide tribal access to resources and places of cultural importance. Initial tribal coordination with the tribes listed below began during Fall 2022. Follow-up tribal consultation would continue when the EA is released to the public.

- Alabama-Coushatta Tribe of Texas
- Alabama-Quassarte Tribal Town
- Caddo Nation of Oklahoma
- Chitimacha Tribe of Louisiana
- The Choctaw Nation of Oklahoma
- Coushatta Tribe of Louisiana
- Jena Band of Choctaw Indians
- Kialegee Tribal Town
- Mississippi Band of Choctaw Indians
- Poarch Band of Creek Indians
- Seminole Nation of Oklahoma
- Seminole Tribe of Florida
- Thlopthlocco Tribal Town
- Tunica-Biloxi Tribe of Louisiana
- Eastern Shawnee Tribe of Oklahoma

Agencies

- Louisiana Department of Natural Resources – Office of Coastal Management
- Louisiana Office of Cultural Development, Division of Historic Preservation, State Historic Preservation Office (SHPO)
- Louisiana Department of Wildlife and Fisheries
- U.S. Fish & Wildlife Service
- U.S. Army Corps of Engineers
- U.S. Environmental Protection Agency (EPA)
- Jefferson Parish Government

Permits

Permits and Approvals Needed to Complete the Project Joint Coastal Use Permit consisting of Coastal Zone Consistency, Clean Water Act Section 404, Rivers and Harbors Act Section 10.

- U.S. Army Corps of Engineers Wetland Permit MVN-2024-00241-ENP permit
- Louisiana Department of Natural Resources, Office of Coastal Management issued Coastal Zone Consistency Determination C20230122 on November 27, 2023, as part of the Joint Coastal Use Permit.

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APPENDIX A – Trail Alternatives

(All measurements are approximate and based on GIS data)

	Name	Board walk	TRLALNAME	Length (LFs)	Length (Mile)	Alternative A	Alternative B	Alternative C
1	Bayou Coquille	Y	Bayou Coquille Trail	3011.640	0.570	No Change	Rebuild	Rebuild
	Bayou Coquille	Y	Flooded Forest	52.610	0.010	No Change	Rebuild	Rebuild
	Bayou Coquille	Y	Monarch of the Swamp	41.990	0.008	No Change	Rebuild	Rebuild
	Bayou Coquille	Y	Abundance of Life	52.640	0.010	No Change	Remove	Remove
	Bayou Coquille	Y	Midden	41.930	0.008	No Change	Remove	Remove
	Bayou Coquille	Y	Spell of the Swamp	53.790	0.010	No Change	Remove	Remove
	Bayou Coquille	Y	Trail Entrance	329.680	0.062	No Change	Remove	Remove
2	Bayou des Familles	Y	Bayou des Familles Overlook (Dock)	344.331	0.065	No Change	No Change	No Change
3	Christmas Road	N	Christmas Road	1210.760	0.229	No Change	No Change	No Change
4	Education	Y	New Visitor Center Trail	1457.220	0.276	No Change	Rebuild	Rebuild
	Education	Y	Education Center Overlook (Dock)	13.930	0.003	No Change	Rebuild	Rebuild
	Education	Y	2nd Interpretive Platform	23.310	0.004	No Change	Rebuild	Rebuild
	Education	Y	Triangle	19.140	0.004	No Change	Rebuild	Rebuild
	Education Connector	N	Construction Access	383.190	0.073	No Change	NEW	NEW
	Education Connector	N	Construction Access	289.860	0.055	No Change	NEW	NEW
	Education	Y	Long Spur	128.850	0.024	No Change	Remove	Remove
	Education	Y	Tent Platform	35.040	0.007	No Change	Remove	Remove
5	Fleming	N	Wetland Trace Bayou Levee Trail (NPS)	364.900	0.069	No Change	No Change	No Change
	Fleming	N	Wetland Trace Bayou Levee Trail (NPS)	815.271	0.154	No Change	No Change	No Change
	Fleming	N	Wetland Trace Bayou Levee Trail	486.835	0.092	No Change	No Change	No Change
	Fleming	N	Wetland Trace Bayou Levee Trail	1057.703	0.200	No Change	No Change	No Change
	Fleming	N	Wetland Trace Bayou Levee Trail	1189.174	0.225	No Change	No Change	No Change
	Fleming	Y	Wetland Trace Cypress Boardwalk	4176.676	0.791	No Change	No Change	No Change
6	Marsh Overlook	Y	Marsh Overlook Trail	2198.580	0.416	No Change	Rebuild	Rebuild
	Marsh Overlook	Y	Kenta Canal Pedestrian Bridge	105.410	0.020	No Change	Rebuild	Rebuild

	Name	Board walk	TRLALTNAME	Length (LFs)	Length (Mile)	Alternative A	Alternative B	Alternative C
	Marsh Overlook	Y	Liquid Land	22.850	0.004	No Change	Rebuild	Rebuild
	Marsh Overlook	Y	Kenta Canal Rest Area	29.620	0.006	No Change	Rebuild	Rebuild
	Marsh Overlook	Y	Marsh Overlook Platform	28.920	0.005	No Change	No Change	No Change
	Marsh Overlook	Y	Marsh Overlook Bridge	93.110	0.018	No Change	No Change	No Change
	Marsh Overlook	Y	Canoe Dock Platform	11.480	0.002	No Change	Remove	Remove
	Marsh Overlook	Y	Canoe Dock Steps	22.110	0.004	No Change	Remove	Remove
	Marsh Overlook	Y	East Overlook	46.700	0.009	No Change	Remove	Remove
	Marsh Overlook	Y	Kenta Canal Overlook	41.050	0.008	No Change	Remove	Remove
	Marsh Overlook	Y	Sinkers Overlook	44.620	0.008	No Change	Remove	Remove
	Marsh Overlook	Y	South Overlook	41.360	0.008	No Change	Remove	Remove
7	Old Barataria	N	Old Barataria West	1285.493	0.243	No Change	No Change	No Change
	Old Barataria	N	Old Barataria East	1110.626	0.210	No Change	No Change	No Change
	Old Barataria	N	Old Barataria South Loop	3868.628	0.733	No Change	Remove	Remove
8	Palmetto	Y	Palmetto Trail	4313.141	0.817	No Change	No Change	Remove
9	Pecan Grove	N	Pecan Grove Picnic Area	708.356	0.134	No Change	No Change	No Change
	Plantation	N	Plantation A East	3839.112	0.727	No Change	Remove	Remove
10	Plantation	N	Plantation A West	5121.199	0.970	No Change	No Change	No Change
	Plantation	N	Plantation B East	3213.649	0.609	No Change	Remove	Remove
11	Plantation	N	Plantation B West	3822.217	0.724	No Change	No Change	No Change
	Plantation	N	Plantation Service Road	161.849	0.031	No Change	No Change	No Change
12	Ring Levee	N	Ring Levee Trail Segment 1	699.694	0.133	No Change	No Change	No Change
	Ring Levee	Y	Ring Levee Boardwalk (Segment 2)	235.000	0.045	No Change	No Change	No Change
	Ring Levee	N	Ring Levee Trail Segment 3	383.781	0.073	No Change	No Change	No Change
	Ring Levee	Y	Ring Levee Segment 4	1250.000	0.237	No Change	No Change	Remove
13	Twin Canals	N	Twin Canals	3664.305	0.694	No Change	No Change	No Change
14	Visitor Center	Y	Visitor Center Trail	1496.120	0.283	No Change	No Change	Remove
	Visitor Center	Y	Visitor Center Overlook	10.560	0.002	No Change	No Change	Remove
15	Wood Duck	N	Wood Duck Trail	1861.555	0.353	No Change	No Change	No Change

APPENDIX B – Maps



Figure B-2: 2015 Trail Brochure

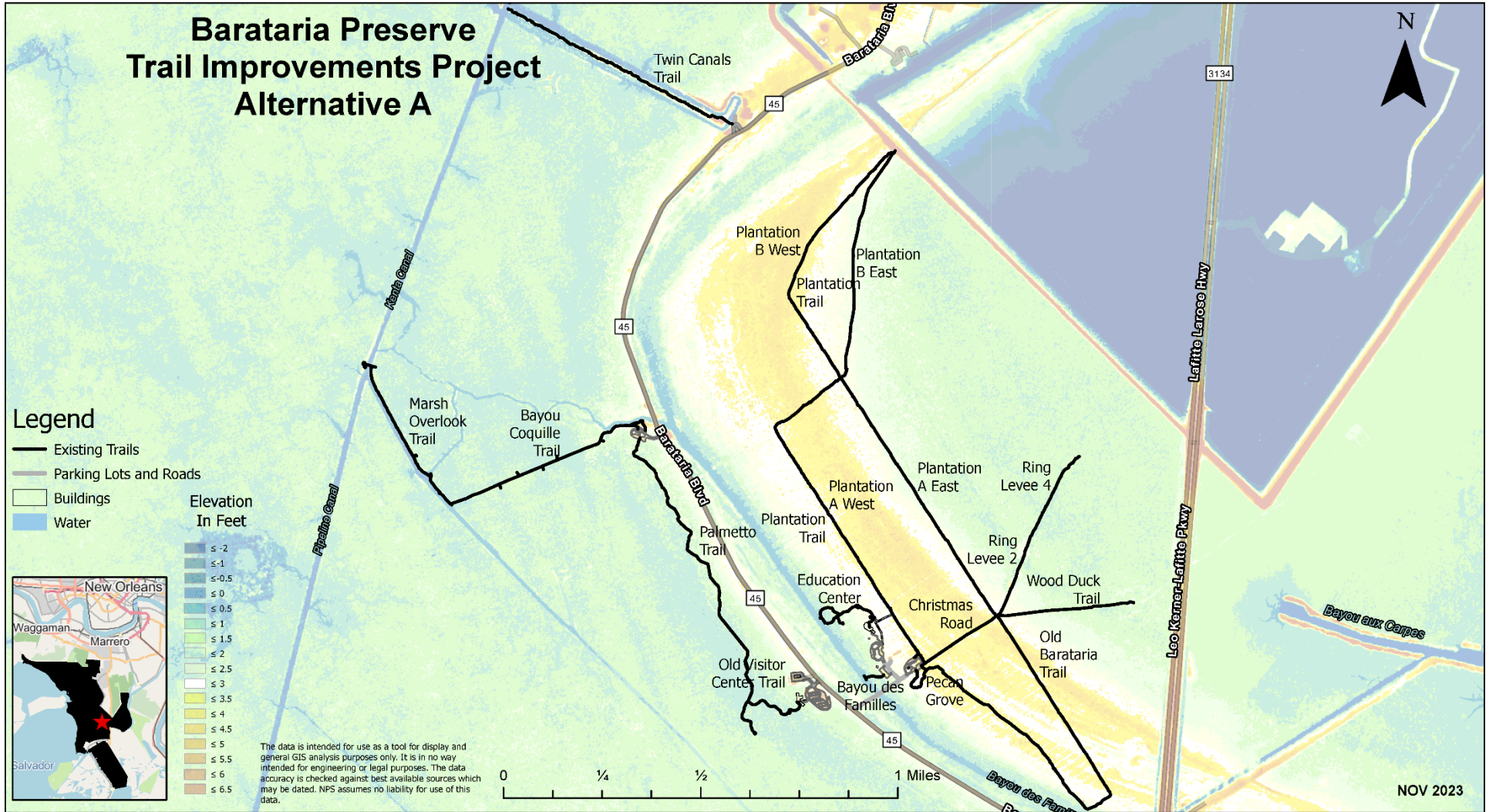


Figure B-3: Alternative A / No Action Alternative

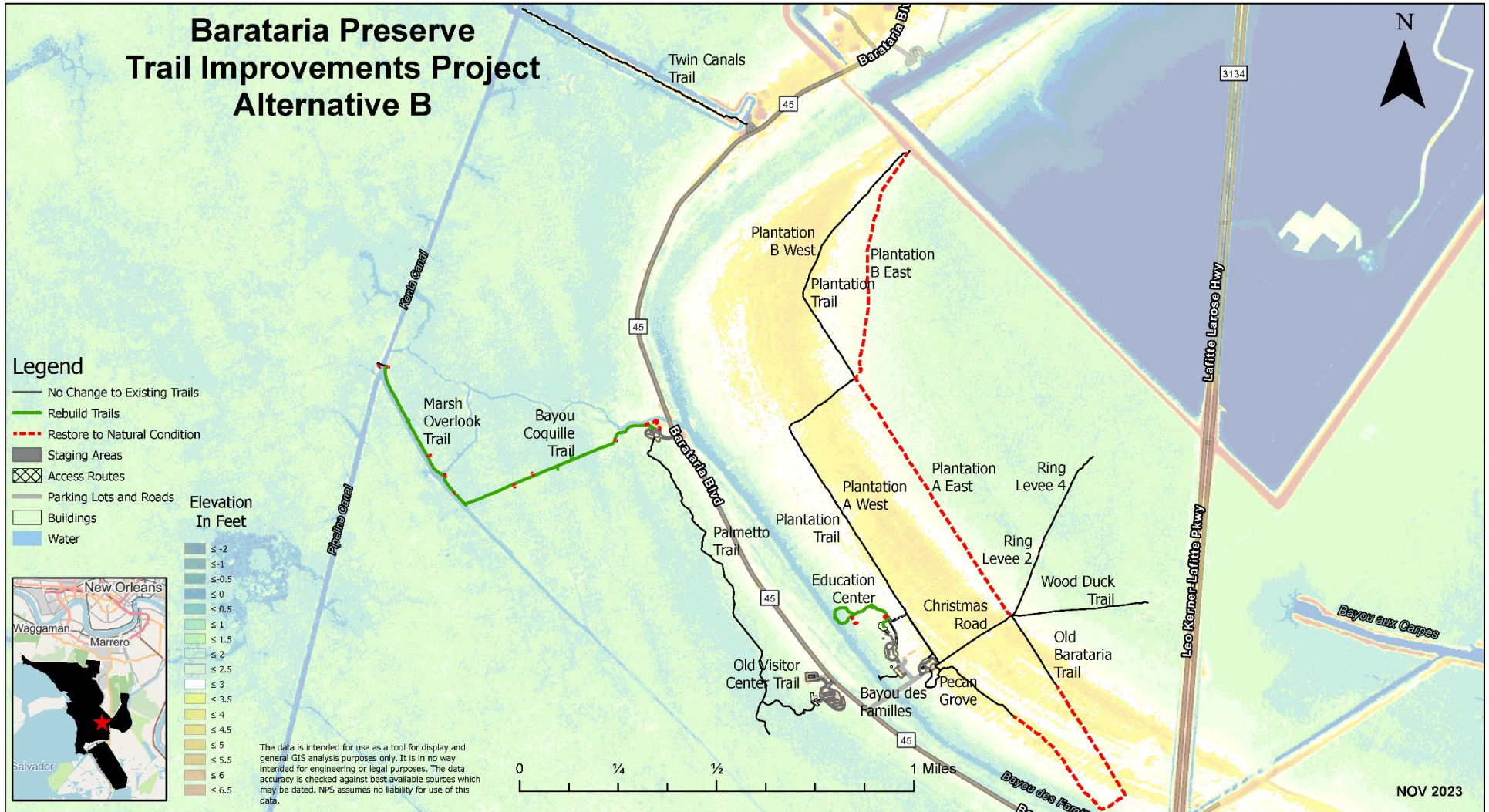


Figure B-4: Alternative B



Barataria Preserve Trail Improvements Project Alternative C

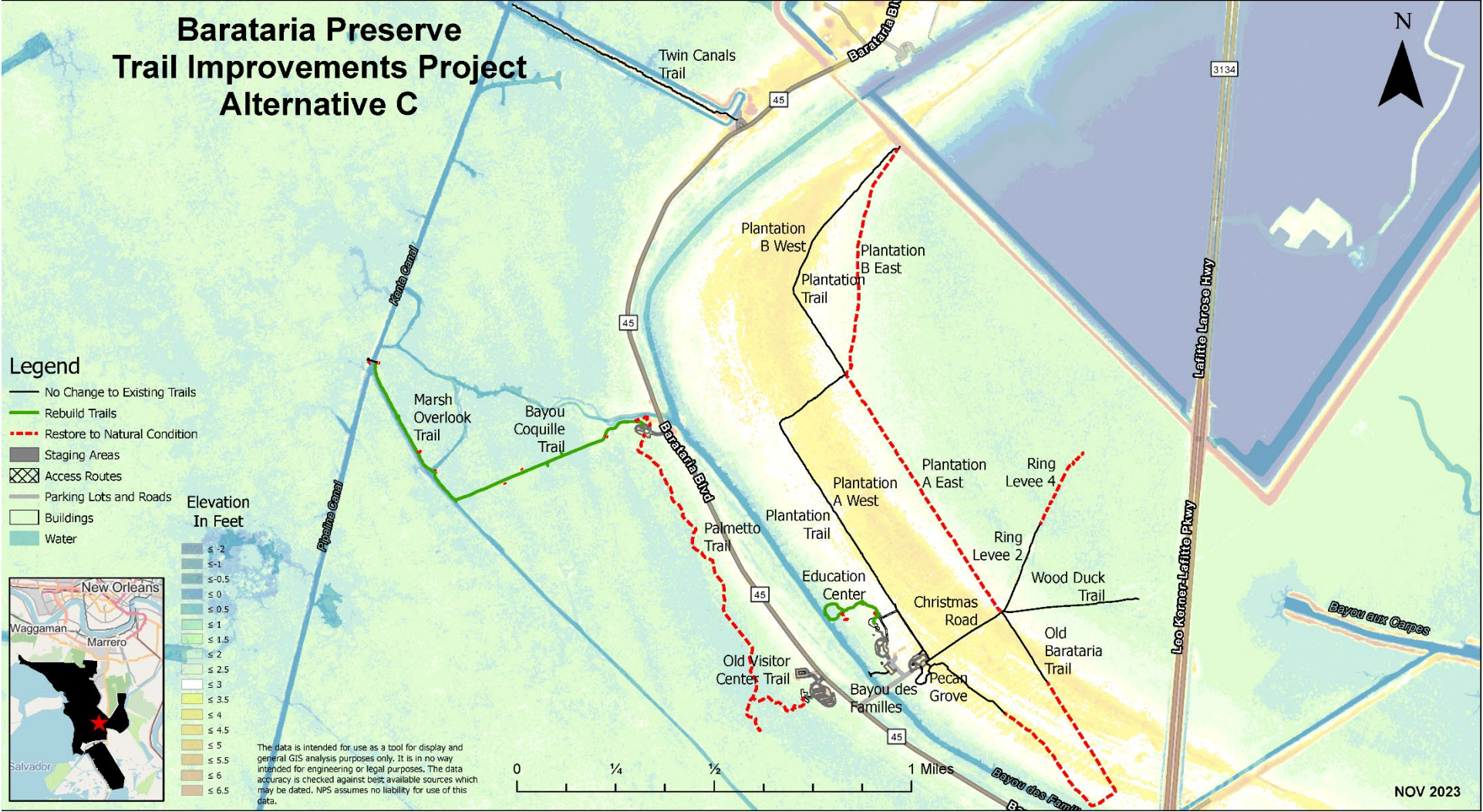


Figure B-5: Alternative C

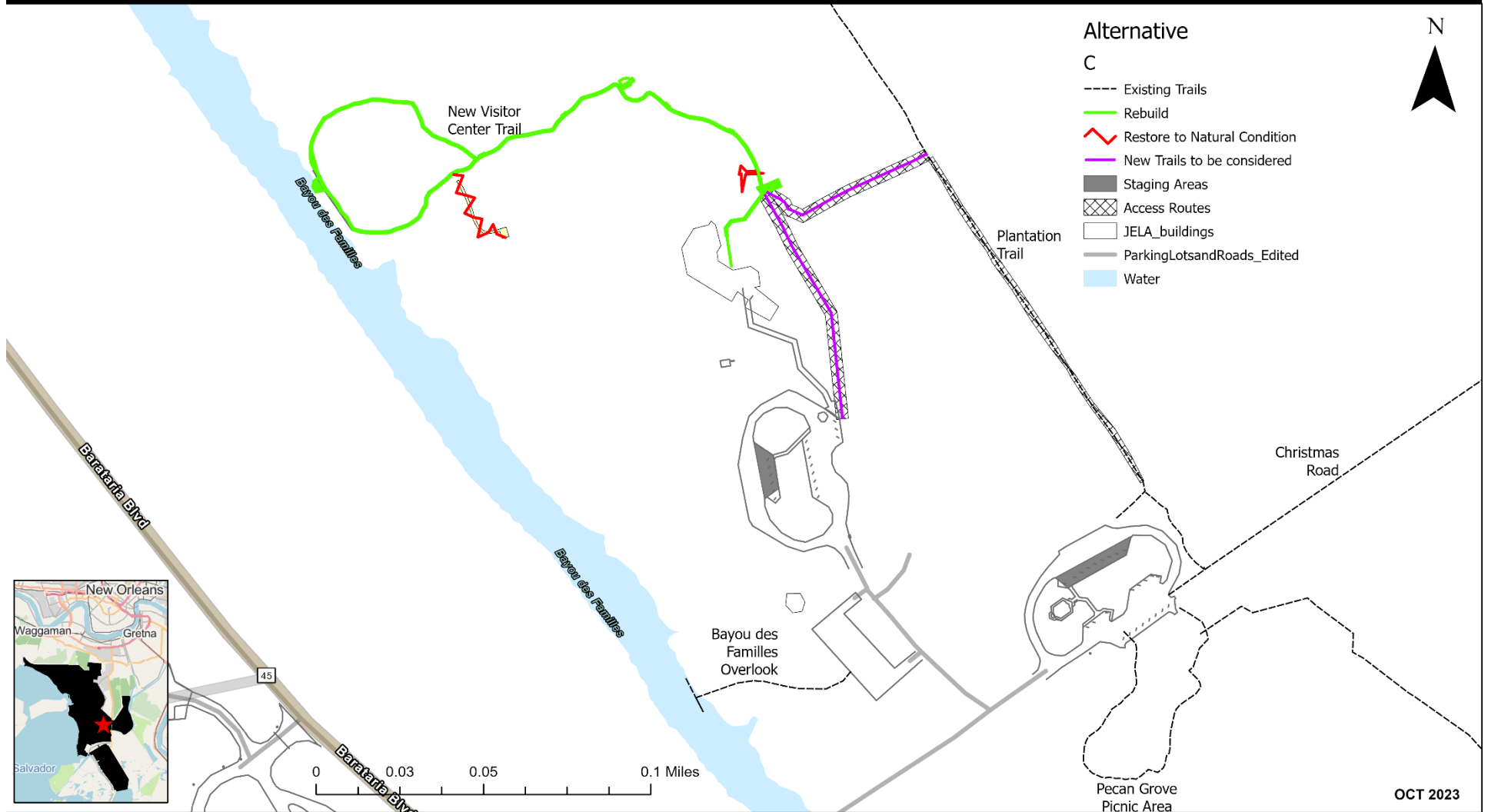


Figure B-6: Education Center Trail, Common to All

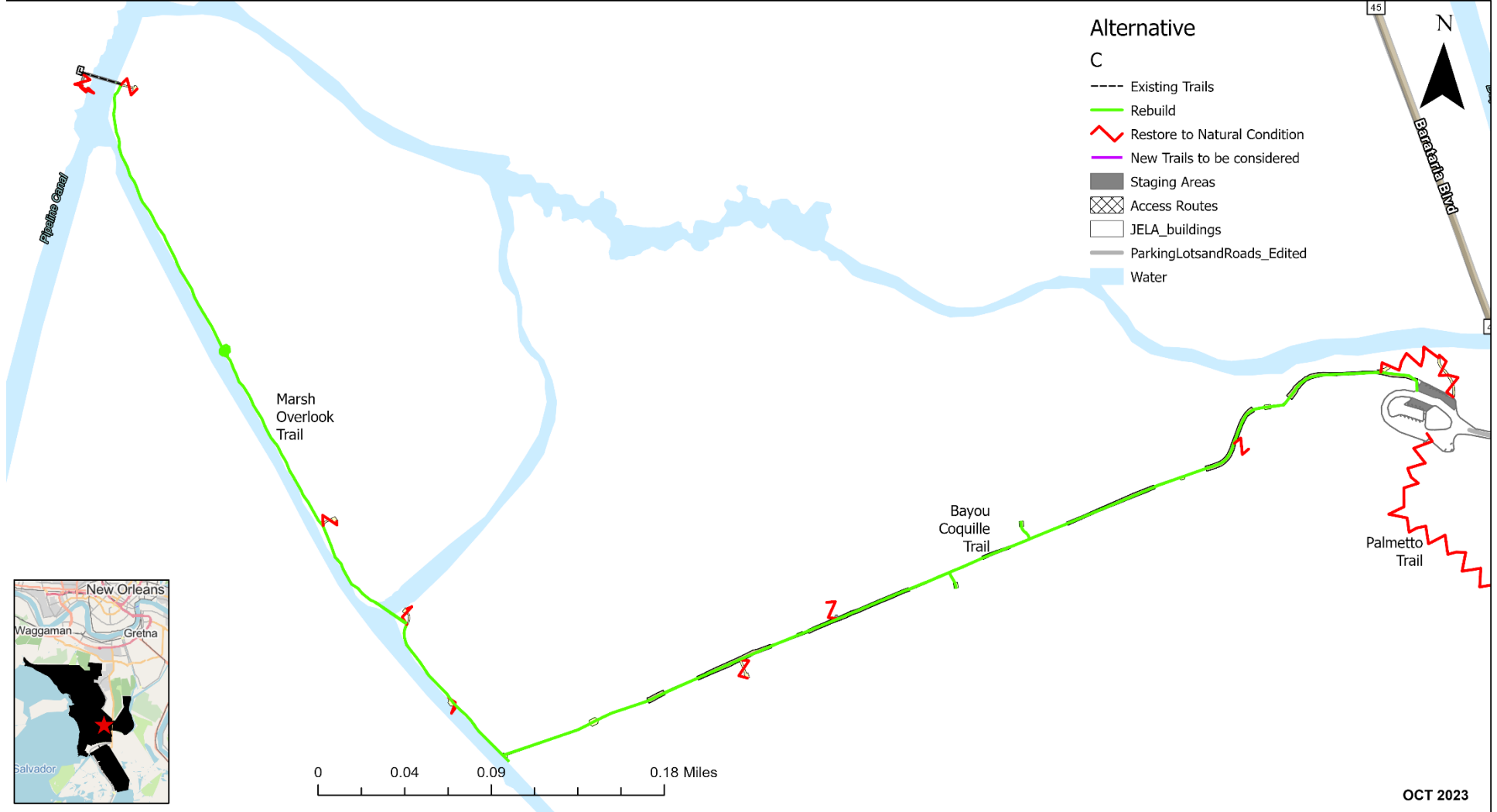


Figure B-7: Marsh Overlook and Bayou Coquille, Common to All

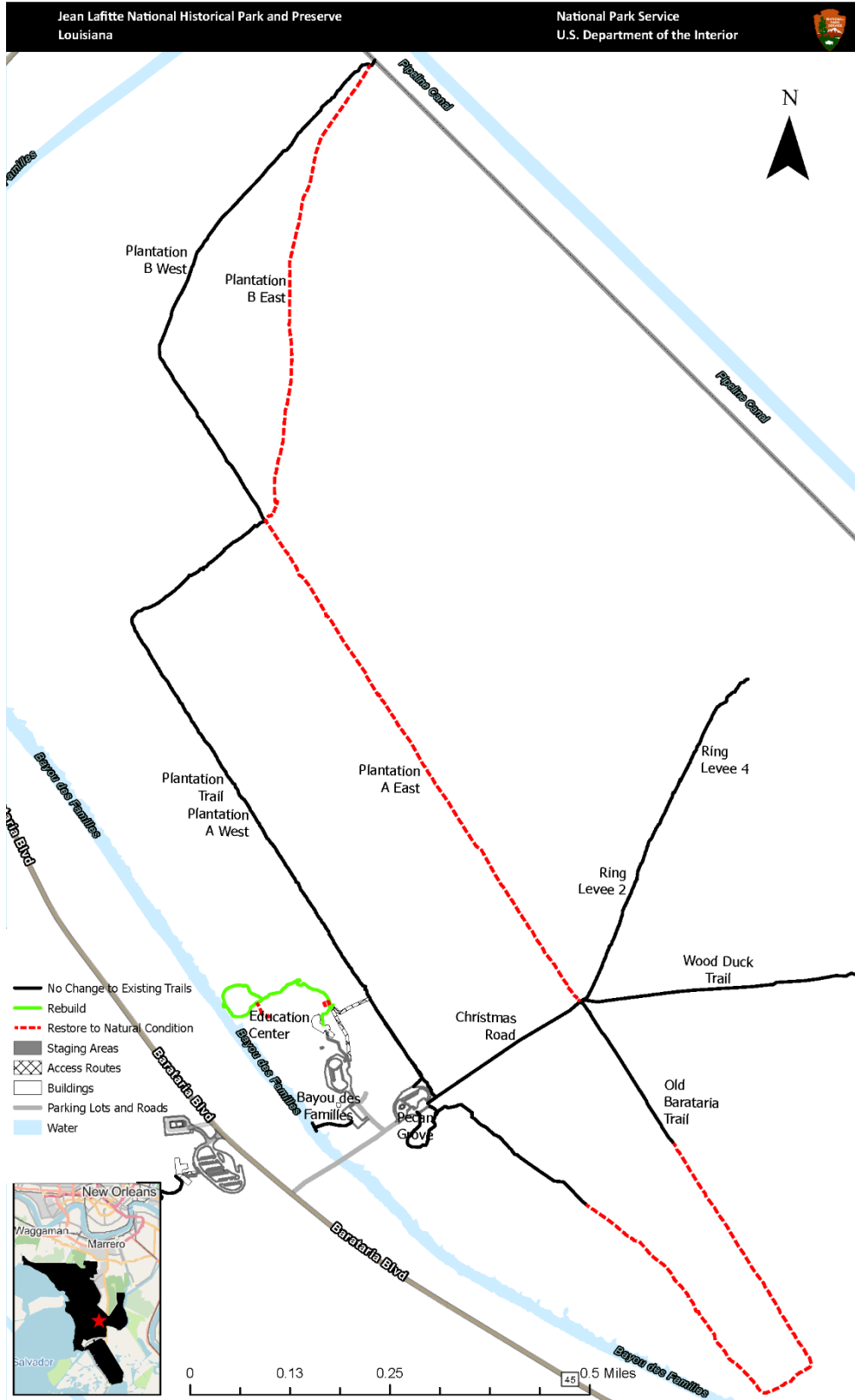


Figure B-8: Plantation and Old Barataria Trails, Common to All

