



Treatments for Cultural Landscapes and Historic Structures of the Light Stations of Michigan, Outer, Devils, Long, and Sand Islands Environmental Assessment

March 2011



APOSTLE ISLANDS NATIONAL LAKESHORE

TREATMENTS FOR CULTURAL LANDSCAPES AND HISTORIC STRUCTURES OF THE LIGHT STATIONS OF MICHIGAN, OUTER, DEVILS, LONG, AND SAND ISLANDS

ENVIRONMENTAL ASSESSMENT

SUMMARY

Apostle Islands National Lakeshore (park) proposes to implement integrated treatments for cultural landscapes and historic structures at the light stations on Michigan, Outer, Devils, Long, and Sand islands (light stations) in the park. The light stations are the buildings and lands around the buildings that are associated with lighthouses built primarily in the late 1800s. The treatment elements include removing trees and tall shrubs to expand cleared areas; removing features from cultural landscapes and historic structures that do not contribute to the historic significance of the landscapes and buildings; preserving and rehabilitating historic structures to improve visitor access and use; repairing or improving a variety of structural features such as windows, roofs, and ventilation in historic structures; and removing or stabilizing hazardous materials.

This Environmental Assessment (EA) evaluates four alternatives: a no action alternative and three action alternatives, one of which is the preferred action alternative (preferred alternative). Under the no action alternative, the park would continue its current level of operations and maintenance at the light stations, and there would be no integrated approach to cultural landscape and historic structure treatments with the associated improvements to protection of cultural resources, visitor experience and access, or park operations. The proposed action is being considered to address the degradation of the features that contribute to the historic significance of the cultural landscapes and structures that has resulted from vegetation encroaching into the light stations, the deterioration of structures, and the addition of noncontributing features. The proposed action also would address existing limitations on visitor access to, and use of, the light station structures. Implementing the proposed work would protect cultural resources, improve visitor experience and access, improve public health and safety, and provide more consistent and effective management and use of the light stations.

This EA has been prepared in compliance with the National Environmental Policy Act (NEPA) to provide the decision-making framework that 1) analyzes a reasonable range of alternatives to meet objectives of the proposal, 2) evaluates potential issues and impacts to the park's resources and values, and 3) identifies mitigation measures to lessen the degree or extent of these impacts. Impact topics evaluated in detail in this EA are geology and coastal processes; soils; vegetation; wildlife; special status species; wetlands; natural soundscape; historic structures and cultural landscapes; archeological resources; visitor experience; and public health, safety, and park operations. Some impact topics were dismissed because the project would result in no more than minor effects. No major effects were identified as a result of this project in an initial analysis of

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effects. The public, regulatory agencies, and other stakeholders will have an opportunity to comment on this EA. Comments received will be considered in the final evaluation of effects.

Public Comment

If you wish to comment on this EA, you may post comments online using the National Park Service Planning, Environment and Public Comment (PEPC) website at: <http://parkplanning.nps.gov>; or mail comments to: Superintendent; Apostle Islands National Lakeshore, Bayfield, Wisconsin 54814.

This EA will be on public review for 30 days. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made available to the public at any time. Although you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

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Acronyms and Abbreviations

ACHP	Advisory Council on Historic Preservation
BMP	Best Management Practice
CEQ	Council on Environmental Quality
CLR	Cultural Landscape Report
Corps	U.S. Army Corps of Engineers
DO	Directors Order
Draft general management plan	Apostle Islands National Lakeshore Draft General Management Plan / Wilderness Management Plan / Environmental Impact Statement
EA	Environmental Assessment
EIS	Environmental Impact Statement
FONSI	Finding of No Significant Impact
HSR	Historic Structure Report
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
National register	National Register of Historic Places
Park	Apostle Islands National Lakeshore
PEPC	Planning, Environment, and Public Comment
SHPO	State Historic Preservation Officer
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service

APOSTLE ISLANDS NATIONAL LAKESHORE

TREATMENTS FOR CULTURAL LANDSCAPES AND HISTORIC STRUCTURES OF THE LIGHT STATIONS OF MICHIGAN, OUTER, DEVILS, LONG, AND SAND ISLANDS

ENVIRONMENTAL ASSESSMENT

INTRODUCTION

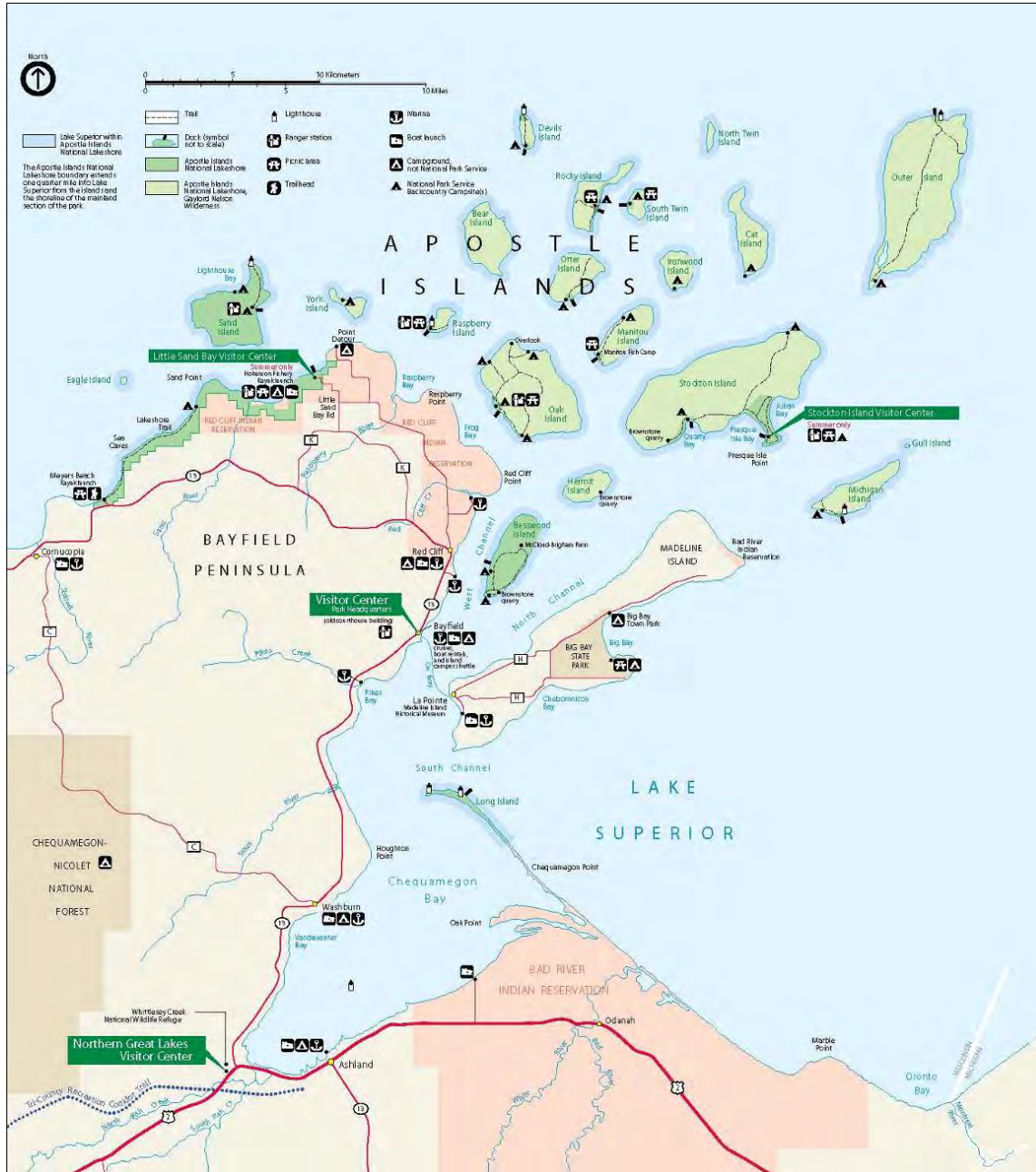
This Environmental Assessment (EA) examines proposed management actions at Apostle Islands National Lakeshore (park). These proposed actions focus on preserving the historic light stations at Michigan, Outer, Devils, Long, and Sand islands. The light stations include lighthouses, residences, support structures, and adjacent grounds built between 1856 and 1939. Proposed actions include:

- Removing encroaching trees and brush from historic grounds;
- Removing nonhistoric features from landscapes and structures;
- Rehabilitating historic structures to improve visitor access and use;
- Repairing structural elements, moisture mitigation, and improving ventilation; and
- Removing or stabilizing hazardous materials.

The proposed actions seek to preserve and partially restore historic structures and cultural landscapes. The proposed actions also address improvements to visitor access and use of the light stations. Implementing the proposed work would protect cultural and natural resources, improve visitor experience and access, improve public health and safety, and provide more effective management of the light stations within the park.

The park is also preparing a draft combined Cultural Landscape Report and Historic Structure Report (draft CLR/HSR) to document and evaluate the cultural landscapes and historic structures of the light stations of Michigan, Outer, Devils, Long, and Sand islands (light stations). The park is in Bayfield and Ashland counties, Wisconsin (Figure 1). The documentation served as a framework upon which alternatives were developed for the treatment and use of the historic structures and landscapes of the light stations. The final CLR/HSR will provide park managers with a comprehensive understanding of the physical evolution of the historic structures and landscapes and guidance for management of the resources.

FIGURE 1. PROJECT LOCATION



The treatment alternatives were combined into three alternatives with specific recommendations on structures and landscapes on each of the light stations. The draft CLR/HSR proposes a preferred treatment alternative that would include rehabilitating each island's cultural landscape and historic structures to best portray the continuum of navigational history that characterizes the Apostle Islands as a system of light stations. The preferred treatment alternative would restore some missing historic features, and repair or rehabilitate others, to better convey the full historical significance of the system. Examples of elements of the preferred treatment alternative include repairing mechanical and electrical systems, repairing and replacing roofs and gutters, painting, clearing vegetation, restoring plantings, investigating improving accessibility to some buildings with ramps and wider door openings, and rehabilitating some buildings for improved visitor use and interpretation.

This EA has been prepared to evaluate potential effects on environmental, socioeconomic, and cultural resources from the draft CLR/HSR's proposed treatment alternative (preferred alternative), the two other draft CLR/HSR treatment alternatives, and a no action alternative. This EA was prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 and implementing regulations, 40 CFR Parts 1500-1508 and NPS Director's Order (DO) – 12 and Handbook, *Conservation Planning, Environmental Impact Analysis, and Decision-making*. This EA determines whether significant impacts would occur as a result of the preferred alternative and if an environmental impact statement (EIS) or finding of no significant impact (FONSI) would be required.

PROJECT PURPOSE AND NEED

Project Purpose

The purpose of the proposed project (implementing the preferred draft CLR/HSR treatment alternative) is to improve cultural resource protection and visitor experience by restoring or rehabilitating light stations on two islands (choosing from Michigan, Outer, or Sand islands) as described in the preferred alternative in Apostle Islands National Lakeshore Draft General Management Plan / Wilderness Management Plan / Environmental Impact Statement (draft general management plan) (NPS 2009a). This purpose would be accomplished on other islands by preserving the exteriors of structures and stabilizing and preserving cultural landscapes.

Implementing the preferred alternative would meet the following objectives:

Protect Cultural and Natural Resources

- Improve conditions of historic buildings and structures
- More accurately represent cultural landscape features
- More accurately represent historic clearing and associated viewshed
- Minimize erosion potential at sites
- Minimize impacts of exotic invasive species

Provide for Visitor Enjoyment and Safety

- Provide a high quality (authentic) visitor experience
- Minimize impacts to visitor experience during rehabilitation activities

Improve Efficiency of Park Operations

- Provide for basic staff needs at housing (e.g., water and restrooms)
- Minimize operational effort
- Reduce exposure to hazardous materials
- Minimize nonrenewable energy usage (and carbon footprint)

Project Need

The proposed project is being considered because of the need to address deficiencies in the condition of the light stations and safety concerns. The park's light stations were constructed between 1856 and 1891 to aid navigation through this portion of Lake Superior. The overall period of historic significance (1856 to 1978) reflects the 122 years from construction of the first light station on Michigan Island to the automation of the Devils Island Light Station and consequent departure of its U.S. Coast Guard (USCG) crew.

With the exception of Raspberry Island Light, which was recently restored, structural stabilization and/or rehabilitation work is needed for all of the other light stations. The lighthouses are kept "presentable" on the exterior, but the interiors are greatly in need of preservation. Decay in all of the light stations exceeds the park staff's ability to keep up with maintenance and repairs, and historic fabric is slowly deteriorating. A growing number of safety deficiencies (such as deteriorating or missing handrails) also are making it increasingly difficult to provide access into the structures. In addition, natural weathering and erosional processes have resulted in the deterioration of the light stations and associated resources, threatening the long-term structural and historical integrity of these properties. Vegetation is encroaching into formerly cleared areas around all of the light stations, contributing to the loss of some of the cultural landscape.

PURPOSE AND SIGNIFICANCE OF APOSTLE ISLANDS NATIONAL LAKESHORE

The park consists of 21 islands and a 12-mile-long segment of the Wisconsin mainland. The park encompasses 69,372 acres, of which 27,323 acres are submerged lands in Lake Superior; and the park boundary extends 0.25 mile from the shore of the mainland and from each island. Eighty percent of the land area of the park was designated as wilderness in December 2004. The islands range in size from 3-acre Gull Island to 10,054-acre Stockton Island. The park includes the largest collection of National Register of Historic Places (national register) lighthouses and lighthouse complexes in the national park system.

The purposes and reasons for significance of the park, as stated in the draft general management plan (NPS 2009a), underlie how the park is managed. The purposes tell why the park was set aside as a national park system unit. The significance of the park addresses why the area is unique—why it is important enough to our natural and/or cultural heritage to warrant national park designation, and how it differs from other parts of the country.

The purposes of Apostle Islands National Lakeshore are to:

- Conserve and protect the outstanding collection of scenic, scientific, biological, geological, historical, archeological, cultural, and wilderness features and values.
- Provide opportunities for the benefit, inspiration, education, recreational use, and enjoyment.
- Secure the benefits of an enduring resource of wilderness in the park's Gaylord Nelson Wilderness for present and future generations of Americans (NPS 2009a).

The park is significant for the following reasons:

- The Apostle Islands archipelago contains scientifically important geologic features, including a highly diverse and stunningly beautiful array of coastal landforms that retain a high degree of ecological integrity.
- Shaped and isolated by Lake Superior and located where northern hardwoods and boreal forests meet, the islands of the park sustain rare communities, habitats, and species of plants and animals. Some of these communities are remnants of ancient forests, providing a rare glimpse into the past.
- The Apostle Islands are the traditional home of the Ojibwe people and integral to their culture. They have used the natural resources of the Apostle Islands area for centuries to sustain their way of life, and continue to do so today.
- The isolation and remoteness of the archipelago has preserved an unparalleled variety of historic and archeological resources reflecting human response to the Great Lakes maritime environment.
- Apostle Islands National Lakeshore has the largest and finest collection of lighthouses in the country.
- Despite hundreds of years of human occupation and use, the Apostle Islands and Lake Superior remain among the wildest places in the Great Lakes, where the unbridled forces of nature prevail.
- The rare combination of remote but accessible scenery, geography, and both open and protected waters affords unparalleled freshwater sailing, boating, sea kayaking, and fishing opportunities.
- The "island experience" of the Apostle Islands, which includes quiet, relative solitude, and clear night skies, continues to provide, as it has for generations, a recreational and rejuvenating experience for people seeking relief from the stresses of their everyday lives (NPS 2009a).

RELATED PLANNING DOCUMENTS

Several previous planning project reports provided background and management information for this EA, including the park's draft general management plan (NPS 2009a) and *NPS Management Policies 2006*.

Apostle Islands National Lakeshore Draft General Management Plan / Wilderness Management Plan / Environmental Impact Statement

The draft general management plan for the park proposes management actions such as designating different management zones within the park and providing opportunities for more people to have an island experience. The draft general management plan indicates the need to restore or rehabilitate structures at two light stations for cultural resource preservation and interpretive opportunities. The associated cultural landscapes would be partially or fully rehabilitated. The draft general management plan also highlights the need to rehabilitate at least part of Long Island Light Station for NPS staff housing to increase resource protection and to provide at least limited information to visitors. Finally, the draft general management plan identifies the need for additional efforts to preserve the exteriors of structures on the remaining islands, and stabilizing and preserving the cultural landscapes in the immediate vicinity of the light stations.

Apostle Islands National Lakeshore Fire Management Plan and Environmental Assessment

The purpose of the fire management plan is to develop a long-range, comprehensive fire management direction for the park. The fire management plan addresses wildland fires and prescribed fire for ecological restoration purposes, maintenance of cultural landscapes, and reduction of any excessive fuel loadings. The specific goals for fire management in the fire management plan are consistent with, and are designed to help achieve the desired conditions related to, natural and cultural resource management and general park administration described in the draft general management plan.

Management Policies 2006

NPS *Management Policies 2006* provides guidance for all management decisions, including decisions related to cultural resources. Cultural resources, including cultural landscapes and historic structures, are addressed in section 5.0, which states the NPS cultural resources management program involves "...stewardship to ensure that cultural resources are preserved and protected, receive appropriate treatments (including maintenance) to achieve desired conditions, and are made available for public understanding and enjoyment." The policy goes on to state that "Each park's resource stewardship strategy will provide comprehensive recommendations about specific actions needed to achieve and maintain the desired resource conditions and visitor experiences for the park's cultural resources."

Impairment Standard

In addition to determining the environmental consequences of implementing the preferred and other alternatives, NPS *Management Policies 2006* (section 1.4) requires a determination of whether or not the effects of the proposed actions would impair a park's resources and values. The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give NPS the management discretion to allow impacts on park resources and values when necessary and appropriate to fulfill the purposes of the park. That discretion is limited by the

statutory requirement that NPS must leave resources and values unimpaired unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values (NPS *Management Policies* 2006). Whether an impact meets this definition depends on the particular resources that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts. An impact on any park resource or value may, but does not necessarily, constitute impairment. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park, or
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or
- identified in the park's general management plan or other relevant NPS planning documents as being of significance.

An impact would be less likely to constitute an impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values and it cannot be further mitigated. Impairment may result from visitor activities; NPS administrative activities; or activities undertaken by concessioners, contractors, and others operating in the park. Impairment may also result from sources or activities outside the park. Impairment findings are not necessary for visitor experience, socioeconomics, public health and safety, environmental justice, land use, and park operations because impairment findings relate back to park resources and values. The draft determination of impairment for the preferred alternative is found in appendix A.

BACKGROUND

The park's light stations were constructed between 1856 and 1891 to aid navigation through this portion of Lake Superior. Five of the light stations (Michigan Island, Raspberry Island, Outer Island, Sand Island, and Devils Island) were collectively listed in the national register in 1977. LaPointe Light Station on Long Island was listed in the national register in 1983. The overall period of historic significance (1856 to 1978) reflects the 122 years from construction of the first light station on Michigan Island to the automation of Devils Island Light Station and consequent departure of its USCG crew.

The light stations are the most visible historic resources in the national lakeshore; they are viewed by many as icons inextricably linked to the region's cultural history. Visitation to the park has generally increased from the 1980s, with slight declines in visitation from 1984 to 1986, 1991 to 1992, and 1999 to 2004. Over the last few years, visitation has been on the rise, although there was a slight decrease from 2006 to 2007, from 189,000 recreation visits in 2006 to 182,000 in 2007. Park staff offer guided tours to visitors arriving in private boats from mid-June to September. These tours occur at several lighthouses. The 2,000 to 4,000 visitors arriving at Raspberry Island via sailboat, power boat, excursion boat, or sea kayak tour the lighthouse each summer. The Sand Island Lighthouse is toured by 1,500 to 2,500 visitors annually with the guidance of volunteer

INTRODUCTION

lighthouse keepers. The light stations at Devils and Michigan islands receive 1,000 to 1,500 visitors each, also with assistance from volunteer lighthouse keepers.

Raspberry Island Light Station is the most readily accessible and most frequently visited of the Apostle Island light stations. For Raspberry Island Light Station, NPS completed erosion-control measures in 2003 in response to severe shoreline erosion and slumping of the embankment that threatened the light station structures. These measures included placing a rock revetment across the base of the bluff below the station; regrading the slope to a stable angle; drainage improvements to divert runoff; and bioengineering using fascines, brush layering, and revegetation to anchor the soils. A rehabilitation project was undertaken in 2006 to address structural deterioration of the lighthouse and keeper's dwelling to improve its functional use for employee housing and enhance visitor interpretation. These measures included restoring (both interior and exterior) the southern half of the building to its early 20th century appearance, adaptive use of the northern half of the building for seasonal employee housing, water supply and electric power systems upgrades, and installing a septic system. Proposed light station treatments considered in this EA are intended to further improve safety and visitor experiences for the remainder of the light stations.

Scoping

Scoping is an early and open process to determine the breadth of issues and alternatives to be addressed in an environmental assessment. Park staff and resource professionals of NPS Denver Service Center and NPS Midwest Regional Office conducted internal scoping. This interdisciplinary process defined the purpose and need, identified potential actions to address the need, determined the likely issues and impact topics, and identified the relationship of the preferred alternative to other planning efforts at the park.

The Lake Superior Tribe of Chippewa/Ojibwe Indians is traditionally associated with the area now containing the park. The tribe and independent Chippewa/Ojibwe tribal governments were sent an informational letter describing the project and asking for comments (Appendix B). The tribes and governments that received letters are:

- Red Cliff Band of Lake Superior Chippewa
- Bad River Band of Lake Superior Chippewa
- Mille Lacs Band of Ojibwe
- Fond du Lac Band of Lake Superior Chippewa
- Lac du Flambeau Band of Lake Superior Chippewa Indians
- Lac Courte Oreilles Band of Ojibwe
- Keweenaw Bay Indian Community
- Sokaogon Chippewa Community
- St. Croix Chippewa Indians
- Lac Vieux Desert Band of Lake Superior Chippewa Indians

The National Historic Preservation Act (16 United States Code [USC] 470 et seq.); NEPA; NPS Organic Act; NPS *Management Policies* 2006; Director's Order (DO) – 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* (2001); and DO – 28: *Cultural Resources*

Management Guideline require the consideration of impacts on cultural resources, either listed in or eligible to be listed in, the national register. Park staff met with the Wisconsin State Historic Preservation Office (SHPO) on November 9, 2010 to discuss the proposed action. The park will continue to consult with the SHPO to determine the effects of the proposed alternatives on eligible historic resources and to develop mitigation for impacts to historical features, if any, from the preferred alternative. The SHPO concurred with a preliminary finding of “no adverse effect” for the potential undertaking (Appendix B).

IMPACT TOPICS

An important part of the decision-making process is seeking to understand the consequences of making one decision over another. This EA identifies the anticipated impacts of possible actions on certain resources, park visitors, and neighbors. The impacts are organized by topic, such as “vegetation” or “public health, safety, and park operations.” Impact topics serve to focus the environmental analysis and to ensure the relevance of impact evaluation. Impact topics were developed from the questions and comments brought forth during scoping. Some topics were dismissed from detailed analysis because the proposed alternatives would either have no effect on the impact topic or the effects would be negligible to minor. Some impact topics are retained even though the effects of the alternatives would be minor because the impact topic is a particularly sensitive resource, like wetlands, or was identified as an important topic in scoping. Issues identified in scoping that are evaluated in this EA are potential effects on geology and coastal processes; soils; vegetation; wildlife; special status species; water quality; wetlands; natural soundscape; historic structures and cultural landscapes; archeological resources; visitor experience; and public health, safety, and park operations. Table 1 discusses the retained impact topics; the reasons for retaining the topic; and relevant laws, regulations, and policies.

TABLE 1. IMPACT TOPICS RETAINED AND RELEVANT LAWS, REGULATIONS, AND POLICIES

Impact Topic	Reasons for Retaining Impact Topic	Relevant Laws, Regulations, and Policies
Geology and Coastal Processes	Boardwalk and boat dock work and selectively removing trees on shoreline bluffs may affect coastal processes. Such changes would be of concern to visitors, the public, and park managers; therefore, this topic was retained for further analysis.	NPS Organic Act; NPS <i>Management Policies 2006</i>
Soils	Because the EA alternatives have the potential to affect soils and because the park identified soil erosion as an ongoing management concern, this topic was retained for further analysis.	NPS Organic Act; NPS <i>Management Policies 2006</i>
Vegetation	Vegetation disturbance could occur and the introduction of invasive nonnative species is possible from ground-disturbing activities during construction and from disposal of logs and other vegetative materials removed from cleared areas. Because the EA alternatives have the potential to affect vegetation, this topic was retained for further analysis.	NPS Organic Act; NPS <i>Management Policies 2006</i> ; Resource Management Guidelines (NPS-77); Federal Noxious Weed Control Act; Executive Order (EO) 13112, “Invasive Species” (1999)

Impact Topic	Reasons for Retaining Impact Topic	Relevant Laws, Regulations, and Policies
Wetlands	The proposed alternatives may have effects on wetlands, which are an important and sensitive resource, so this topic was retained for further analysis.	Clean Water Act sections 401 and 404; NPS <i>Management Policies 2006</i> ; NPS DO-77-1; EO 11990, "Protection of Wetlands"
Wildlife	Construction activities, vegetation management, and increased visitor use could affect wildlife in the project area. Because the EA alternatives have the potential to affect wildlife and wildlife is an important and sensitive resource, this topic was retained for further analysis.	NPS Organic Act; enabling legislation; NPS <i>Management Policies 2006</i>
Special Status Species	Piping plover designated critical habitat is present in the Long Island portion of the project area. In recent years, piping plovers have successfully and consistently nested on Long Island. Gray wolf is also an occasional transient species in the park. Available survey data and interviews with park staff indicate that state threatened and endangered plant species occur near the light stations, especially at Devils and Outer islands. Because the EA alternatives have the potential to affect piping plover gray wolf and several state threatened and endangered plant species, this topic was retained for analysis.	Endangered Species Act; NPS <i>Management Policies 2006</i>
Natural Soundscape	There could be at least local temporary increases in noise associated with the EA alternatives. Because the EA alternatives have the potential to affect the soundscape, this topic was retained for further analysis.	NPS <i>Management Policies 2006</i> ; DO – 47: <i>Soundscape Preservation and Noise Management</i>
Historic Structures and Cultural Landscapes	The future of the light stations and their historic structures and cultural landscapes is a key issue of the draft general management plan. Changes to historic structures and the cultural landscapes that could result from implementing one or more of the alternatives would be of concern to visitors, the public, the tribes, the SHPO, and NPS managers; therefore, this topic was retained for further analysis.	Sections 106 and 110 of the National Historic Preservation Act; Advisory Council on Historic Preservation's (ACHP) implementing regulations regarding the "Protection of Historic Properties" (36 CFR 800); DO/NPS-28: <i>Cultural Resources Management Guideline</i> ; NPS <i>Management Policies 2006</i> ; <i>Secretary of the Interior's Standards for the Treatment of Historic Properties</i> ; National Environmental Policy Act; <i>Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes</i> (1996)

Impact Topic	Reasons for Retaining Impact Topic	Relevant Laws, Regulations, and Policies
Archeological Resources	Ground-disturbing construction activities and vegetation removal associated with the EA alternatives have the potential to impact archeological resources and, therefore, this topic was retained for further analysis.	Sections 106 and 110 of the National Historic Preservation Act; ACHP implementing regulations regarding the "Protection of Historic Properties" (36 CFR 800); DO/NPS-28: <i>Cultural Resources Management Guideline</i> ; <i>Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation</i> ; <i>NPS Management Policies 2006</i> ; National Environmental Policy Act; DO – 28A: <i>Archeology</i> (2004)
Visitor Experience	The EA alternatives could affect overall visitor understanding of the park, particularly pertaining to the light stations, including interpretive and educational opportunities and, therefore, this topic was retained for further analysis.	NPS Organic Act; <i>NPS Management Policies 2006</i>
Public Health and Safety	The EA alternatives could affect visitor safety with regard to hazardous materials, and, therefore, this topic was retained for further analysis.	<i>NPS Management Policies 2006</i> ; DO – 50C: <i>Public Risk Management Program</i>
Park Operations	Park operations could be affected by the EA alternatives, including facility construction and facility or infrastructure maintenance and, therefore, this topic was retained for further analysis.	<i>NPS Management Policies 2006</i>

Impact Topics Dismissed from Further Consideration

The following impact topics or issues were eliminated from consideration because effects, if any, would be negligible to minor.

Floodplains. EO 11988: *Floodplain Management* requires an examination of impacts to floodplains and potential risks involved in placing facilities within floodplains. *NPS Management Policies 2006* and DO – 77-2: *Floodplain Management* provide guidelines for proposed actions in floodplains. The action alternatives propose work on the boardwalk and dock at Long Island LaPointe Light Station, which are located within the 100-year floodplain of Lake Superior. Under alternative 1, a new boardwalk would be constructed in the location of the historic boardwalk and in alternative 2, the preferred alternative, a new boardwalk would be constructed in the alignment of the existing boardwalk. In both alternatives, the proposed activities would consist of constructing a new boardwalk that would extend to approximately the ordinary high water mark of the lake, and maintenance and repair of the existing dock. Because the work would not include constructing new permanent structures (the boardwalk would float away in a flood) or discharge of fill material into the floodplain, alternatives 1 and 2 would have no effect on the floodplain. Under alternative 3, the existing dock would be replaced with a new dock just east of the existing dock in the location of the historic dock. The new dock would be similar in size, materials, and form to the existing dock. Additionally, a new boardwalk would be constructed that would extend from the shoreline to the new dock. Replacing the existing dock with a similar dock in a slightly different location and constructing the new boardwalk would have, at most, a negligible effect on the floodplain.

INTRODUCTION

The proposed alternatives would result in a negligible change in natural floodplain values (e.g., river processes or aquatic habitat) and the ability of the floodplain to function naturally. There would be essentially no increase in risk to life or property. Because there would be negligible effects on floodplains, this impact topic was dismissed from further analysis in this EA.

Water Resources. The Clean Water Act; section 10 of the Rivers and Harbors Appropriation Act; EO 12088, “Federal Compliance with Pollution Control Standards”; and NPS *Management Policies 2006* direct NPS to avoid or minimize human-caused pollution of waters or to obstruct the navigable capacity of waters of the U.S. Lake Superior’s clean waters are one of the park’s fundamental resources and navigation in the lake is important to recreation and commercial uses. The lake’s clean water supports the park’s natural ecosystems and is important for recreational activities including fishing, boating, swimming, wading, and kayaking.

Under the action alternatives, there would be small areas of excavation, grading, and exposure of soil material, which would increase the potential for sediment to enter Lake Superior until work is complete and vegetation is reestablished. Selectively thinning trees on the shoreline bluffs on Michigan and Outer islands has the potential to increase erosion, with associated effects on water quality. Under Alternative 3, sediment in Lake Superior would be temporarily disturbed during removal and reconstruction of the LaPointe dock. The transport of sediment to and disturbance of sediment in Lake Superior would be minimized by using best management practices (BMPs) to contain sediment and control erosion. Effects of the proposed alternatives on the water quality of Lake Superior would be negligible because of the use of BMPs and because any sediment contributions to the lake would be very minor in relation to the supply of sediment and erosion naturally occurring in this watershed.

The proposed alternatives would not have any new effects on the navigable capacity of Lake Superior. The no action alternative and alternatives 1 and 2 would not result in any work in or discharge of fill material into navigable waters. Alternative 3 would replace the existing Long Island dock with a new dock in a slightly different location, but there would be no more than negligible effects because the location, size, and form of the new dock would be similar to the existing dock that would be removed. Because the alternatives would have no more than negligible effects on water resources, this impact topic was dismissed from further analysis in this EA.

Prime or Unique Farmland. In 1980, the Council on Environmental Quality (CEQ) directed federal agencies to assess the effects of their actions on farmland soils classified as prime or unique by the United States Department of Agriculture, Natural Resources Conservation Service (NRCS). Prime or unique farmland is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed; and specialty crops such as fruits, vegetables, and nuts.

Three soil map units that occur in the park are prime farmlands, and two map units are prime farmland if drained. Most of the prime farmlands are on Outer and South Twin islands. There are no unique farmlands where the light stations are located. Because there are no prime or unique farmlands in the project area, this topic was dismissed from further analysis.

Air Quality. The park is classified as a Class II area under the Clean Air Act. This air quality classification is designed to protect the majority of the country from air quality degradation. Hydrocarbons, nitrogen oxide, sulfur dioxide, and particulates would be emitted from the use of equipment and boats during project activities and burning slash piles under the action

alternatives, resulting in localized effects on air quality. Emissions from equipment and vehicles and wood smoke would be rapidly dissipated; and visibility, deposition, and other air quality-related values are not expected to be appreciably impaired. Neither overall park air quality nor regional air quality would be more than negligibly affected by the local short-term increase in emissions. Because the effects of the proposed alternatives would be no more than negligible, this impact topic was dismissed from further analysis in this EA.

Climate Change. Some greenhouse gases, such as carbon dioxide, also would be emitted from the use of construction equipment and boats and from burning slash piles. These emissions would have a negligible short-term adverse effect on climate change. Changes in visitor use following implementation of the action alternatives would not result in a substantial increase in traffic to the island or associated vehicle emissions. Because the proposed alternatives would result in no more than negligible parkwide and regional short-term adverse effects on climate change, this impact topic was dismissed from further analysis in this EA.

Lightscape. In accordance with *NPS Management Policies 2006*, NPS strives to preserve natural ambient lightscapes, which are natural resources and values that exist in the absence of human-caused light. The actions proposed in the alternatives could result in the expanded use of buildings for employee housing, some of which could necessitate some nighttime lighting. However, the effects of this lighting would be localized and minimized. Only a small area would be affected by the facilities. In addition, future expansion of lighting is strongly limited by the lack of power at most locations. It is expected that these few developments would have a negligible impact on the night sky. Therefore, lightscape was dismissed as an impact topic in this EA.

Paleontological Resources. *NPS Management Policies 2006* directs NPS to protect, preserve, and manage paleontological resources. Because the park is not known to contain scientifically important paleontological resources, it is unlikely there would be any effects on paleontological resources. Therefore, paleontological resources was dismissed as an impact topic in this EA.

Indian Trust Resources. Secretarial Order 3175 requires that any anticipated impacts to Indian trust resources from a proposed project or action by the Department of the Interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights. The order represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes. None of the lands of the park are trust resources according to this definition. In addition, any Indian titles to such lands now within the park have been extinguished through cession or sale. Therefore, Indian trust resources was dismissed as an impact topic in this EA.

Ethnographic Resources. Ethnographic resources are defined by NPS as any “site, subsistence, or other significance in the cultural system of a group traditionally associated with it” (DO – 28). The Lake Superior Tribe of Chippewa/Ojibwe Indians is traditionally associated with the park. NPS will forward this EA to the tribal contacts and independent tribal governments for their review and comments. If issues or concerns are identified, appropriate consultations would be undertaken. According to NPS professional staff and the draft general management plan (NPS 2009a), to date no ethnographic resources within the park have been determined eligible for listing in the national register. Because it is unlikely that ethnographic resources would be affected by the proposed project, and because appropriate steps would be taken to protect any ethnographic resources that are inadvertently discovered, ethnographic resources was dismissed as an impact topic in this EA.

Museum Collections. Museum collections include historic artifacts, natural specimens, and archival and manuscript material. These collections may be threatened by fire, vandalism, natural disasters, and careless acts. The preservation of museum collections is an ongoing process of preventative conservation, supplemented by conservation treatment, when necessary. The primary goal is preservation of artifacts in the most stable condition possible to prevent damage and minimize deterioration. The proposed activities associated with the light station treatments would not affect the current museum objects of the park. The proposed activities would likely produce some new museum accessions including archeological objects, samples of original fabric and paint, and newly acquired archival materials including official project records. These new accessions would make minor contributions to the understanding of the park's natural and cultural resources. Because the effects on the museum collection would be minor, museum collections was dismissed as an impact topic in this EA.

Socioeconomics. The local economy and most businesses within the communities adjacent to the park are based on professional services, construction, tourism, and light industry. The proposed project would improve the overall quality of the visitor experience, which is beneficial to the local economy. Construction-related spending also would provide a short-term benefit to the economy through employment and purchase of construction materials and services. There would be no beneficial socioeconomic effects under the no action alternative. No adverse socioeconomic effects were identified; therefore, socioeconomics was dismissed as an impact topic in this EA.

Environmental Justice. EO 12898: *General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing the disproportionately high and/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. According to the Environmental Protection Agency, environmental justice is the

...fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

The goal of 'fair treatment' is not to shift risks among populations, but to identify potentially disproportionately high and adverse effects, and identify alternatives that may mitigate these impacts. No actions in the alternatives would have disproportionate health or environmental effects on minorities or low-income populations or communities as defined in the Environmental Protection Agency's "Draft Environmental Justice Guidance" (July 1996); therefore, environmental justice was dismissed as an impact topic in this EA.

Wilderness. The Wilderness Act and NPS *Management Policies 2006* (section 6.2.1, NPS 2006) require that all lands administered by NPS be evaluated for their suitability for inclusion within the National Wilderness Preservation System. Areas suitable for wilderness designation are those that generally have the qualities of being untrammeled, natural, undeveloped, and offering solitude or a primitive and unconfined type of recreation. Following a positive evaluation of the

park's suitability for designation as wilderness, about 80% of the park was designated in 2004 as the Gaylord Nelson Wilderness. The light station reservations were excluded from the wilderness designation, but they abut wilderness on Michigan, Outer, and Devils islands. Sand and Long islands have no designated wilderness.

NPS is directed to protect the wilderness character of designated wilderness areas by restricting motorized vehicles, equipment, and motorboats; roads; structures; and most commercial enterprises. Protecting the wilderness characteristic of solitude also means limiting distractions such as large groups, signs and other modern artifacts, and unnatural noise. The Wilderness Act does not offer protection from sights or sounds originating outside of wilderness. The park's draft general management plan includes general directions for management of the Gaylord Nelson Wilderness, including protecting and maintaining cultural resources in the wilderness.

The no action alternative would have no new effects on wilderness character or values. The proposed action alternatives include removing and managing vegetation contiguous with wilderness areas. Removing and managing vegetation would temporarily increase the presence of humans and noise levels, but these changes would be occurring outside of designated wilderness. These conditions may have short term, minor effects on the ability of people in the wilderness to experience solitude, but there would be no permanent effect on wilderness character or values. Because the effects would be no more than minor and temporary, wilderness was dismissed from further analysis in this EA.

Wild and Scenic Rivers. No rivers in the park are included in the nationwide rivers inventory, or proposed for wild and scenic river study; therefore, wild and scenic rivers was dismissed as an impact topic in this EA.

ALTERNATIVES

INTRODUCTION

This section describes the no action alternative and three action alternatives, including the preferred alternative, for cultural landscapes and historic structures treatments. The no action alternative would not restore or rehabilitate any historic structures or cultural landscapes, and would continue the present level of use, management, operations, and maintenance. The action alternatives were developed to address the purpose and need for the project to rehabilitate each park island's cultural landscape and historic structures in ways consistent with the park's draft general management plan and other relevant laws, regulations, policies, and guidance.

The preferred alternative presents NPS's preferred management action and defines the rationale for the action in terms of resource protection and management; visitor use, operations, and cost; and other applicable factors. Other alternatives that were considered are discussed in this section. Also included in this section is a comparison of how well the alternatives meet project objectives, and a summary comparison of the environmental effects of each of the alternatives.

Initial concepts for treatments began with a planning workshop in February 2010, where three overall approaches were identified. The results of the planning workshop provided direction for the Value Analysis that was completed in May 2010 (NPS 2010).

The objectives of the Value Analysis were to select a preferred treatment alternative for cultural landscapes and historic structures at the light stations. The project objectives used to guide the evaluation of a full range of alternatives were the same as those for the project as a whole, which are to:

- **Protect Cultural and Natural Resources**
 - Improve conditions of historic buildings and structures
 - More accurately represent cultural landscape features
 - More accurately represent historic clearing and associated viewshed
 - Minimize erosion potential at sites
 - Minimize impacts of exotic invasive species
- **Provide for Visitor Enjoyment and Safety**
 - Provide a high quality (authentic) visitor experience
 - Minimize impacts to visitor experience during rehabilitation activities
- **Improve Efficiency of Park Operations**
 - Provide for basic staff needs at housing (e.g., water and restrooms)
 - Minimize operational effort
 - Reduce exposure to hazardous materials
 - Minimize nonrenewable energy usage (and carbon footprint)

The treatment alternatives were evaluated using the Choosing by Advantages process, where the decisions are based on the importance of advantages between the alternatives. The evaluation

involves the identification of the attributes or characteristics of each alternative relative to the evaluation criteria, a determination of the advantages for each alternative within each evaluation factor, and then weighing the importance of each advantage.

Three treatment alternatives were evaluated in the Value Analysis (NPS 2010). The alternatives included a range of approaches, including preservation, restoration, and rehabilitation. The alternatives also included a range of the number of buildings and cultural landscape features that would be addressed, number of buildings open to visitors, number of safety improvements, and number of improved water and waste water facilities. The preferred alternative provided the best combination of features that met project objectives. The preferred alternative preserves and improves historic buildings, structures, and cultural landscapes; reestablishes clearings and viewsheds that more accurately represent historic conditions; improves public health and safety by removing or stabilizing hazardous materials and adding safety features; and improves park operation by providing a clear and integrated approach to the repair, maintenance, and improvements to historic cultural resources at the light stations.

While all of the alternatives considered had different advantages, the preferred alternative had the best overall combination of features that met the project objectives. The alternative preferred in the Value Analysis is the preferred alternative in this EA.

DEFINITIONS

The descriptions of the alternatives include a number of words that have specific meaning when used in the context of historic structures and cultural landscapes.

National Register of Historic Places

NPS administers the national register. The national register is the official federal list of districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, engineering, and culture. National register properties have significance to the history of their community state, or the nation.

Contributing Feature

A contributing feature is a building, site, structure, or object adding to the historic significance of a property, structure, or cultural landscape.

Treatment Approaches

The Secretary of the Interior has developed four nationally accepted treatment approaches for addressing historic resources. Each treatment approach has associated guidelines and standards for how it is applied to historic resources. The four treatment approaches are:

Preservation standards require retention of the greatest amount of historic fabric, including the landscape's historic form, features, and details as they have evolved over time. Limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work is permitted.

ALTERNATIVES

Rehabilitation standards acknowledge the need to alter or add to a building or cultural landscape to meet continuing or new uses while retaining the site's historic character. Rehabilitation allows for repairs, alterations, restoration of missing features, and additions necessary to enable a compatible use for a property as long as the portions or features which convey the historical, cultural, or architectural values are preserved.

Restoration standards allow for the depiction of a building or landscape at a particular time in its history by preserving materials from the period of significance and removing materials from other periods.

Reconstruction standards allow for depicting, by means of new construction, the form, features, and detailing of a nonsurviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location.

Treatment Terminology

The following terms are used in the descriptions of alternatives:

Alter – is to change in some fashion from the existing condition.

Maintain – are those standard maintenance practices (mowing, pruning, thinning vegetation or painting, cleaning small scale features) that are necessary to retain the features or area as a contributing resource. Maintenance activities are usually not classified as repair, however, minor repair such as replacing posts or railings or segments of paving are included. Limited and sensitive upgrading of systems (mechanical, electrical, plumbing) and other code related work is appropriate.

Plant –removing and replanting landscape plantings and vegetation as part of maintenance activities.

Protect – short term and minimal measures used to stabilize and protect features, such as fencing around landscape features.

Reestablish – measures necessary to depict a landscape feature as it occurred historically. Reestablish may include replacing a missing feature, such as replacing a pattern of planting, or a replacing missing quality, such as the reestablishment of a view.

Relocate –removing and resetting noncontributing features.

Remove –removing nonhistoric features.

Repair – are those measures necessary to maintain a building or portion of a building in place using the same materials that exist, or with very minimal addition of new materials. Repairs are more extensive than regular maintenance. Features that are repaired will match the old in design, color, texture, and if possible, material. Replacement work will only occur when historic fabric is deteriorated beyond repair. Evaluation of restoration and low-impact options must be exhausted before replacement is considered feasible.

Restore – are those measures necessary to depict a feature or area as it occurred historically. Restoration may include repairing a feature so that it appears as it did historically or it may include replacing missing features (such as replacing a section of a historic fence) or quality (restoring a view). Restoration is undertaken when a "period of significance" is determined and that period of significance (original construction or a succeeding period representing a continuum of change for the property) becomes a project goal. Restoration is only recommended when restorative details can be substantiated by documentary and physical evidence. Without indisputable evidence restorative work risks conjectural decision making, leading to inaccurate and inappropriate historical appearance. Restoration must avoid the creation of a false sense of historical development.

Retain – are those actions that are necessary to allow for a feature (contributing or noncontributing) to remain in place in its contributing current configuration and condition. Retention of historic fabric is the primary tenet for preservation treatment of historic properties. The extent of historic fabric represents historic integrity which is fundamental to the recognition and status of historic properties.

Stabilize – immediate measures (more than standard maintenance practices) are needed to prevent deterioration, failure, or loss of features.

NO ACTION ALTERNATIVE

The no action alternative provides a basis for comparison with the action alternatives, including the preferred alternative, and the respective environmental consequences. Under the no action alternative, there would be the fewest changes to the existing landscape, and generally, it perpetuates the current conditions at the light stations (Figures 2 to 13). This alternative would preserve existing forms and materials through as-needed stabilization, ongoing preservation maintenance, and repairing historic materials and features. Historic small scale features in the landscape, pedestrian circulation, lawn and gardens, and historic clearing would persist through on-going maintenance. The existing views from the light stations to the lake and from the lake to the light stations would be maintained.

Examples of continuing conditions on each island include:

Michigan Island. Guided visitor access to the Old Michigan Island Lighthouse and Second Tower would continue and staff housing would continue to be provided in the Keepers Quarters. The currently cleared area would remain at about 1.6 acres, which is about 16% of the historically cleared area. Buildings would continue to experience excessive moisture. Hazardous materials, including asbestos, mold, and bat guano, would remain unabated. The operability of the tramway would continue to decline due to the unavailability of parts.

Outer Island. Self-guided access would continue to be offered for Outer Island building exteriors. Limited housing for NPS seasonal staff would continue to be provided in the Keepers Quarters. The currently cleared area would remain at about 1.6 acres, which is about 17% of the historically cleared area. Buildings would continue to experience excessive moisture and mold. Hazardous materials, primarily lead-based paint, would remain unabated. The tramway would remain inoperable.

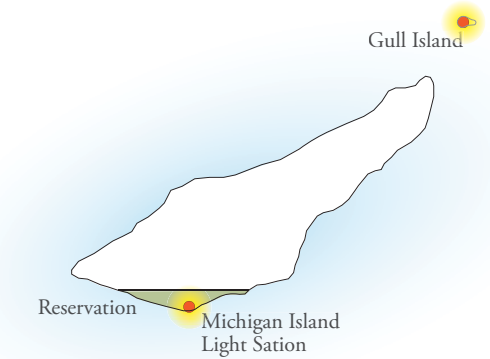
ALTERNATIVES

Devils Island. Guided access would continue to be provided to the tower and Keepers Quarters and the Keepers Quarters would be used for NPS seasonal staff housing. The currently cleared area would remain at about 3.0 acres, which is about 18% of the historically cleared area. Buildings would continue to experience excessive moisture. Hazardous materials, primarily lead-based paint, would remain unabated.

Long Island. Self-guided access would continue to be offered for Long Island building exteriors. There would be no staff housing. The currently cleared area would remain at about 1.5 acres, which is about 11% of the historically cleared area. Buildings would continue to experience excessive moisture. Hazardous materials, including lead-based paint, bat guano, and mold, would remain unabated.

Sand Island. Limited guided visitor access and staff housing would continue to be provided at the Light Station Tower and Keepers Quarters. The currently cleared area would remain at about 3.0 acres, which is about 45% of the historically cleared area. Buildings would continue to experience excessive moisture. Hazardous materials, primarily lead-based paint, would remain unabated.

Michigan Island Reservation Existing Conditions



Michigan Island

Legend

- Cleared Area
- Forest
- Edge of Historic Cleared Area

Note: Features in *italics* are Noncontributing

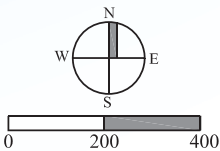
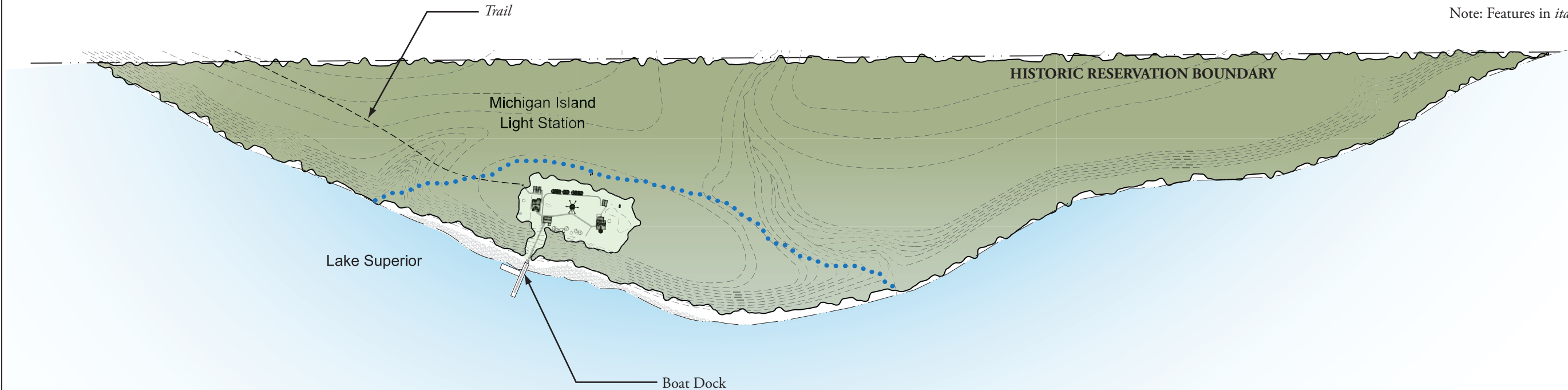
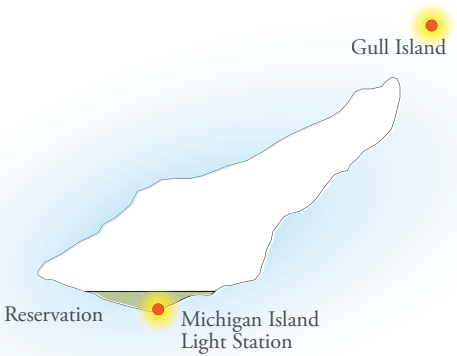
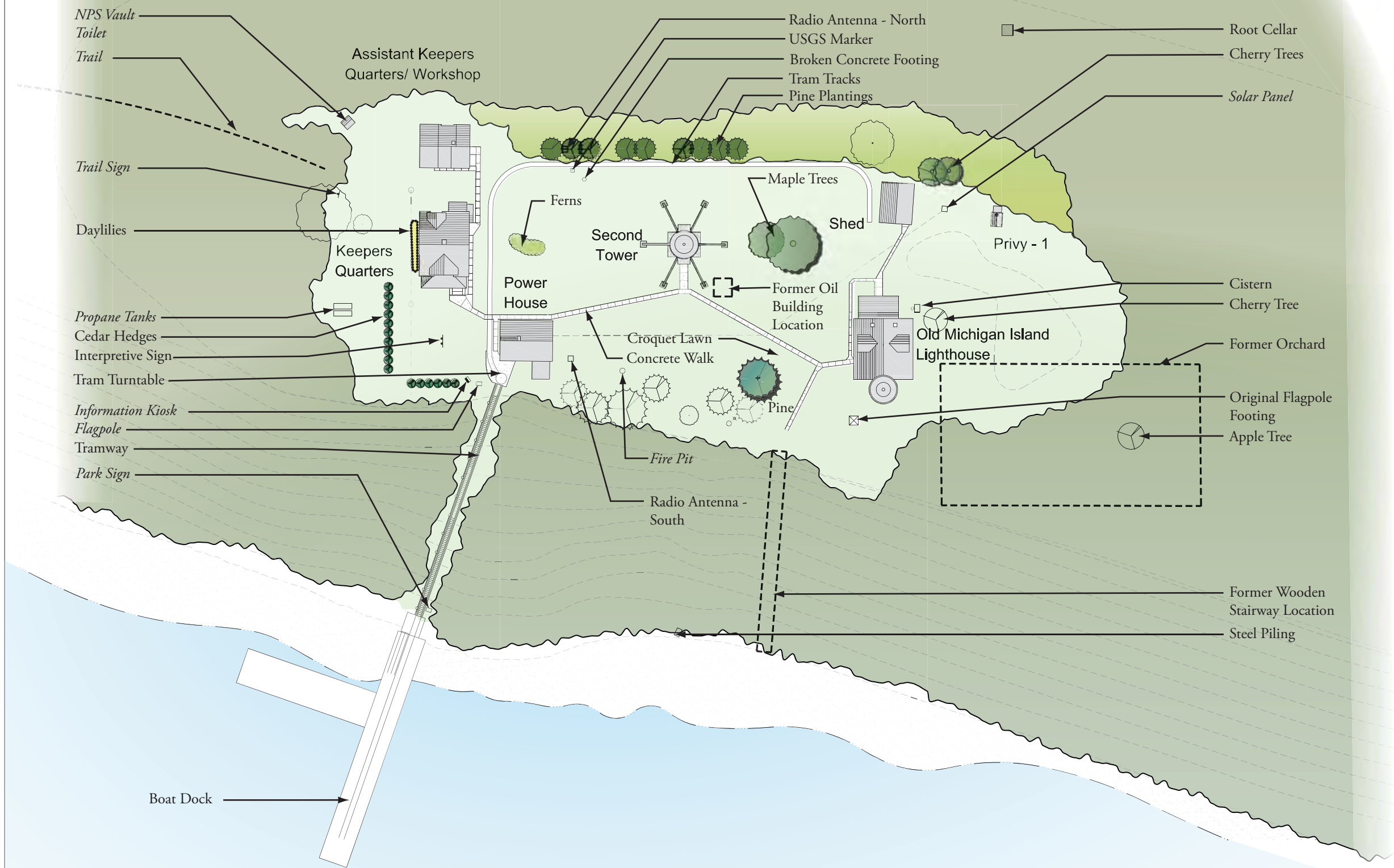


FIGURE 2		
TITLE OF PROJECT		
HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES		
TITLE OF DRAWING		
MICHIGAN ISLAND - RESERVATION BOUNDARY		
NAME OF PARK		
APOSTLE ISLANDS NATIONAL LAKESHORE		
REGION	COUNTY	STATE
MIDWEST	ASHLAND	WISCONSIN
UNITED STATES DEPARTMENT OF THE INTERIOR		
APOSTLE ISLANDS NATIONAL LAKESHORE		
100% 3/18/11		

Michigan Island Existing Conditions

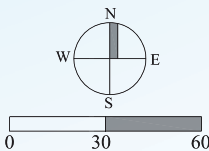


Michigan Island

Legend

- Lawn Clearing
- Forest
- Low Brush Clearing

Note: Features in *italics* are Noncontributing



UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE		100% 3/18/11	
REGION MIDWEST		STATE WISCONSIN	

FIGURE 3

TITLE OF PROJECT
HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT
& ENVIRONMENTAL ASSESSMENT
TREATMENT ALTERNATIVES

TITLE OF DRAWING

MICHIGAN ISLAND LIGHT STATION

NAME OF PARK
APOSTLE ISLANDS NATIONAL LAKESHORE

REGION
MIDWEST

COUNTY
ASHLAND

STATE
WISCONSIN

Outer Island Reservation Existing Conditions

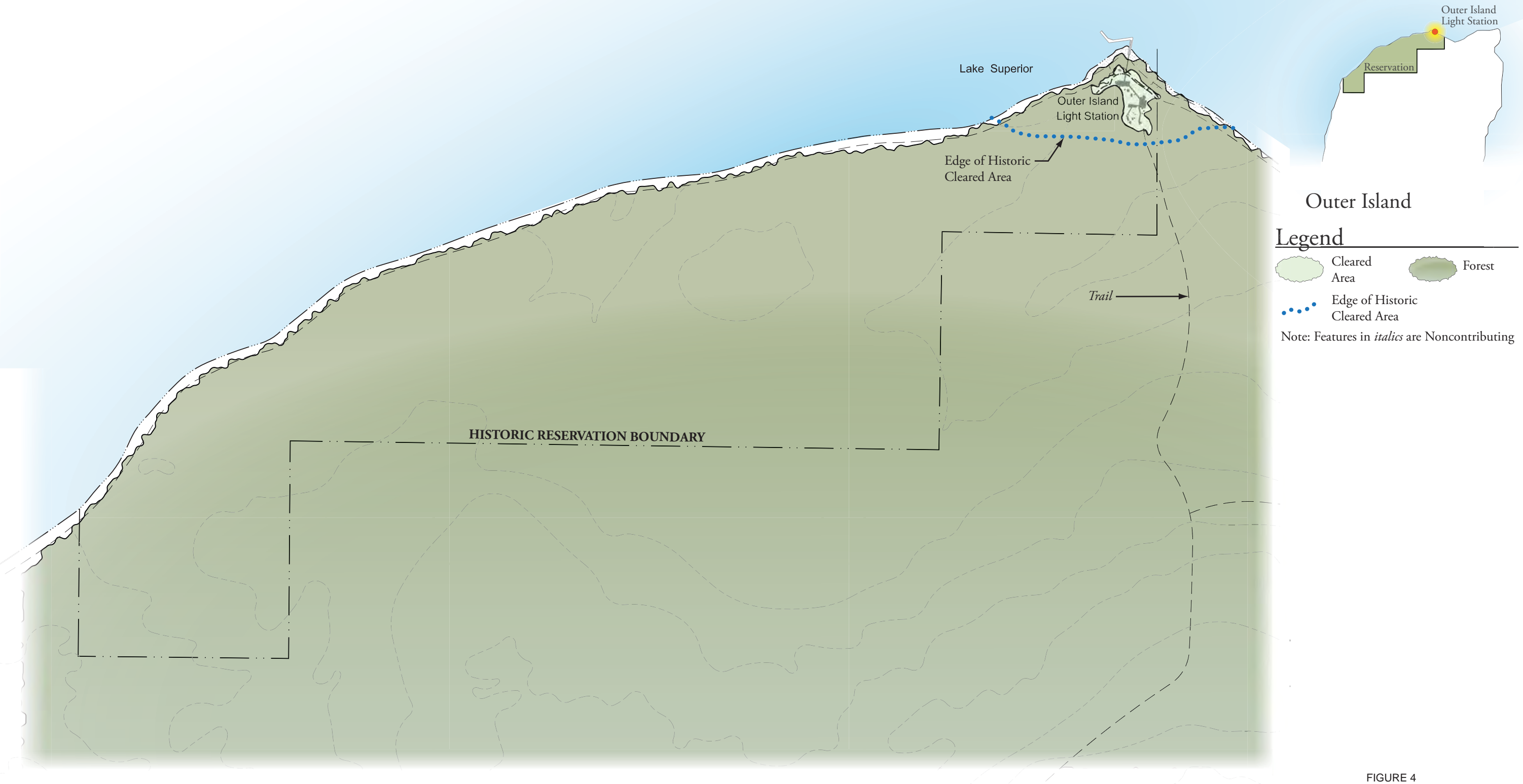
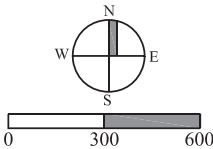
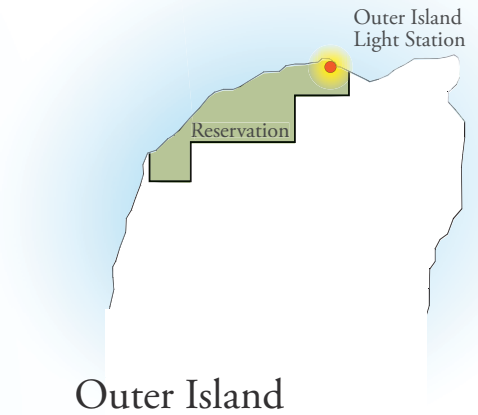
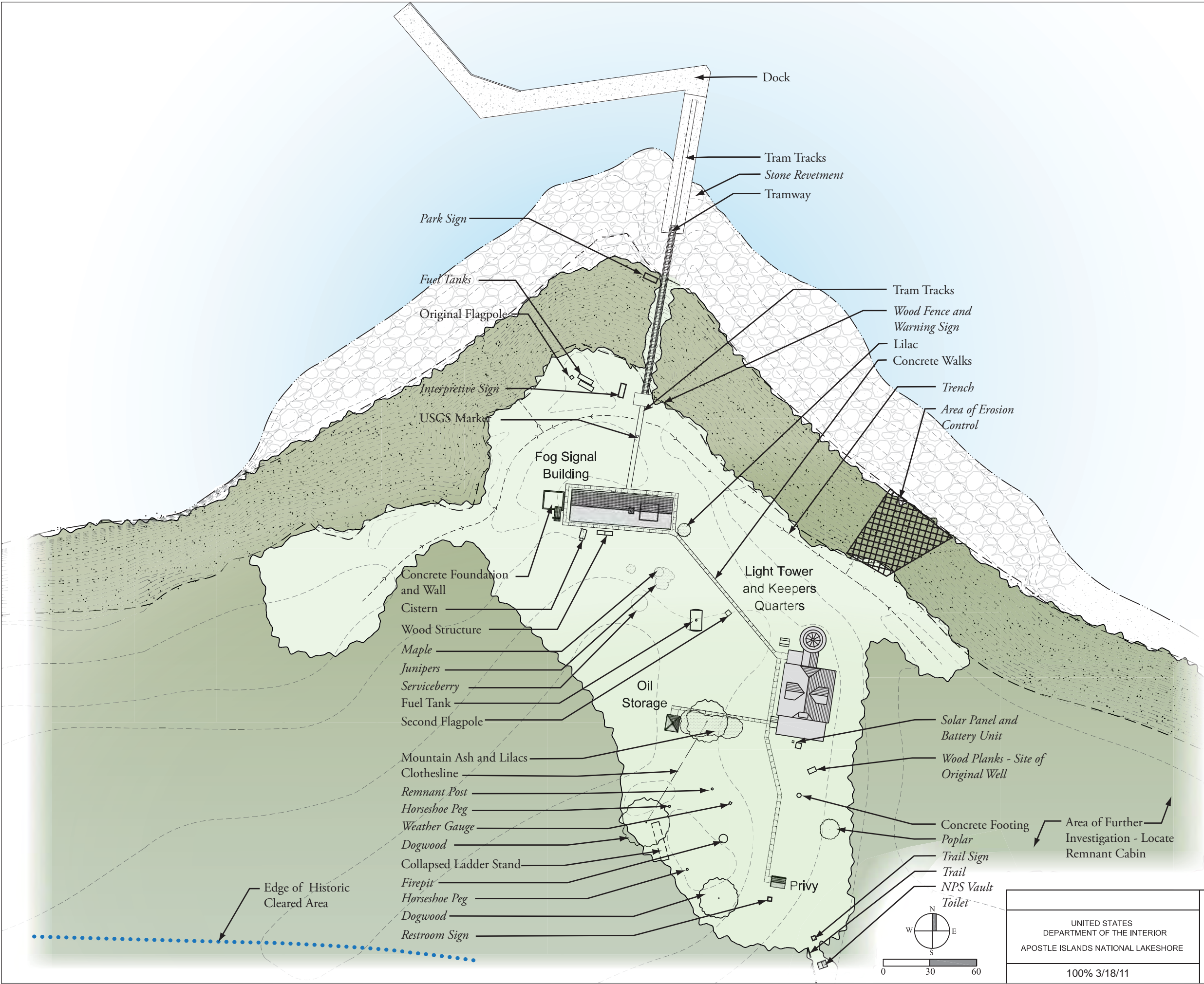


FIGURE 4

TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES		
TITLE OF DRAWING OUTER ISLAND - RESERVATION BOUNDARY		
NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE		
REGION MIDWEST	COUNTY ASHLAND	STATE WISCONSIN
UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE		
100% 3/18/11		



Outer Island Existing Conditions



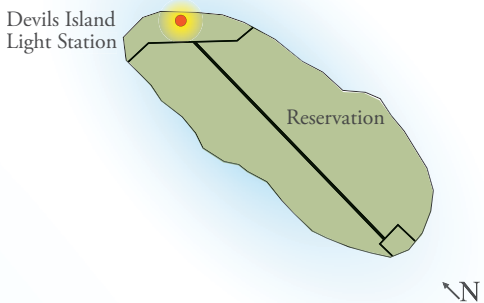
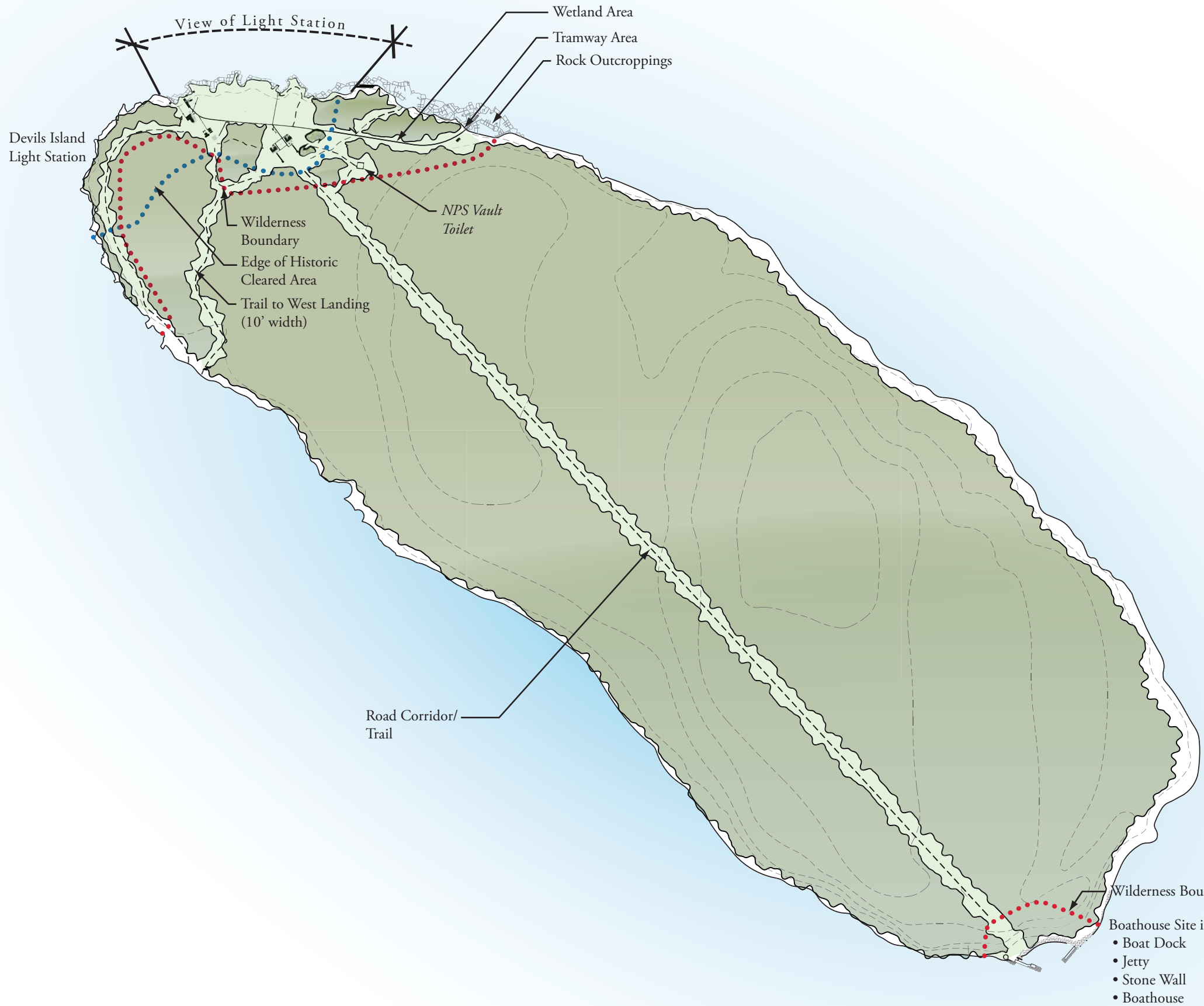
Legend

- Cleared Area
- Forest
- Edge of Historic Cleared Area

Note: Features in *italics* are Noncontributing




FIGURE 5		
TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES		
TITLE OF DRAWING OUTER ISLAND LIGHT STATION		
NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE		
REGION MIDWEST	COUNTY ASHLAND	STATE WISCONSIN
UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE		
100% 3/18/11		

Devils Island Reservation Existing Conditions



Devils Island

Legend

- | | |
|---|---|
|  Cleared Area |  Forest |
|  Edge of Historic Cleared Area |  Wilderness Boundary |

Note: Features in *italics* are Noncontributing

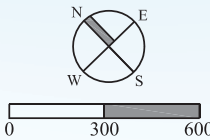
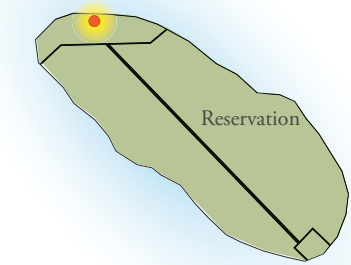
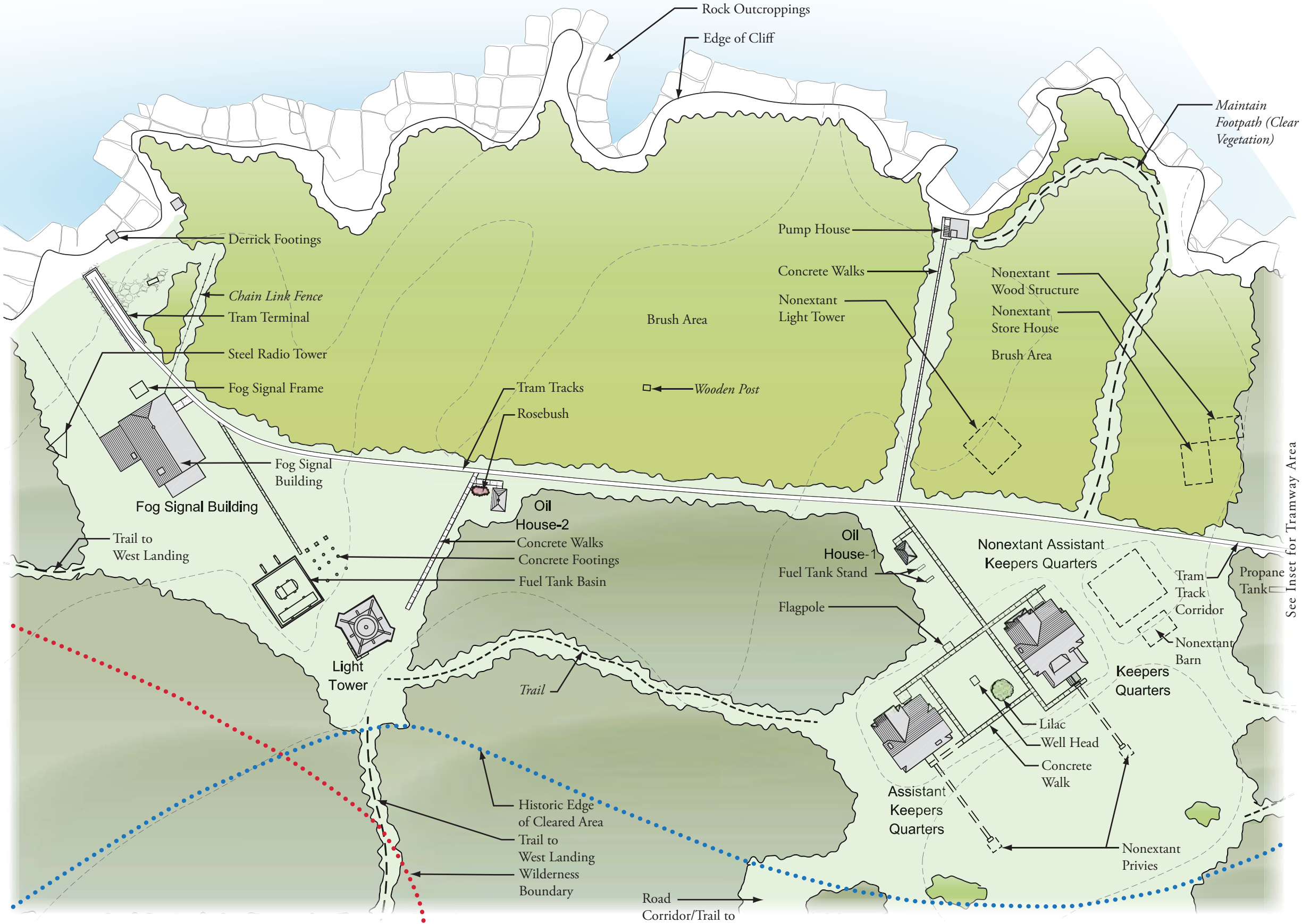


FIGURE 6	
TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES TITLE OF DRAWING	
DEVILS ISLAND	
NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE	
REGION MIDWEST	STATE WISCONSIN
COUNTY ASHLAND	
100% 3/18/11	

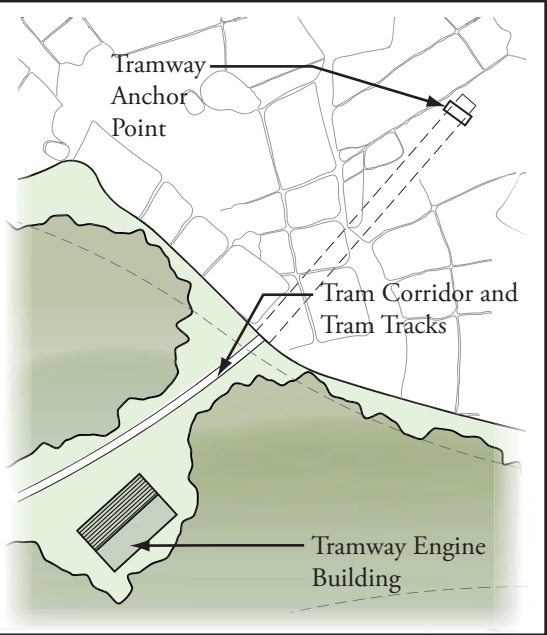
Devils Island Existing Conditions



Devils Island

- Legend**
- Lawn Clearing
 - Low Brush Clearing
 - Edge of Historic Cleared Area
 - Forest
 - Wilderness Boundary
 - Existing Edge of Forest

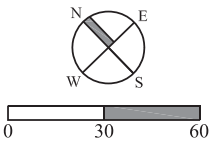
Note: Features in *italics* are Noncontributing



Tramway Area

FIGURE 7

TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES TITLE OF DRAWING		
DEVILS ISLAND LIGHT STATION		
NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE		
REGION MIDWEST	COUNTY ASHLAND	STATE WISCONSIN

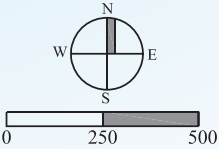


Long Island Reservation Existing Conditions

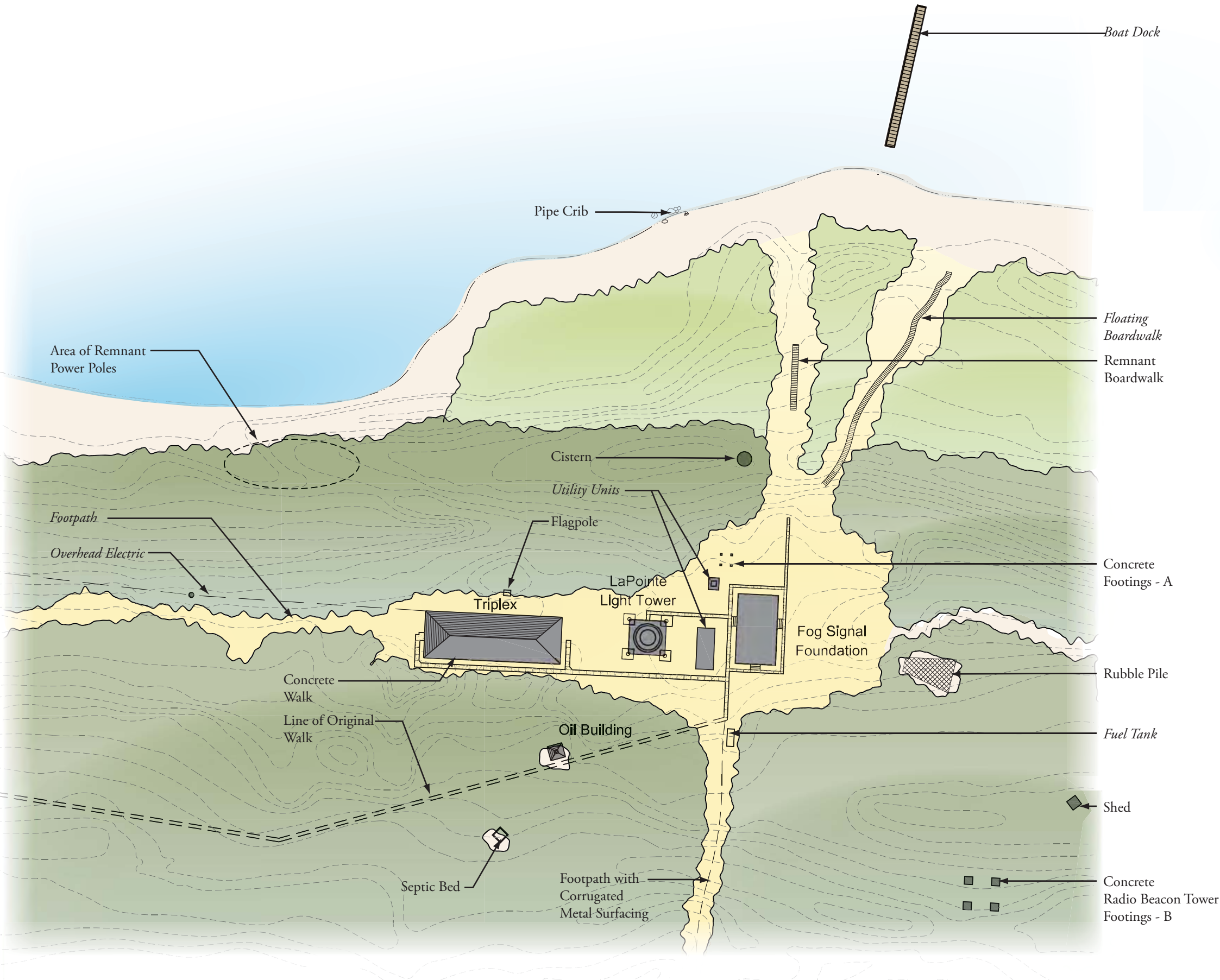


FIGURE 8

UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE	TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES		
	TITLE OF DRAWING LONG ISLAND - RESERVATION BOUNDARY		
	NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE		
	REGION MIDWEST	COUNTY ASHLAND	STATE WISCONSIN



Long Island LaPointe Light Station Existing Conditions

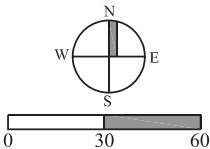


Long Island

Legend

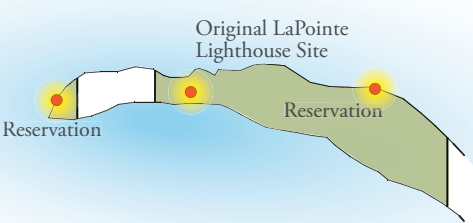
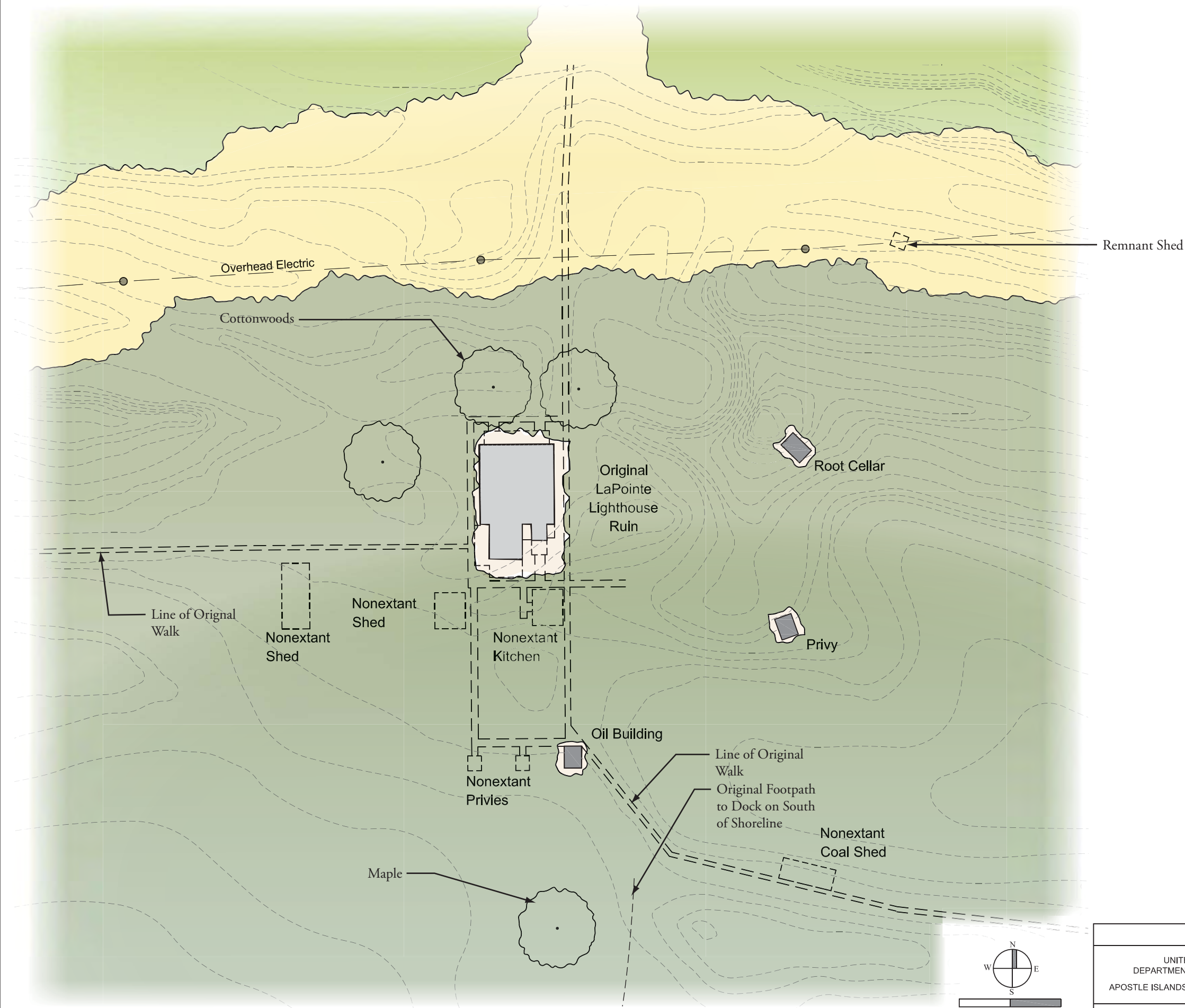
Dune Vegetation (not managed)	Forest
Managed Dune Vegetation	Beach/Sand

Note: Features in *italics* are Noncontributing



UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE		100% 3/18/11	
HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES		FIGURE 9	
TITLE OF PROJECT		TITLE OF DRAWING	
LONG ISLAND - LAPOINTE SITE		NAME OF PARK	
APOSTLE ISLANDS NATIONAL LAKESHORE		COUNTY	
REGION		STATE	
MIDWEST		ASHLAND WISCONSIN	

Long Island Original LaPointe Lighthouse Existing Conditions



Long Island

Legend

Dune Vegetation (not managed)	Forest
Managed Dune Vegetation	Beach/Sand

Note: Features in *italics* are Noncontributing

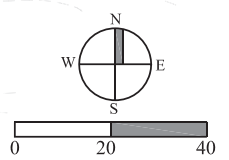
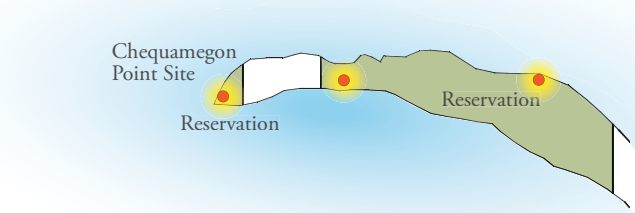
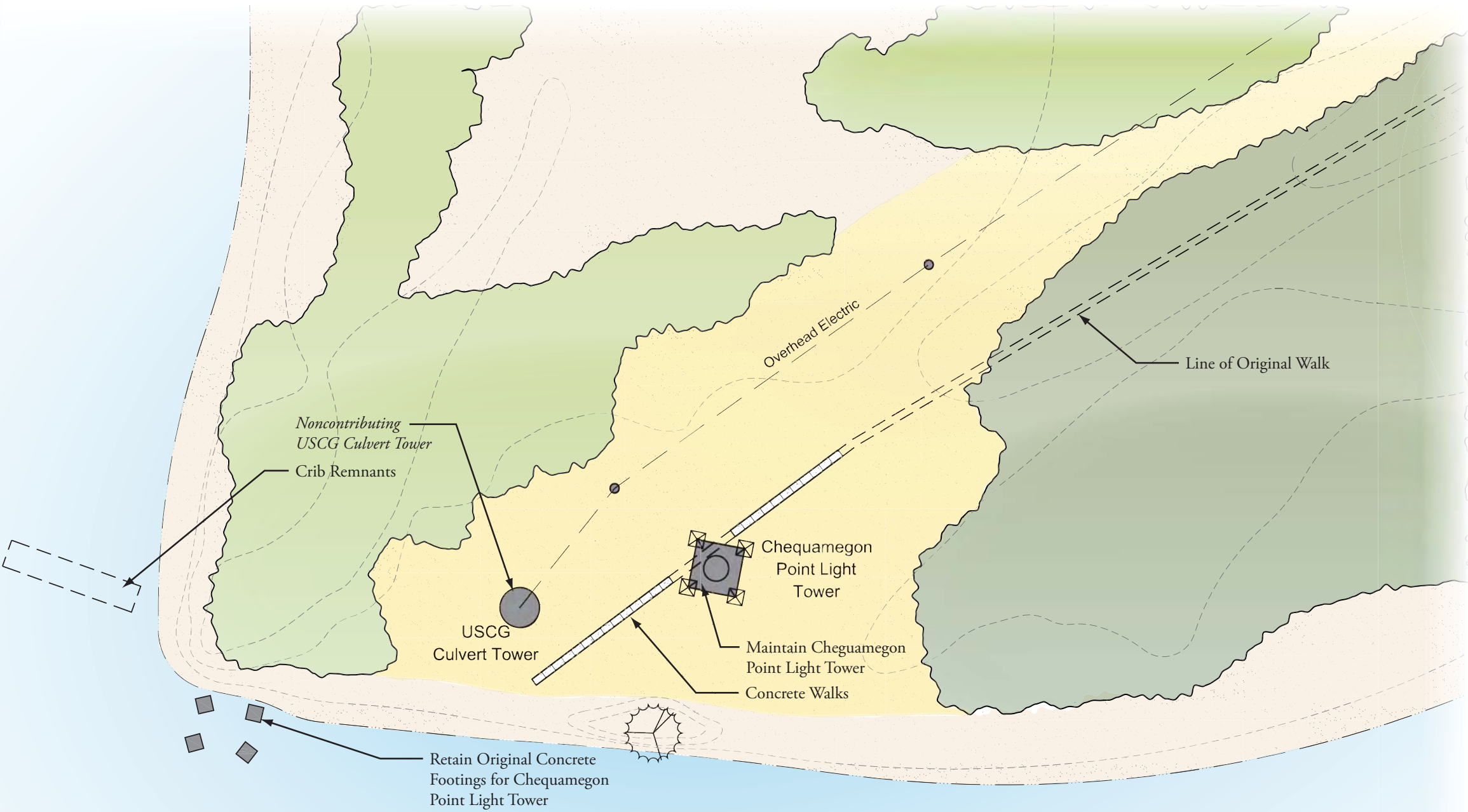


FIGURE 10	
TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES	
TITLE OF DRAWING LONG ISLAND-ORIGINAL LAPOINTE LTHOUSE SITE	
NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE	
REGION MIDWEST	COUNTY ASHLAND
STATE WISCONSIN	
UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE	
100% 3/18/11	

Long Island Chequamegon Point Existing Conditions

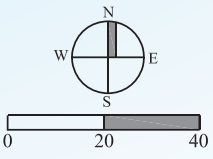


Long Island

Legend

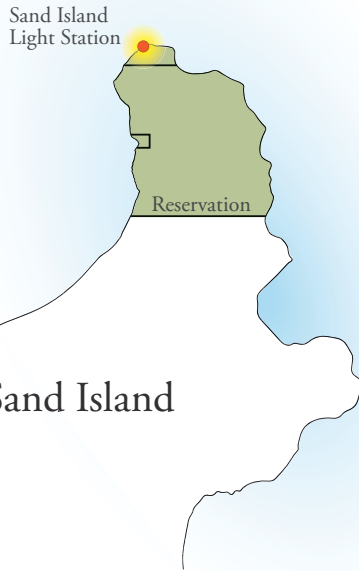
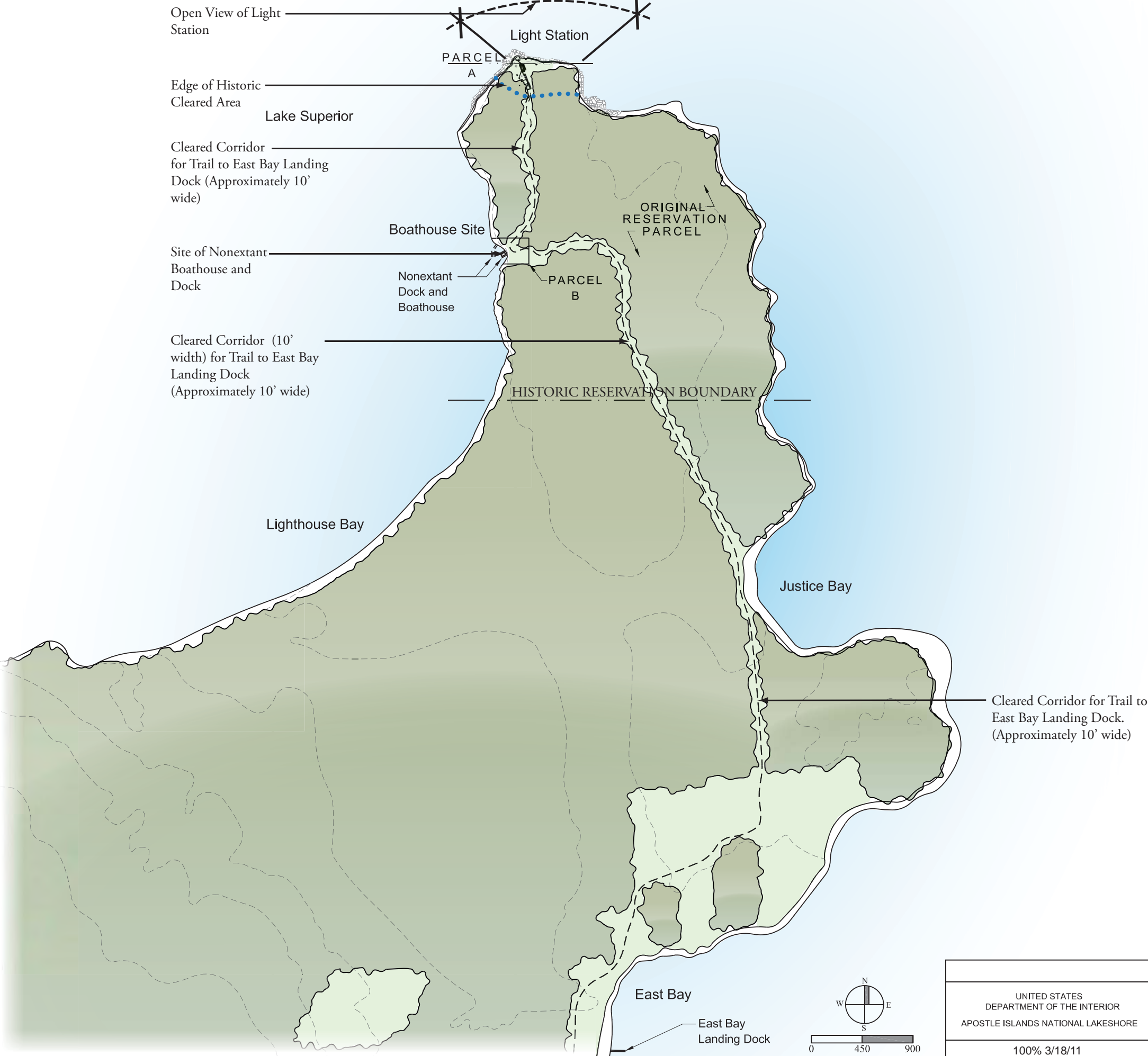
- Dune Vegetation (not managed)
- Managed Dune Vegetation
- Forest
- Beach/Sand

Note: Features in *italics* are Noncontributing



UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE		FIGURE 11 TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES TITLE OF DRAWING LONG ISLAND - CHEQUAMEGON POINT SITE NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE REGION COUNTY STATE MIDWEST ASHLAND WISCONSIN	
100% 3/18/11			

Sand Island Reservation Existing Conditions



Legend

- Cleared Area
- Forest
- Edge of Historic Cleared Area

FIGURE 12		
TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES		
TITLE OF DRAWING SAND ISLAND - RESERVATION BOUNDARY		
NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE		
REGION MIDWEST	COUNTY BAYFIELD	STATE WISCONSIN
UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE		
100% 3/18/11		

Sand Island Existing Conditions

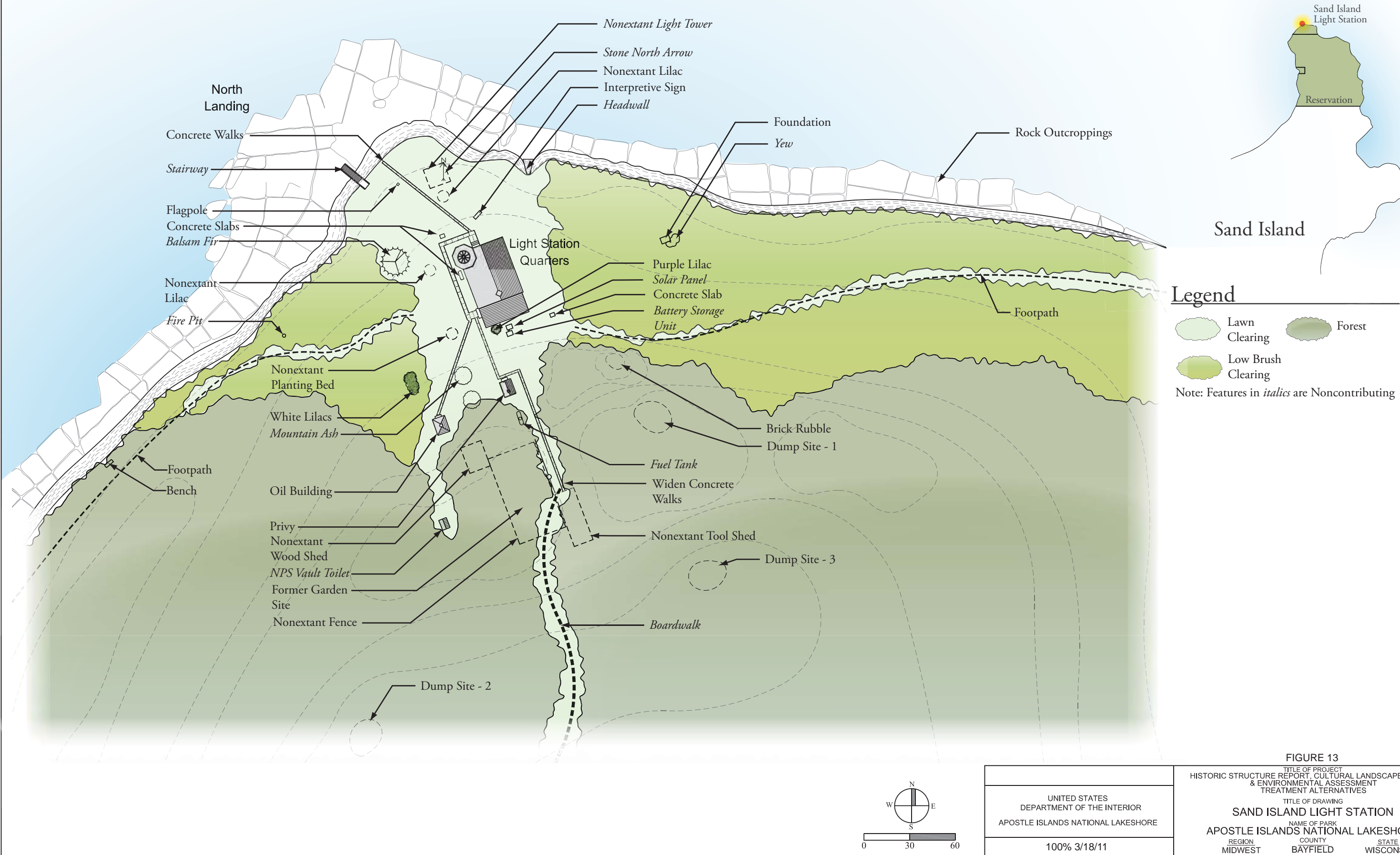


FIGURE 13

UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE	TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES		
	TITLE OF DRAWING SAND ISLAND LIGHT STATION		
	NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE		
	REGION MIDWEST	COUNTY BAYFIELD	STATE WISCONSIN
100% 3/18/11			

TREATMENT ALTERNATIVES

This section first lists recommendations that are common for each light station under the three treatment alternatives, then generally describes each of the three treatment alternatives and lists specific recommendations for each light station under each alternative.

Recommendations Common to Treatment Alternatives for Each Light Station

The treatment alternatives for each light station include some treatment recommendations that are the same under each of the three alternatives. Because they are common to the three treatment alternatives, they are not used to differentiate between the alternatives and are listed below, rather than described under each alternative.

Michigan Island

- Preserve and maintain the Power House.
- Repair the tramway to a working condition with minor track and railing repair and replacement of the tram hoist.
- Retain the tram turntable in its current location and condition.
- Provide basic maintenance and repair of small scale features including: flagpole, radio antennae base and pole, cisterns, and concrete remnants.
- Remove noncontributing, noncompatible small scale features and vegetation.
- Establish meadow-like grasses in newly cleared areas.
- Remove noncontributing trees in the lawn area.
- Improve circulation at the light station by maintaining existing contributing concrete walks with minor leveling and vegetation removal.
- Improve accessibility at the light station by providing additional width to the existing concrete walks. Install new, compatible precast concrete sections alongside the existing concrete walks.
- Provide an accessible trail (precast concrete sections) to a new accessible NPS restroom.
- Maintain contributing landscape plantings with standard horticultural pruning and maintenance practices.
- Maintain the area of ‘croquet lawn’ on the light station.
- Address hazardous materials with bat guano abatement, water intrusion/mold mitigation, soil characterization (lead), asbestos sampling of materials to be preserved/stabilized, removing/stabilizing lead paint, and removing and replacing asbestos roofing. Hazardous material abatement in the buildings with housing would be to the level necessary to provide conditions suitable for use as basic housing for seasonal NPS staff.

Outer Island

- Preserve and maintain the Oil Storage Building and Privy.
- Maintain, monitor, and protect all existing slope stabilization measures along the shoreline embankment.
- Retain the boat dock in its current location and configuration.
- Repair the tramway to a working condition with minor track and railing repair and replacement of the tram hoist.
- Provide basic maintenance and repair of small scale features including: flagpoles, cistern, and concrete remnants.
- Improve circulation at the light station by maintaining existing contributing concrete walks with minor leveling and vegetation removal.
- Maintain contributing landscape plantings with standard horticultural and maintenance pruning practices.
- Remove noncontributing, noncompatible small scale features and vegetation in the lawn area.
- Locate a remnant cabin east of the Light Tower and Keepers Quarters and clear forest vegetation in the immediate area.
- Address hazardous materials with soil characterization (lead), asbestos sampling of materials to be preserved/stabilized, removing/stabilizing lead paint, and water intrusion mitigation. Hazardous material abatement in the buildings with housing would be to the level necessary to provide conditions suitable for use as basic housing for seasonal NPS staff.
- Replace damaged asbestos cement siding on the Fog Signal Building.

Devils Island

- Preserve Oil House No. 1, Oil House No. 2, Tramway Engine Building, and Boathouse. Basic measures include roofing, repainting, replacing missing features, and foundation work, where needed.
- Maintain low brush vegetation in the area between the shoreline and tram tracks by manually removing trees and large shrubs.
- Maintain boat dock features at the Boathouse. Measures include dock decking and framing repair and masonry wall repair.
- Provide basic maintenance and repair of small scale features and structures, including derrick footings, radio tower, cisterns, and pump house.
- Maintain all concrete walks with minor leveling and vegetation removal.
- Continue to maintain the cleared corridor (about 10 feet wide) for the path between the Light Station and Boathouse by removing and pruning vegetation.
- Clear vegetation along the tram tracks between the Keepers Quarters and Tramway Engine Building to maintain a width of approximately 10 feet.

- Address hazardous materials with soil characterization (lead), asbestos sampling of materials to be preserved/stabilized, removing/stabilizing lead paint, abatement of damaged asbestos cement siding, and field screening of the tank storage area for hydrocarbon characterization. Hazardous material abatement in the buildings with housing would be to the level necessary to provide conditions suitable for use as basic housing for seasonal NPS staff.

Long Island

- Preserve and maintain the oil buildings at the LaPointe and Original Lighthouse sites.
- Remove trees to create a 50-foot fire break from the LaPointe Tower, Triplex, and Chequamegon Point Tower.
- Remove the USCG culvert tower after the USCG agrees to have the light moved to the Chequamegon Point Tower.
- Remove forest vegetation and stabilize the Original Lighthouse ruin.
- Stabilize the root cellar by removing any vegetation immediately adjacent that may damage the structure.
- Provide lockable cover for the historic cistern at LaPointe.
- Provide basic maintenance and repair of small scale features, including concrete footings, flagpole, and pipe crib remnants.
- Maintain the Fog Signal foundation with minor concrete and masonry repair and vegetation removal.
- Retain all rubble piles and protect from vandalism.
- Improve circulation at the LaPointe site by maintaining existing contributing concrete walks with minor leveling and vegetation removal.
- Maintain the existing cleared corridor (4-foot width) for a path leading from the LaPointe site to Chequamegon Bay by pruning and removing encroaching vegetation. Retain the sheet metal covering on the path.
- Address hazardous materials with bat guano abatement, water intrusion/mold mitigation, soil characterization (lead), and asbestos and lead paint sampling of materials to be preserved/stabilized; replace damaged asbestos cement siding.

Sand Island

- Preserve and maintain the Oil Building and Privy.
- Improve accessibility at the light station by providing additional width to the existing concrete walks. Install new, compatible precast concrete sections alongside the existing concrete walks.
- Maintain the existing trail and trail corridor from the East Bay Landing to the light station.
- Provide an accessible trail to a new accessible NPS restroom.
- Remove the noncontributing tree in the lawn area.

ALTERNATIVES

- Retain and protect ruins, rubble piles, and dump sites.
- Address hazardous materials with intrusion/mold mitigation, soil characterization (lead), asbestos sampling of materials to be preserved/stabilized, removing/stabilizing lead paint, and general cleaning to remove lead dust. Hazardous material abatement in the buildings with housing would be to the level necessary to provide conditions suitable for use as basic housing for seasonal NPS staff.

Alternative 1

Alternative 1 proposes a primary treatment approach of preservation for each light station's cultural landscape and historic structures. This overall approach is intended to sustain each light station's existing form, maintain its integrity, and protect its features and materials. Current levels of staff housing would continue. Under this alternative, specific measures are recommended to stabilize, protect, and maintain existing cultural landscape features and historic structures that convey the light station's historical, cultural, and architectural values. Treatment measures allow for noncontributing, compatible features to be retained and preserved, and the removal or relocation of noncontributing, noncompatible features. In addition to the preservation efforts for cultural resources, actions are proposed to provide for improved visitor access, improved efficiency of park operational and maintenance activities, and to protect the natural systems of the light stations.

The following are general descriptions of the treatment recommendations for each light station under this alternative.

Michigan Island Light Station

Under alternative 1, the overall treatment approach of preservation at Michigan Island Light Station is primarily focused on 1) clearing and maintaining a portion of the historic cleared area of the light station; 2) reestablishing views from the lake to the light station; 3) stabilizing and repairing circulation features (tramway, tram tracks, concrete walks); 4) maintaining landscape plantings; 5) removing noncompatible features; and 6) preserving historic structures.

Treatment recommendations for Michigan Island Light Station generally include the following measures (Figures 14 and 15).

- Preserve and maintain all contributing buildings including: Old Michigan Island Lighthouse, Michigan Island Second Tower, Keepers Quarters, Assistant Keepers Quarters and Workshop, Shed, and Privy. Basic measures include reroofing, repairing existing contributing features, repainting, foundation repairs, and ventilation improvements, where needed.
- Clear and maintain a portion of the historic cleared area of Michigan Island Light Station by removing forest vegetation that has encroached into historically cleared areas. Clearing just over 1.3 acres of forest would produce an overall cleared area that is approximately 29% of the size of the original cleared area.
- Establish meadow-like grasses in newly cleared areas.
- Selectively cut and remove trees that obscure views to the light station from the lake within an area of about 0.4 acre along the south shoreline bluff of the light station.

- Remove vegetation and excess soil between the tram track rails and adjacent to the tracks so that the rails are clearly visible and to reduce further obscuring of the tracks by vegetation.
- Maintain the existing apple tree by pruning and clearing adjacent vegetation.
- Maintain the line of pine plantings at the north edge of the light station by pruning and shaping.

Outer Island Light Station

Under alternative 1, the overall treatment approach of preservation at Outer Island Light Station is primarily focused on 1) reestablishing views from the lake to the light station; 2) stabilizing and repairing circulation and small scale features (tramway, concrete walks); 3) maintaining landscape plantings; 4) removing noncompatible features; and 5) preserving historic structures.

Treatment recommendations for Outer Island Light Station generally include the following measures (Figures 16 and 17).

- Preserve and maintain all contributing buildings including: the Outer Island Light Tower, Keepers Quarters, Fog Signal Building,. Basic measures include repairing existing contributing features, repainting, masonry repairs, and ventilation improvements.
- Maintain the existing cleared area of Outer Island Light Station. The existing cleared area represents approximately 17% of the historic cleared area.
- Remove forest vegetation (approximately 1,000 square feet) east of the Light Tower and Keepers Quarters for fire prevention.
- Selectively cut and remove trees that obscure views to the light station from the lake within an area of approximately 0.8 acre along the north shoreline bluff of the light station.

Devils Island Light Station

Under alternative 1, the overall treatment approach of preservation at Devils Island Light Station is primarily focused on 1) reestablishing a portion of the historic cleared area of the light station; 2) stabilizing and repairing circulation features (tram tracks, concrete walks); 3) maintaining landscape plantings; 4) removing noncompatible features; and 5) preserving historic structures.

Treatment recommendations for Devils Island Light Station generally include the following measures (Figures 18 and 19).

- Preserve and maintain all contributing buildings including: the Light Tower, Keepers Quarters, Assistant Keepers Quarters, and Fog Signal Building. Basic measures include reroofing where needed, repairing existing contributing features, repainting, foundation repairs, and ventilation improvements.
- Clear and maintain a portion of the historic cleared area of Devils Island Light Station by removing forest vegetation from the area between the Light Tower and Keepers

ALTERNATIVES

Quarters. Clearing about 4.0 acres would produce an overall cleared area that is approximately 42% of the size of the original cleared area.

- Remove vegetation and excess soil between the tram track rails and adjacent to the tracks so that the rails are clearly visible and to reduce further obscuring of the tracks by vegetation.
- Stabilize the stone tram terminal by removing vegetation.

Long Island Light Station

Under alternative 1, the overall treatment approach of preservation at Long Island Light Station is primarily focused on 1) restoring a portion of the historic cleared areas near the light towers and Original LaPointe Lighthouse ruin; 2) restoring views from the lake to the LaPointe Tower and Triplex; and 3) preserving ruins, structures, and site features.

Treatment recommendations for Long Island Light Station generally include the following measures (Figures 20 to 23).

- Preserve and maintain all contributing buildings including: the LaPointe Tower, Chequamegon Point Light Tower, Triplex, and oil buildings. Basic measures include reroofing, repairing existing contributing features, replacing missing features, repainting, foundation repairs, mitigation of hazardous materials, and ventilation improvements, where needed.
- Clear and maintain a portion of the historic cleared area at the LaPointe Tower by removing forest vegetation. Clearing about 1.8 acres would produce an overall cleared area that is approximately 31% of the size of the original cleared area.
- Clear and maintain a portion of the historic cleared area around the Original Lighthouse ruin by removing forest vegetation. Clearing approximately 0.8 acre would produce an overall cleared area that is approximately 25% of the size of the original cleared area.
- Construct a new boardwalk (approximately 170 linear feet) across the dune along the historic alignment at the LaPointe Tower leading from the Fog Signal foundation to the beach. Document and remove remnants of the historic boardwalk.
- Repair and maintain boat dock in current location.

Sand Island Light Station

Under alternative 1, the overall treatment approach of preservation at Sand Island Light Station is primarily focused on 1) maintaining the existing cleared area of the light station; 2) clearing forest vegetation in the nonextant garden area; 3) maintaining landscape features; and 4) preserving Sand Island Light Station Quarters and other historic structures.

Treatment recommendations for Sand Island Light Station generally include the following measures (Figures 24 and 25).

- Preserve and maintain Sand Island Light Station Quarters, Oil Building, and Privy. Basic measures include reroofing, repairing existing features, ventilation improvements, and repainting, where needed.
- Clear and maintain the historic garden area of Sand Island Light Station by removing and disposing of forest tree vegetation that has encroached into historically cleared areas. Clearing approximately 0.4 acre would produce an overall cleared area approximately 51% of the size of the original cleared area.
- Maintain all contributing landscape plantings.

Alternative 2 (Preferred Alternative)

Alternative 2 proposes a general approach of rehabilitation for each light station's cultural landscape and historic structures. This approach is intended to best portray the continuum of navigational history that characterizes the Apostle Islands as a system of light stations and to sustain each light station's existing form, maintain its integrity, and protect its features and materials. Under this alternative, an approach of rehabilitation would allow for repairs, alterations, and additions that are necessary to address the degradation of contributing features, and to preserve the characteristics and features that convey the light stations' historical, cultural, and architectural values. Treatment measures allow for noncontributing, compatible features to be retained and preserved, and removing or relocating noncontributing, noncompatible features. In addition to the rehabilitation efforts for cultural resources, actions are proposed to provide for improved visitor access, additional staff housing, improved efficiency of park operational and maintenance activities, and to protect the natural systems of the light stations.

The following are general descriptions of the treatment recommendations for each light station under this alternative.

Michigan Island Light Station

Under alternative 2, the overall treatment approach of rehabilitation at Michigan Island Light Station is primarily focused on 1) reestablishing a portion of the historic cleared area of the light station; 2) reestablishing views from the lake to the light station; 3) repairing circulation features (tramway, tram tracks, concrete walks); 4) restoring missing landscape plantings; 5) removing noncompatible features; and 6) rehabilitating historic structures. While the overall treatment intent for the cultural landscape is one of rehabilitation, many of the individual treatment measures for the cultural landscape focus on preserving existing site features.

Treatment recommendations for Michigan Island Light Station generally include the following measures (Figures 26 and 27).

- Rehabilitate contributing buildings including, Old Michigan Island Lighthouse, Michigan Island Second Tower, Keepers Quarters, and Privy. Basic measures include repairing existing contributing features or adding compatible features to meet building codes, maintain safety, and improve visitor experience and accessibility. Work includes reroofing, repairing and replacing materials, repainting, ventilation improvements, framing, and repointing masonry.

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- Preserve contributing buildings including, Assistant Keepers Quarters and Workshop, and Shed. Basic measures include repairing existing contributing features or adding compatible features to meet building codes, maintain safety, and improve visitor experience and accessibility. Work includes reroofing, repairing and replacing materials, repainting, ventilation improvements, framing, and repointing masonry, where needed.
- Clear and maintain a portion of the historic cleared area of Michigan Island Light Station by removing forest vegetation that has encroached into historically cleared areas. Clearing about 2.2 acres would produce an overall cleared area approximately 37% of the size of the original cleared area.
- Selectively cut and remove trees that obscure views to the light station from the lake within an area of about 1.8 acres along the south shoreline bluff of the light station.
- Repair the tram tracks to working condition by removing and replacing the timbers and bedding, replacing or straightening sections of damaged rails, and resetting existing rails.
- Restore the pattern of orchard planting at the light station by planting new fruit trees and pruning the extant apple tree.
- Restore the line of pine plantings at the north edge of the light station by removing and replanting the line of pines.
- Restore missing landscape plantings near the Keepers Quarters and Old Michigan Island Lighthouse including stone planters and perennial and annual plantings.
- Mark the line of the nonextant fence, indicating the maintained area prior to light station expansion, by installing 12-inch × 12-inch concrete squares, flush to the lawn, at approximately 10 feet on center.

Outer Island Light Station

Under alternative 2, the overall treatment approach of rehabilitation at Outer Island Light Station is primarily focused on 1) reestablishing a portion of the historic cleared area of the light station; 2) reestablishing views from the lake to the light station; 3) maintaining all circulation features (tramway, tram tracks and concrete walks); 4) maintaining landscape plantings; 5) removing noncompatible features; and 6) rehabilitating or preserving historic structures. While the overall treatment intent for the cultural landscape is one of rehabilitation, many of the individual treatment measures for the cultural landscape focus on preserving existing site features.

Treatment recommendations for Outer Island Light Station generally include the following measures (Figures 28 and 29).

- Rehabilitate the Outer Island Light Tower, Keepers Quarters, Fog Signal Building. Basic measures include repairing existing contributing features, repainting, masonry repairs, and ventilation improvements, where needed.
- Clear and maintain a portion of the historic cleared area of Outer Island Light Station by removing forest vegetation that has encroached into historically cleared areas. Clearing about 1.2 acre would produce an overall cleared area approximately 29% of the size of the original cleared area.

- Establish meadow-like grasses in newly cleared areas.
- Selectively cut and remove trees along the shoreline slope that obscure views to the light station from the lake within an area of about 1.3 acre along the north embankment of the light station.

Devils Island Light Station

Under alternative 2 the overall treatment approach of rehabilitation at Devils Island Light Station is primarily focused on 1) reestablishing a portion of the historic cleared area of the light station; 2) maintaining and stabilizing all circulation features (tram tracks and concrete walks); 3) removing noncontributing features; and 4) rehabilitating and preserving historic structures. While the overall treatment intent for the cultural landscape is one of rehabilitation, many of the individual treatment measures for the cultural landscape focus on preserving existing site features and the restoration of the tower.

Treatment recommendations for Devils Island Light Station generally include the following measures (Figures 30 and 31).

- Rehabilitate the Light Station Tower, Keepers Quarters, Assistant Keepers Quarters, and Fog Signal Building. Basic measures include repairing existing contributing features, framing repair, repainting, septic repair, and ventilation and electrical improvements, where needed.
- Clear and maintain a portion of the historic cleared area of Devils Island Light Station by removing forest vegetation from the area between the Light Tower and Keepers Quarters. Clearing about 9.0 acres would produce an overall cleared area approximately 74% of the size of the original cleared area.
- Remove vegetation and excess soil between the tram track rails and adjacent to the tracks so that the rails are clearly visible and to reduce further obscuring of the tracks by vegetation.
- Maintain boat dock features at the Boathouse. Measures include dock decking and framing repair and masonry wall repair.
- Repair the stone tram terminal by removing vegetation and stabilizing and repointing stone wall masonry.

Long Island Light Station

Under alternative 2, the overall treatment approach of rehabilitation at Long Island Light Station is primarily focused on 1) reestablishing a portion of the historic cleared areas near the light towers and Original LaPointe Lighthouse ruin; 2) reestablishing views from the lake to the LaPointe Tower and Triplex; 3) reestablishing circulation features (connecting corridor); 4) preserving ruins, structures and site features; and 5) rehabilitating and preserving historic structures. While the overall treatment intent for the cultural landscape is one of rehabilitation, many of the individual treatment measures for the cultural landscape focus on preserving existing site features.

ALTERNATIVES

Treatment recommendations for Long Island Light Station generally include the following measures (Figures 32 to 35).

- Rehabilitate the LaPointe Light Tower and Chequamegon Point Lighthouse. Basic measures for these structures include reroofing, repairing existing features, replacing missing features, repainting, foundation repairs, and electrical and ventilation improvements, where needed.
- Preserve the Triplex.
- Clear and maintain a portion of the historic cleared area at the LaPointe Tower by removing pine trees. Clearing about 2.5 acres would produce an overall cleared area that is about 45% of the size of the original cleared area.
- Clear and maintain a portion of the historic cleared area at the Original Lighthouse ruin by clearing forest tree vegetation. Clearing about 1.0 acre would produce an overall cleared area that is about 25% of the size of the original cleared area.
- Stabilize the Original Lighthouse privy by reroofing and repairing and securing the door.
- Install a floating boardwalk (approximately 170 linear feet) across the dune at the LaPointe Tower site that can be relocated to adapt to the changing shoreline conditions and avoid piping plover critical habitat, as determined by park staff.
- Preserve remnants of the historic boardwalk.
- Reestablish the cleared corridor (10-foot width) for a path between the LaPointe, Original Lighthouse, and Chequamegon Point sites. The corridor alignment would follow the historic alignment of concrete walk with adjustments to avoid wetlands.
- Repair and maintain boat dock in current location.

Sand Island Light Station

Under alternative 2, the overall treatment approach of rehabilitation Sand Island Light Station is primarily focused on 1) reestablishing a portion of the historic cleared area of the light station; 2) reestablishing views from the lake to the light station; 3) reestablishing missing landscape features; and 4) restoring the Sand Island Light Station Quarters and preserving structures. While the overall treatment intent for the cultural landscape is one of rehabilitation, many of the individual treatment measures for the cultural landscape focus on preserving existing site features and restoring missing features.

Treatment recommendations for Sand Island Light Station generally include the following measures (Figures 36 and 37).

- Restore the Light Station Quarters. Basic measures include reroofing, repairing existing features, replacing missing features, ventilation and electrical improvements, and repainting, where needed.
- Provide accessibility improvements (ramp) at the Quarters.
- Clear and maintain a portion of the historic cleared area of Sand Island Light Station by removing forest tree vegetation that has encroached into historically cleared areas.

Clearing approximately 1.0 acre would produce an overall cleared area that is approximately 60% of the size of the original cleared area.

- Add missing fencing feature at garden area.

Alternative 3

Alternative 3 proposes a general approach of rehabilitation for each light station's cultural landscape and historic structures with an emphasis on reestablishing cultural landscape features. This approach is intended to best portray the continuum of navigational history that characterizes the Apostle Islands as a system of light stations and to sustain each light station's existing form, maintain its integrity, and protect its features and materials. Under this alternative an approach of rehabilitation would allow for repairs, alterations, and additions that are necessary to address the degradation of contributing features, and to preserve the characteristics and features that convey the light stations' historical, cultural, and architectural values. Treatment measures allow for reestablishing missing features where the significance of the feature or space outweighs the loss of existing features. In addition to the rehabilitation efforts for cultural resources, actions are proposed to provide for improved visitor access and additional staff housing, facilitate operational and maintenance needs, and protect the natural systems of the light stations.

The following are general descriptions of the treatment recommendations for each light station under this alternative.

Michigan Island Light Station

Under alternative 3, the overall treatment approach of rehabilitation at Michigan Island Light Station is primarily focused on 1) reestablishing a portion of the historic cleared area of the light station; 2) reestablishing views from the lake to the light station; 3) repairing circulation features (tramway, tram tracks, concrete walks); 4) reestablishing missing landscape plantings; 5) removing noncompatible features; and 6) rehabilitating and preserving the historic structures of the light station. While the overall treatment intent is one of rehabilitation, many of the individual treatment measures for the cultural landscape and historic structures focus on repairing existing resources and restoring missing features.

Treatment recommendations for Michigan Island Light Station generally include the following measures (Figures 38 and 39).

- Rehabilitate the Old Michigan Island Lighthouse, Michigan Island Second Tower, Keepers Quarters, Assistant Keepers Quarters and Workshop, Shed, and Privy. Basic measures include repairing existing contributing features or adding compatible features to meet building codes, maintain safety, and improve visitor experience and accessibility. Work includes reroofing, repairing and replacing materials, repainting, ventilation improvements, framing, and repointing masonry, where needed.
- Provide accessibility improvements at the Old Michigan Island Lighthouse (ramp).
- Clear and maintain a portion of the historic cleared area of Michigan Island Light Station by removing and disposing of forest vegetation that has encroached into historically cleared areas. Clearing about 3.6 acres would produce an overall cleared area that is approximately 51% of the size of the original cleared area.

ALTERNATIVES

- Selectively cut and remove trees that obscure views to the light station from the lake within an area of about 1.4 acres along the south shoreline bluff of the light station.
- Remove vegetation and excess soil between the tram track rails and adjacent to the tracks so that the rails are clearly visible and to reduce further obscuring of the tracks by vegetation.
- Repair the tram tracks to working condition by removing and replacing the timbers and bedding, replacing or straightening sections of damaged rails, and resetting existing rails.
- Reestablish the pattern of orchard planting at the light station by planting new fruit trees and pruning the extant apple tree.
- Reestablish the line of pine plantings at the north edge of the light station by removing stumps and planting missing trees.
- Reestablish missing landscape plantings near the Keepers Quarters and Old Michigan Island Lighthouse including stone planters and perennial and annual plantings.

Outer Island Light Station

Under alternative 3, the overall treatment approach of rehabilitation at Outer Island Light Station is primarily focused on 1) reestablishing a portion of the historic cleared area of the light station; 2) reestablishing views from the lake to the light station; 3) maintaining all circulation features (tramway, tram tracks, and concrete walks); 4) maintaining landscape plantings; 5) removing noncompatible features; 6) relocating compatible and noncontributing features; and 7) rehabilitating or preserving historic structures. While the overall treatment intent of the cultural landscape is one of rehabilitation, many of the individual treatment measures for the cultural landscape focus on preserving existing site features.

Treatment recommendations for Outer Island Light Station generally include the following measures (Figures 40 and 41).

- Rehabilitate the Outer Island Tower, Keepers Quarters (staff housing 2nd Floor), and Fog Signal Building. Basic measures include repairing existing contributing features, repainting, masonry repairs, removing noncompatible features, and plumbing and ventilation improvements, where needed.
- Clear and maintain a portion of the historic cleared area of Outer Island Light Station by removing and disposing of forest vegetation that has encroached into historically cleared areas. Clearing about 6.0 acres would produce an overall cleared area that is near 80% of the size of the original cleared area.
- Selectively cut and remove trees that obscure views to the light station from the lake within an area of about 1.8 acres along the north shoreline bluff of the light station.
- Relocate the solar panel and battery unit.

Devils Island Light Station

Under alternative 3, the overall treatment approach of rehabilitation at Devils Island Light Station is primarily focused on 1) reestablishing a portion of the historic cleared area of the light station;

2) maintaining concrete walks; 3) repairing the tram tracks to a working condition; 4) removing noncompatible features; and 5) rehabilitating historic structures. While the overall treatment intent of the cultural landscape is one of rehabilitation, many of the individual treatment measures for the historic landscape focus on preserving existing site features.

Treatment recommendations for Devils Island Light Station generally include the following measures (Figures 42 and 43).

- Rehabilitate the Light Station Tower for guided visitor use. Basic measures include repairing existing contributing features, repainting, and ventilation and electrical improvements, where needed.
- Rehabilitate the Keepers Quarters, Assistant Keepers Quarters, and Fog Signal Building. Basic measures include repairing existing contributing features, framing repair, repainting, septic repair, and ventilation and electrical improvements, where needed.
- Clear and maintain a portion of the historic cleared area of Devils Island Light Station by removing and disposing of forest vegetation from the area between the Light Tower and Keepers Quarters. Clearing approximately 10.5 acres would produce an overall cleared area that is approximately 83% of the original cleared area.
- Repair the tram tracks to working condition by removing and replacing the timbers and bedding, replacing or straightening sections of bent rails, and resetting existing rails.
- Repair the stone tram terminal by removing vegetation and stabilizing and repointing stone wall masonry.

Long Island Light Station

Under alternative 3, the overall treatment approach of rehabilitation at Long Island Light Station is primarily focused on 1) reestablishing a portion of the historic cleared areas near the LaPointe Tower and Original LaPointe Lighthouse ruin; 2) reestablishing views from the lake to the LaPointe Tower and Triplex; 3) reestablishing circulation features (connecting corridor); 4) preserving ruins and site features; and 5) rehabilitating and preserving historic structures. While the overall treatment intent to the cultural landscape is one of rehabilitation, many of the individual treatment measures for the cultural landscape focus on preserving existing site features.

Treatment recommendations for Long Island Light Station generally include the following measures (Figures 44 to 47).

- Rehabilitate the LaPointe Light Tower, Chequamegon Point Lighthouse, and Triplex (staff housing and group use). Basic measures for these structures include reroofing, repairing existing features, replacing missing features, repainting, foundation repairs, plumbing, and electrical and ventilation improvements, where needed.
- Clear and maintain a portion of the historic cleared area at the LaPointe Tower by removing pine trees. Clearing about 9.0 acres would produce an overall cleared area that is near 75% of the size of the original cleared area.

ALTERNATIVES

- Clear and maintain a portion of the historic cleared area at the Original Lighthouse ruin by clearing forest tree vegetation. Clearing about 2.5 acres would produce an overall cleared area that is near 60% of the size of the original cleared area.
- Stabilize the Original Lighthouse privy.
- Reestablish the cleared corridor (approximate 10-foot width) for a path between the LaPointe, Original Lighthouse, and Chequamegon Point sites. The corridor alignment would follow the historic alignment of the concrete walk with adjustments to avoid wetlands.
- Construct a new dock in the original landing location adjacent to the remnant landing crib. The new dock would be engineered to allow sediment to move along the shoreline. Remove the existing boat dock. Construct a new boardwalk (approximately 170 linear feet) across the dune along the historic alignment at the LaPointe Tower leading from the Fog Signal foundation to the beach. Document and remove remnants of the historic boardwalk.

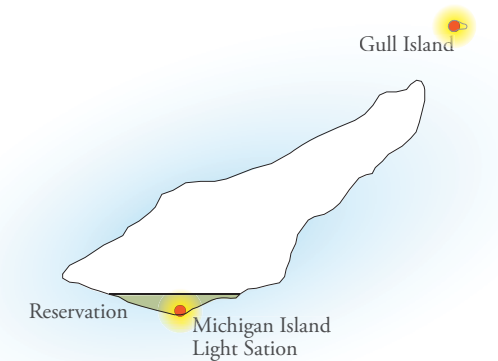
Sand Island Light Station

Under alternative 3, the overall treatment approach of rehabilitation at Sand Island Light Station is primarily focused on 1) reestablishing a portion of the historic cleared area of the light station; 2) reestablishing views from the lake to the light station; 3) restoring missing landscape features; and 4) rehabilitating the Light Station Tower and Keepers Quarters. While the overall treatment intent for the cultural landscape of Sand Island Light Station is one of rehabilitation, many of the individual treatment measures for the cultural landscape focus on preserving existing site features and restoring missing features.

Treatment recommendations for Sand Island Light Station generally include the following measures (Figures 48 and 49).

- Rehabilitate the Sand Island Light Station Quarters for visitor access and staff housing. Basic measures include reroofing, repairing existing features, ventilation and electrical improvements, septic improvements, and repainting, where needed.
- Provide accessibility improvements at the kitchen level in the Quarters.
- Clear and maintain a portion of the historic cleared area of Sand Island Light Station by removing and disposing of forest tree vegetation that has encroached into historically cleared areas. Clearing about 2.3 acres would produce an overall cleared area that is approximately 79% of the size of the original cleared area.
- Reestablish missing landscape features in the garden area including the wood shed, tool shed, fencing, and landscape plantings.

Michigan Island Reservation Treatment Alternative 1



Michigan Island

Legend

- Cleared Area
- Forest
- Edge of Historic Cleared Area

Note: Features in *italics* are Noncontributing

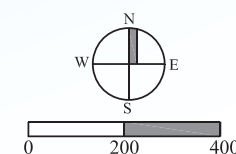
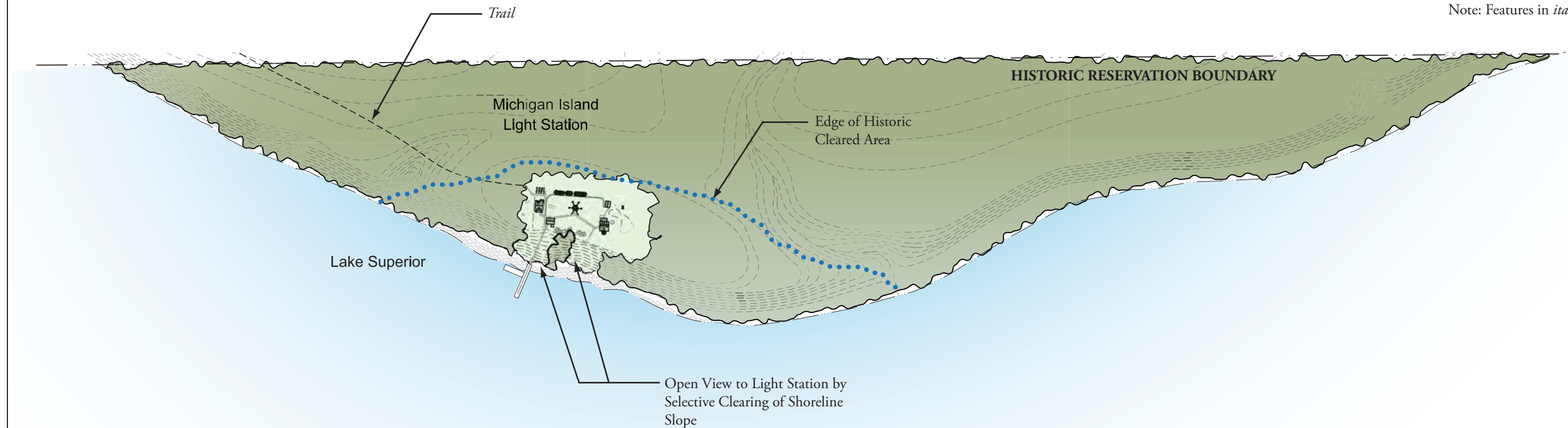
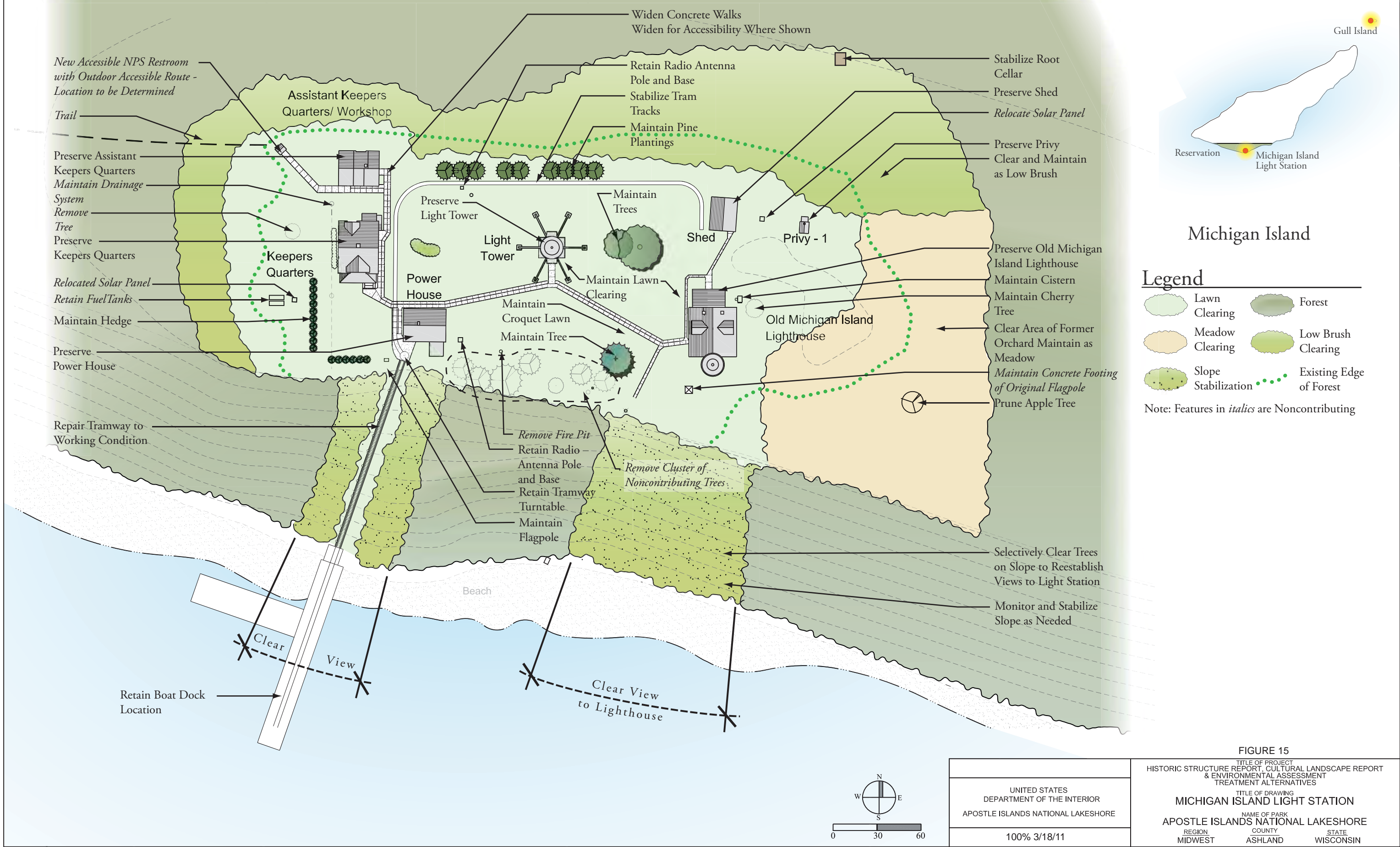


FIGURE 14

UNITED STATES DEPARTMENT OF THE INTERIOR		TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES	
APOSTLE ISLANDS NATIONAL LAKESHORE		TITLE OF DRAWING MICHIGAN ISLAND - RESERVATION BOUNDARY	
100% 3/18/11		NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE	
REGION MIDWEST	COUNTY ASHLAND	STATE WISCONSIN	

Michigan Island Treatment Alternative 1



Outer Island Reservation Treatment Alternative 1

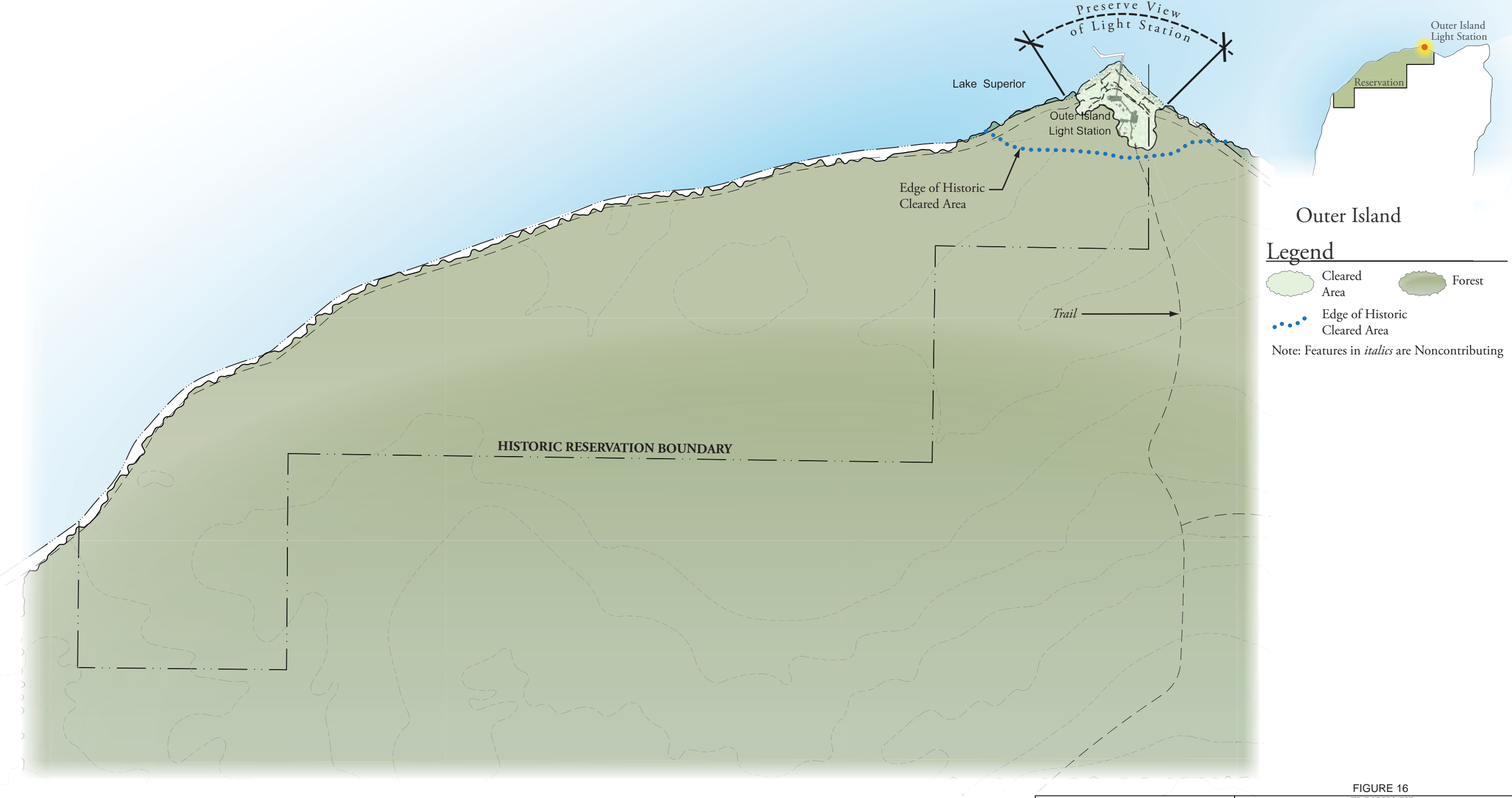
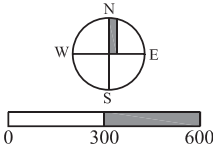
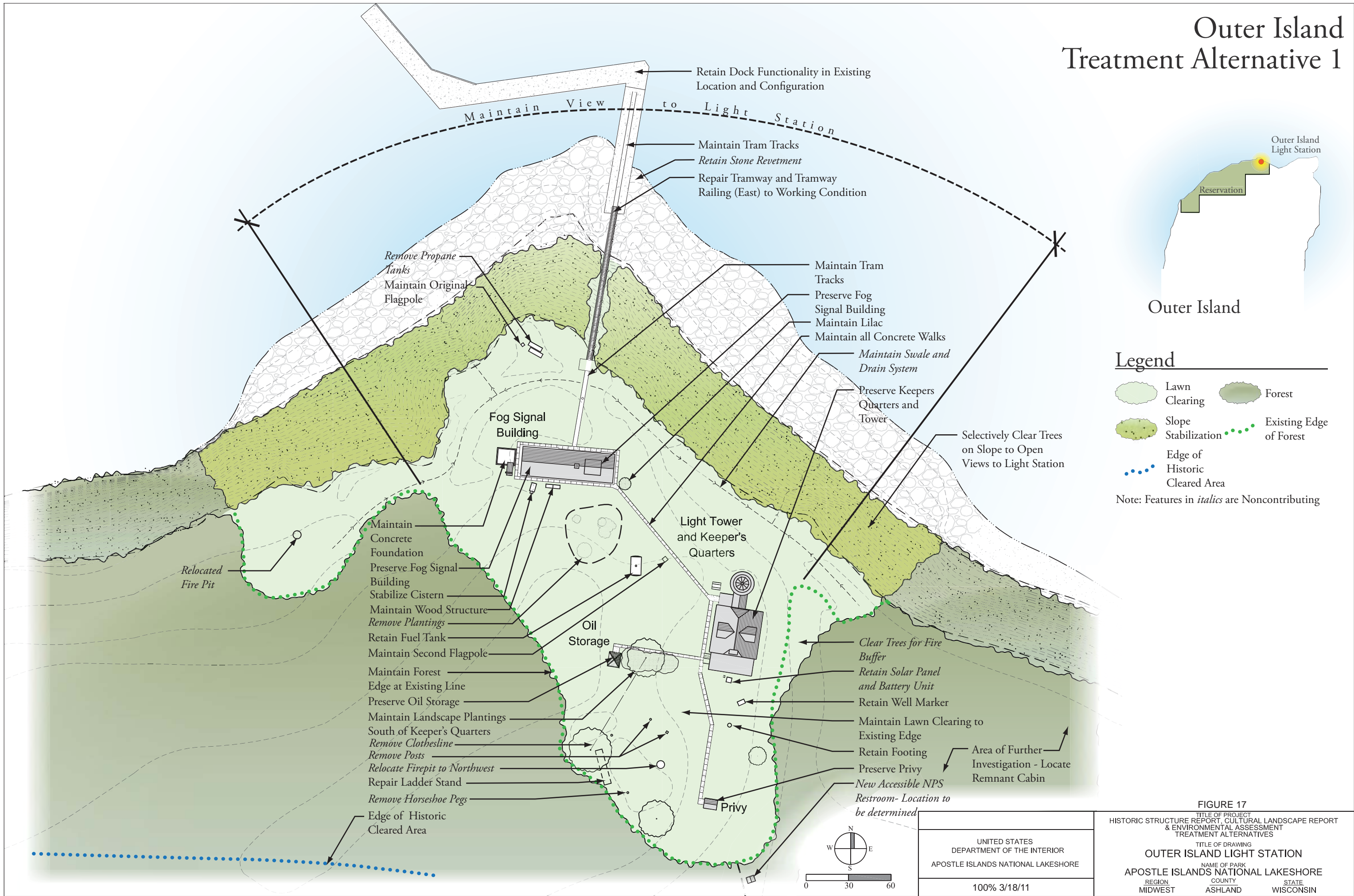


FIGURE 16

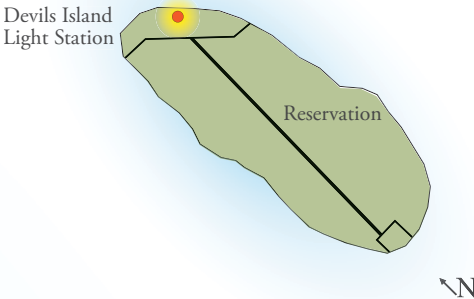
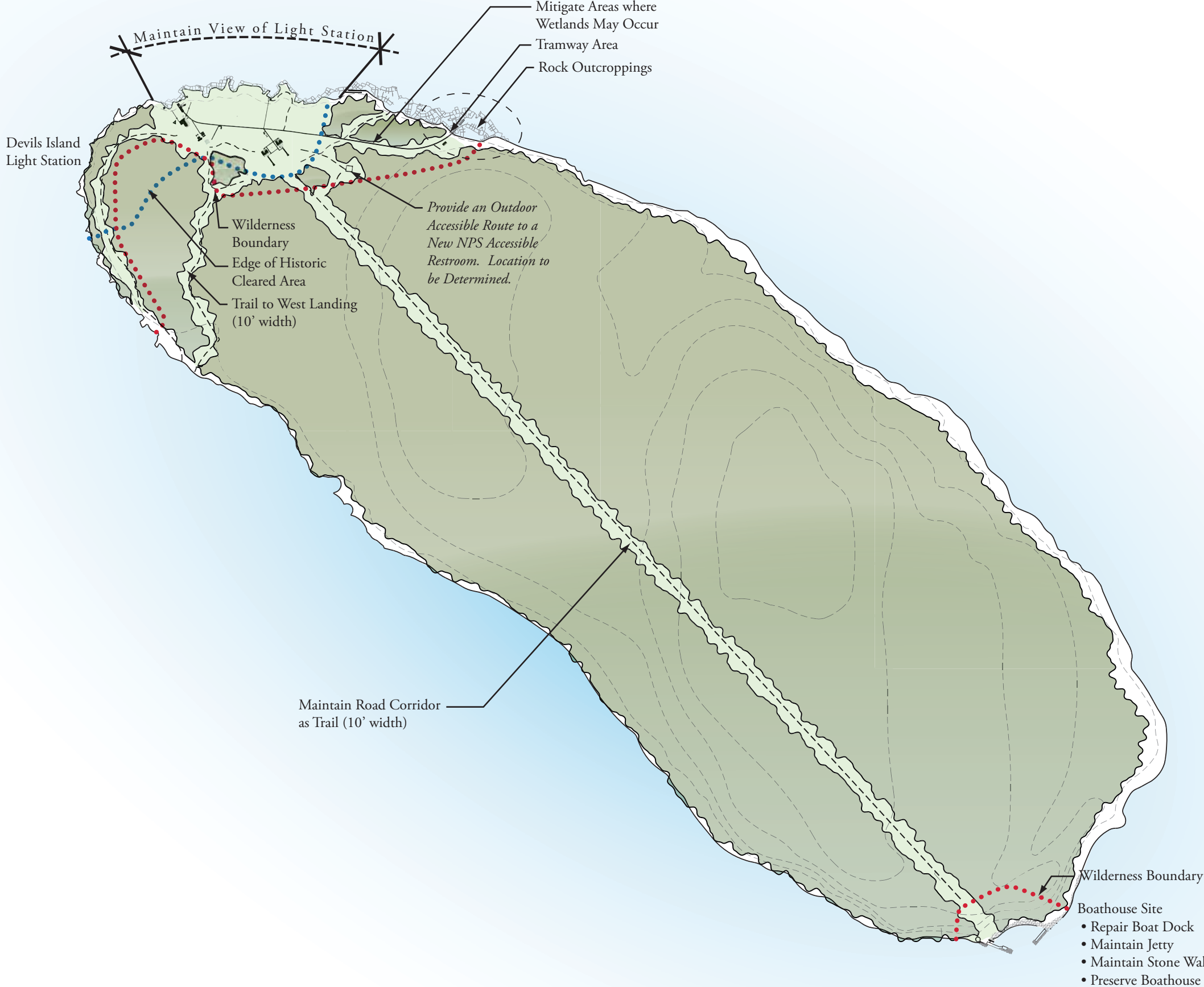
TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES		
TITLE OF DRAWING OUTER ISLAND - RESERVATION BOUNDARY		
NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE		
REGION MIDWEST	COUNTY ASHLAND	STATE WISCONSIN
UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE		
100% 3/18/11		



Outer Island Treatment Alternative 1



Devils Island Reservation Treatment Alternative 1



Devils Island

Legend

- Cleared Area
- Forest
- Edge of Historic Cleared Area
- Wilderness Boundary

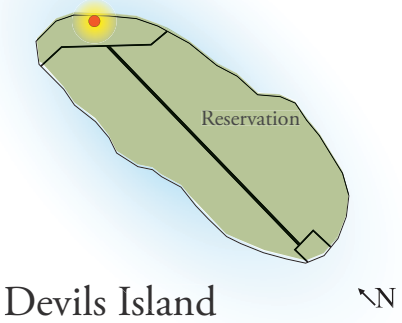
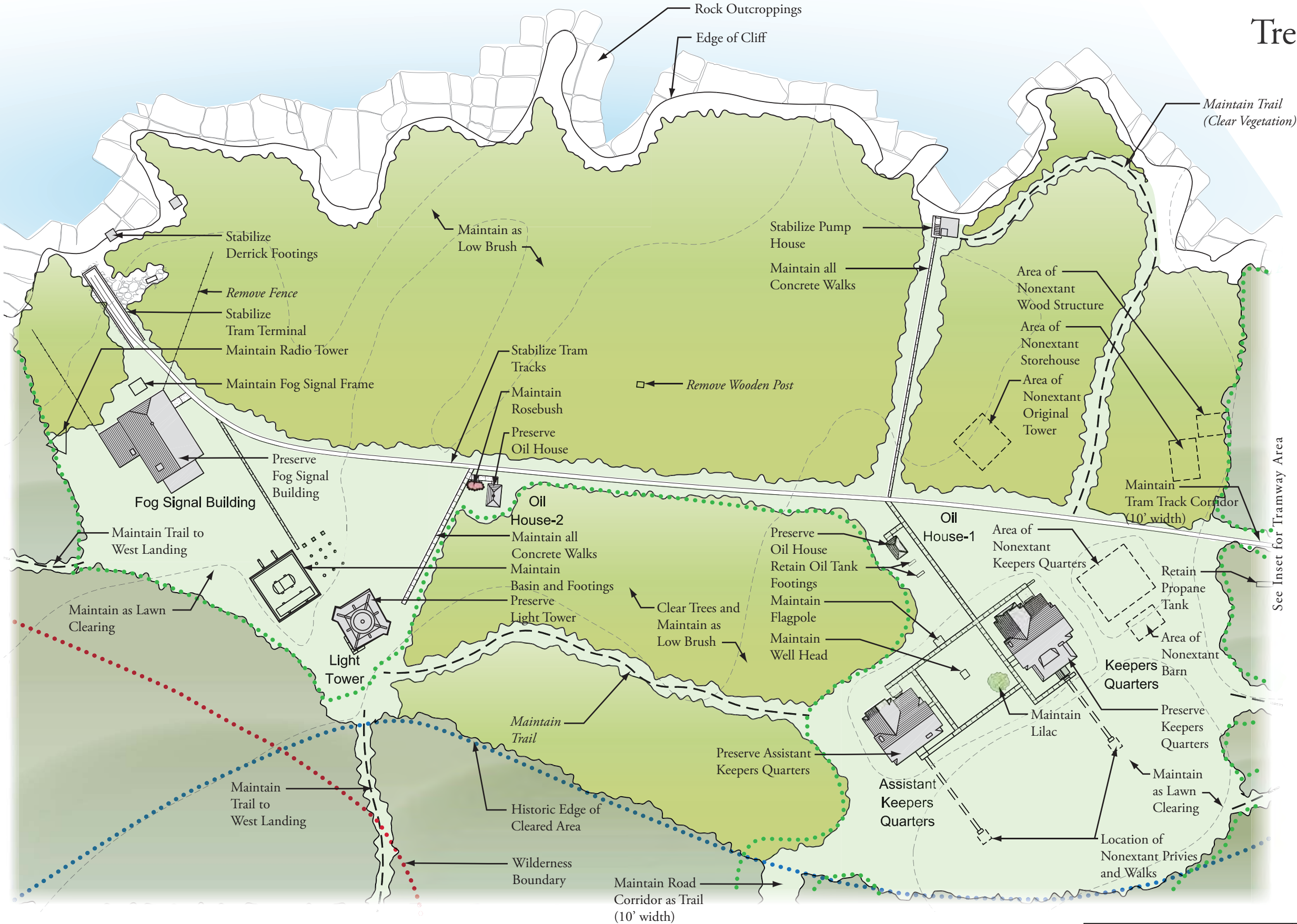
Note: Features in *italics* are Noncontributing



0 300 600

FIGURE 18		
TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES TITLE OF DRAWING		
DEVILS ISLAND		
NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE		
REGION MIDWEST	COUNTY ASHLAND	STATE WISCONSIN
UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE		
100% 3/18/11		

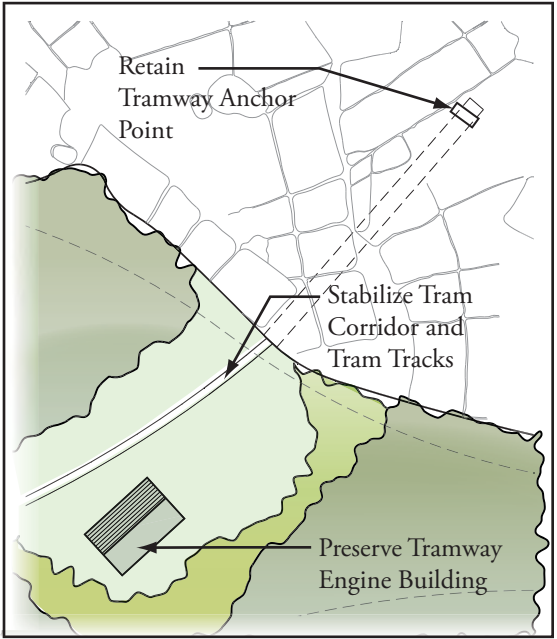
Devils Island Treatment Alternative 1



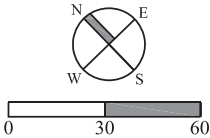
Legend

	Lawn Clearing		Forest
	Low Brush Clearing		Wilderness Boundary
	Edge of Historic Cleared Area		Existing Edge of Forest

Note: Features in *italics* are Noncontributing



Tramway Area

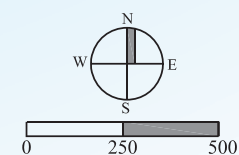


UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE	FIGURE 19		
	TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES		
	TITLE OF DRAWING DEVILS ISLAND LIGHT STATION		
	NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE		
100% 3/18/11	REGION MIDWEST	COUNTY ASHLAND	STATE WISCONSIN

Long Island Reservation Treatment Alternative 1








FIGURE 20



UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE	TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES		
	TITLE OF DRAWING LONG ISLAND - RESERVATION BOUNDARY		
	NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE		
	REGION MIDWEST	COUNTY ASHLAND	STATE WISCONSIN
100% 3/18/11			

A map of the LaPointe Site showing the location of the Reservation and the LaPointe Site. The map features a green area representing the Reservation, with a yellow dot indicating the LaPointe Site. The word 'Reservation' is written twice, once on the left and once on the right. The word 'LaPointe Site' is written at the top right.

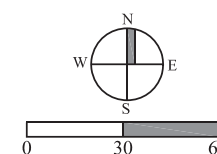
Legend

	Dune Vegetation (not managed)		Forest
	Managed Dune Vegetation		Sand
	Existing Edge of Vegetation		

This site plan for the Cape Cod Light Station includes the following annotations:

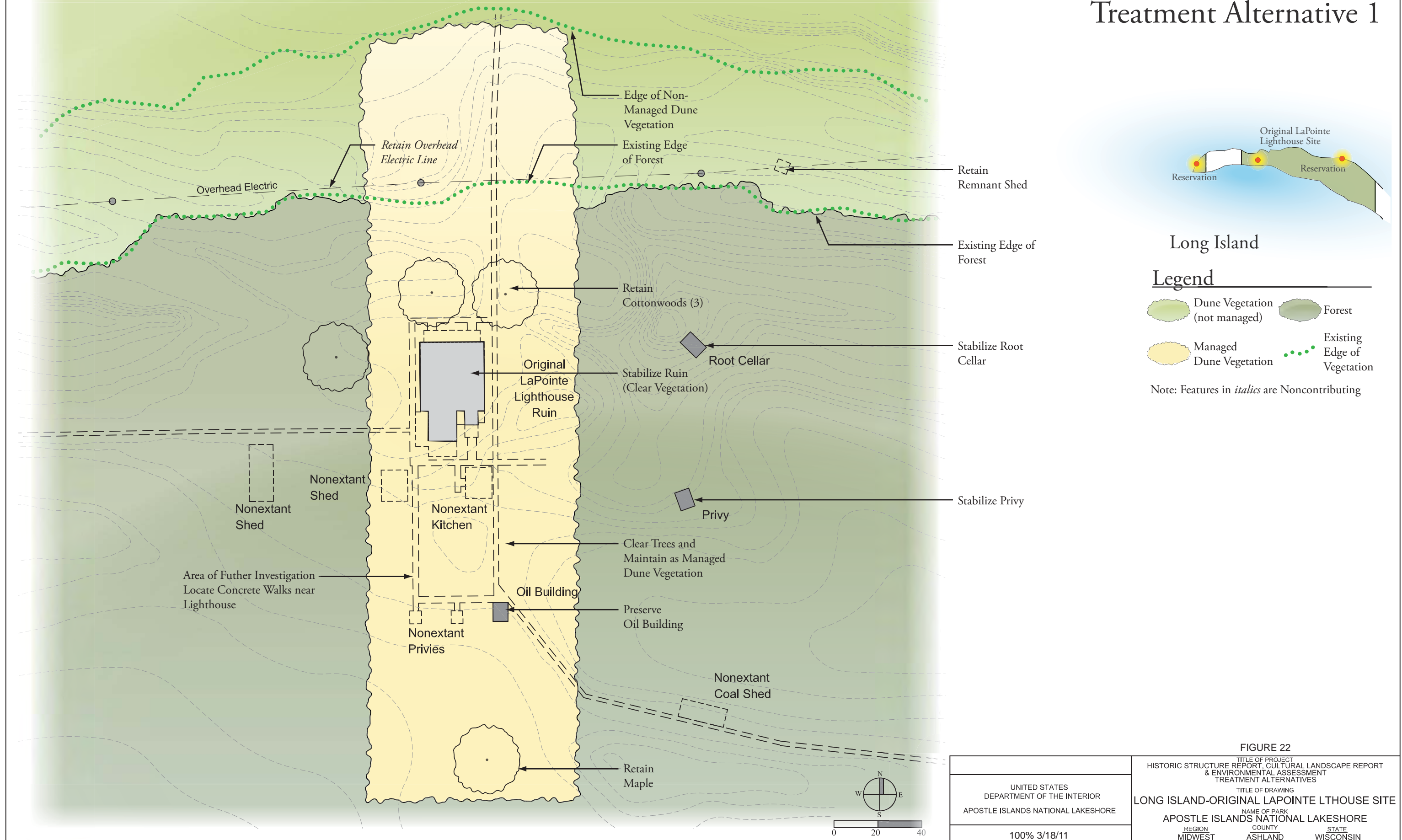
- Maintain Dock in Current Location
- Clear View of Light Station
- Retain Pipe Crib
- Clear Trees Maintain as Dune Vegetation
- Remove Floating Boardwalk
- New Boardwalk along Historic Alignment
- Maintain all Concrete Walks
- Retain Concrete Radio Tower Footings - A
- Maintain Fog Signal Building Foundation
- Retain Rubble Pile
- Retain Fuel Tank
- Stabilize Shed
- Retain Concrete Radio Beacon Tower Footings - B
- Maintain Area for Footpath (4' width). Retain Corrugated Metal
- Retain Septic Bed
- Preserve Oil Building
- Area of Further Investigation - Locate Concrete Walk. Clear Corridor (10' width)
- Preserve Triplex
- Clear Trees 50' from Buildings. Maintain as Dune Vegetation
- Retain Existing Footpath Corridor
- Retain Overhead Electric Line and Poles
- Maintain Cistern and Piping
- Remove Utility Units
- Repair Flagpole
- Preserve Light Tower
- Light Tower
- Fog Signal Foundation
- Oil Building
- Triplex

<u>REGION</u>	<u>COUNTY</u>	<u>STATE</u>
MIDWEST	ASHLAND	WISCONSIN

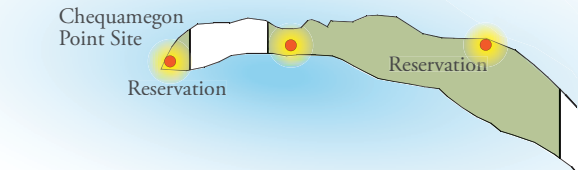
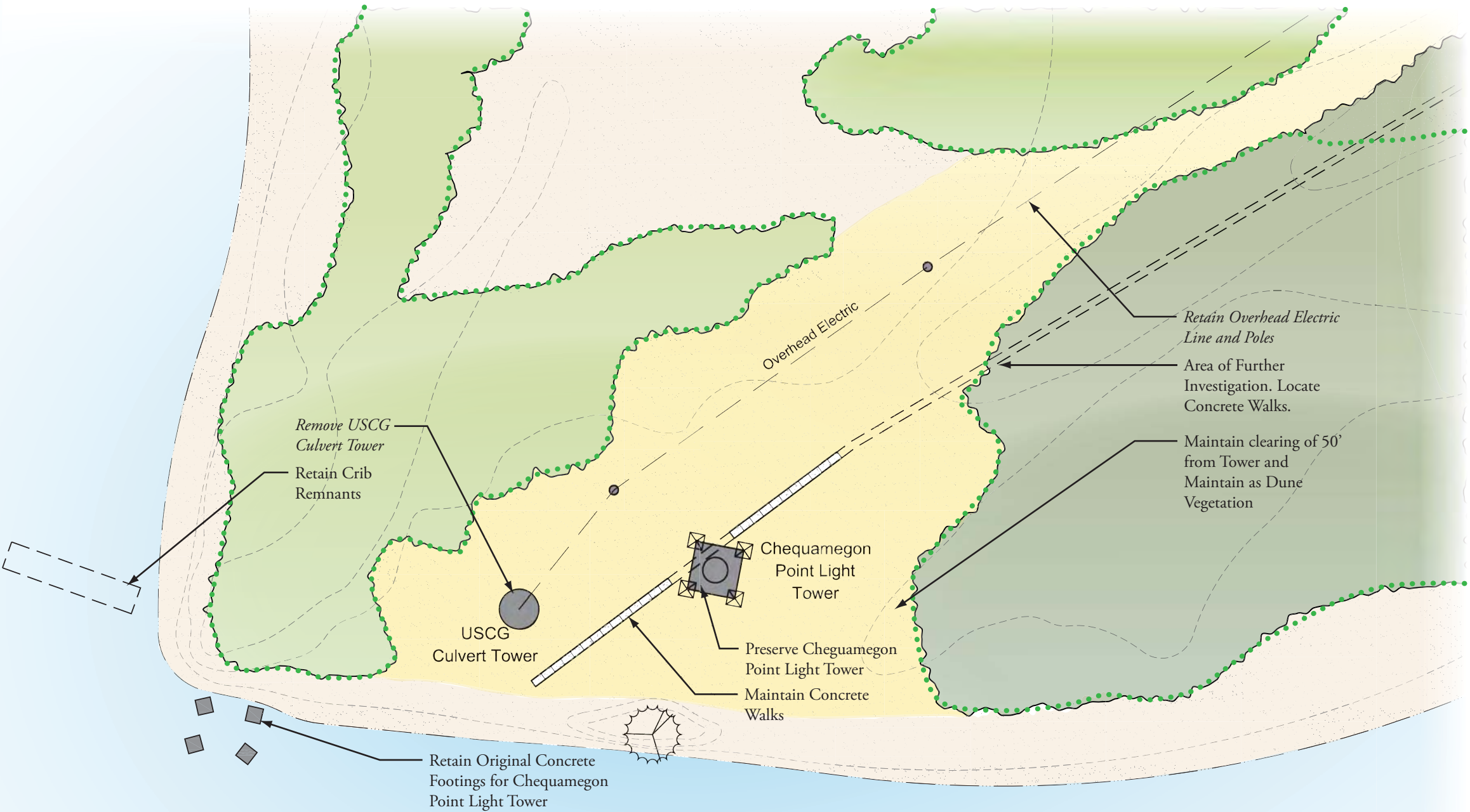


<p>UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE</p>
<p>100% 3/18/11</p>

Long Island Original LaPointe Lighthouse Treatment Alternative 1



Long Island Chequamegon Point Treatment Alternative 1



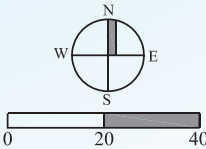
Long Island

Legend

- Dune Vegetation (not managed)
- Managed Dune Vegetation
- Existing Edge of Vegetation
- Sand/Beach
- Forest

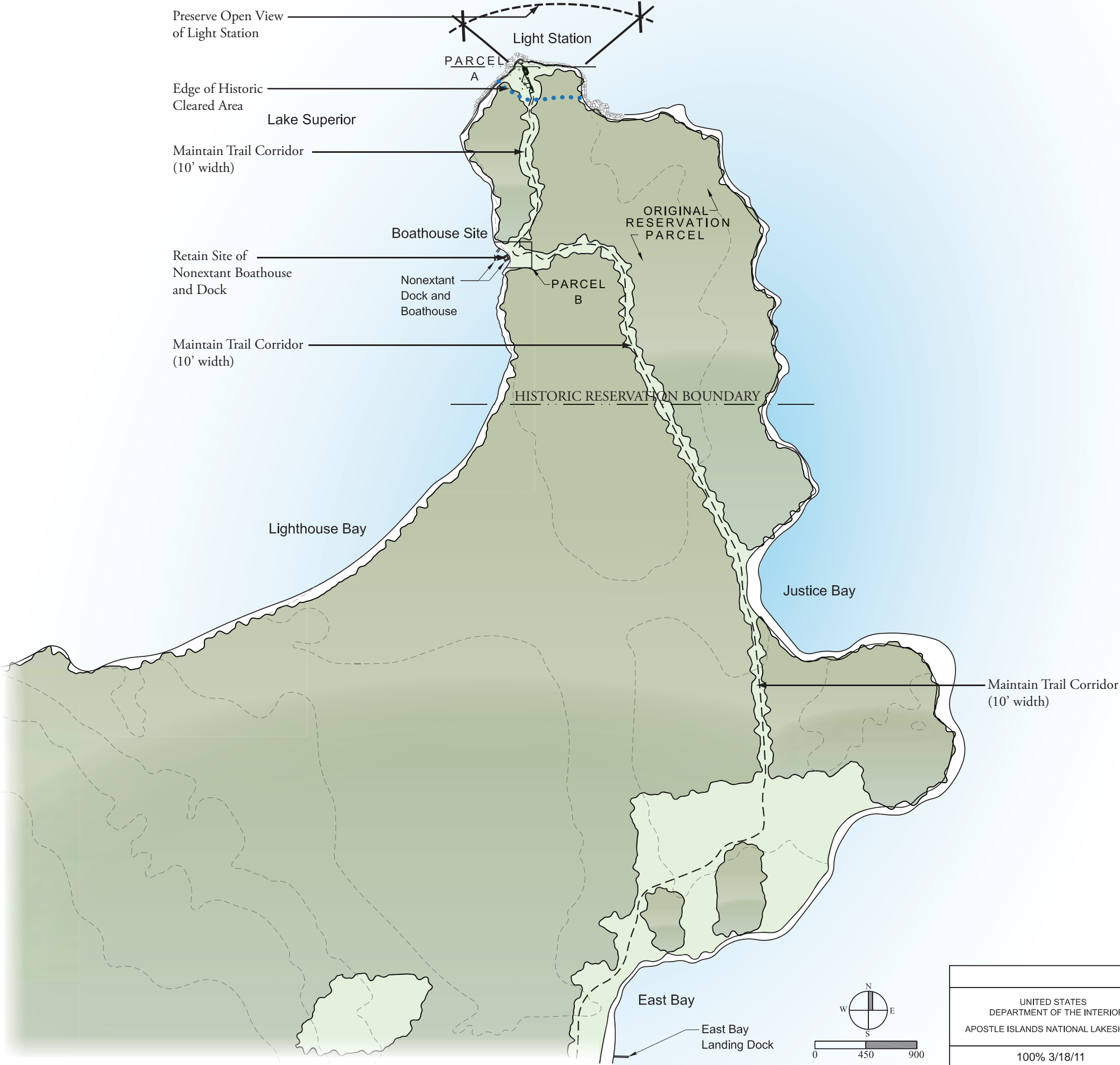
Note: Features in *italics* are Noncontributing

FIGURE 23



UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE	TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES		
	TITLE OF DRAWING LONG ISLAND - CHEQUAMEGON POINT SITE		
	NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE		
	REGION MIDWEST	COUNTY ASHLAND	STATE WISCONSIN
100% 3/18/11			

Sand Island Reservation Treatment Alternative 1



Legend

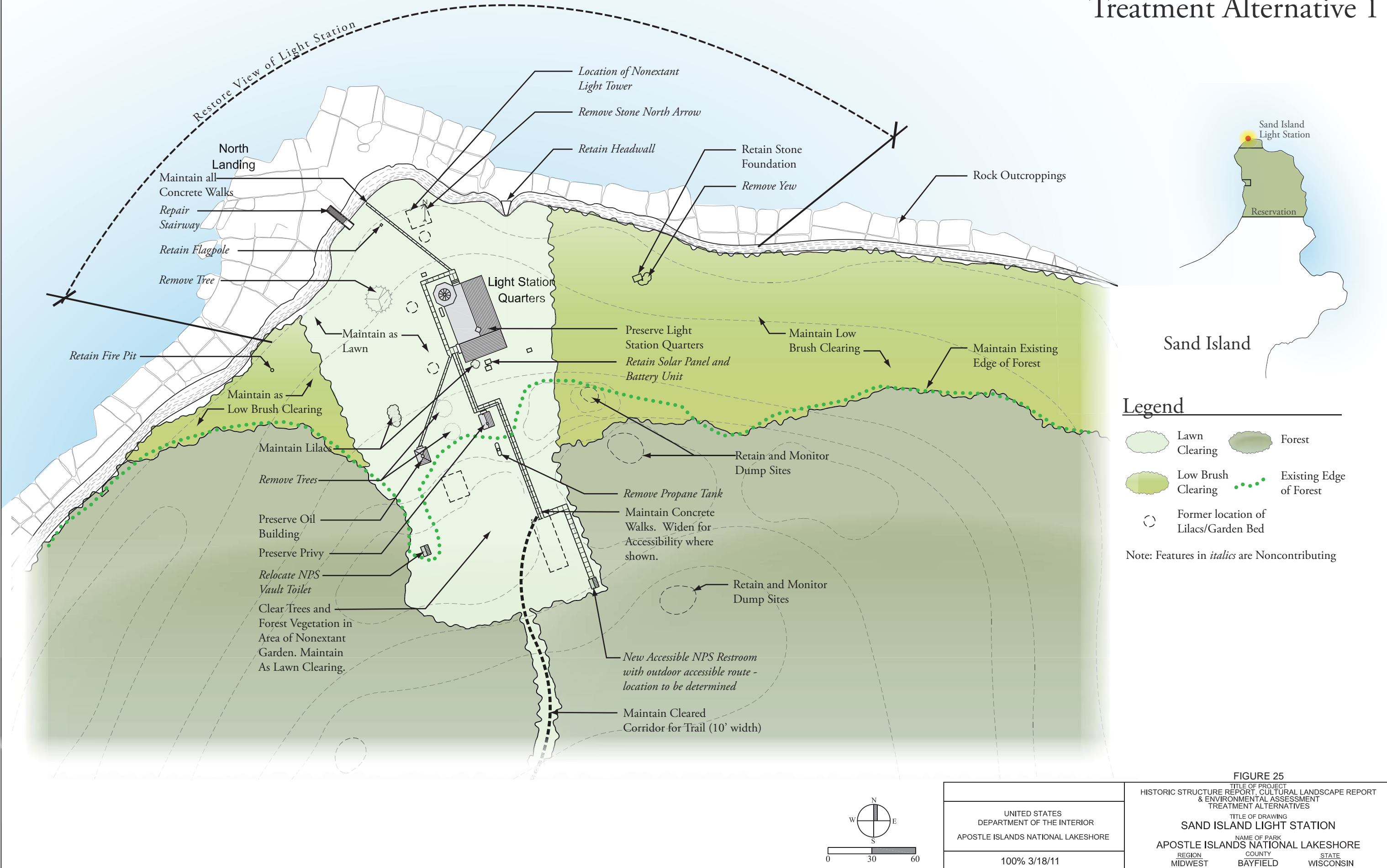
Cleared Area

Forest

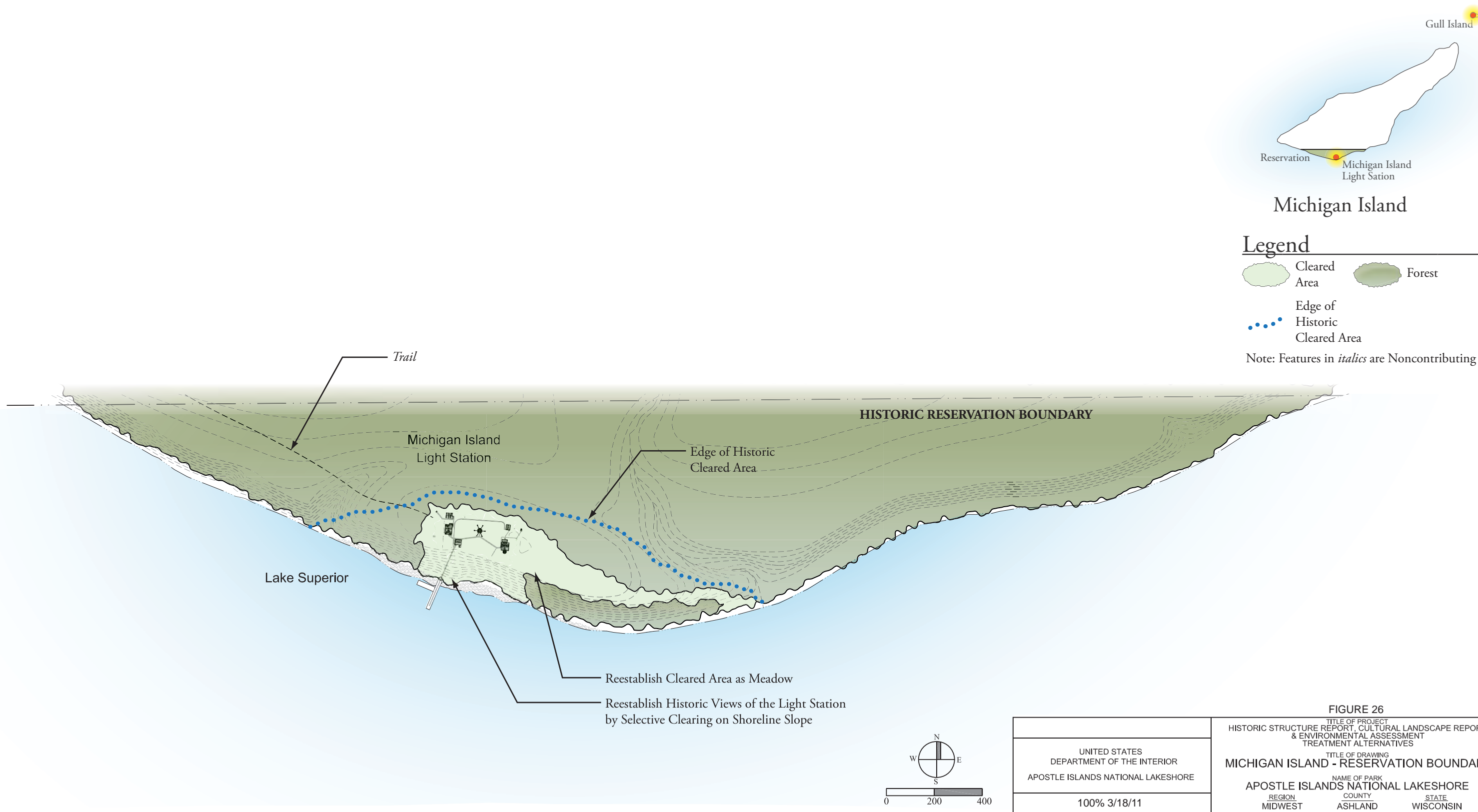
Edge of Historic Cleared Area

FIGURE 24		
TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES		
TITLE OF DRAWING SAND ISLAND - RESERVATION BOUNDARY		
NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE		
REGION MIDWEST	COUNTY BAYFIELD	STATE WISCONSIN
UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE		
100% 3/18/11		

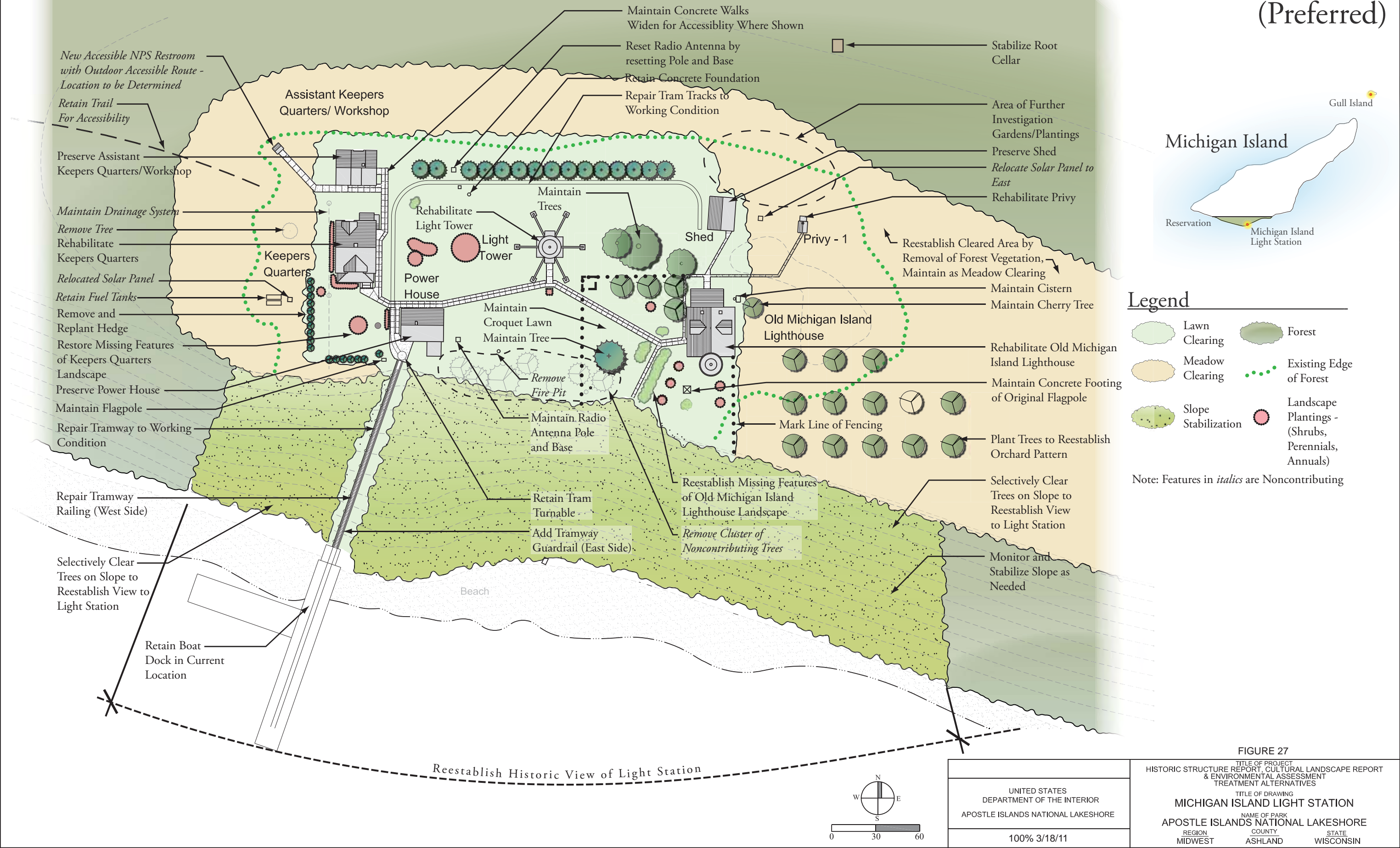
Sand Island Treatment Alternative 1



Michigan Island Reservation Treatment Alternative 2 (Preferred)



Michigan Island Treatment Alternative 2 (Preferred)



Outer Island Reservation Treatment Alternative 2 (Preferred)

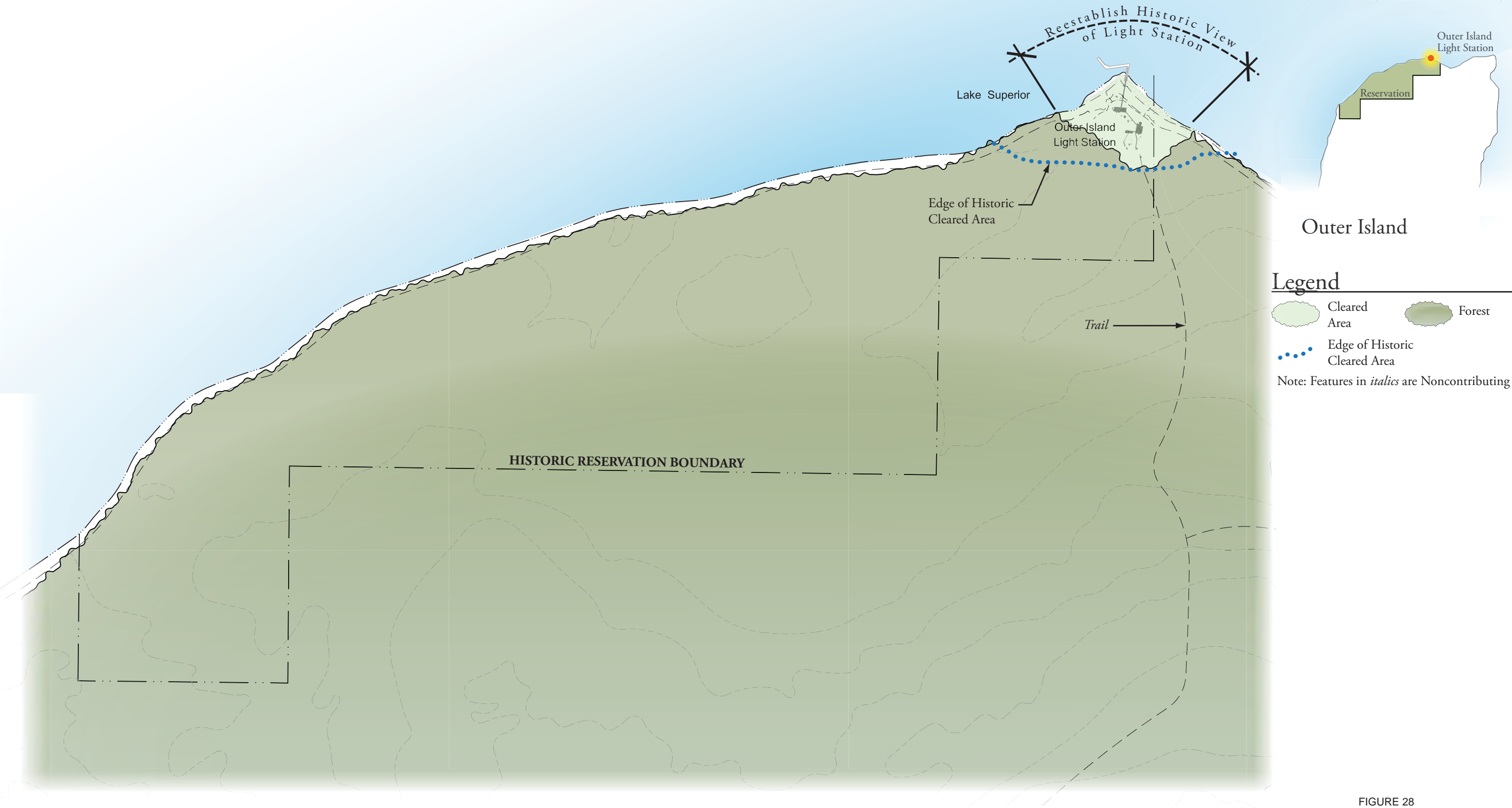
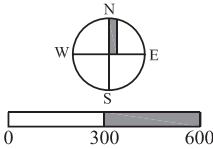
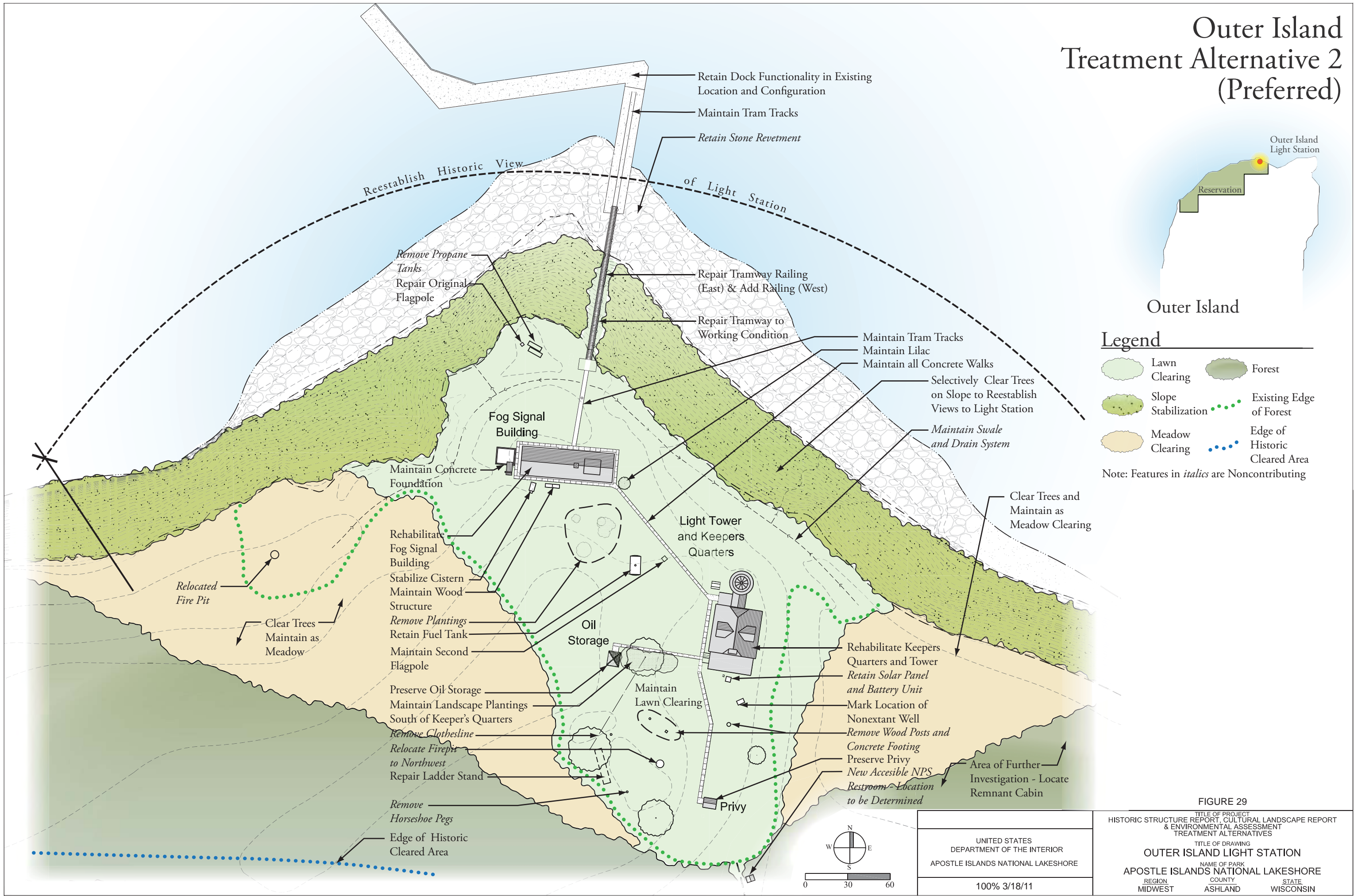


FIGURE 28

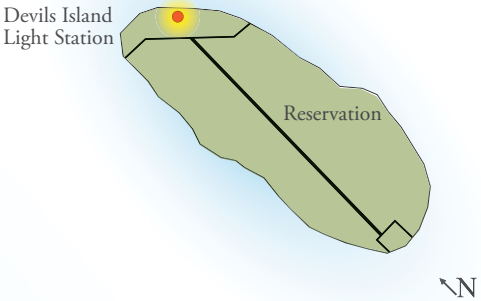
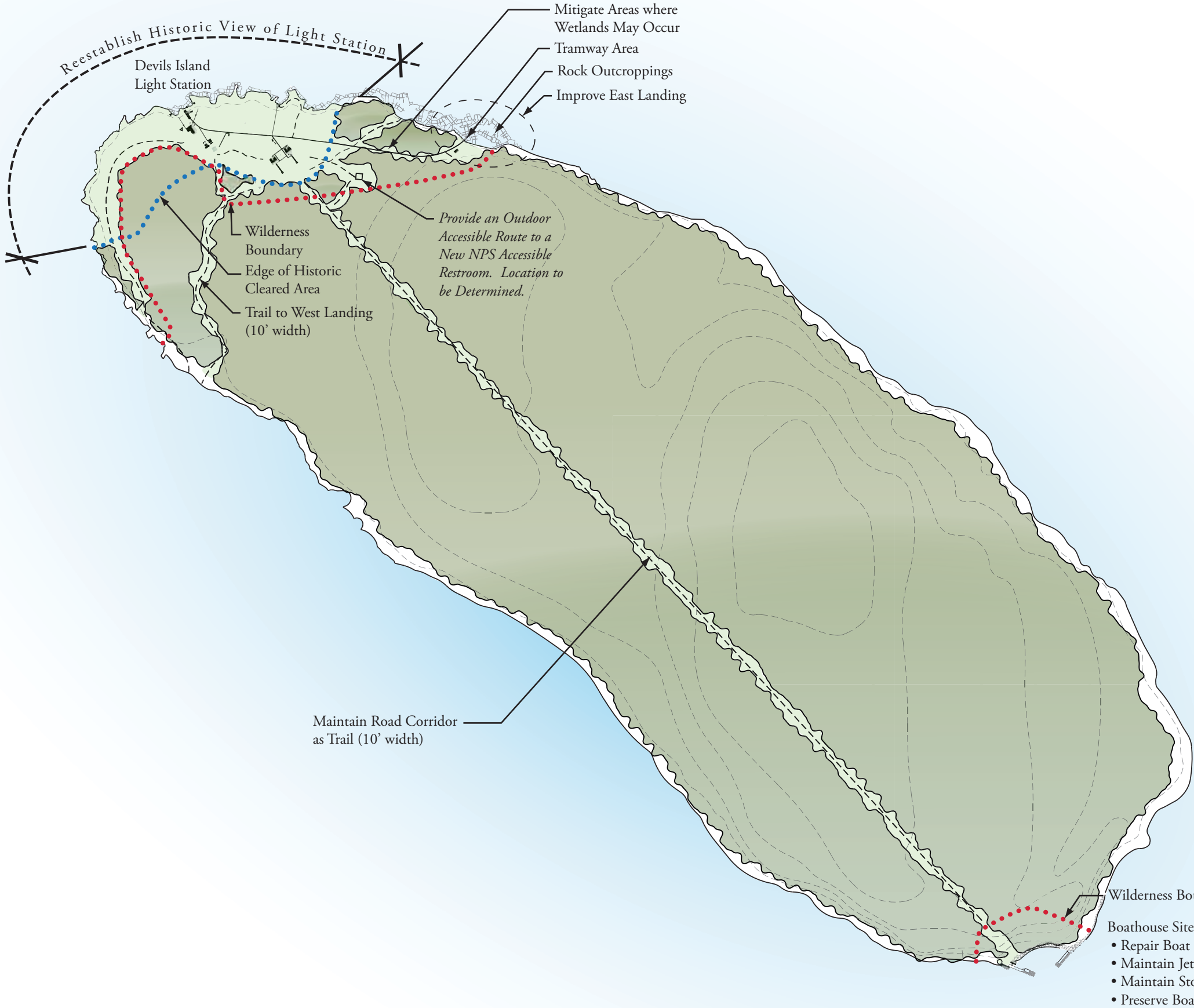
TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES	
TITLE OF DRAWING OUTER ISLAND - RESERVATION BOUNDARY	
NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE	
REGION MIDWEST	STATE WISCONSIN
COUNTY ASHLAND	
DATE 100% 3/18/11	
DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE	



Outer Island Treatment Alternative 2 (Preferred)



Devils Island Reservation Treatment Alternative 2 (Preferred)



Devils Island

Legend

- Cleared Area
- Forest
- Edge of Historic Cleared Area
- Wilderness Boundary

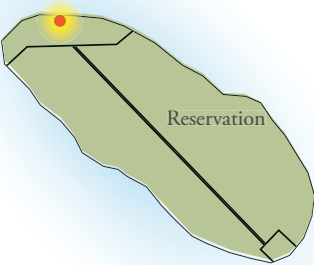
Note: Features in *italics* are Noncontributing



0 300 600

FIGURE 30	
TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES TITLE OF DRAWING	
DEVILS ISLAND	
NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE	
REGION MIDWEST	COUNTY ASHLAND
STATE WISCONSIN	

Devils Island
Treatment Alternative 2
(Preferred)

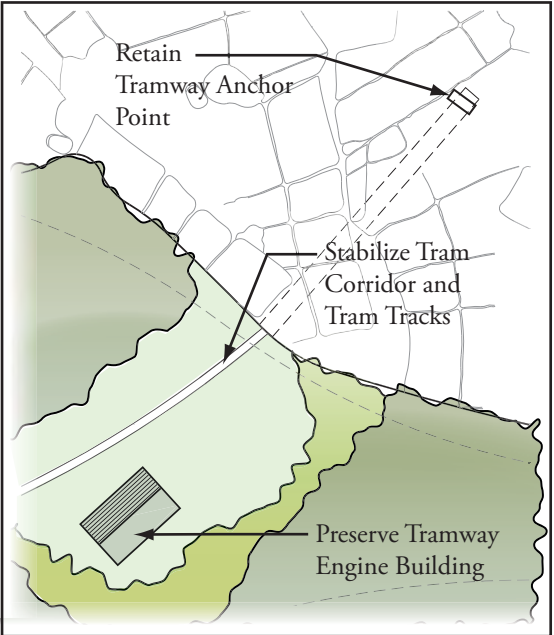


Devils Island

Legend

Lawn Clearing	Forest
Low Brush Clearing	Wilderness Boundary
Edge of Historic Cleared Area	Existing Edge of Forest

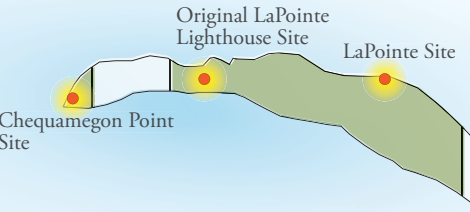
Note: Features in *italics* are Noncontributing



Tramway Area

UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE	FIGURE 31		
	TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES		
	TITLE OF DRAWING DEVILS ISLAND LIGHT STATION		
	NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE		
	REGION MIDWEST	COUNTY ASHLAND	STATE WISCONSIN

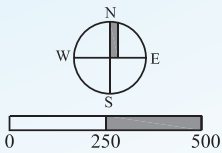
Long Island Reservation
Treatment Alternative 2
(Preferred)



Legend

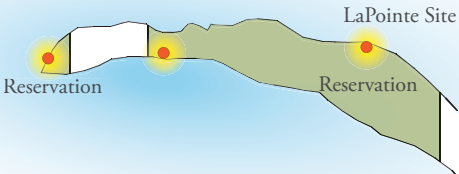
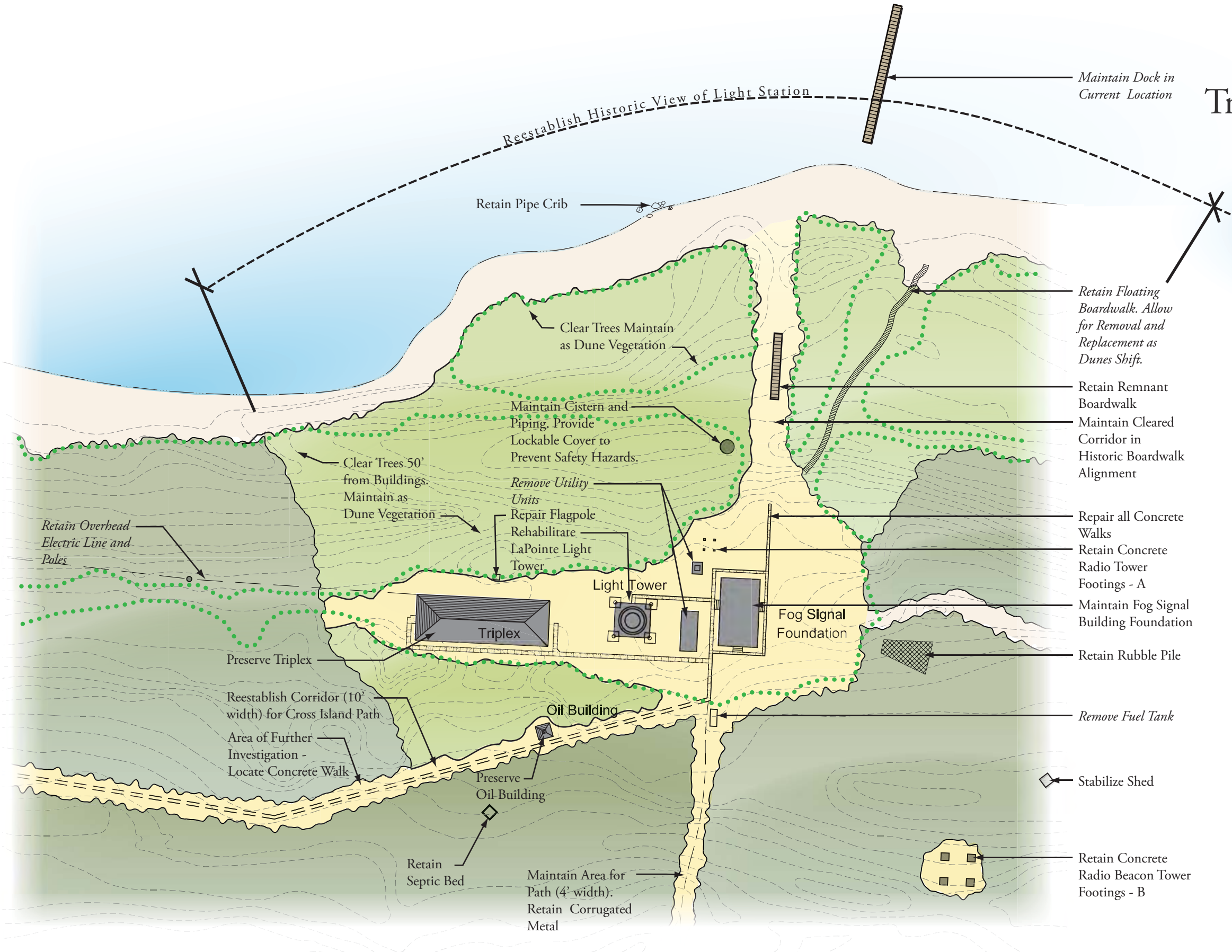
Dune Vegetation (not managed)	Forest
Managed Dune Vegetation	Beach/Sand

Note: Features in *italics* are Noncontributing



UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE	FIGURE 32		
	TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES		
	TITLE OF DRAWING LONG ISLAND - RESERVATION BOUNDARY		
	NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE		
100% 3/18/11	REGION MIDWEST	COUNTY ASHLAND	STATE WISCONSIN

Long Island LaPointe Site Treatment Alternative 2 (Preferred)



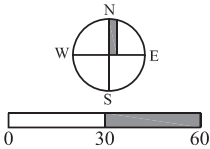
**Long Island
Legend**

Dune Vegetation (not managed)	Forest
Managed Dune Vegetation	Sand
Existing Edge of Vegetation	

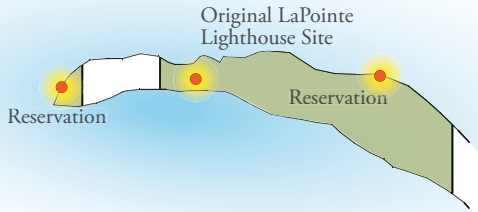
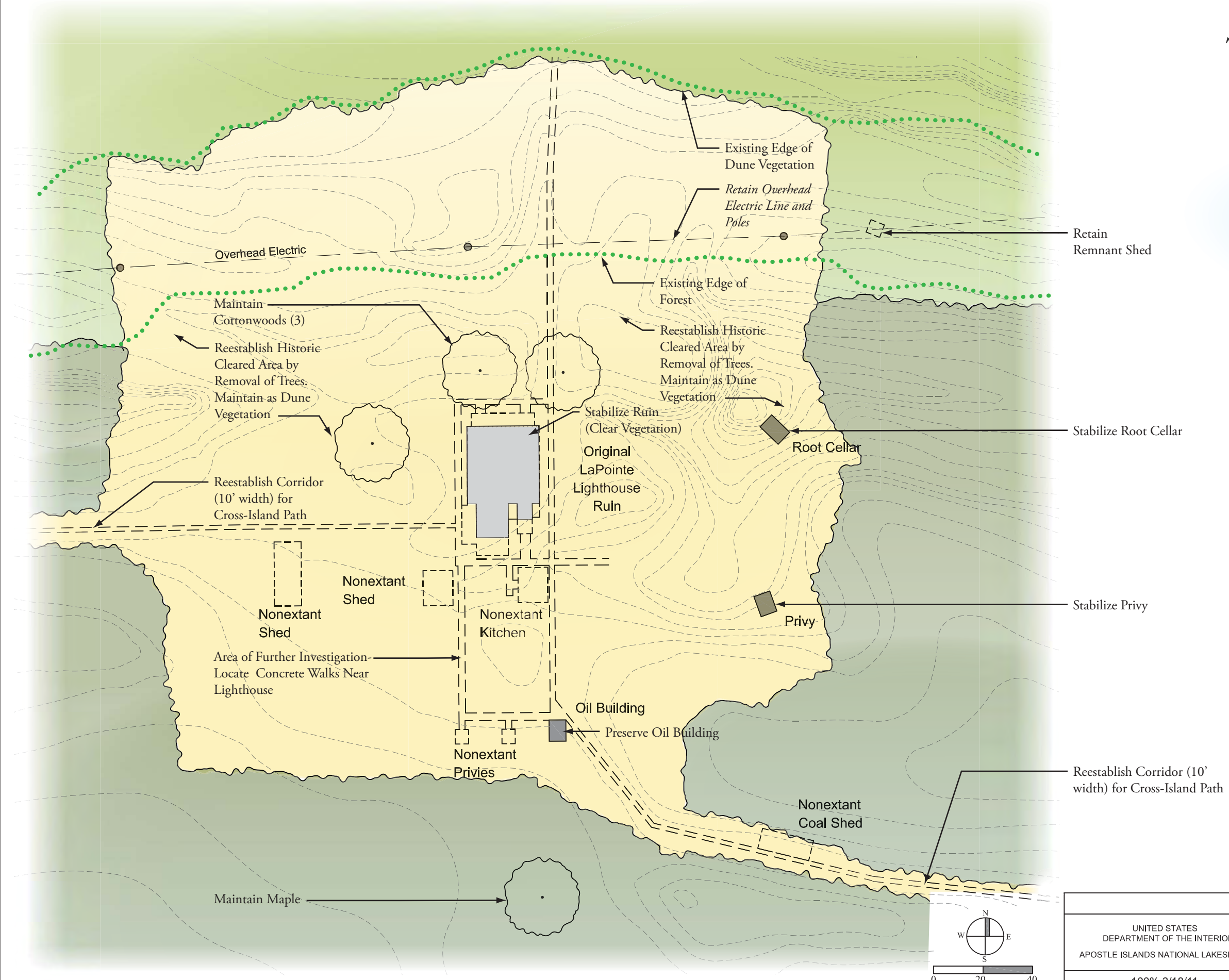
Notes:
1.) Features in *italics* are Noncontributing
2.) New Accessible NPS Restroom to be added. Location to be determined

FIGURE 33

UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE	TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES		
	TITLE OF DRAWING LONG ISLAND - LAPOINTE LIGHT STATION		
	NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE		
	REGION MIDWEST	COUNTY ASHLAND	STATE WISCONSIN
100% 3/18/11			



Long Island Original LaPointe Lighthouse Treatment Alternative 2 (Preferred)



Long Island

Legend

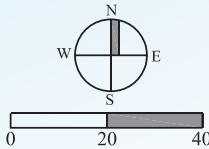
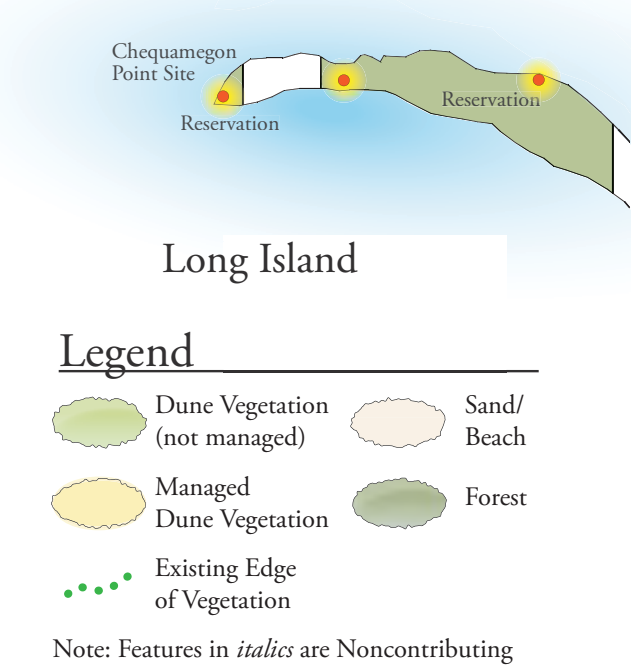
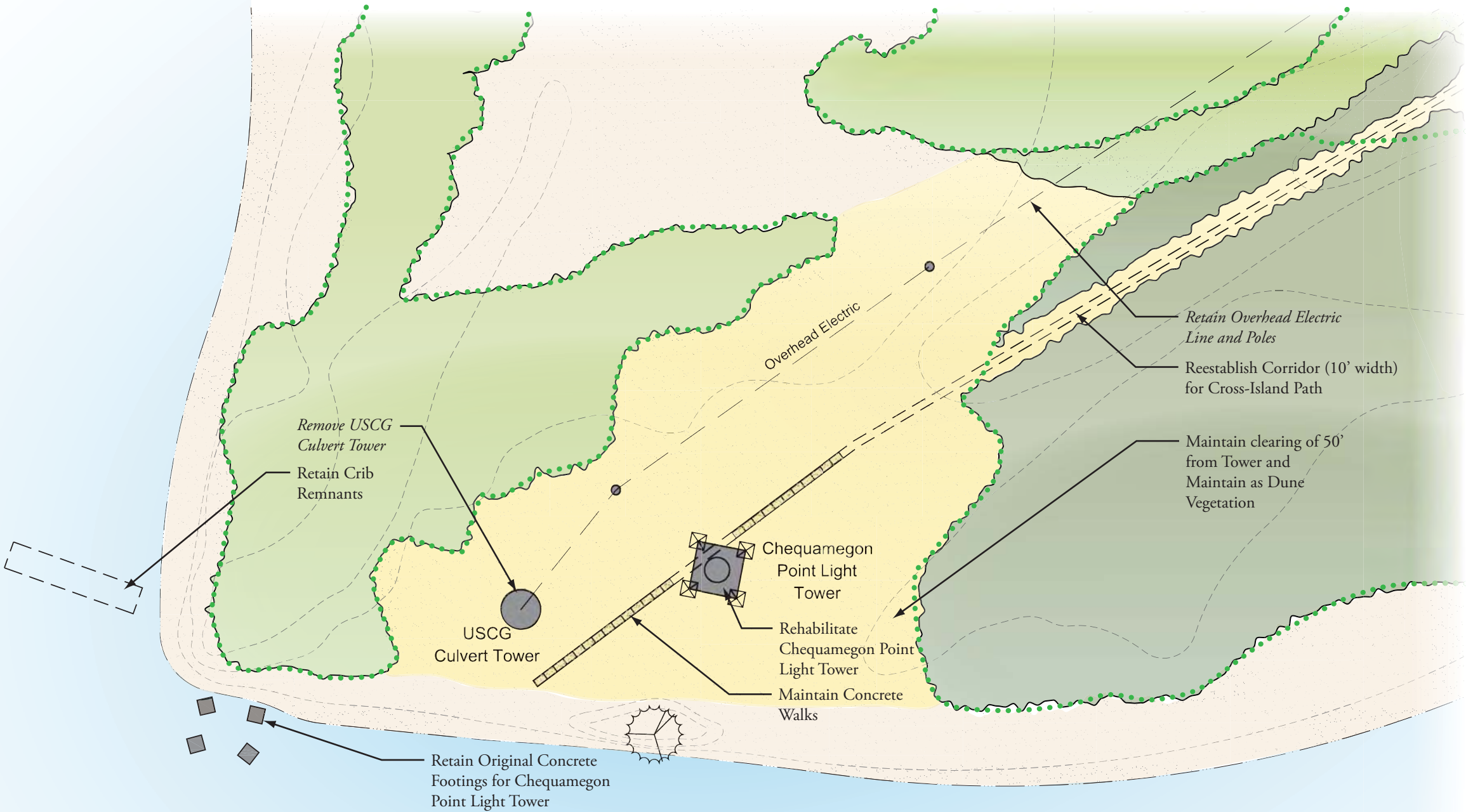
- Dune Vegetation (not managed)
- Forest
- Managed Dune Vegetation
- Existing Edge of Vegetation

Note: Features in *italics* are Noncontributing

FIGURE 34

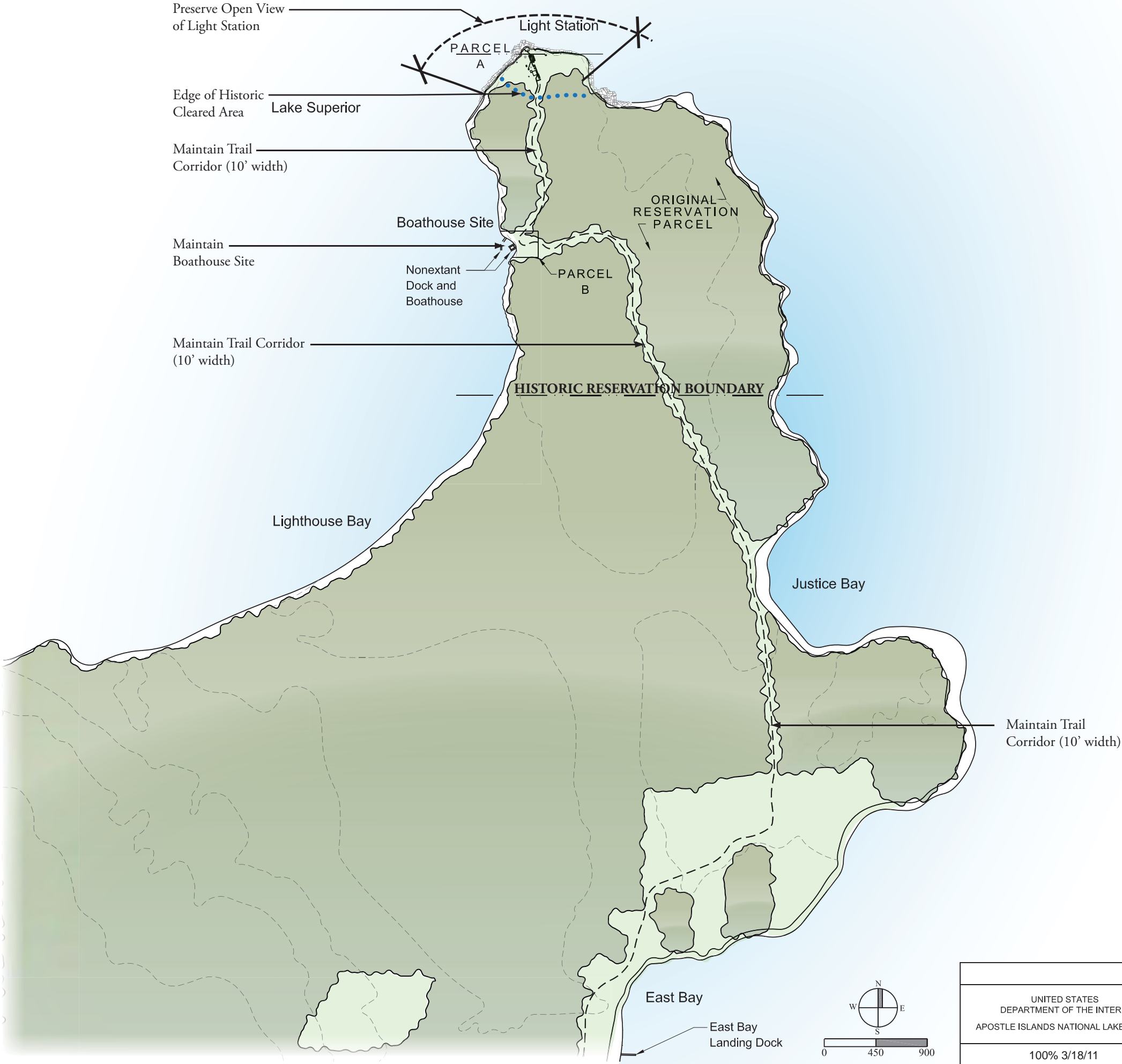
TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES	
TITLE OF DRAWING LONG ISLAND-ORIGINAL LAPOINTE LTHOUSE SITE	
NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE	
REGION MIDWEST	STATE WISCONSIN
COUNTY ASHLAND	
100% 3/18/11	

Long Island
Chequamegon Point
Treatment Alternative 2
(Preferred)



UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE		100% 3/18/11	
TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES		TITLE OF DRAWING LONG ISLAND - CHEQUAMEGON POINT SITE	
NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE		NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE	
REGION MIDWEST	COUNTY ASHLAND	STATE WISCONSIN	

Sand Island Reservation Treatment Alternative 2 (Preferred)



Legend

- Cleared Area
- Forest
- Edge of Historic Cleared Area

UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE			FIGURE 36 TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES TITLE OF DRAWING SAND ISLAND - RESERVATION BOUNDARY NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE REGION MIDWEST COUNTY BAYFIELD STATE WISCONSIN		
100% 3/18/11					

Sand Island Treatment Alternative 2 (Preferred)

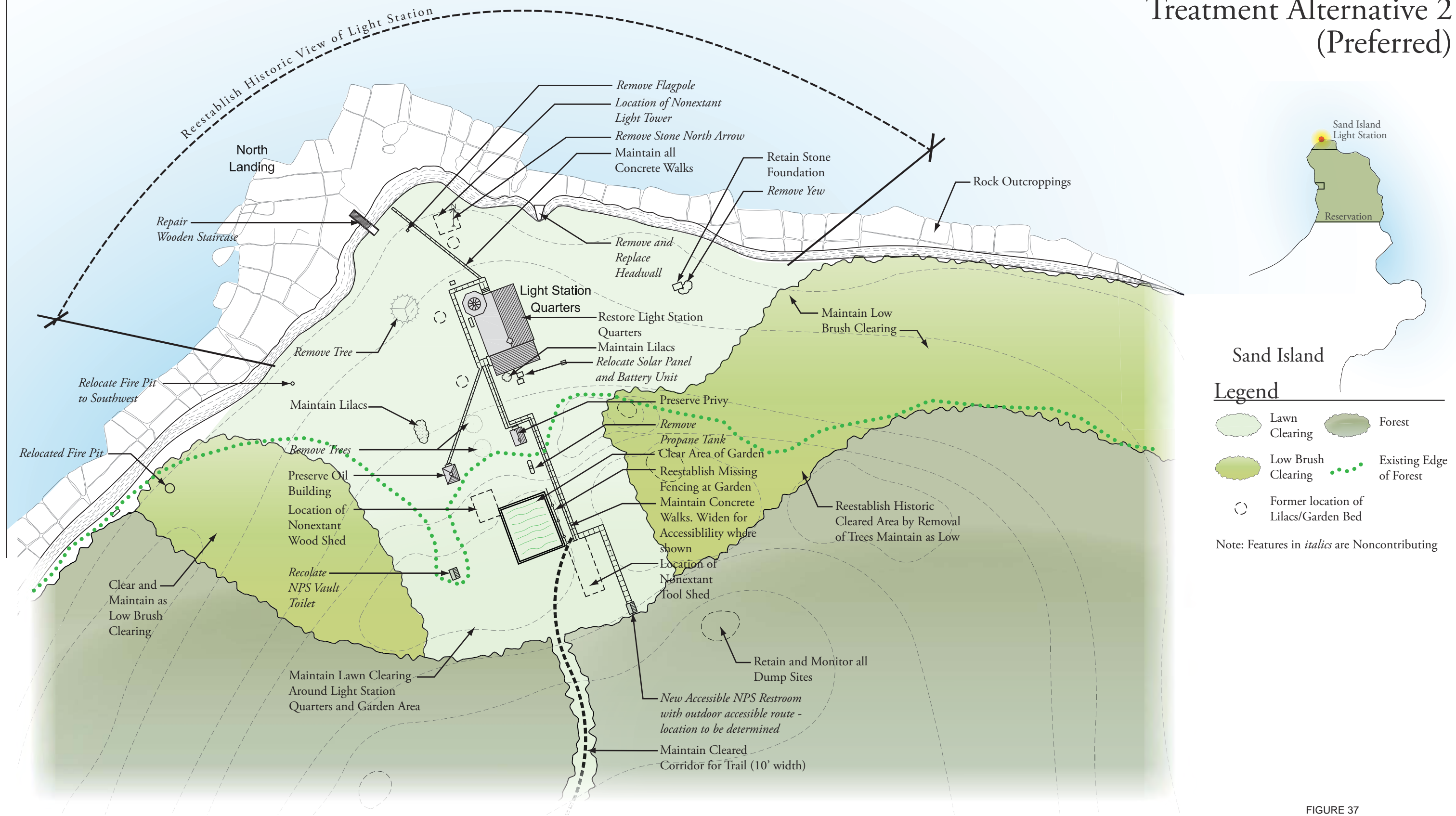


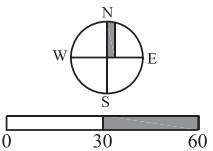
FIGURE 37

TITLE OF PROJECT
HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT
& ENVIRONMENTAL ASSESSMENT
TREATMENT ALTERNATIVES

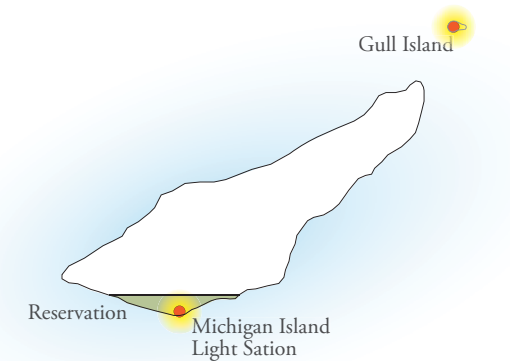
UNITED STATES
DEPARTMENT OF THE INTERIOR
APOSTLE ISLANDS NATIONAL LAKESHORE

TITLE OF DRAWING
SAND ISLAND LIGHT STATION
NAME OF PARK
APOSTLE ISLANDS NATIONAL LAKESHORE
REGION COUNTY STATE
MIDWEST BAYFIELD WISCONSIN

100% 3/18/11



Michigan Island Reservation Treatment Alternative 3



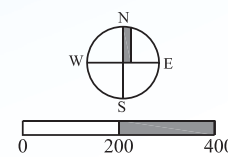
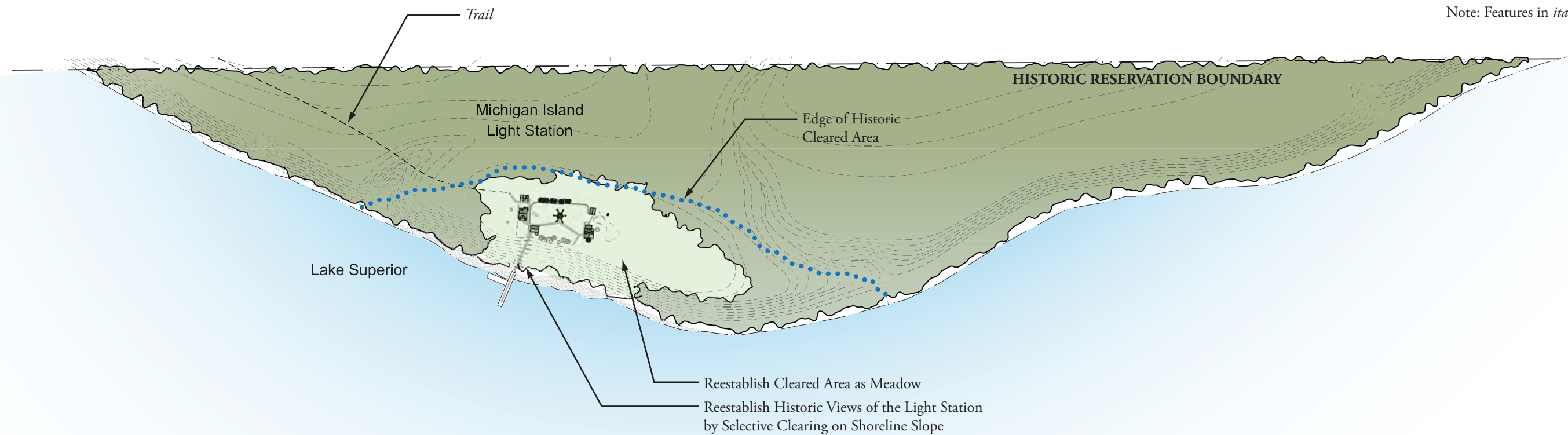
Michigan Island

Legend

- Cleared Area
- Forest

- Edge of Historic Cleared Area

Note: Features in *italics* are Noncontributing



UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE		FIGURE 38 TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES TITLE OF DRAWING MICHIGAN ISLAND - RESERVATION BOUNDARY NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE REGION COUNTY STATE MIDWEST ASHLAND WISCONSIN	
100% 3/18/11			

Michigan Island Treatment Alternative 3

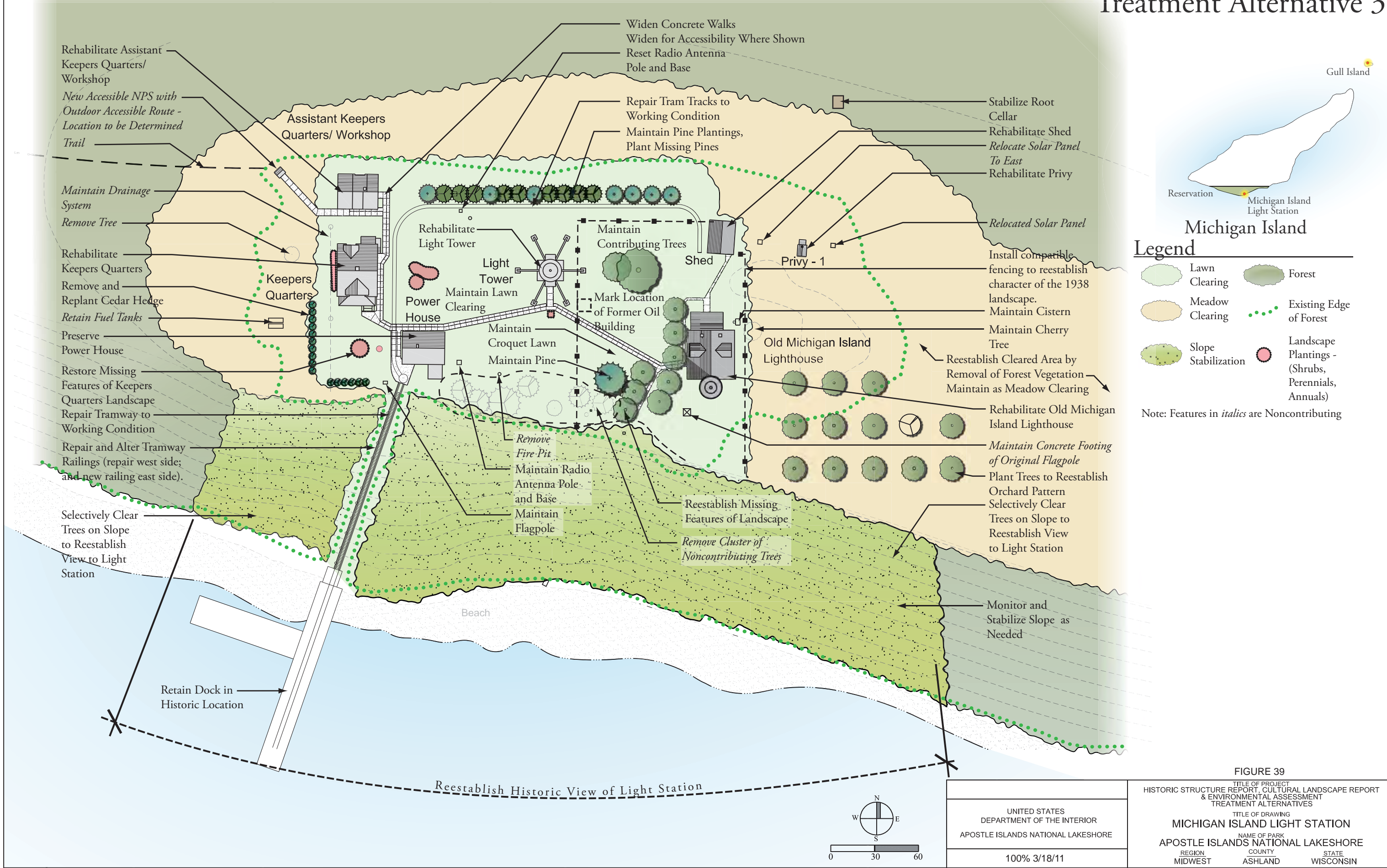


FIGURE 39

TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES		TITLE OF DRAWING MICHIGAN ISLAND LIGHT STATION	
UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE		NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE	
100% 3/18/11		REGION MIDWEST	STATE WISCONSIN

Outer Island Reservation Treatment Alternative 3

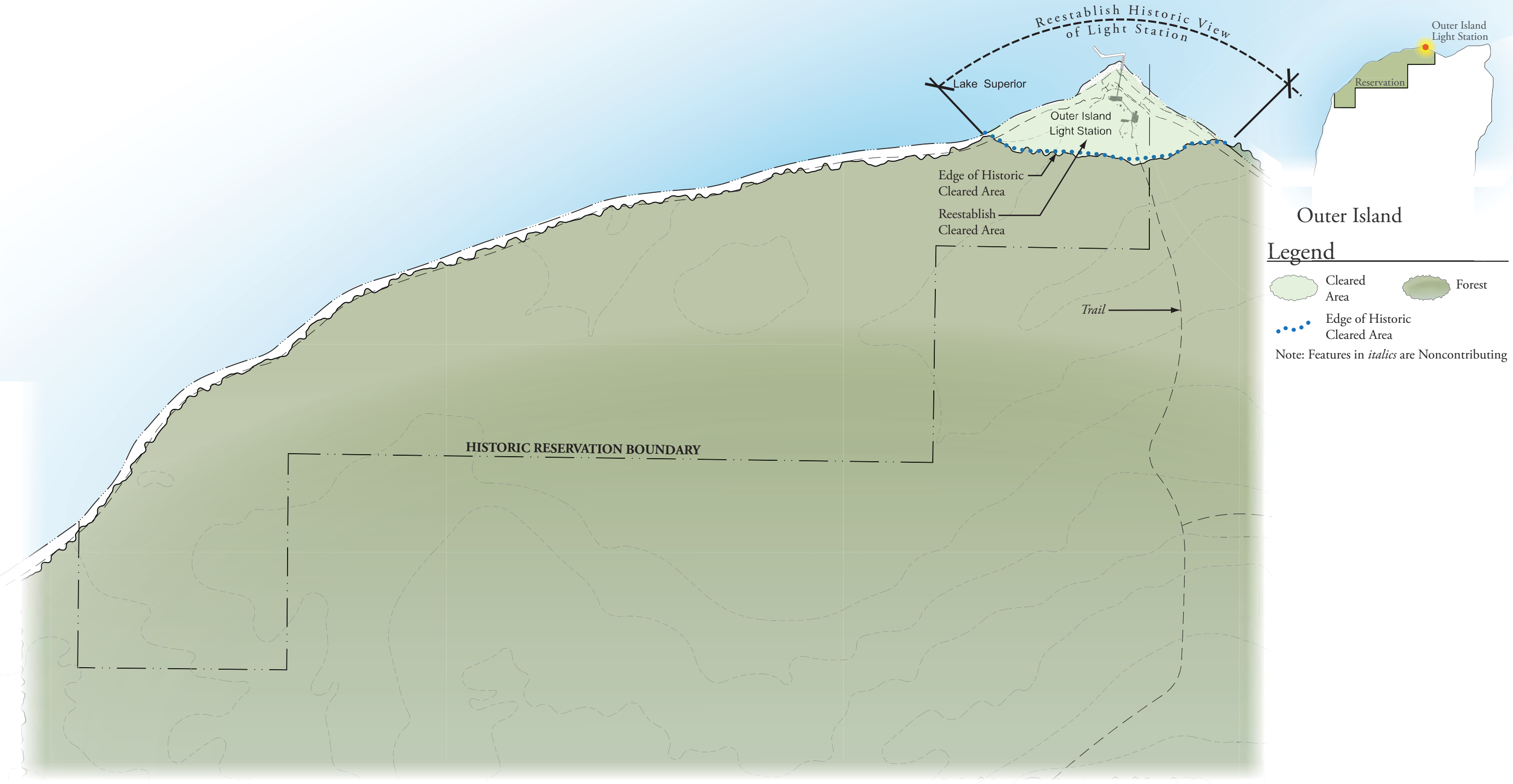


FIGURE 40

TITLE OF PROJECT
HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT
& ENVIRONMENTAL ASSESSMENT
TREATMENT ALTERNATIVES

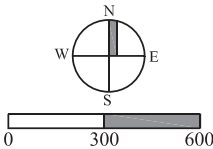
TITLE OF DRAWING
OUTER ISLAND - RESERVATION BOUNDARY

NAME OF PARK
APOSTLE ISLANDS NATIONAL LAKESHORE

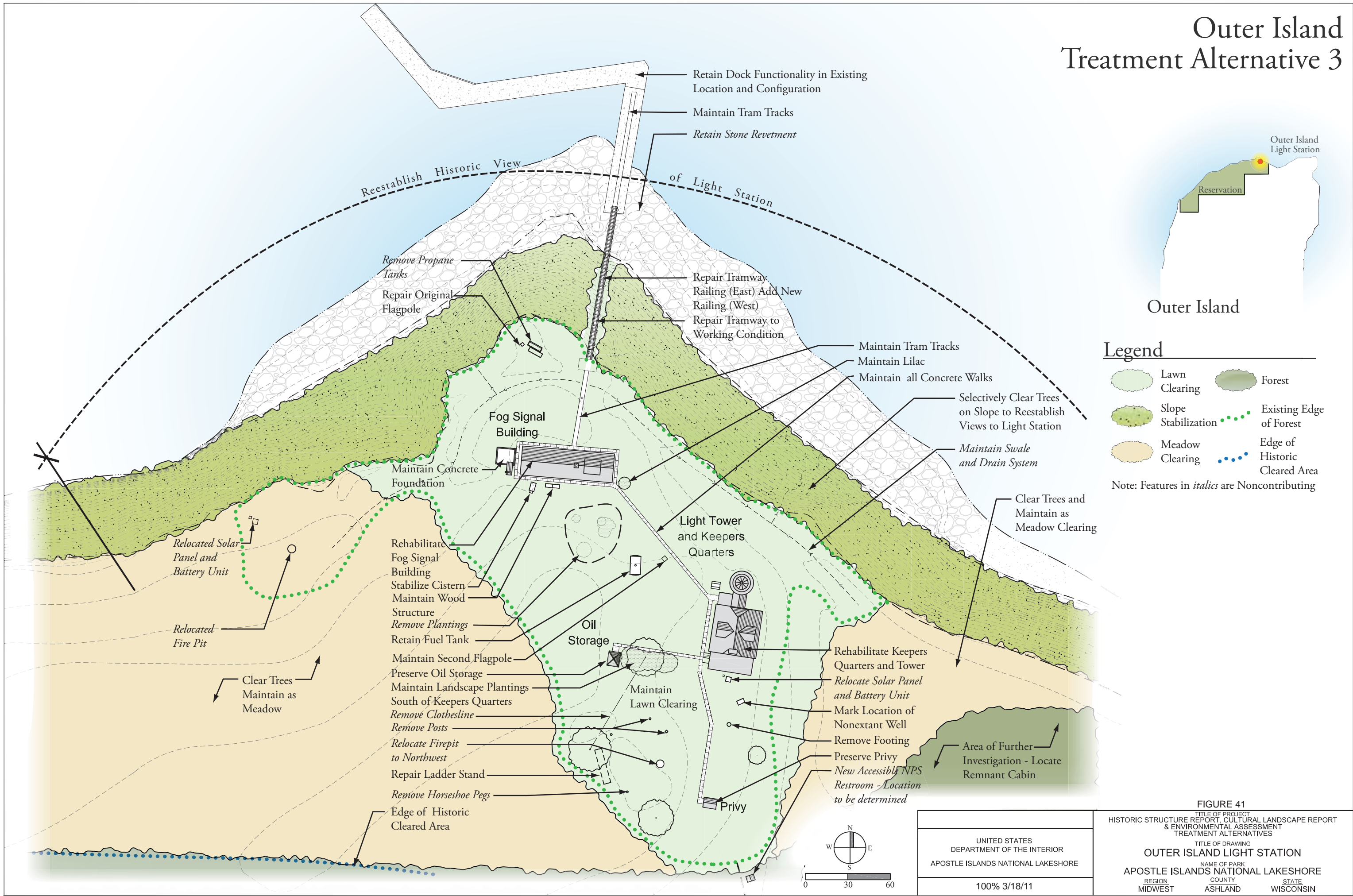
REGION COUNTY STATE
MIDWEST ASHLAND WISCONSIN

UNITED STATES
DEPARTMENT OF THE INTERIOR
APOSTLE ISLANDS NATIONAL LAKESHORE

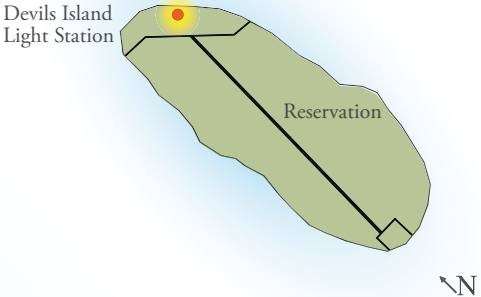
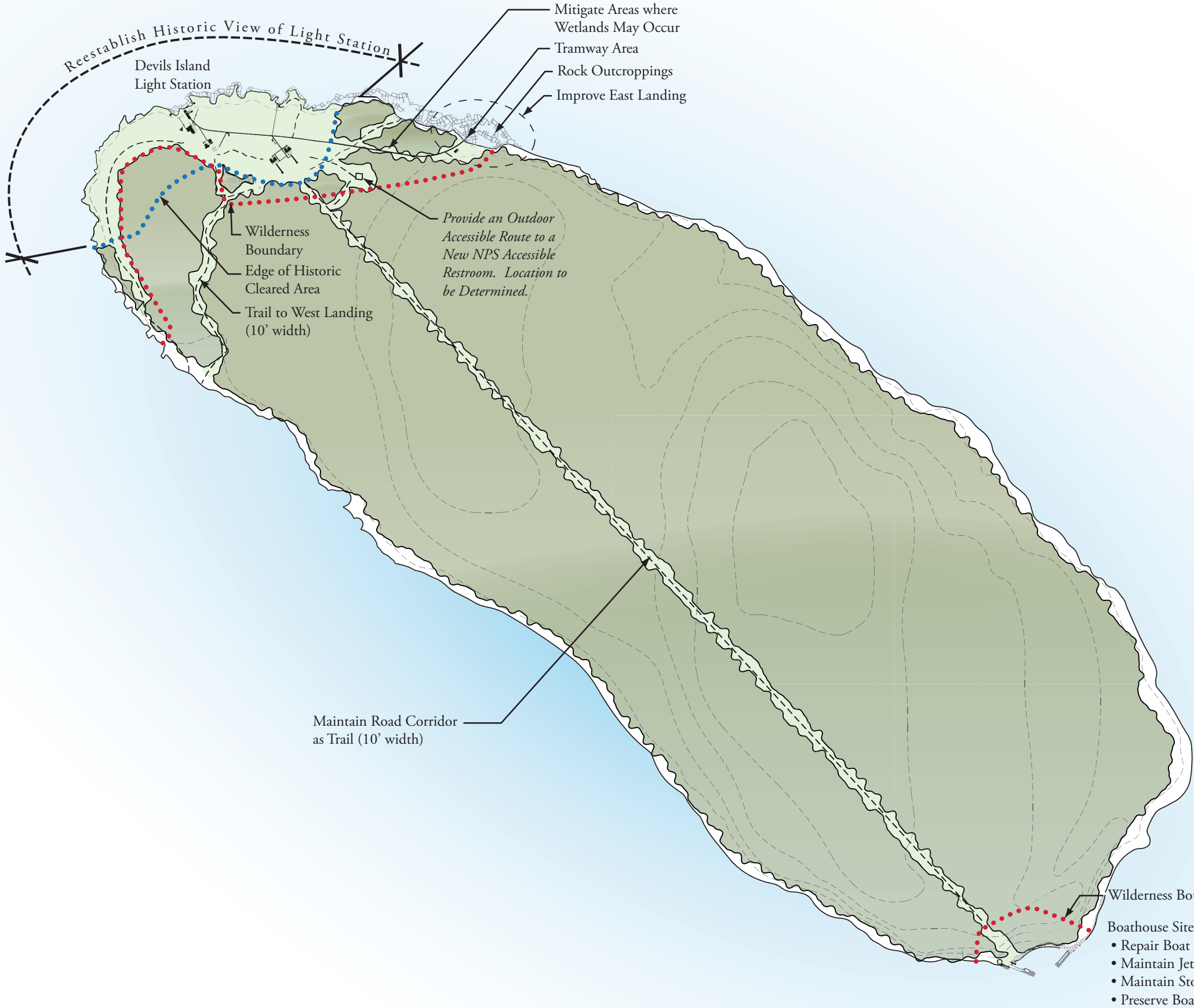
100% 3/18/11



Outer Island Treatment Alternative 3



Devils Island Reservation Treatment Alternative 3



Devils Island

Legend

- Cleared Area
- Forest
- Edge of Historic Cleared Area
- Wilderness Boundary

Note: Features in *italics* are Noncontributing

- Wilderness Boundary
- Boathouse Site
- Repair Boat Dock
 - Maintain Jetty
 - Maintain Stone Wall
 - Preserve Boathouse

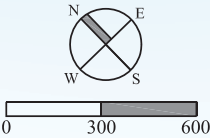
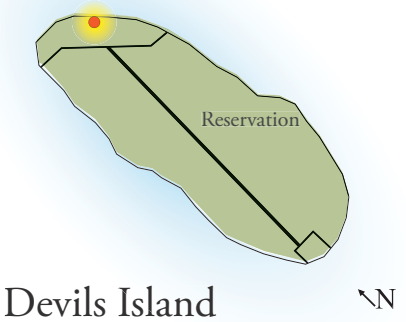
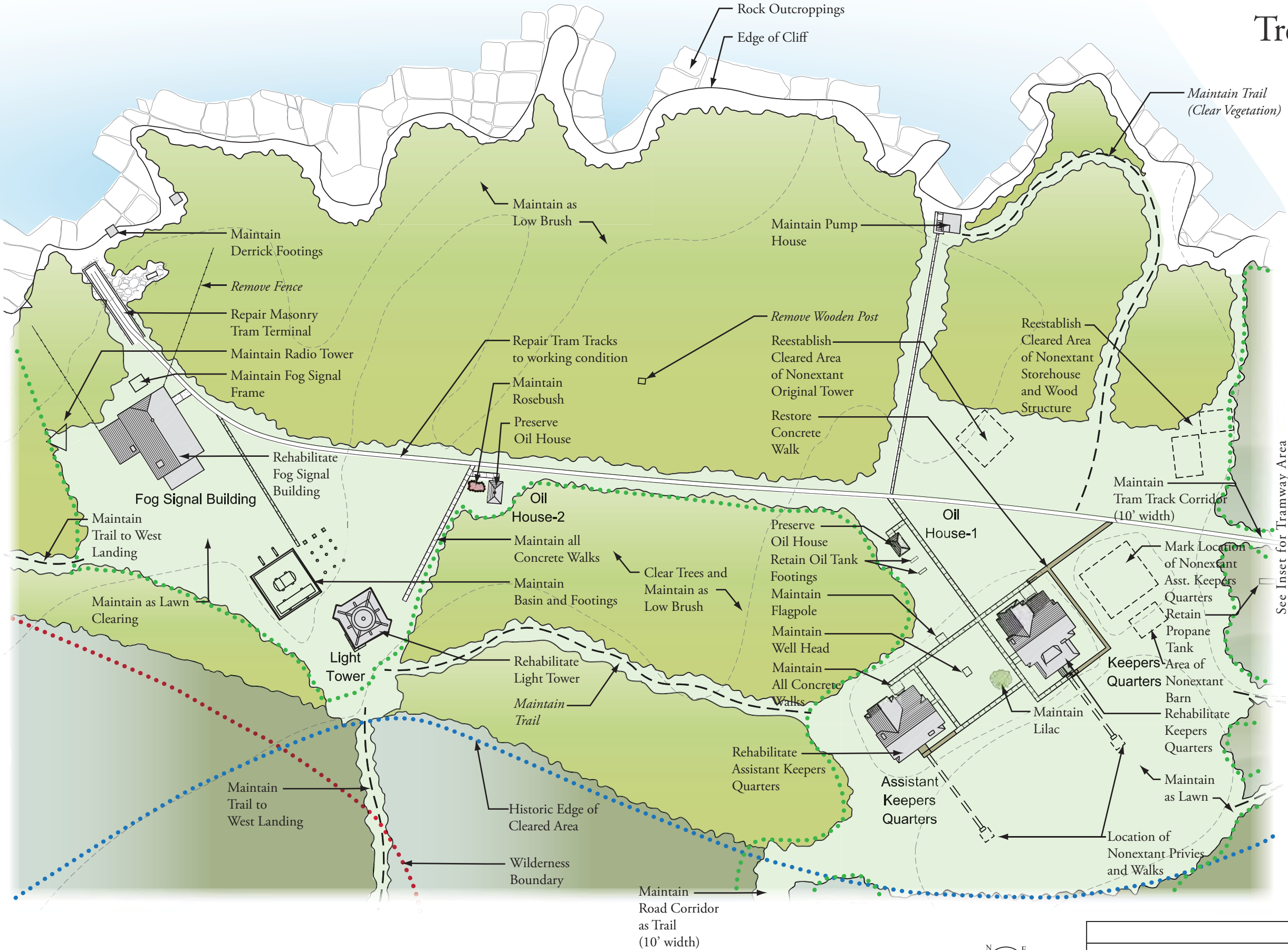


FIGURE 42		
TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES TITLE OF DRAWING		
DEVILS ISLAND		
NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE		
REGION MIDWEST	COUNTY ASHLAND	STATE WISCONSIN
UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE		
100% 3/18/11		

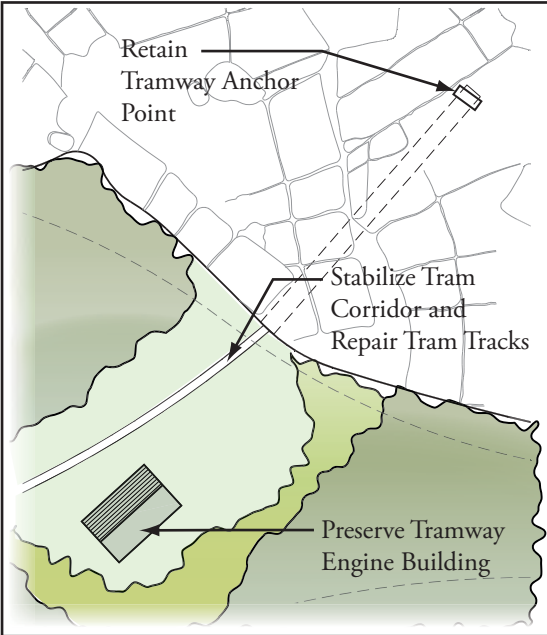
Devils Island
Treatment Alternative 3



Legend

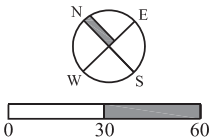
- Lawn Clearing
- Low Brush Clearing
- Edge of Historic Cleared Area
- Forest
- Wilderness Boundary
- Existing Edge of Forest

Note: Features in *italics* are Noncontributing



Tramway Area

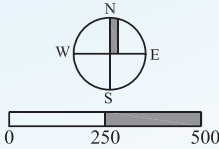
UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE	FIGURE 43 TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES		
	TITLE OF DRAWING DEVILS ISLAND LIGHT STATION		
	NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE		
	REGION MIDWEST	COUNTY ASHLAND	STATE WISCONSIN



Long Island Reservation Treatment Alternative 3

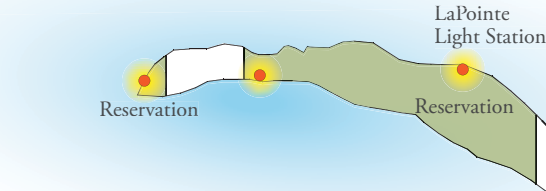
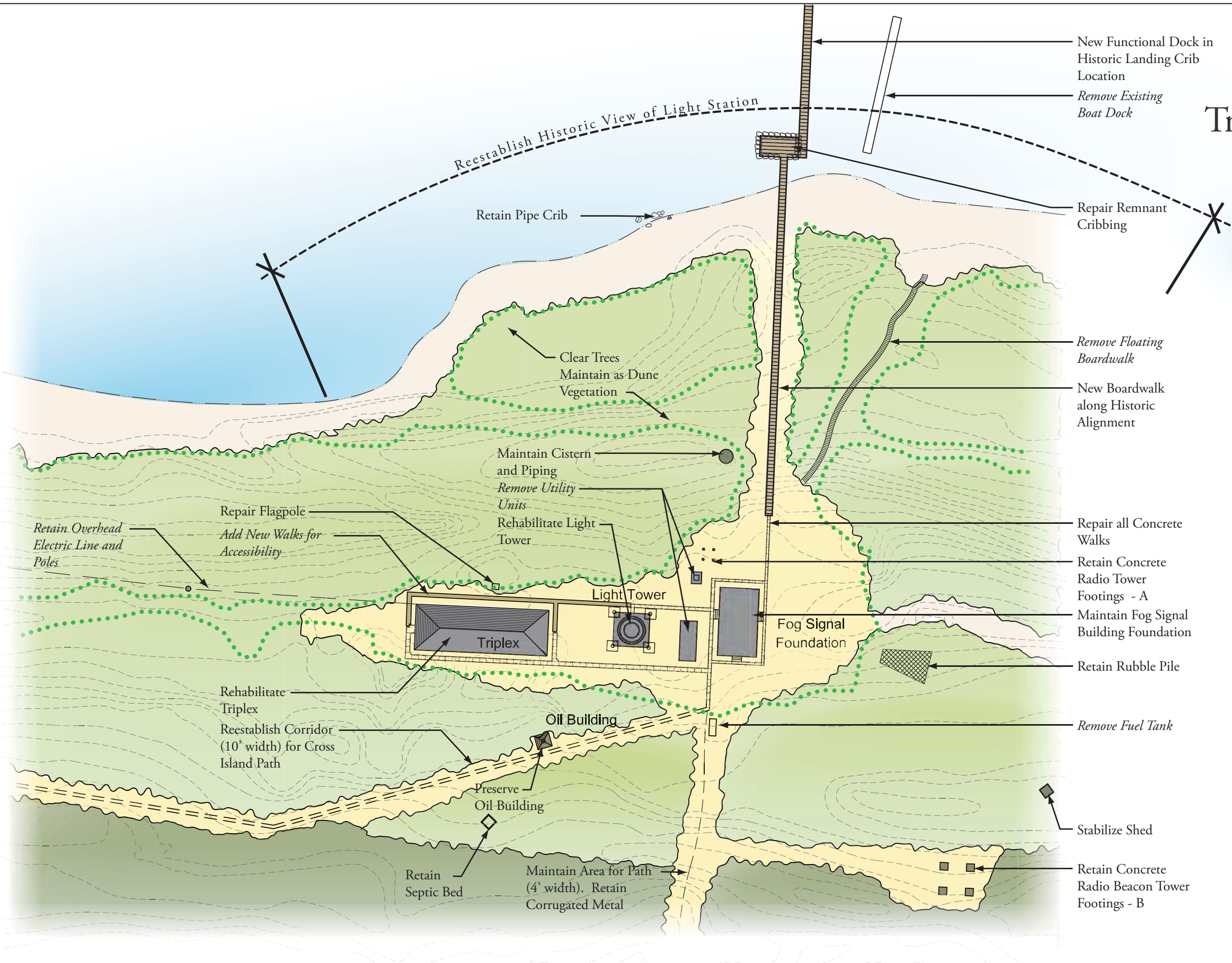


FIGURE 44



UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE	TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES		
	TITLE OF DRAWING LONG ISLAND - RESERVATION BOUNDARY		
	NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE		
	REGION MIDWEST	COUNTY ASHLAND	STATE WISCONSIN
100% 3/18/11			

Long Island LaPointe Site Treatment Alternative 3



Long Island

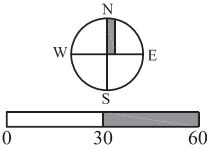
Legend

Dune Vegetation (not managed)	Forest
Managed Dune Vegetation	Sand
Existing Edge of Vegetation	

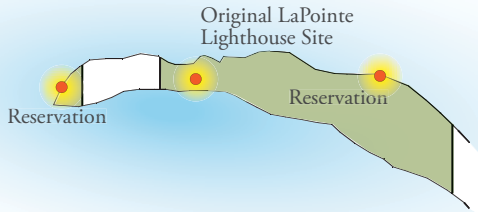
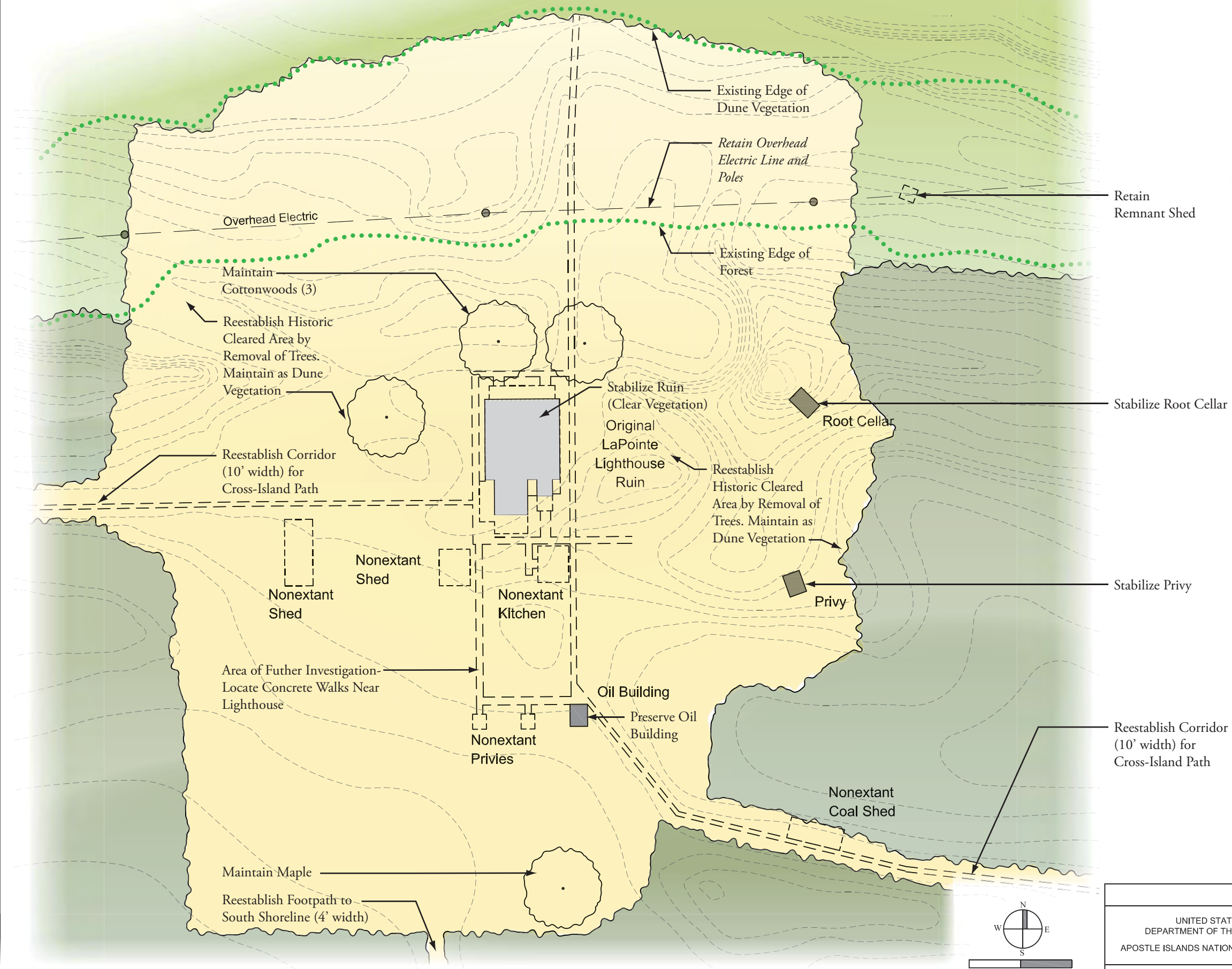
Notes:
1.) Features in *italics* are Noncontributing
2.) New Accessible NPS Restroom to be added. Location to be determined

FIGURE 45

UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE	TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES		
	TITLE OF DRAWING LONG ISLAND - LAPOINTE LIGHT STATION		
	NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE		
	REGION MIDWEST	COUNTY ASHLAND	STATE WISCONSIN
100% 3/18/11			



Long Island Original LaPointe Lighthouse Treatment Alternative 3



Long Island

Legend

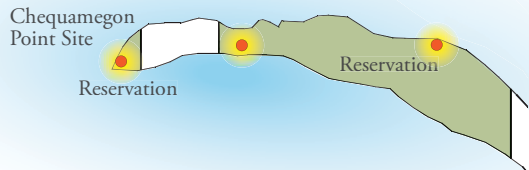
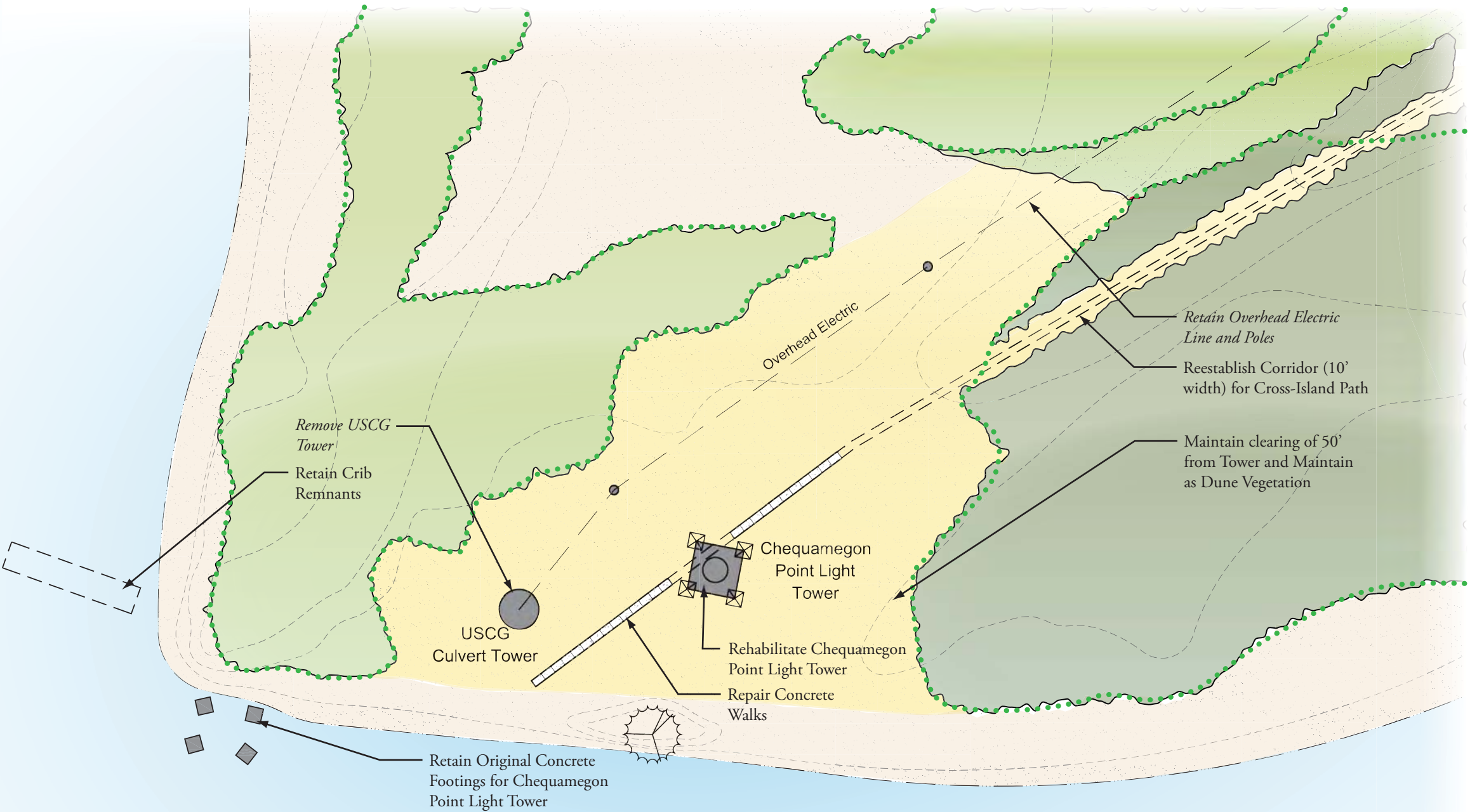
- Dune Vegetation (not managed)
- Managed Dune Vegetation
- Forest
- Existing Edge of Vegetation

Note: Features in *italics* are Noncontributing

FIGURE 46

TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES	
TITLE OF DRAWING LONG ISLAND-ORIGINAL LAPOINTE LTHOUSE SITE	
NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE	
REGION MIDWEST	STATE WISCONSIN
COUNTY ASHLAND	
100% 3/18/11	

Long Island
Chequamegon Point
Treatment Alternative 3

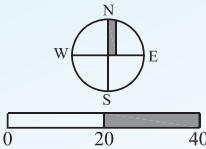


Long Island

Legend

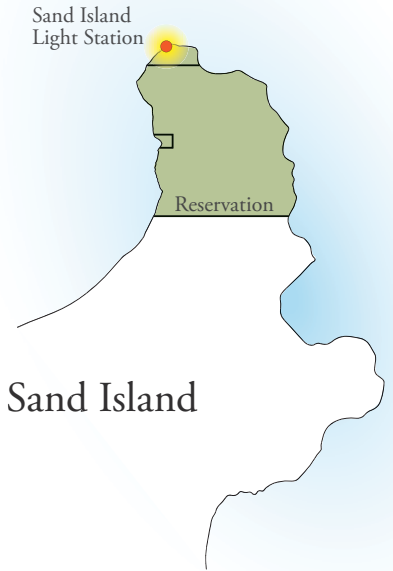
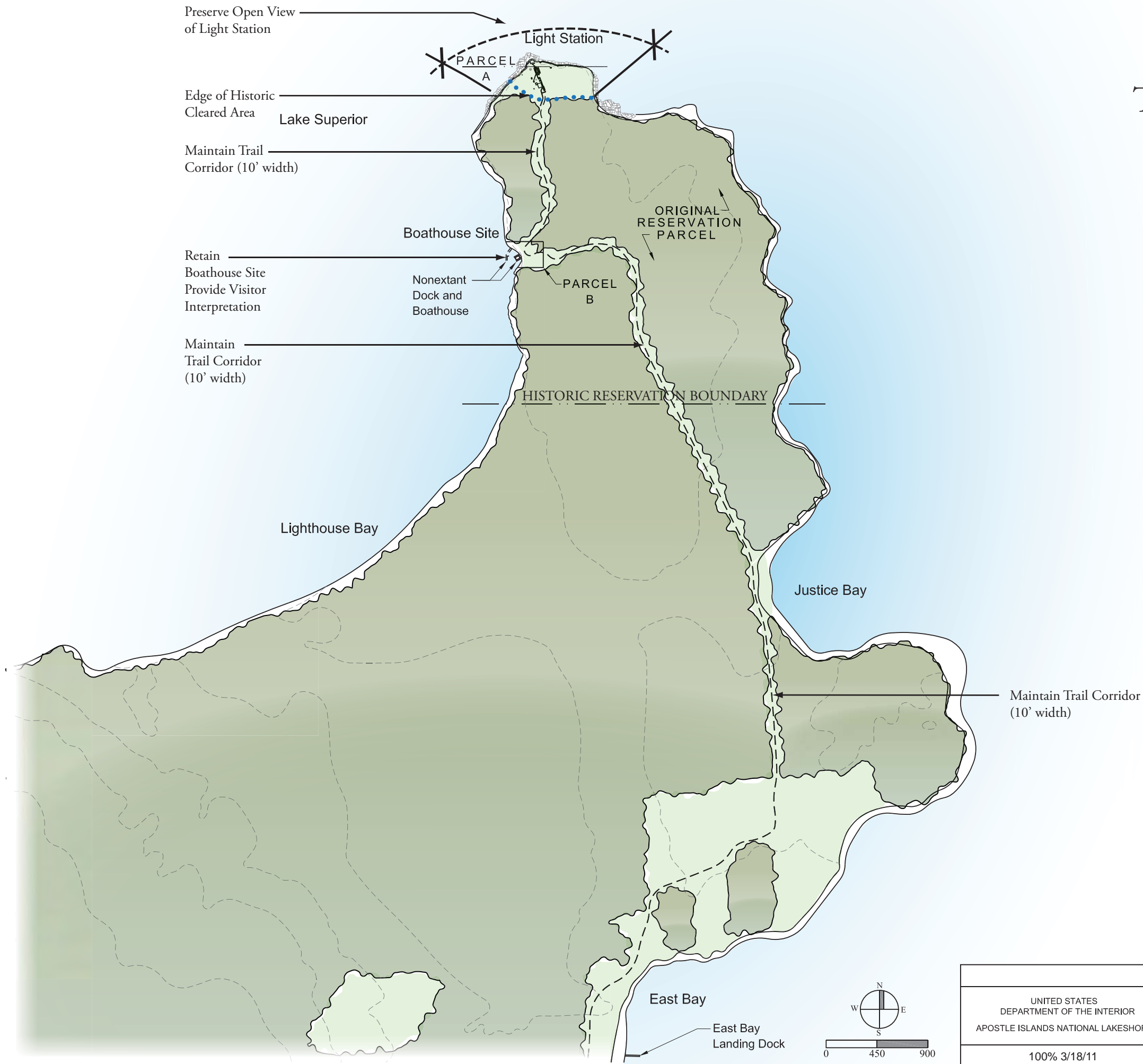
- Dune Vegetation (not managed)
- Managed Dune Vegetation
- Existing Edge of Vegetation
- Sand/ Beach
- Forest

Note: Features in *italics* are Noncontributing



UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE			FIGURE 47 TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES TITLE OF DRAWING LONG ISLAND - CHEQUAMEGON POINT SITE NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE REGION COUNTY STATE MIDWEST ASHLAND WISCONSIN		
100% 3/18/11					

Sand Island Reservation Treatment Alternative 3



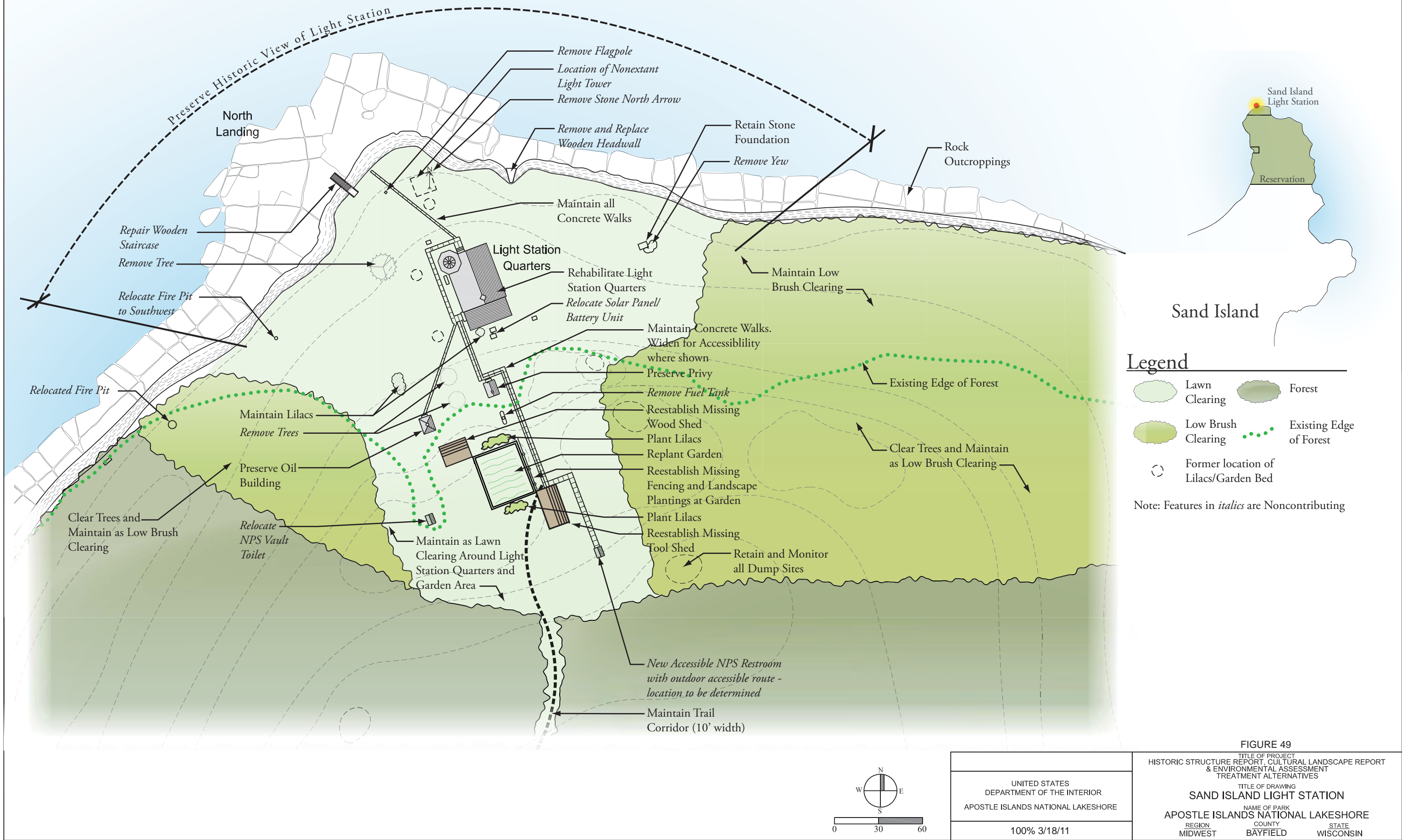
Legend

- Cleared Area
- Forest
- Edge of Historic Cleared Area

FIGURE 48		
TITLE OF PROJECT HISTORIC STRUCTURE REPORT, CULTURAL LANDSCAPE REPORT & ENVIRONMENTAL ASSESSMENT TREATMENT ALTERNATIVES		
TITLE OF DRAWING SAND ISLAND - RESERVATION BOUNDARY		
NAME OF PARK APOSTLE ISLANDS NATIONAL LAKESHORE		
REGION MIDWEST	COUNTY BAYFIELD	STATE WISCONSIN

UNITED STATES DEPARTMENT OF THE INTERIOR APOSTLE ISLANDS NATIONAL LAKESHORE
100% 3/18/11

Sand Island Treatment Alternative 3



ALTERNATIVES COMPARISON TABLES

A comparison of the alternatives and the degree to which each alternative fulfills the needs and objectives of the proposed project is summarized in Table 2. Treatment recommendations for contributing and noncontributing features by alternative are summarized in Table 3.

TABLE 2. ALTERNATIVES COMPARISON

Comparison Factor	No Action Alternative	Treatment Alternative 1	Treatment Alternative 2 (Preferred)	Treatment Alternative 3
General Treatment Approach	The no action alternative stresses maintaining and stabilizing existing resources to retard rapid deterioration and prevent catastrophic loss. Repairs are prioritized according to greatest need according to cyclical risk assessments. Weatherproofing methods and emergency repair takes precedence over restoration and rehabilitation.	This approach demonstrates greater commitment to preserving resources with more aggressive application of Secretary of Interior Standards to preservation treatments. Preservation is aimed a longer range protection and attention to restorative work. A more robust maintenance program is a result. The focus is on physical resources with no, or limited, integration of interpretive program objectives and rehabilitation work.	This approach features long range treatments leading to final restoration and rehabilitation of the structures and landscapes of each site. Full compliance with Secretary of Interior Standards for Preservation Treatment of Historic Resources, including more research and analysis in advance of construction. Project outcomes would satisfy the draft general management plan goals as final stage work. Work on sites and facilities would be prioritized based on overall park phasing plan and funding to implement work.	This approach seeks full and final reversal of site and facility impacts. Like Alternative 2, adherence to Secretary of Interior Standards is paramount. The outcome represents the full integration of partner goals for this park and project, including environmental restoration, interpretive effects, rehabilitated uses, and park operations support. Solutions represent compatibility among a diverse set of site use agendas and impacts into the future.
Treatment Elements				
Number of Buildings Open to the Public (including guided, self-guided, limited, and Plexiglas visibility)	6	6	13	17
Structures Suitable for Use as Park Staff/Volunteer Housing	4	4	4	5

ALTERNATIVES

Comparison Factor	No Action Alternative	Treatment Alternative 1	Treatment Alternative 2 (Preferred)	Treatment Alternative 3
Number of Full Time Equivalent (FTE) Maintenance and Interpretive Staff Required Above Baseline	0	0.6	1.2	1.9
Additional Water and Sanitation	0	0	1	3
Contributing Landscape Features Preserved, Rehabilitated, or Restored and Noncontributing Landscape Features Removed	0	124	135	145
Total Acres Cleared to Represent Historically Cleared Areas (percent of total historically cleared areas)	10.7 acres (19%) (current conditions)	19 acres (34%)	27.6 acres (49%)	44.7 acres (79%)
Acres of Selective Tree Removal on Shoreline Bluffs to Manage for Views to Buildings	0	1.15 acre	3.1 acres	3.2 acres
Extent to Which Each Alternative Meets Treatment Objectives				
Protect Cultural and Natural Resources <ul style="list-style-type: none"> • Improve conditions of historic buildings and structures • Accurately represent cultural landscape features • Accurately represent historic clearing and associated viewsheds • Minimize erosion potential at sites • Minimize impacts of exotic invasive species 	<p>The no action alternative would not adequately fulfill this project objective. The conditions of historic buildings and structures would not be improved. Cultural landscape features and historic viewsheds would not be accurately represented.</p> <p>The no action alternative would have a minimal effect on erosion and impacts from exotic invasive species.</p>	<p>Alternative 1 would partially fulfill this objective because historic buildings and structures would be improved by preservation measures, but structures would not be restored. Standards and guidelines would be in place for repairs, maintenance, and improvements to historic structures and cultural landscapes.</p> <p>Cultural landscape features and the historic clearing and viewsheds would not be accurately represented.</p> <p>Includes the lowest increased risk of erosion and impacts from exotic species.</p>	<p>Alternative 2 would meet this objective by preserving and rehabilitating historic buildings and structures. Standards and guidelines would be in place for repairs, maintenance, and improvements to historic structures and cultural landscapes.</p> <p>Cultural landscapes and historic viewsheds would be represented in a substantially accurate way.</p> <p>Includes increased risk of erosion and impacts from exotic species that is higher than alternative 1 and about the same as alternative 3.</p>	<p>Alternative 3 would meet this objective by preserving and rehabilitating historic buildings and structures. Standards and guidelines would be in place for repairs, maintenance, and improvements to historic structures and cultural landscapes.</p> <p>Cultural landscapes and historic viewsheds would be represented in a substantially accurate way.</p> <p>Includes increased risk of erosion and impacts from exotic species that is higher than alternative 1 and about the same as alternative 2.</p>

Comparison Factor	No Action Alternative	Treatment Alternative 1	Treatment Alternative 2 (Preferred)	Treatment Alternative 3
Provide for Visitor Enjoyment and Safety <ul style="list-style-type: none"> • Provide a high quality (authentic) visitor experience • Minimize impacts to visitor experience during rehabilitation activities 	<p>The no action alternative would not fulfill this objective because there would be no changes to historic buildings, structures, cultural landscapes, or viewsheds that would provide a more authentic experience for the public.</p>	<p>Alternative 1 would partially meet this objective by making minor improvements to the authenticity of the representation of cultural landscapes and historic viewsheds. This would improve visitor experience.</p> <p>Alternative 1 would have some potential to have short-term effects on visitor experience during the work, but by timing work to off peak seasons as much as practicable, impacts to visitors would be minimized.</p>	<p>Alternative 2 would meet this objective. Historic structures and buildings would be preserved and restored to substantially authentic conditions. A variety of buildings would be open to visitors, which would provide a quality experience.</p> <p>Cleared areas and viewsheds would be substantially restored to represent historic conditions.</p> <p>Alternative 2 would have the potential to have short-term effects on visitor experience during the work, but by timing work to off peak seasons as much as practicable, Alternative 2 would minimize impacts to visitors during implementation.</p>	<p>Alternative 3 would meet this objective. Historic structures and buildings would be preserved and rehabilitated to substantially authentic conditions. A variety of buildings would be open to visitors, which would provide a quality experience.</p> <p>Cleared areas and viewsheds would be substantially restored to represent historic conditions.</p> <p>The length of time necessary to implement this alternative would have the highest probability of short-term effects on visitors during work, but by timing work to off peak seasons as much as practicable, impacts would be minimized.</p>

ALTERNATIVES

Comparison Factor	No Action Alternative	Treatment Alternative 1	Treatment Alternative 2 (Preferred)	Treatment Alternative 3
Improve Efficiency of Park Operations <ul style="list-style-type: none"> • Minimize operational effort • Reduce exposure to hazardous materials • Provide basic staff amenities at housing • Minimize nonrenewable energy usage (and carbon footprint) 	<p>The no action alternative partially meets this objective. It would minimize operational effort and use of nonrenewable energy, but it would not reduce exposure to hazardous materials, and staff amenities would remain primitive.</p> <p>Under the no action alternative, there would be no increase in the use of nonrenewable energy.</p>	<p>Alternative 1 partially meets this objective.</p> <p>Operational efforts would increase by about 0.6 FTEs above baseline conditions.</p> <p>There would be some reduction in exposure to hazardous materials.</p> <p>Staff amenities would remain primitive.</p> <p>The use of nonrenewable energy would be similar to the no action alternative because trips for improvements and maintenance would be similar to current conditions. Use would be minimized by combining trips to the islands and using hand tools when possible.</p>	<p>Alternative 2 partially meets this objective.</p> <p>Operational efforts would increase by about 1.2 FTE.</p> <p>Exposure to hazardous materials would be substantially reduced and staff amenities would be added at one location.</p> <p>The use of nonrenewable energy would be higher than the no action alternative because additional trips for improvements and maintenance would necessary. Use would be minimized by combining trips to the islands and using hand tools when possible.</p>	<p>Alternative 3 partially meets this objective.</p> <p>Operational efforts would increase by about 1.9 FTEs above baseline conditions.</p> <p>Exposure to hazardous materials would be substantially reduced and staff amenities would be added at three locations.</p> <p>The use of nonrenewable energy would be highest under this alternative because additional trips for improvements and maintenance would necessary and additional propane would be used for staff housing. Use would be minimized by combining trips to the islands and using hand tools when possible.</p>

TABLE 3. TREATMENT OF CONTRIBUTING FEATURES AND NONCONTRIBUTING FEATURES BY ALTERNATIVE

Michigan Island	No Action Alternative	Treatment Alternative 1	Treatment Alternative 2	Treatment Alternative 3
Contributing Features				
Old Michigan Island Lighthouse		Preserve	Rehabilitate	Rehabilitate
Michigan Island Second Tower		Preserve	Rehabilitate	Rehabilitate
Keepers Quarters		Preserve	Rehabilitate	Rehabilitate
Assistant Keepers Quarters and Workshop		Preserve	Preserve	Rehabilitate
Power House		Preserve	Preserve	Preserve
Shed		Preserve	Preserve	Rehabilitate
Privy		Preserve	Rehabilitate	Rehabilitate
Light Station Cleared Area		Restore (1.3 acres)	Restore (2.2 acres)	Restore (3.6 acres)
Selective Tree Removal on Shoreline Bluffs		Restore (0.4 acre)	Restore (1.8 acres)	Restore (1.4 acres)
Tramway		Repair	Repair	Repair
Tram Tracks		Preserve/Stabilize	Repair	Repair
Tram Turntable		Repair	Rehabilitate	Retain
Concrete Walks		Maintain/Rehab.	Maintain/Rehab.	Maintain/Rehab.
Root Cellar		Stabilize	Stabilize	Stabilize
Radio Antenna Poles/Bases		Retain	Maintain	Maintain
Cistern		Maintain	Maintain	Maintain
Flagpole		Maintain	Maintain	Maintain
Landscape Plantings		Maintain	Restore Features	Restore Features
Orchard Plantings		Maintain	Restore Pattern	Restore Pattern
Noncontributing Features				
Boat Dock		Retain location	Retain location	Retain location
NPS Contemporary Vault Toilet		Retain	Retain	Retain
Solar Panel		Relocate	Relocate	Relocate
Park Signs		Retain	Retain	Retain
Fuel Tanks		Retain	Retain	Retain
Fire Pit		Remove	Remove	Remove
Hiking Trail		Retain	Retain	Retain
Noncontributing Trees		Remove	Remove	Remove

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Outer Island	No Action Alternative	Treatment Alternative 1	Treatment Alternative 2	Treatment Alternative 3
Contributing Features				
Outer Island Tower		Preserve	Rehabilitate	Rehabilitate
Keepers Quarters		Preserve	Rehabilitate	Rehabilitate
Fog Signal Building		Preserve	Rehabilitate	Rehabilitate
Oil Storage		Preserve	Preserve	Preserve
Privy		Preserve	Preserve	Preserve
Boat Dock		Retain	Retain	Retain
Remnant Cabin		Preserve	Preserve	Preserve
Tramway		Repair	Repair	Repair
Tram Tracks		Maintain	Maintain	Maintain
Concrete Walks		Maintain	Maintain	Maintain
Light Station Cleared Area		Restore (< 0.1 acre)	Restore (1.2 acres)	Restore (6 acres)
Selective Tree Removal on Shoreline Bluffs		Restore (0.8 acre)	Restore (1.3 acres)	Restore (1.8 acres)
Fuel Tank		Retain	Retain	Retain
Concrete Foundation		Maintain	Maintain	Maintain
Cistern		Stabilize	Stabilize	Stabilize
Original Flagpole		Maintain	Repair	Repair
Ladder Stand		Repair	Repair	Repair
Landscape Plantings		Maintain	Maintain	Maintain
Noncontributing Features				
Drainage Swale		Maintain	Maintain	Maintain
NPS Contemporary Vault Toilet		Replace	Replace	Replace
Solar Panel		Retain	Retain	Relocate
Propane Tanks		Remove	Remove	Remove
Park Signs		Retain	Retain	Retain
Fire Pit		Relocate	Relocate	Relocate
Clothesline		Remove	Remove	Remove
Noncontributing Plantings		Remove	Remove	Remove

Devils Island	No Action Alternative	Treatment Alternative 1	Treatment Alternative 2	Treatment Alternative 3
Contributing Features				
Light Station Tower		Preserve	Rehabilitate	Rehabilitate
Keepers Quarters		Preserve	Rehabilitate	Rehabilitate
Assistant Keepers Quarters		Preserve	Rehabilitate	Rehabilitate
Fog Signal Building		Preserve	Rehabilitate	Rehabilitate
Oil House #1		Preserve	Preserve	Preserve
Oil House # 2		Preserve	Preserve	Preserve
Tramway Engine Building		Preserve	Preserve	Preserve
Boathouse		Preserve	Preserve	Preserve
Boat Dock		Repair	Repair	Repair
Pump House		Stabilize	Maintain	Maintain
Light Station Cleared Area		Restore (4.0 acres)	Restore (9.0 acres)	Restore (10.5 acres)
Tram Tracks		Preserve/Stabilize	Preserve/Stabilize	Rehabilitate
Tramway Anchor Point		Retain	Retain	Retain
Stone Tram Terminal		Stabilize	Repair	Repair
Road Corridor		Maintain	Maintain	Maintain
Concrete Walks		Maintain	Maintain	Maintain/Restore
Derrick Footings		Stabilize	Stabilize	Maintain
Radio Tower		Maintain	Maintain	Maintain
Beacon Light		Maintain	Maintain	Maintain
Concrete Basin/Fuel Tanks/Footings		Maintain	Maintain	Maintain
Oil Tank Footings		Retain	Retain	Retain
Well Head		Maintain	Maintain	Maintain
Flagpole		Maintain	Maintain	Maintain
Landscape Plantings		Maintain	Maintain	Maintain
Noncontributing Features				
NPS Contemporary Vault Toilet		Replace	Replace	Replace
Solar Panel		Relocate	Relocate	Relocate
Park Signs		Retain	Retain	Retain
Chain Link Fence		Remove	Remove	Remove
Hiking Trail		Maintain	Maintain	Maintain
Wooden Post		Remove	Remove	Remove
Noncontributing Trees		Remove	Remove	Remove

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Long Island	No Action Alternative	Treatment Alternative 1	Treatment Alternative 2	Treatment Alternative 3
Contributing Features				
Cleared Area		Restore (2.8 acres)	Restore (3.5 acres)	Restore (11.5 acres)
Connecting Corridor Between Stations		No Action	Reestablish	Reestablish
LaPointe				
LaPointe Light Tower		Preserve	Rehabilitate	Rehabilitate
Chequamegon Point Lighthouse		Preserve	Rehabilitate	Rehabilitate
Triplex		Preserve	Preserve	Rehabilitate
Oil Building		Preserve	Preserve	Preserve
Boat Dock		Maintain	Maintain	Remove and Replace
Fog Signal Building Foundation		Maintain	Maintain	Maintain
Shed		Stabilize	Stabilize	Stabilize
Flagpole		Repair	Repair	Repair
Concrete Walks		Maintain	Repair	Repair
Footpath to Bay		Maintain	Maintain	Maintain
Boardwalk		Remove	Remove	Remove
Concrete Footings		Retain	Retain	Retain
Cistern		Maintain	Maintain	Maintain
Pipe Crib		Retain	Retain	Retain
Rubble Piles		Retain	Retain	Retain
Original Lighthouse				
Original Lighthouse Ruin		Stabilize	Stabilize	Stabilize
Oil Building		Preserve	Preserve	Preserve
Root Cellar		Stabilize	Stabilize	Stabilize
Privy		Stabilize	Stabilize	Stabilize
Footpath to Bay		No Action	No Action	Reestablish
Chequamegon Point				
Concrete Walks		Maintain	Maintain	Repair
Crib Remnants		Retain	Retain	Retain
Concrete Footings		Retain	Retain	Retain

Long Island	No Action Alternative	Treatment Alternative 1	Treatment Alternative 2	Treatment Alternative 3
Noncontributing Features				
Culvert Light Tower (Chequamegon Point)		Remove	Remove	Remove
Floating Boardwalk (LaPointe)		Remove	Retain/Relocate	Remove
Electric Line and Poles		Retain	Retain	Retain
Utility Unit		Remove	Remove	Remove
Fuel Tank		Retain	Remove	Remove

Sand Island	No Action Alternative	Treatment Alternative 1	Treatment Alternative 2	Treatment Alternative 3
Contributing Features				
Sand Island Light Station Quarters		Preserve	Restore	Rehabilitate
Oil Building		Preserve	Preserve	Preserve
Privy		Preserve	Preserve	Preserve
Cleared Area		Restore (0.4 acre)	Restore (1.0 acre)	Restore (2.3 acres)
Concrete Walks		Maintain/Rehab.	Maintain/Rehab.	Maintain/Rehab.
Dump Sites		Retain	Retain	Retain
Wood Shed/Tool Shed		No Action	No Action	Restore
Stone Foundation		Retain	Retain	Retain
Landscape Plantings		Maintain	Maintain	Restore
Fencing at Garden		No Action	Restore	Restore
Noncontributing Features				
NPS Vault Toilet		Replace	Replace	Replace
Solar Panel		Retain	Relocate	Relocate
Park Signs		Retain	Retain	Retain
Stone North Arrow		Remove	Remove	Remove
Wooden Headwall		Retain	Replace	Replace
Flagpole		Retain	Remove	Remove
Fire Pit		Retain	Relocate	Relocate
Hiking Trail		Maintain	Maintain	Maintain
Noncontributing Trees		Remove	Remove	Remove

MITIGATION

NPS places strong emphasis on avoiding, minimizing, and mitigating potentially adverse environmental impacts. To help ensure the protection of natural and cultural resources and the quality of the visitor experience, the following protective measures would be implemented as part of the selected action alternative (Table 4). NPS would implement an appropriate level of monitoring throughout the construction process to help ensure that protective measures are being properly implemented and are achieving their intended results.

TABLE 4. MITIGATION MEASURES FOR ALL ACTION ALTERNATIVES

Resource Area	Mitigation
General Considerations	<p>Where necessary for resource or visitor protection, work areas would be identified with construction fence, silt fence, or some similar material prior to any activity. The fencing would define the work zone and confine activity to the minimum area required. All protection measures would be clearly stated in the construction specifications, and workers would be instructed to avoid conducting activities beyond the work zone. Disturbances would be limited to areas inside the designated construction limits. No machinery or equipment would access areas outside the work limits.</p> <p>Construction equipment staging would occur within previously disturbed areas as much as possible. All staging and stockpiling areas would be returned to preconstruction conditions following construction.</p> <p>Contractors would be required to properly maintain construction equipment (i.e., mufflers and brakes) to minimize noise.</p> <p>All tools, equipment, barricades, signs, surplus materials, and rubbish would be removed from the project work limits upon project completion.</p>
Geology and Coastal Processes	<p>In addition to mitigation measures described to protect water quality and soils, erosion on the shoreline bluffs of Michigan and Outer islands will be monitored. If the banks show unacceptable levels of instability, biostabilization techniques will be used to stabilize the banks. Additional measures such as redirecting surface flows at the top of the banks or installing erosion control mat would also be used if needed.</p>
Vegetation, Including Wetlands	<p>All disturbed ground would be reclaimed using appropriate BMPs including planting native plants. Until the soil is stable and vegetation is established, erosion-control measures would be implemented to minimize erosion and prevent sediment from reaching streams and the lake.</p> <p>Temporary barriers would be provided to protect existing trees, plants, and root zones. Trees or other plants would not be removed, injured, or destroyed without prior approval.</p> <p>To prevent the introduction of, and minimize the spread of, nonnative vegetation and noxious weeds, the following measures would be implemented during construction:</p> <ul style="list-style-type: none"> • Where needed, work limits would be established in wetland areas along the Devils Island tram track for work in this area. • Soil disturbance would be minimized. • All construction equipment would be pressure washed and/or steam cleaned before entering the park to ensure that all equipment, machinery, rocks, gravel, and other materials are cleaned and weed free. • Staging areas outside the park would be surveyed for noxious weeds and treated appropriately prior to use. • All fill, rock, and additional topsoil would be obtained from stockpiles from previous projects or excess material from this project, if possible. If not available, then weed-free fill, rock, or additional topsoil would be obtained from sources outside the park to the maximum extent possible. NPS personnel would certify that the source is weed free. • Monitoring and follow-up treatment of exotic vegetation would occur after project activities are completed.

Resource Area	Mitigation
Water Quality and Soils	<p>Erosion-control BMPs for drainage and sediment control, as identified and used by NPS, including those in NPS Procedural Manual #77-1: Wetland Protection, would be implemented to prevent or reduce nonpoint source pollution and minimize soil loss and sedimentation in drainage areas.</p> <p>These practices may include, but are not limited to, silt fencing, filter fabric, temporary sediment ponds, check dams of pea gravel-filled burlap bags or other material, and/or immediate mulching of exposed areas to minimize sedimentation and turbidity impacts as a result of construction activities. The placement and specific measures used would be dictated to a large degree by the steep topography in some parts of the project area. Silt fencing fabric would be inspected daily during project work, and weekly after project completion, until removed. Accumulated sediments would be removed when the fabric is estimated to be approximately 75% full. Silt removal would be accomplished in such a way as to avoid introduction into any water bodies.</p> <p>Regular site inspections would be conducted to ensure that erosion-control measures are properly installed and functioning effectively.</p> <p>The operation of ground-disturbing equipment would be temporarily suspended during large precipitation events to reduce the production of sediment that may be transported to wetlands, streams, or lakes.</p> <p>In the unlikely event there would be more than 1 acre of ground disturbance at a construction site, a storm water pollution prevention plan (SWPPP) would be developed and approved by the park and submitted to the Wisconsin Department of Natural Resources prior to commencing any activities.</p> <p>All equipment would be maintained in a clean and well-functioning state to avoid or minimize contamination from fluids and fuels. Prior to starting work each day, all machinery would be inspected for leaks (e.g., fuel, oil, and hydraulic fluid); and all necessary repairs would be made before commencing work.</p> <p>A hazardous spill plan would be required from the contractor prior to the start of construction that states what actions would be taken in the case of a spill, and preventive measures to be implemented. Hazardous spill clean-up materials would be on-site at all times. This measure is designed to avoid/minimize the introduction of chemical contaminants associated with machinery (e.g., fuel, oil, and hydraulic fluid) used in project implementation.</p>
Wildlife	<p>No construction activities would occur from 7 P.M. to 5 A.M. to minimize impacts to wildlife that are most active at dawn and dusk. These hours would be adjusted by the park biologist seasonally for varying day lengths. Other construction restrictions for special status species, described below, also would protect wildlife.</p> <p>Lights used for night construction activities would be shielded and directed downward to minimize the areas impacted by the artificial light, and to avoid light pollution.</p> <p>Openings made in walls or other structural components that expose potential roosting areas for bats to enter will be screened or netted to prevent bats from being inadvertently closed into structures.</p> <p>The construction contractor would be required to keep all garbage and food waste contained and removed periodically from the work site to avoid attracting wildlife into the construction zone. Construction workers would be instructed to remove food scraps and not feed or approach wildlife.</p>
Special Status Species	<p>Sensitive plant surveys would be conducted prior to disturbance of any suitable habitat. If sensitive species are found, the area would be avoided (if practicable) and mitigation measures, such as establishing buffer areas, would be implemented to minimize impacts. Work on Long Island would be done outside of the piping plover nesting season, or upon approval by the park biologist.</p>

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Resource Area	Mitigation
Visitor Experience, Public Health, Safety, and Park Operations	Visitors would be informed in advance of construction activities via the park website, local media outlets, park bulletin boards, and visitor center. Visitor access to buildings would be prohibited during removal of hazardous materials and construction activities.
Cultural Resources	<p>All activities would comply with the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR 44716, revised).</p> <p>Archeological resources in the vicinity of the project area would be identified and delineated for avoidance prior to project work.</p> <p>The park would continue to coordinate with the SHPO throughout the course of the project to protect and mitigate cultural resources affected by the preferred alternative.</p> <p>Should any archeological resources be uncovered during construction, as appropriate, work would be halted in the area and the park archeologist, SHPO, and appropriate Native American tribes would be contacted for further consultation.</p> <p>Park cultural resources staff would be available during construction to advise or take appropriate actions should any archeological resources be uncovered during construction. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) would be followed.</p> <p>NPS would ensure that all contractors and subcontractors are informed of the penalties for illegally collecting artifacts or intentionally damaging archeological sites or historic properties. Contractors and subcontractors also would be instructed on procedures to follow in case previously unknown archeological resources are uncovered during construction.</p> <p>Equipment and material staging areas would avoid known archeological resources.</p> <p>Known dump sites exposed by forest clearing would be monitored for deterioration and disturbance.</p>

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The CEQ defines the Environmentally Preferable Alternative as "...the alternative that will promote the national environmental policy as expressed in the National Environmental Policy Act § 101." Section 101 states that, "...it is the continuing responsibility of the Federal Government to:

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. Assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
3. Attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
4. Preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice;
5. Achieve a balance between population and resource use, which will permit high standards of living and a wide sharing of life's amenities; and

6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.”

This means that the environmentally preferable alternative is the alternative that causes the least damage to the biological and physical environment; it also means it is the alternative that best protects, preserves, and enhances historic, cultural, and natural resources. The identification of the “Environmentally Preferable Alternative” was based on an analysis that balances factors such as physical impacts on various aspects of the environment, mitigation measures to deal with impacts, and other factors, including the statutory mission of NPS and the purposes for the project.

Although an environmentally preferable alternative is identified, it may not be the preferred alternative. The preferred alternative is the alternative that NPS believes would best fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors.

While the no action alternative would maintain existing conditions, it would not be considered the environmentally preferable alternative because it would not meet environmental goals in the same manner as the other action alternatives. Although it would not result in new disturbance to natural resources, the no action alternative would not preserve important cultural landscape or historic structural elements as well as the treatment alternatives because of the continued presence of numerous noncontributing landscape and architectural features. The no action alternative would also not include restoring significant cultural elements or introducing features that complement the landscape and structures. Cultural landscapes and historic structures would continue to deteriorate without the guidance provided by a treatment plan. The no action alternative is not the environmentally preferable alternative because other alternatives better protect, preserve, and enhance historic, cultural, and natural resources. With regard to sections 101 and 102(1) of NEPA, the no action alternative is not the environmentally preferable alternative for the following reasons: 1) it would not meet the stewardship responsibility for protecting park resources (goal 1); 2) it would not improve visitor safety or access, or protect environmental and cultural resources (goals 2, 3, and 4); and 3) cultural landscapes and historic structures would continue to deteriorate, resulting in increased maintenance costs (goal 3).

Alternative 1 is focused on preserving cultural landscapes and structures. It would include needed maintenance and repairs on buildings and would slightly reduce the encroachment of forest vegetation into the historically cleared areas, but it would not include restoring or rehabilitating cultural landscape and structural features. The protection, preservation, and enhancement of historic resources are not as extensive under alternative 1 as under alternatives 2 and 3. For this reason, alternative 1 is not the environmentally preferable alternative. Alternative 1 does not fully meet the provisions of NEPA section 101 goals for the following reasons: 1) it would provide some improvements to visitor safety; but would not improve visitor use, access, or understanding of cultural resources (goals 2, 3, and 4); and 2) noncontributing cultural landscape and structural features would remain (goal 4).

Alternative 2, the preferred alternative, and alternative 3 are very similar and would include restoring and rehabilitating cultural resources, which would improve cultural resource protection and visitor access, use, and understanding (goals 1, 2, 4, and 5). Alternatives 2 and 3 would meet many of the NEPA section 101 goals and would protect, preserve, and enhance historic resources better than the no action alternative or alternative 1. Although very similar, alternative 2 includes

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slightly less historic resource rehabilitation than alternative 3 and so would not be the environmentally preferable alternative.

NPS determined that the environmentally preferable alternative is alternative 3 because it surpasses the no action alternative and alternative 1 and is slightly better than alternative 2 in realizing the fullest range of national environmental policy goals stated in NEPA section 101. Although alternative 3 is the environmentally preferable alternative, alternative 2 remains the preferred alternative because it meets almost the same range of section 101 goals as alternative 3, but it provides the best combination of features that meet the project objectives.

IMPACT SUMMARY

A summary of potential environmental effects for the alternatives is presented in Table 5.

TABLE 5. IMPACT SUMMARY

Impact Topic	No Action Alternative	Treatment Alternative 1	Treatment Alternative 2 (Preferred)	Treatment Alternative 3
Geology and Coastal Processes	The no action alternative would have no new effect on geology or coastal processes because there would be no new activities that would affect geologic features or the shoreline and the alternative would have no cumulative effects.	<p>Alternative 1 would include selective tree removal on about 1.2 acres of shoreline bluffs. This could increase the area of soils exposed to erosion, but mitigation would minimize effects. Also, dock repairs and a new boardwalk at the LaPointe site on Long Island may have minor effects on the shoreline.</p> <p>Alternative 1 would have local long-term minor to moderate adverse effects. Cumulative effects would be local, minor to moderate, and adverse.</p>	<p>Alternative 2 would have similar effects as alternative 1, but 3.1 acres of shoreline bluff trees would be managed and the LaPointe site boardwalk would be located in its current alignment.</p> <p>Alternative 2 would have local long-term minor to moderate adverse effects. Cumulative effects would be local, minor to moderate, and adverse.</p>	<p>Alternative 3 would have similar effects as alternative 1, but 3.2 acres of shoreline bluff trees would be managed. Also, the Long Island dock would be rebuilt in its historic location and a new, permanent boardwalk would be built from the dock up the shore toward the Triplex. The new dock and boardwalk could affect sediment movement along the shoreline. The dock would be designed to minimize changes in sediment.</p> <p>Alternative 3 would have local long-term minor to moderate adverse effects. There would be additional short-term adverse effects during and immediately after construction. Cumulative effects would be local, minor to moderate, and adverse.</p>

Impact Topic	No Action Alternative	Treatment Alternative 1	Treatment Alternative 2 (Preferred)	Treatment Alternative 3
Soils	The no action alternative would have no new soil disturbance and so would have no new or cumulative effects on soils	<p>Alternative 1 would affect about 22 acres of land, included some currently developed areas. Although areas of soil would be exposed to the potential for higher erosion, the effects on soils would be minimized by the flat topography of the light stations, the remaining ground cover, and implementing erosion-control measures.</p> <p>Alternative 1 would have local short-term minor adverse effects. Cumulative effects would be local, minor, and adverse.</p>	<p>Alternative 2 would have the same effects and would include the same mitigation measures as alternative 1, except that alternative 2 would affect about 31 acres of land, including some currently developed areas.</p> <p>Alternative 2 would have local short-term minor adverse effects on soils as a result of the treatment. Cumulative effects would be local, minor, and adverse.</p>	<p>Alternative 3 would have the same effects and would include the same mitigation measures as alternatives 1 and 2, except that alternative 3 would affect about 42 acres of land, including some currently developed areas.</p> <p>Alternative 3 would have local short-term minor adverse effects on soils as a result of the treatment. Cumulative effects would be local, minor, and adverse.</p>
Vegetation	The no action alternative does not include new effects on vegetation. The existing maintenance of currently cleared areas would continue. There would be no change in the rate of introduction or spread of invasive exotic plants. The no action alternative would have no new effects on vegetation in the project area, and would have no cumulative effects.	<p>Alternative 1 would include managing about 16 acres of vegetation, including clearing trees and shrubs. The infestation and spread of invasive exotic plants, including plants in the cultural landscapes, is possible. Implementing weed control BMPs would minimize the potential for weed establishment and long-term adverse effects.</p> <p>Alternative 1 would have local long-term minor to moderate adverse effects on vegetation. Cumulative effects would be parkwide, moderate, and adverse.</p>	<p>Alternative 2 would include the same effects and mitigation measures as under alternative 1, except that 23 acres of vegetation would be affected.</p> <p>Alternative 2 would have local long-term minor to moderate adverse effects on vegetation. Cumulative effects would be parkwide, moderate, and adverse.</p>	<p>Alternative 3 would include the same effects and mitigation measures as under alternatives 1 and 2, except that 33 acres of vegetation would be affected.</p> <p>Alternative 3 would have local long-term minor to moderate adverse effects on vegetation. Cumulative effects would be parkwide, moderate, and adverse.</p>

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Impact Topic	No Action Alternative	Treatment Alternative 1	Treatment Alternative 2 (Preferred)	Treatment Alternative 3
Wildlife	The no action alternative would have no new effects on wildlife or wildlife habitat, and would have no cumulative effects.	Human presence and construction noise would temporarily disturb and displace resident wildlife, resulting in local short-term adverse effects. Additional, periodic short-term effects would occur when cleared areas are periodically maintained by mowing or brush removal. About 16 acres of habitat would be permanently modified, resulting in local long-term minor adverse effects on wildlife. Cumulative effects would be local, minor, and adverse.	The effects on wildlife under Alternative 2 are the same as those under alternative 1, except that about 25 acres of habitat would be permanently modified. Alternative 2 would have local long-term minor adverse effects on wildlife. Cumulative effects would be local, minor, and adverse.	The effects on wildlife under Alternative 3 are the same as those under alternatives 1 and 2, except that about 36 acres of habitat would be permanently modified. Alternative 3 would have local long-term minor adverse effects on wildlife. Cumulative effects would be local, minor, and adverse.
Special Status Species	Because there would be no habitat-disturbing activities under the no action alternative, there would be no new effects on special status species and no cumulative effects.	Alteration of about 16 acres of habitat and disturbance during construction would have no effect on the federally listed gray wolf or piping plover and would not likely adversely modify piping plover designated critical habitat. Mitigation measures, such as preconstruction surveys and limiting construction to the nonnesting season, would reduce the potential for disturbing piping plovers. Work would only proceed with approval from the park biologist. Alternative 1 would likely have no effect on state-listed wildlife species because listed species potentially present are migrant birds that would easily	Alternative 2 would have the same effects and would include the same mitigation measures as under alternative 1, expect that about 25 acres of habitat would be disturbed. Alternative 2 would have no effect on gray wolf or piping plover and would not likely adversely modify piping plover critical habitat. Alternative 2 would have no effect on state listed wildlife and local long-term negligible adverse effects on state listed plant species. Cumulative effects would be local, minor, and adverse.	Alternative 3 would have the same effects and would include the same mitigation measures as under alternatives 1 and 2, expect that about 36 acres of habitat would be disturbed. Alternative 3 would have no effect on gray wolf or piping plover and would not likely adversely modify piping plover critical habitat. Alternative 3 would have no effect on state listed wildlife and local long-term negligible adverse effects on state listed plant species. Cumulative effects would be local, minor, and adverse.

Impact Topic	No Action Alternative	Treatment Alternative 1	Treatment Alternative 2 (Preferred)	Treatment Alternative 3
		<p>avoid the small areas of disturbance at the light stations.</p> <p>Surveys for state-listed and other rare plants would be performed prior to vegetation removal, and vegetation treatments would be altered, where practicable, to avoid disturbing populations. As a result, alternative 1 would have local long-term negligible adverse effects on special status plant species. Cumulative effects would be local, minor, and adverse.</p>		

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Impact Topic	No Action Alternative	Treatment Alternative 1	Treatment Alternative 2 (Preferred)	Treatment Alternative 3
Wetlands	The no action alternative would have no new effects on wetlands and would have no cumulative effects.	<p>Alternative 1 would include continuing existing management of the Devils Island trail between the light station and the boat house and vegetation would be managed along the tram tracks. Both alignments pass through wetlands. Vegetation would be managed to maintain a trail corridor between the LaPointe site and Chequamegon Bay. Wetland vegetation along the managed trails would be trampled.</p> <p>Alternative 1 would have local short- to long-term negligible adverse effects on wetlands. Cumulative effects would be local, negligible, and adverse.</p>	<p>Alternative 2 would include the activities and effects described for alternative 1.</p> <p>It would also include managing vegetation along a trail between the Long Island LaPointe, Original Lighthouse, and Chequamegon Point sites. The trail would avoid wetlands.</p> <p>Alternative 2 would have local short- to long-term negligible adverse effects on wetlands. Cumulative effects would be local, minor, and adverse.</p>	<p>Alternative 3 would include the activities described under alternative 2, but repairing the tram tracks on Devils Island would temporarily impact up to 0.06 acre of wetlands.</p> <p>Alternative 3 would have local short- to long-term minor adverse effects on wetlands. Cumulative effects would be local, minor, and adverse.</p>
Soundscape	The no action alternative would have no new effect on the existing soundscape and would not contribute to cumulative effects.	<p>Alternative 1 would result in temporarily elevated noise levels during vegetation removal and ongoing management, building repairs and rehabilitation, and occasionally operating generators for various uses.</p> <p>Alternative 1 would have local short term minor adverse effects on the soundscape and local minor and adverse cumulative effects.</p>	<p>Alternative 2 would have the same effects as those under alternative 1.</p> <p>Alternative 2 would have local short term minor adverse effects on the soundscape and local minor and adverse cumulative effects.</p>	<p>Alternative 3 would have the same effects as those under alternatives 1 and 2.</p> <p>Alternative 3 would have local short term minor adverse effects on the soundscape and local minor and adverse cumulative effects.</p>

Impact Topic	No Action Alternative	Treatment Alternative 1	Treatment Alternative 2 (Preferred)	Treatment Alternative 3
Historic Structures and Cultural Landscapes	<p>The total area cleared on the light stations would remain at about 10.7 acres, which is about 19% of the historically cleared area.</p> <p>There would continue to be no treatment recommendations for the historic resources and incremental degradation would continue and potentially accelerate.</p> <p>Because current management practices and maintenance capabilities would continue under the no action alternative, the alternative would have local long-term moderate adverse effects on historic structures or cultural resources. Cumulative effects would be local, moderate, and adverse.</p>	<p>Alternative 1 would include activities to remove vegetation to reestablish some areas of historic clearing, preserve and maintain structures, and add features to meet building codes.</p> <p>The total area cleared on the light stations would be about 19 acres, which is about 34% of the historically cleared areas.</p> <p>Under alternative 1, there would be local long-term beneficial effects as a result of preservation and stabilization measures. Cumulative impacts would be local, minor, and adverse, with long-term beneficial impacts contributed from alternative 1.</p>	<p>Under alternative 2, existing contributing structures and landscape features would be repaired or altered, and missing historic features would be restored. Some noncompatible features would be removed. Where needed, compatible features would be added to meet building codes and maintain safety. Some areas of vegetation would be cleared to better represent the extent of clearing in the light stations during the period of significance.</p> <p>The total area cleared on the light stations would be about 28 acres, which is about 49% of the historically cleared areas.</p> <p>Under alternative 2, there would be local long-term beneficial effects as a result of rehabilitation measures. Cumulative impacts would be local, minor, and adverse, with a long-term beneficial contribution from alternative 2.</p>	<p>Existing contributing structures and landscape features would be repaired or altered, and missing historic features would be restored. Some noncompatible features would be removed. Where needed, compatible features would be added to meet building codes and maintain safety. Alternative 3 would remove slightly more vegetation than alternative 2 to better represent the extent of clearing in the light stations during the period of significance.</p> <p>The total area cleared on the light stations would be about 45 acres, which is about 79% of the historically cleared areas.</p> <p>Under alternative 3, local long-term effects would be beneficial as a result of rehabilitation and restoration measures. Cumulative impacts would be local, minor, and adverse, with a local long-term beneficial contribution.</p>

ALTERNATIVES

Impact Topic	No Action Alternative	Treatment Alternative 1	Treatment Alternative 2 (Preferred)	Treatment Alternative 3
Archeological Resources	There would be no new impacts on archeological resources under the no action alternative and there would be no cumulative impacts.	Alternative 1 includes activities such as vegetation removal and constructing a new foundation for a shed on Michigan Island that may expose previously unknown archeological resources. To minimize potential adverse effects, surveys for archeological resources would be done prior to construction and monitoring would be done during construction in areas with high likelihood to contain artifacts. Alternative 1 would have local long-term minor adverse effects and local minor adverse cumulative effects.	The effects and mitigation measures under alternative 2 would be the same as those under alternative 1, except that forest vegetation around two known dump sites would be removed. The dump sites would be monitored for deterioration or disturbance. Alternative 2 would have local long-term minor adverse effects and local minor adverse cumulative effects.	The effects and mitigation measures under alternative 3 would be the same as those under alternatives 1 and 2, except that forest vegetation around three known dump sites would be removed. The dump sites would be monitored for deterioration or disturbance. Alternative 3 would have local long-term minor adverse effects and local minor adverse cumulative effects.
Visitor Experience	Visitor access would remain at 6 buildings. There would be no improvements to water or sanitation facilities. The light station clearings would not be reestablished to any degree and the views to and from the light stations would not improve. Under the no action alternative, the current conditions of visitor facilities and interpretive opportunities would remain unchanged, so there would be no new effect on visitor experience and no cumulative effects.	Visitor access to the light stations would be restricted during vegetation clearing, and access to buildings would be limited during exterior and interior work. The number of buildings open to the public would remain at 6 and there would be no improvements to water and sanitation facilities. Unlike the no action alternative, visitor experiences would improve under alternative 1 because interpretive opportunities would increase by repairing and preserving some buildings, removing some noncontributing features, and rehabilitating some of the cleared areas. Compatible features would be added to meet building and	Alternative 2 would expand visitor access and use to 13 buildings and upgrade one water and sanitation facility. Alternative 2 provides more interpretive opportunities and would expand cleared areas more than alternative 1. As with alternative 1, under alternative 2, visitor access to the light stations would be restricted during vegetation clearing, and access to buildings would be limited during exterior and interior work. Alternative 2 would have local short-term minor adverse effects and local long-term beneficial effects on visitor experience. Cumulative effects	Activities and effects under alternative 3 would be very similar to those under alternative 2. Alternative 3 would expand visitor access and use to 17 buildings and improve three water and sanitation facilities. Alternative 3 provides more interpretive opportunities and would expand cleared areas more than alternatives 1 and 2. As with alternatives 1 and 2, under alternative 3, visitor access to the light stations would be restricted during vegetation clearing, and access to buildings would be limited during exterior and interior work. Alternative 3 would

Impact Topic	No Action Alternative	Treatment Alternative 1	Treatment Alternative 2 (Preferred)	Treatment Alternative 3
		<p>safety codes. Clearing vegetation would improve visitor views to and from the light stations.</p> <p>Alternative 1 would have local short-term minor adverse effects and local long-term beneficial effects on visitor experience. Cumulative effects would be local and beneficial.</p>	would be local and beneficial.	<p>have local short-term minor adverse effects and local long-term beneficial effects on visitor experience. Cumulative effects would be local and beneficial.</p>
Public Health and Safety	<p>The continued presence of unaddressed hazardous materials and conditions under the no action alternative would have local long-term minor adverse effects on public health and safety. There are no known reasonably foreseeable actions that would have a new effect on public health and safety, so there would be no cumulative effects.</p>	<p>Under alternative 1, hazardous materials would be addressed by removing bat guano and removing and stabilizing lead-based paint and asbestos. Minor safety issues would be addressed.</p> <p>Alternative 1 would have local long-term beneficial effects on public health and safety. There would be no cumulative effects.</p>	<p>Activities and their effects under alternative 2 would be similar to those under alternative 1, but would be more extensive.</p> <p>Alternative 2 would have local long-term beneficial effects on public health and safety. There would be no cumulative effects.</p>	<p>Activities and their effects under alternative 3 would be similar to those under alternatives 1 and 2, but would be more extensive.</p> <p>Alternative 1 would have local long-term beneficial effects on public health and safety. There would be no cumulative effects.</p>

ALTERNATIVES

Impact Topic	No Action Alternative	Treatment Alternative 1	Treatment Alternative 2 (Preferred)	Treatment Alternative 3
Park Operations	<p>Current management practices would continue and the estimated number of hours required to maintain the light stations would not change. There would continue to be no treatment guidance.</p> <p>Because current operation and management practices would continue, there would be no new effect on park operations under the no action alternative.</p> <p>There are no known reasonably foreseeable actions that would have a new effect on park operations so there would be no cumulative effects.</p>	<p>Implementing alternative 1 would require an estimated 0.6 FTE per year over the baseline FTEs of the no action alternative. There would be guidance on treatments.</p> <p>Increased hours necessary for maintaining the light stations, exotic species monitoring and control, bluff erosion monitoring, and potential mitigation efforts under alternative 1 would have local long-term minor adverse effects on park operations.</p> <p>Having guidance on treatments under alternative 1, would have local long-term beneficial effects on park operations. There would be no cumulative effects.</p>	<p>Actions under alternative 2 would be the same as those under alternative 1, but alternative 2 would require 1.2 FTE per year over baseline FTEs.</p> <p>Increased hours necessary for maintaining the light stations, exotic species monitoring and control, bluff erosion monitoring, and potential mitigation efforts under alternative 2 would have local long-term minor adverse effects on park operations.</p> <p>Having guidance on treatments under alternative 2, would have local long-term beneficial effects on park operations. There would be no cumulative effects.</p>	<p>Actions under alternative 3 would be the same as those under alternative 1 and 2, but alternative 3 would require 1.9 FTE per year over baseline FTEs.</p> <p>Increased hours necessary for maintaining the light stations, exotic species monitoring and control, bluff erosion monitoring, and potential mitigation efforts under alternative 3 would have local long-term minor adverse effects on park operations.</p> <p>Having guidance on treatments under alternative 2, would have local long-term beneficial effects on park operations. There would be no cumulative effects.</p>

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This section provides a description of the resources potentially impacted by the alternatives, and the likely environmental consequences. It is organized by impact topics that were derived from scoping. Impacts are evaluated based on context, duration, intensity, and whether they are direct, indirect, or cumulative. More detailed information on resources in the park may be found in the draft general management plan (NPS 2009a) and in the draft CLR/HSR.

GENERAL METHODS

This section contains the environmental impacts, including direct and indirect effects, and their significance for each alternative. The analysis is based on the assumption that the mitigation measures identified in the “Mitigation” section of this EA will be implemented for the action alternatives. Overall, NPS based these impact analyses and conclusions on the review of existing literature and park studies, information provided by experts within the park, other agencies, professional judgment and park staff insights, and public input.

The following terms are used in the discussion of environmental consequences to assess the impact intensity threshold and the nature of impacts associated with each alternative:

Type: Effects can be beneficial or adverse. Beneficial effects are a positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition. Adverse effects are negative change in the condition or appearance of the resource or a change that moves the resource away from a desired condition.

Context: Context is the setting within which an impact would occur, such as local (in the project area); islandwide (limited to an island); parkwide (in Apostle Islands National Lakeshore); or regional (in Ashland and Bayfield counties, Wisconsin).

Impact Intensity: Impact intensity is defined individually for each impact topic. There may be no impact, or impacts may be negligible, minor, moderate, or major.

Duration: Duration of impact is analyzed independently for each resource because impact duration is dependent on the resource being analyzed. Depending on the resource, impacts may last for the construction period, a single year or growing season, or longer. For purposes of this analysis, impact duration is described as short-term or long-term. Impact duration is defined in a table for each resource topic.

Direct and Indirect Impacts: Effects can be direct, indirect, or cumulative. Direct effects are caused by an action and occur at the same time and place as the action. Indirect effects are caused by the action and occur later or farther away, but are still reasonably foreseeable. Direct and indirect impacts are considered in this analysis, but are not specified in the narratives. Cumulative effects are discussed in the next section.

Threshold for Impact Analysis: The duration and intensity of effects vary by resource. Therefore, the definitions for each impact topic are described separately. These definitions were formulated through the review of existing laws, policies, and guidelines; and with assistance from park staff, regional NPS staff, and NPS Denver Service Center specialists. Impact intensity thresholds for negligible, minor, moderate, and major adverse effects are defined in a table for each resource topic.

CUMULATIVE EFFECTS

Cumulative impacts are defined as “the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions” (40 CFR 1508.7). Cumulative effects can result from individually minor, but collectively significant, actions taking place over a period of time. The CEQ regulations that implement NEPA require assessment of cumulative impacts in the decision-making process for federal projects.

Methods for Assessing Cumulative Effects

Cumulative impacts were determined by combining the impacts of each action alternative and the no action alternative with other past, present, and reasonably foreseeable future actions. Past actions include activities that influenced and affected the current conditions of the environment near the project area. Ongoing or reasonably foreseeable future projects near the park or the surrounding region might contribute to cumulative impacts. The geographic scope of the analysis includes actions in the project area as well as other actions in the park or surrounding lands, including Bayfield and Ashland counties, where overlapping resource impacts are possible. The temporal scope includes actions within a range of approximately 10 years.

Once identified, past, present, and reasonably foreseeable actions were then assessed in conjunction with the impacts of the alternatives to determine if they would have any added adverse or beneficial effects on a particular resource, park operation, or visitor use. The impacts of past, present, and reasonably foreseeable actions vary for each resource. Cumulative effects are considered for each alternative and are presented in the environmental consequences discussion for each impact topic.

The following past, present, and reasonably foreseeable actions are relevant to the analysis of the effects on resources and values that would result from the alternatives, and are based on actions described in the park’s draft general management plan (NPS 2009a).

Past, present, and reasonably foreseeable management of the light stations by NPS includes various preservation and stabilization measures applied to the cultural landscape and buildings. In the past, because there has not been a coherent treatment approach, there have been incremental changes to historic resources, including the introduction of noncompatible features and materials and the encroachment of vegetation into historically cleared landscapes. Additionally, money and manpower issues have hampered park efforts to address all repair needs in the past, which has contributed to the deterioration of the historic structures and cultural landscapes. Nonnative species, particularly plant species, have spread throughout the park due to past construction activities and visitor activities. The spread of nonnative species will likely continue in the future. NPS has managed, and continues to manage, vegetation to control invasive and noxious plant

species in the park; and has managed deer populations on the islands. These management activities will continue in the future. Shoreline bank stabilization was done on Outer and Raspberry islands to reduce erosion and the potential for light station buildings to be damaged.

IMPACTS TO CULTURAL RESOURCES AND SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT

For purposes of the NEPA process, cultural resources are considered under section 106 of the National Historic Preservation Act, and specifically its implementing regulations under 36 CFR Part 800. Section 106 requires federal agencies to consider the effects of an undertaking on historic properties, and provides a process under which to implement section 106 compliance.

In this EA, impacts to cultural resources are described in terms of type, context, duration, and intensity, as described above, which is consistent with the regulations of the CEQ, which implements NEPA. CEQ regulations and NPS Conservation Planning, Environmental Impact Analysis and Decision-making (DO – 12) also call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact (e.g., reducing the intensity of an impact from major to moderate or minor). Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only. It does not suggest that the level of effect, as defined by section 106, is similarly reduced. Although adverse effects under section 106 may be mitigated, the effect remains adverse. The park will coordinate with the SHPO to address mitigation measures for the preferred alternative.

GEOLOGY AND COASTAL PROCESSES

Affected Environment

The following summary of the geology of the park is primarily based on Nuhfer and Dalles (1987). The bedrock and core of the Apostle Islands are made up of sandstone formations deposited during the Precambrian era. Three Precambrian sandstone formations are recognized in the park. The Orienta formation is found on Eagle Island, the northwestern half of Sand Island, and in adjacent portions of the mainland unit of the park. The Devils Island formation is found on Devils Island, the southeastern half of Sand Island, and portions of the mainland unit. The remainder of the islands and adjacent mainland are part of the Chequamegon formation. These sandstones (especially the Devils Island formation) forms shelves, cliffs, and caves on the islands.

The Pleistocene glaciation began about 3 million years ago and lasted until about 10,000 years ago. During the Pleistocene glaciation, glaciers repeatedly covered the region, depositing three thick layers of reddish sandy clay till on the islands. The till is thickest on the western sides of the islands where it is exposed as steep clay bluffs. The till is thinnest on the eastern sides of the islands, where sandstone cliffs and ledges are most evident.

Erosion and deposition continue to occur in the archipelago. Several small islands have washed away or experienced substantial deterioration, and other islands have increased in size because of deposition during historic times. The islands continue to be affected by erosion and weathering from waves, wind, and weather, especially sandstone cliffs and bluffs.

The park's many sandscapes depend upon wave action and wind to transport and deposit sand. The park's sandscapes tend to occur on the southern end of islands, where glacial till along shorelines provides a supply of sand (Nuhfer and Dalles 1987). The types of sandscapes found in the islands include sandspits, cusped forelands, tombolos, barrier spits, and beaches. Cusped forelands and tombolos are not found on the five islands addressed in this EA. Sandspits are found on Outer Island, and Long Island is a barrier spit with a narrow connection to the mainland. Beaches are found throughout the islands. Sandscapes typically have several zones, including a beach that lacks vegetation and dunes, interdunal hollows, stabilized dunes, and beach ridges.

The shoreline of Long Island is comprised of sand beaches that change over the years. For example, the original lighthouse on the island was constructed near the shore in 1858, and is now about 0.25 mile inland as sand accumulates on the northern shore of the island. In addition, Long Island alternates on a scale of decades between being an island and a barrier spit connected to the mainland. Long Island has been connected to the mainland by a narrow spit of land since a large storm in November 1975 (Judziewicz and Koch 1993).

Coastal processes, such as erosion of bluffs and sandscapes, are influenced by Lake Superior water levels. Docks and other developments also may affect coastal processes. Docks may affect the drift of sand along coastlines, especially if the docks have solid cores. In 1987, a dock was constructed in front of Michigan Island Light Station. Monitoring indicated that the area to the west of the dock was eroding at a very high rate for the next several years, and the entire dock was periodically engulfed in sand. The dock was modified in 1993 to reduce erosion and improve its usefulness for docking, but the modifications were only partially successful. There are still issues related to sand buildup, accessibility of the dock, and impacts to longshore sediment transport.

Severe erosion has occurred on the slopes in front of the lighthouses on Michigan and Outer islands. Forest clearing, building construction, and alteration of natural drainage has helped destabilize these banks. The slopes in front of the Michigan Island Lighthouse are currently somewhat stable, but vegetation-disturbing activities such as tree removal would increase the likelihood of erosion, with the potential to affect the lighthouse, if left unaddressed.

The Outer Island Lighthouse is about 50 feet from the top of the shoreline bluff. This bluff is very steep and is highly susceptible to erosion from intense rainfall and wave action at the shoreline. Outer Island is exposed to the full force of Lake Superior, and portions of the cliff below the lighthouse have washed away during large storms. NPS staff implemented an erosion-control project from 2004 to 2006 to protect the Outer Island Lighthouse and the shoreline below the lighthouse. Shoreline stabilization measures at Outer Island have included constructing a drain parallel to the top of the slope to redirect surface flows; installing riprap; using bioengineering measures, including log cribs; and revegetating slopes using native plant species.

Impact Intensity Threshold

Available information on potentially impacted geological features and coastal areas in the project area was compiled. Potential impacts from the alternatives were based on professional judgment and experience with similar actions. The threshold of change for the intensity of an impact on geology and coastal processes is defined in Table 6.

TABLE 6. GEOLOGY AND COASTAL PROCESSES IMPACT AND INTENSITY

Impact Intensity	Intensity Description
Negligible	The action would result in changes to park geology and coastal processes, but the changes would be barely detectable based on standard scientific methods.
Minor	The action would result in detectable changes, but the changes in geology and coastal processes would be slight and localized, possibly showing small disruptions or improvements. No changes to key geological and coastal processes would occur.
Moderate	The action would result in a clearly detectable change in geology and coastal processes—a geological feature or process would be obviously altered, or a few features would show changes in a localized area. The changes could result in disruption or restoration of key geological and coastal processes.
Major	The action would result in clearly detectable changes in key geological and coastal processes—important geological and coastal processes or features would be disrupted or restored, or there would be highly noticeable, widespread changes in many processes and features.

All changes to geology and coastal resources are permanent.

Environmental Consequences

No Action Alternative

Direct and Indirect Impacts of the Alternative. The no action alternative would have no new effects on normal geology and coastal processes. There would be no changes to docks, boardwalks, or bank stabilization efforts. The existing levels of shoreline and bank erosion would continue to occur.

Cumulative Impacts. Construction of the docks and changes in shoreline bluff vegetation have had localized effects on coastline sedimentation and erosion on the islands. Past, present, and reasonably foreseeable future actions have local minor adverse effects on geology and coastal processes. The no action alternative would have no cumulative effects.

Conclusion. The no action alternative would have no new effect on geology or coastal processes, and would have no cumulative effect.

Alternative 1

Direct and Indirect Impacts of the Alternative. Under alternative 1, the Long Island dock would be repaired and maintained, but because it would retain its current location and configuration, the activities would have no new effect on shoreline erosion or sediment transport. Also on Long Island, a new boardwalk about 170 linear feet long would be constructed across the dune area along the approximate alignment of the historic boardwalk leading from the Fog Signal foundation to the beach at the LaPointe site. The boardwalk would end at about the edge of vegetation at the shore. It would not be anchored, so it would be subject to movement by waves and ice action along the shore. Because it would end relatively high on the shore and would not be anchored, the boardwalk itself would have only negligible effects on erosion and sediment transport. Because the historic location of the boardwalk is at an eroded part of the shoreline, visitors would have to either use a ladder segment of the boardwalk or would have to scramble up the bank. Either means of access would increase bank instability and erosion.

In addition to activities at the shoreline of the LaPointe site, vegetation on the shoreline bluffs of the light stations at Michigan and Outer islands would be managed to open up views to the light

stations. The bluff vegetation would be managed by selectively removing trees that extend more than 20 feet above the top of the slope. The stumps and root systems would remain in place. Clearing would be done incrementally so that only small areas of slope would be potentially destabilized at one time. Disturbed areas would be biostabilized using native species adapted for the specific conditions of the site. About 0.4 acre of the bluff would be managed on Michigan Island and about 0.8 acre of bluff would be managed on Outer Island. Periodic maintenance would include evaluating the effectiveness of the biostabilization efforts and thinning large trees to lower, but not remove, unstable or overcrowded elements.

Managing the shoreline bluff vegetation would expose soils on the slope to precipitation, and soil would be disturbed by crews removing trees. Soil erosion would be minimized by monitoring the slopes and implementing erosion-control measures based on site-specific needs. Erosion-control measures may include constructing a subdrain at the top of the Michigan Island slope (one is already in place on Outer Island), placing erosion-control fabric, and revegetating with shrubs or herbaceous ground cover.

Activities proposed along the shore of Long Island and selective tree removal on the shoreline bluffs of Michigan and Outer islands would result in local long-term minor to moderate adverse effects on geology and coastal processes.

Cumulative Impacts. As described under the no action alternative, past, present, and reasonably foreseeable future actions would have local minor adverse effects on geology and coastal processes. Those impacts, along with the local long-term minor to moderate adverse effects of alternative 1, would result in local minor to moderate adverse cumulative effects.

Conclusion. Because some activities may increase the potential for erosion along the shoreline bluffs of Michigan and Outer islands, alternative 1 would have local long-term minor to moderate adverse effects on geology and coastal processes. Cumulative effects would be local, minor to moderate, and adverse.

Alternative 2 (Preferred Alternative)

Direct and Indirect Impacts of the Alternative. Alternative 2 is similar to alternative 1, but the new LaPointe site boardwalk would be located at a gentle slope of the shoreline and would be moved as needed to adjust to changing shoreline conditions and to avoid piping plover habitat. As under alternative 1, shoreline bluff vegetation would be managed on Michigan and Outer islands, but more vegetation would be removed – 1.8 acres on Michigan Island and 1.3 acres on Outer Island. Alternative 2 would have local long-term minor adverse effects on geology or coastal processes.

Cumulative Impacts. As described under the no action alternative, past, present, and reasonably foreseeable future actions would have local minor adverse effects on geology and coastal processes. Those impacts, along with the local long-term minor to moderate adverse effects of alternative 2, would result in local minor to moderate adverse cumulative effects.

Conclusion. Alternative 2 would have a local long-term minor to moderate adverse effect on geology or coastal processes. Cumulative effects would be local, minor to moderate, and adverse.

Alternative 3

Direct and Indirect Impacts of the Alternative. As under alternatives 1 and 2, shoreline bluff vegetation on Michigan and Outer islands would be managed to reestablish views to the light stations, but under alternative 3, 3.2 acres of shoreline bluff vegetation would be affected.

As under alternative 1, under alternative 3, the boardwalk at Long Island LaPointe Light Station would be rebuilt along the historic alignment, but unlike alternative 1, it would extend across the shore and connect with a new dock constructed in the location of the historic dock. The existing LaPointe site dock would be removed. Building a new LaPointe boardwalk and dock would change the movement patterns of sediment along the shoreline, potentially resulting in areas of excessive sedimentation or scour. The effect of the dock would be minimized by designing the structure to cause as little disruption to the shoreline as possible, but there would be a higher level of disturbance during, and for a short time after, construction.

Managing the shoreline bluff vegetation and constructing a new dock and boardwalk would have local long-term minor to moderate adverse effects on geology or coastal processes.

Cumulative Impacts. As described under the no action alternative, past, present, and reasonably foreseeable future actions would have local minor adverse effects on geology and coastal processes. Those impacts, along with the local long-term minor to moderate adverse effects of alternative 3, would result in local minor to moderate adverse cumulative effects.

Conclusion. Alternative 3 would have local long-term minor to moderate adverse effects on geology or coastal processes. Cumulative effects would be local, minor to moderate, and adverse.

SOILS

Affected Environment

Soils in the park are generally young, and are derived from a variety of parent materials including lacustrine clay, water-deposited sand, and glacial till. The Natural Resources Conservation Service completed a survey of soils in the park in 2006 (NRCS 2006a, 2006b). The soil types in the park are diverse (ranging from sandy to clayey), and include clays, loams, sands, and combinations of these types. As described in the previous section, shoreline erosion has been a concern in the park. Wave action has eroded steep bluffs on the islands and has been a threat to park attractions, including campgrounds and lighthouses. Soils on Long Island are derived from sandy outwash and lacustrine deposits. The soils on Long Island occur on beach ridges, sand dunes, and beaches, and are highly susceptible to erosion.

Impact Intensity Threshold

Available information on potentially impacted soils in the project area was compiled. Potential impacts from the alternatives were based on professional judgment and experience with similar actions. The threshold of change for the intensity of an impact on soils is defined in Table 7.

TABLE 7. SOILS IMPACT AND INTENSITY

Impact Intensity	Intensity Description
Negligible	The effects on soils would be below or at a very low level of detection. Any effects on productivity or erosion potential would be slight.
Minor	An action's effects on soils would be detectable. The effects would change a soil's profile in a relatively small area, but would not appreciably increase the potential for erosion of additional soil. If mitigation were needed to offset adverse effects, it would be relatively simple to implement and would likely be successful.
Moderate	An action would result in a change in quantity or alteration of the topsoil, overall biological productivity, or the potential for erosion to remove small quantities of soil. Changes to localized ecological processes would be limited. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.
Major	An action would result in a change in the potential for erosion to remove large quantities of soil or in alterations to topsoil and overall biological productivity in a relatively large area. Key ecological processes would be altered, and landscape-level changes would be expected. Mitigation measures to offset adverse effects would be necessary, extensive, and their success could not be guaranteed.

Short-term impact—recovers in less than three years

Long-term impact—takes more than three years to recover

Environmental Consequences

No Action Alternative

Direct and Indirect Impacts of the Alternative. No new disturbance to soil resources would occur because there would be no construction-related actions. The no action alternative would have no new effect on soils.

Cumulative Impacts. Small scale land disturbance associated with NPS repair and maintenance activities has exposed small areas of soil to erosion and has resulted in some soil compaction. Past, present, and reasonably foreseeable future projects would have a local minor adverse effect on soils. Because the no action alternative would not add any effects to the effects of past, present, or reasonably foreseeable projects, the alternative would not have a cumulative effect.

Conclusion. The no action alternative would have no new adverse effects on soils and would have no cumulative effect.

Alternative 1

Direct and Indirect Impacts of the Alternative. Alternative 1 would affect about 22 acres of land, including about 6 acres of currently developed areas and 0.4 acre of beaches and banks (Table 8). The activities would include clearing trees and/or trimming shrubs that have encroached into the historically cleared areas of the light stations. It also includes continuing the current management practice of clearing vegetation from trail corridors on Devils and Sand islands. Although understory vegetation would remain, removing the tree canopy and/or trimming the shrub layer would expose soils more directly to precipitation, which may increase erosion. Because most of the light stations are in relatively level areas, increased erosion would likely be negligible to minor.

TABLE 8. TYPE OF AREA ON EACH ISLAND AFFECTED BY ALTERNATIVE 1 (IN ACRES)

Island	Type of Area						Total
	Dune	Forest	Shrub	Wetland	Beach or Bank (unvegetated)	Developed	
Michigan	0.00	1.70	0.00	0.00	0.01	1.46	3.17
Outer	0.00	0.48	0.00	0.00	0.12	1.53	2.13
Devils	0.00	4.55	2.71	0.00	0.00	1.97	9.23
Long	0.61	3.64	1.19	0.00	0.13	0.53	6.10
Sand	0.00	0.31	0.61	0.00	0.14	0.55	1.61
Total	0.61	10.68	4.51	0.00	0.40	6.04	22.24

In addition to larger areas in which vegetation would be removed or managed, there would be small areas of disturbance associated with other treatment elements, including removing noncontributing features from the cultural landscape, and repairing or stabilizing buildings and other structures. Soil material exposed during construction would be subject to erosion until stabilized or revegetated. Standard erosion-control BMPs would be used in all construction areas.

Although a fairly large area would be cleared of trees and shrubs, the amount of bare soil exposed would be small. These areas would be exposed to a greater potential for erosion, but the effects on soils would be minimized by the flat topography of the light stations, the remaining ground cover, and implementing erosion-control measures. For these reasons, impacts to soils from alternative 1 would be local, short-term, minor, and adverse.

Cumulative Impacts. As described under the no action alternative, past, present, and reasonably foreseeable future projects would have a local minor adverse effect on soils. Those impacts, in combination with the local long-term minor adverse effects of alternative 1, would result in local minor adverse cumulative impacts.

Conclusion. Alternative 1 would have local short-term minor adverse effects on soils as a result of the treatment. Cumulative effects would be local, minor, and adverse.

Alternative 2 (Preferred Alternative)

Direct and Indirect Impacts of the Alternative. Alternative 2 would include the same activities and effects as those described for alternative 1, but the extent of the activities is greater (Table 9), particularly slope vegetation management. About 31 acres of land, including about 7 acres of currently developed areas and slightly more than 1 acre of beaches and banks, would be maintained as clearings. Additionally, trees and shrubs would be pruned and removed on Long Island to reestablish the historic walkway between the lights. The sandy soils along the walkway would be vulnerable to erosion. The walkway would be monitored to determine if unacceptable levels of erosion were occurring and if revegetation or visitor management was necessary.

TABLE 9. TYPE OF AREA ON EACH ISLAND AFFECTED BY ALTERNATIVE 2 (IN ACRES)

Island	Type of Area						Total
	Dune	Forest	Shrub	Wetland	Beach or Bank (unvegetated)	Developed	
Michigan	0.00	4.03	0.00	0.00	0.09	1.48	5.60
Outer	0.00	2.25	0.00	0.00	0.88	1.93	5.06
Devils	0.00	7.34	2.71	0.00	0.00	1.98	12.03
Long	0.20	3.41	1.30	0.00	0.12	0.53	5.56
Sand	0.00	1.33	0.74	0.00	0.19	0.66	2.92
Total	0.20	18.36	4.75	0.00	1.28	6.58	31.17

Although a fairly large area would be cleared of trees and shrubs, the amount of bare soil exposed would be small. These areas would be exposed to a greater potential for erosion, but the effects on soils would be minimized by the flat topography of the light stations, the remaining ground cover, and implementing erosion-control measures. For these reasons, the impacts to soils from alternative 2 would be local, short-term, minor, and adverse.

Cumulative Impacts. As described under the no action alternative, past, present, and reasonably foreseeable future projects would have local minor adverse effects on soils. Those impacts, in combination with the local long-term minor adverse effects of alternative 2, would result in local minor adverse cumulative impacts.

Conclusion. Alternative 2 would have local short-term minor adverse effects on soils as a result of the treatment. Cumulative effects would be local, minor, and adverse.

Alternative 3

Direct and Indirect Impacts of the Alternative. Alternative 3 would include the same activities and effects as those described for alternative 1 and the preferred alternative, but the extent of the activities would be greater than either one (Table 10). About 42 acres of land, including about 6 acres of currently developed areas and 3 acres of beaches and banks, would be maintained as clearings.

TABLE 10. TYPE OF AREA ON EACH ISLAND AFFECTED BY ALTERNATIVE 3 (IN ACRES)

Island	Type of Area						Total
	Dune	Forest	Shrub	Wetland	Beach or Bank (unvegetated)	Developed	
Michigan	0.00	4.03	0.00	0.00	0.09	1.48	5.60
Outer	0.00	2.25	0.00	0.00	0.88	1.93	5.06
Devils	0.00	7.28	2.72	0.06	0.00	1.98	12.04
Long	2.56	9.37	2.75	0.00	1.74	0.09	16.51
Sand	0.00	1.33	0.74	0.00	0.19	0.66	2.92
Total	2.56	24.26	6.21	0.06	2.90	6.14	42.13

Although a fairly large area would be cleared of trees and shrubs, the amount of bare soil exposed would be small. These areas would be exposed to a greater potential for erosion, but the effects on soils would be minimized by the flat topography of the light stations, the remaining ground

cover, and implementing erosion-control measures. For these reasons, impacts to soils from alternative 3 would be local, short-term, minor, and adverse.

Cumulative Impacts. As described under the no action alternative, past, present, and reasonably foreseeable future projects would have a local minor adverse effect on soils. Those impacts, in combination with the local long-term minor adverse effects of alternative 3, would result in local minor adverse cumulative impacts.

Conclusion. Alternative 3 would have local short-term minor adverse effects on soils as a result of the treatment. Cumulative effects would be local, minor, and adverse.

VEGETATION

Affected Environment

More than 750 plant species occur in the park, including 26 rare species of concern. The park is at the northwestern limits of the hemlock-white pine-northern hardwood forest, and also contains elements of boreal forest. Historically, most of the islands were covered by a forest dominated by eastern hemlock (*Tsuga canadensis*), white pine (*Pinus strobus*), sugar maple (*Acer saccharum*), yellow birch (*Betula alleghaniensis*), and white birch (*Betula papyrifera*) (Judziewicz and Koch 1993). The boreal forest component was dominated by white spruce (*Picea glauca*), balsam fir (*Abies balsamea*), tamarack (*Larix laricina*), white cedar (*Thuja occidentalis*), birch, and quaking aspen (*Populus tremuloides*) (NPS 2009a).

The park's current forests reflect a history of human disturbance. Much of the park has been subjected to logging, fires, and deer browsing. Most logging activities ceased between 80 and 100 years ago. About 1,300 acres of old growth forest remain in the park. Second growth northern hardwood forest covers most of the islands. Hemlock and white pine have declined due to logging, and the most common tree species on the islands are white birch, sugar maple, red maple (*Acer rubrum*), balsam fir, and white cedar (Judziewicz and Koch 1993). Following logging, deer populations increased on many of the islands, impacting species favored by deer, such as Canada yew (*Taxus canadensis*). Islands that historically had few to no deer have lush stands of Canada yew, a rare species on the mainland.

Additional plant communities occur less frequently in the park, including wet mesic forests, wet forests, alder thickets, beaver flowages, bogs, lagoons, clay bluffs, rock ledges and bluffs, and sandscapes. Brownstone ledges and cliffs are common on the islands' coasts. The vegetation in these areas ranges from willows and weed species to rare subarctic species.

Several nonnative invasive plant species occur on the islands, including purple loosestrife (*Lythrum salicaria*), spotted knapweed (*Centaurea biebersteinii*), and Japanese knotweed (*Polygonum cuspidatum*). The park has engaged in monitoring and control efforts to limit the spread of these weeds.

The prevalent vegetation on each of the five islands addressed in this EA is described in greater detail below. Wetlands are included in this section as a vegetation type, but are addressed specifically as a resource in the "Wetlands" section.

Michigan Island

Michigan Island has a history of commercial logging, and generally supports a mature second growth forest. The presettlement forests were dominated by large hemlock, white pine, yellow birch, and white cedar. Present day forests on Michigan Island are dominated by balsam fir, white birch, yellow birch, and white cedar (Judziewicz and Koch 1993). Dense stands of Canada yew and mountain maple occur in the understory. Michigan Island historically had a moderate deer population, thus Canada yew is still a dominant species. Michigan Island includes a bog/lagoon complex associated with the sandscape at the southwest end of the island. The dominant species in the dunes include beach grass (*Ammophila breviligulata*), beach wormwood (*Artemisia campestris*), beach pea (*Lathyrus japonicus*), common juniper (*Juniperus communis*), and sand cherry (*Prunus pumila*). The lighthouse grounds have been disturbed by human activity, and several exotic species (including periwinkle (*Vinca minor*)) are present (Judziewicz and Koch 1993). A dense stand of trees and other vegetation is now present in the formerly cleared area between the lighthouse and the shoreline (NPS 2009a).

Outer Island

The presettlement forest on Outer Island was dominated by large hemlock, white pine, and yellow birch, with sugar maple, white cedar, balsam fir, red oak, white birch, and red maple also present (Judziewicz and Koch 1993). Most of the island was commercially logged from the 1920s through the 1950s. Currently, the majority of the vegetation on Outer Island is dominated by the mesic forest type, which includes the hemlock/white pine/hardwood community (NPS 2009a). The lighthouse reservation on Outer Island was not commercially logged. A 200-acre old growth forest occurs on the northern end of the island within the lighthouse reservation, and is one of the oldest remaining stands of hemlock-northern hardwood forest remaining in the Great Lakes region (Judziewicz and Koch 1993). This stand also is unique because the island has never had a resident population of deer, and the forest has not been subjected to deer browsing. Canada yew and mountain maple form a dense understory. The vegetation within the light station is mostly a mowed lawn with scattered trees and shrubs. Forest trees now grow in formerly cleared areas to the west, south, and east of the light station grounds. Nonnative species are present, including weedy species on the steep clay bank and steps in front of the lighthouse (Judziewicz and Koch 1993). Unusual plant communities are found along the ledges and bluff, and include rare species such as marsh grass-of-parnassus and butterwort (*Pinguicula vulgaris*) (see the “Federal and State Threatened and Endangered Species” section).

Devils Island

Devils Island was never commercially logged. The northern two-thirds of Devils Island is “classic boreal forest” dominated by white spruce, balsam fir, white cedar, white birch, and aspen (Judziewicz and Koch 1993). Canada yew and mountain maple are common in the understory. Devils Island also has the best example in the park of krumholtz forest. These low-growing forests are dominated by white birch, balsam fir, white cedar, and Canada yew; and occur along the coastal bluff tops (NPS 2009a). The stunted krumholtz growth form is caused by the harsh soil and climatic conditions found on the bluff-tops. The Devils Island brownstone formation occurs along cliffs, especially at the northern end of the island. An unusual plant community occurs on the cliffs, including species such as butterwort, bird’s-eye primrose (*Primula mistassinica*), three-toothed cinquefoil (*Potentilla tridentata*), fragile ferns (*Cystopteris* sp.), bog reedgrass

(*Calamagrostis inexpansa*), and sedge (*Scirpus hudsonius*) (Judziewicz and Koch 1993). The area around the lighthouse has been repeatedly cleared for the past century, and contains a mixture of native and exotic plant species (Judziewicz and Koch 1993). Forest trees now grow in formerly cleared areas surrounding and within the light station grounds.

Long Island

Long Island is a barrier spit, and has vegetation communities typical of sandscapes in the park. Sandscapes typically include a beach without vegetation, active dunes, intertidal hollows (sometimes with ephemeral ponds or pools), stabilized dunes or beach ridges (often covered by pine forest), and often a filled-in lake basin with either bog or alder thicket vegetation (Nuhfer and Dales 1987 as cited in Judziewicz and Koch 1993). Plant communities in sand dune areas are dominated by dune vegetation such as beach grass, beach pea, speckled alder (*Alnus rugosa*), quaking aspen, and white birch (NPS 2009a). Presettlement forests on Long Island were dominated by red pine (*Pinus resinosa*), white pine, white birch, and quaking aspen on the ridges (Judziewicz and Koch 1993). The island was extensively logged for timber in the late 19th and early 20th centuries. The present forest is dominated mostly by red pine, jack pine (*Pinus banksiana*), and oak (*Quercus* sp.). The area around LaPointe Light Tower (the eastern lighthouse) has been cleared periodically. Nearby plant communities include jack pine forest and pine barrens (NPS 2009a). The area around Chequamegon Point Lighthouse (the western lighthouse) is a mixture of dunes with junipers and jack pine forest (NPS 2009a).

Sand Island

The presettlement forest on Sand Island was balsam fir, birch, sugar maple, white pine, white cedar, spruce, and hemlock (Judziewicz and Koch 1993). Presently, the most common trees are yellow birch, balsam fir, white birch, white cedar, and red maple. Canada yew and mountain maple are abundant in the understory. The lighthouse reservation on Sand Island escaped commercial logging, and is one of several old growth forests in the park. The old growth remnant at the northern tip of Sand Island is notable for its extremely large white pine trees. The elements of boreal forest also occur on Sand Island. Wetlands are associated with bogs in the interior of the island. Sand Island did not have a resident deer population until recent years. Deer browse on Sand Island is now threatening the Canada yew plant community on the island. The lighthouse grounds have been maintained for decades, and several exotic species are present including common periwinkle and gill-over-the-ground (*Glechoma hederacea*) (Judziewicz and Koch 1993). A lawn is still present, but most vegetation clearing activities around the light station were last conducted in the early 1990s, and the area has revegetated with balsam fir (NPS 2009a). A number of uncommon plants are found on the Orienta formation brownstone ledges southeast of the lighthouse, including bird's eye primrose, harebell, ninebark, red osier dogwood, and long-beaked willow (*Salix bebbiana*) (Judziewicz and Koch 1993).

Impact Intensity Threshold

Predictions about impacts were based on the expected disturbance to vegetation communities, and professional judgment and experience with previous projects. The thresholds of change for the intensity of an impact on vegetation are defined in Table 11.

TABLE 11. VEGETATION IMPACT AND INTENSITY

Impact Intensity	Intensity Description
Negligible	The impacts on vegetation (individuals or communities) would not be measurable. The abundance or distribution of individuals would not be affected or would be slightly affected. The effects would be on a small scale and no species of special concern would be affected. Ecological processes and biological productivity would not be affected.
Minor	The action would not necessarily decrease or increase the project area's overall biological productivity. The alternative would affect the abundance or distribution of individuals in a localized area, but would not affect the viability of local or regional populations or communities. Mitigation to offset adverse effects, including special measures to avoid affecting species of special concern, would be required and would be effective. Mitigation may be needed to offset adverse effects, would be relatively simple to implement, and would likely be successful.
Moderate	The action would result in effects on some individual native plants and also would affect a sizeable segment of the species' population over a relatively large area. Permanent impacts would occur to native vegetation, but in a relatively small area. Some special status species also would be affected. Mitigation measures would be necessary to offset adverse effects and would likely be successful.
Major	The action would have considerable effects on native plant populations, including special status species, and would affect a relatively large area within and outside the park. Extensive mitigation measures to offset the adverse effects would be required; and the success of the mitigation measures could not be guaranteed.

Short-term impact—recovers in less than one year

Long-term impact—takes more than one year to recover

Environmental Consequences

No Action Alternative

Direct and Indirect Impacts of the Alternative. There would be no new project-related ground disturbance or associated introduction of exotic or noxious weeds with the potential to adversely impact vegetation under the no action alternative. Visitor use and management activities in currently cleared areas would continue. The no action alternative would have no new effect on vegetation.

Cumulative Impacts. Small scale disturbance associated with NPS repair and maintenance activities has affected small areas of vegetation. Past disturbance has introduced and spread nonnative species, as will current and future disturbance. NPS efforts to control the introduction and spread of nonnative species will offset some, but not all, of the adverse effects of nonnative species. Past, present, and reasonably foreseeable future projects would have a moderate adverse effect on vegetation in the park. Because the no action alternative would not add any effects to the effects of past, present, or reasonably foreseeable projects, the alternative would not have a cumulative effect.

Conclusion. The no action alternative would have no new adverse effects on vegetation in the project area, and would have no cumulative effects.

Alternative 1

Direct and Indirect Impacts of the Alternative. Alternative 1 would include increasing the area of vegetation management by clearing trees and/or trimming shrubs on about 16 acres vegetation, including about 11 acres of forest that has encroached into the historically cleared areas of the

light stations (Table 12; Figures 50 to 57). Trees and shrubs would also be pruned and removed on Long Island to reestablish the historic walkways between the LaPointe station and Chequamegon Bay. The vegetation managed on each island would represent a small fraction of the total vegetation on the island. The alternative would affect about 2% of the vegetation on Devils Island, about 3% on Long Island, and less than one-half of 1% on the remaining islands. In all, the managed areas would be less than one-quarter of 1% of the approximate 13,141 acres of vegetation present on the five islands. The areas in which trees are removed would likely become shrublands unless managed otherwise. In addition to larger areas in which vegetation would be removed or managed, there would be small areas of disturbance associated with removing cleared logs and other plant materials and other treatment elements, including removing noncontributing features from the cultural landscape, and repairing or stabilizing buildings and other structures. Temporarily disturbed areas would be revegetated with native species.

TABLE 12. TYPE OF VEGETATION ON EACH ISLAND AFFECTED BY ALTERNATIVE 1 (IN ACRES)

Island	Vegetation Type				Island Total
	Dune	Forest	Shrub	Wetland	
Michigan	0.00	1.70	0.00	0.00	1.70
Outer	0.00	0.48	0.00	0.00	0.48
Devils	0.00	4.55	2.71	0.00	7.26
Long	0.62	3.64	1.19	0.00	5.45
Sand	0.00	0.31	0.61	0.00	0.92
Total	0.62	10.68	4.51	0.00	15.81

To minimize adverse effects on vegetation, several mitigation measures would be implemented. An island-specific removal plan would be developed for logs and plant materials generated by clearing activities. The plans would identify areas of sensitive vegetation to avoid and would designate areas for stockpiling, chipping, and burning slash material. Construction activities would be confined to the smallest area necessary to complete the work, and all areas of disturbed vegetation would be restored with native vegetation following construction. Equipment and any machinery used in restoration and rehabilitation activities would be thoroughly cleaned to minimize exotic species introductions. The infestation and spread of invasive exotic plants, including plants in the cultural landscape, is possible. Weeds frequently invade disturbed ground where they easily become established and outcompete native species if left unchecked. Implementing weed control BMPs would minimize the potential for weed establishment and long-term adverse effects. BMPs would include using native species, monitoring for infestations and spread, and using an integrated pest-management approach to controlling invasive exotics. Native species will be used to the maximum extent possible, however, in cultural resource clearings, noninvasive nonnative grasses might be necessary. Revegetating disturbed areas is expected to take more than one year because of the low soil fertility and water holding capacity of the soils.

Because alternative 1 would include permanently modifying about 16 acres of vegetation and the likely introduction and spread of nonnative species, its effects would be local, long-term, minor to moderate, and adverse.

Cumulative Impacts. As described in the no action alternative, past, present, and reasonably foreseeable future projects would have a moderate adverse effect on vegetation in the park. Those impacts, in combination with the local long-term minor to moderate adverse effects of alternative 1, would result in park wide long-term moderate adverse cumulative impacts.

Conclusion. Alternative 1 would modify about 16 acres of vegetation. Invasive exotics may become established in the areas of disturbed soil, but their introduction and spread would be minimized with various mitigation measures. On a parkwide basis, the adverse effects on vegetation would be negligible, but locally, they would be long-term, minor to moderate, and adverse. Cumulative effects would be parkwide, moderate, and adverse.

Alternative 2 (Preferred Alternative)

Direct and Indirect Impacts of the Alternative. The activities and effects associated with alternative 2 would be the same as those for alternative 1, but would be of greater extent, and would include reestablishing the historic trail between the light station sites on Long Island. Alternative 2 would include managing vegetation, including clearing trees and/or trimming shrubs, on about 23 acres of vegetation, including about 18 acres of forest that has encroached into the historically cleared areas of the light stations (Table 13; Figures 58 to 64). The vegetation managed on each island would represent a small fraction of the total vegetation on the island. The alternative would affect about 4% of the vegetation on Devils Island, about 2% on Long Island, and under one-half of 1% on the remaining islands. In all, managed areas would be less than one-quarter of 1% of the approximate 13,141 acres of vegetation present on the five islands. Adverse effects on vegetation would be minimized by the mitigation measures described under alternative 1. Because alternative 2 would include the permanent modification of about 23 acres of vegetation and the likely introduction and spread of nonnative species, the effects would be local, long-term, minor to moderate, and adverse.

TABLE 13. TYPE OF VEGETATION ON EACH ISLAND AFFECTED BY ALTERNATIVE 2 (IN ACRES)

Island	Vegetation Type				Island Total
	Dune	Forest	Shrub	Wetland	
Michigan	0.00	4.03	0.00	0.00	4.03
Outer	0.00	2.25	0.00	0.00	2.25
Devils	0.00	7.34	2.72	0.00	10.06
Long	0.22	3.41	1.30	0.00	4.93
Sand	0.00	1.33	0.74	0.00	2.07
Total	0.22	18.36	4.76	0.00	23.34

Cumulative Impacts. As described in the no action alternative, past, present, and reasonably foreseeable future projects would have a moderate adverse effect on vegetation in the park. Those impacts, in combination with the local long-term minor adverse effects of alternative 2, would result in park wide long-term moderate adverse cumulative impacts.

Conclusion. Alternative 2 would modify about 23 acres of vegetation. Invasive exotics may become established in the areas of disturbed soil, but their introduction and spread would be minimized with various mitigation measures. On a parkwide basis, the adverse effects on vegetation would be negligible, but locally they would be long-term, minor to moderate, and adverse. Cumulative effects would be parkwide, moderate, and adverse.

Alternative 3

Direct and Indirect Impacts of the Alternative. The activities and effects associated with alternative 3 would be the same as those for alternative 1 and alternative 2, but would be of greater extent than the other alternatives. Alternative 3 would include managing vegetation, including clearing trees and/or trimming shrubs, on about 33 acres vegetation, including about 24 acres of forest that has encroached into the historically cleared areas of the light stations (Table 14; Figures 65 to 73). The vegetation managed on each island would represent a small fraction of the total vegetation on the island. The alternative would affect about 4% of the vegetation on Devils Island, about 4% on Long Island, and under one-half of 1% on the remaining islands. In all, the cleared areas would be about one-quarter of 1% of the approximate 13,141 acres of vegetation present on the five islands. Adverse effects on vegetation would be minimized by the mitigation measures described under alternative 1. Because alternative 3 would include permanently modifying about 33 acres of vegetation and the likely introduction and spread of nonnative species, its effects would be local, long-term, minor to moderate, and adverse.

TABLE 14. TYPE OF VEGETATION ON EACH ISLAND AFFECTED BY ALTERNATIVE 3 (IN ACRES)

Island	Vegetation Type				Island Total
	Dune	Forest	Shrub	Wetland	
Michigan	0.00	4.03	0.00	0.00	4.03
Outer	0.00	2.25	0.00	0.00	2.25
Devils	0.00	7.28	2.72	0.06	10.06
Long	2.56	9.37	2.75	0.00	14.68
Sand	0.00	1.33	0.74	0.00	2.07
Total	2.56	24.26	6.21	0.06	33.09

Cumulative Impacts. As described in the no action alternative, past, present, and reasonably foreseeable future projects would have a minor to moderate adverse effect on vegetation in the park. Those impacts, in combination with the local long-term minor adverse effects of alternative 3, would result in parkwide long-term moderate adverse cumulative impacts.

Conclusion. Alternative 3 would modify about 33 acres of vegetation. Invasive exotics may become established in the areas of disturbed soil, but their introduction and spread would be minimized with various mitigation measures. On a parkwide basis, adverse effects on vegetation would be negligible, but locally, they would be long-term, minor to moderate, and adverse. Cumulative effects would be parkwide, moderate, and adverse.



Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

- Lawn Clearing
- Low Brush Clearing
- Meadow Clearing
- Slope Stabilization
- Vegetation Community

Image Source: USDA NAIP , 2008

Data Source: APIS Natural Resource Database - Plants, 2009

0 150 300
feet



Figure 50
Michigan Island
Treatment Alternative 1

File: 4532 - michigan isle.mxd (WH)
March 2011



Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

- | | |
|---|--|
| Lawn Clearing | Marsh Grass of Parnassas (<i>Parnassia palustris</i>) |
| Slope Stabilization | Vegetation Community |

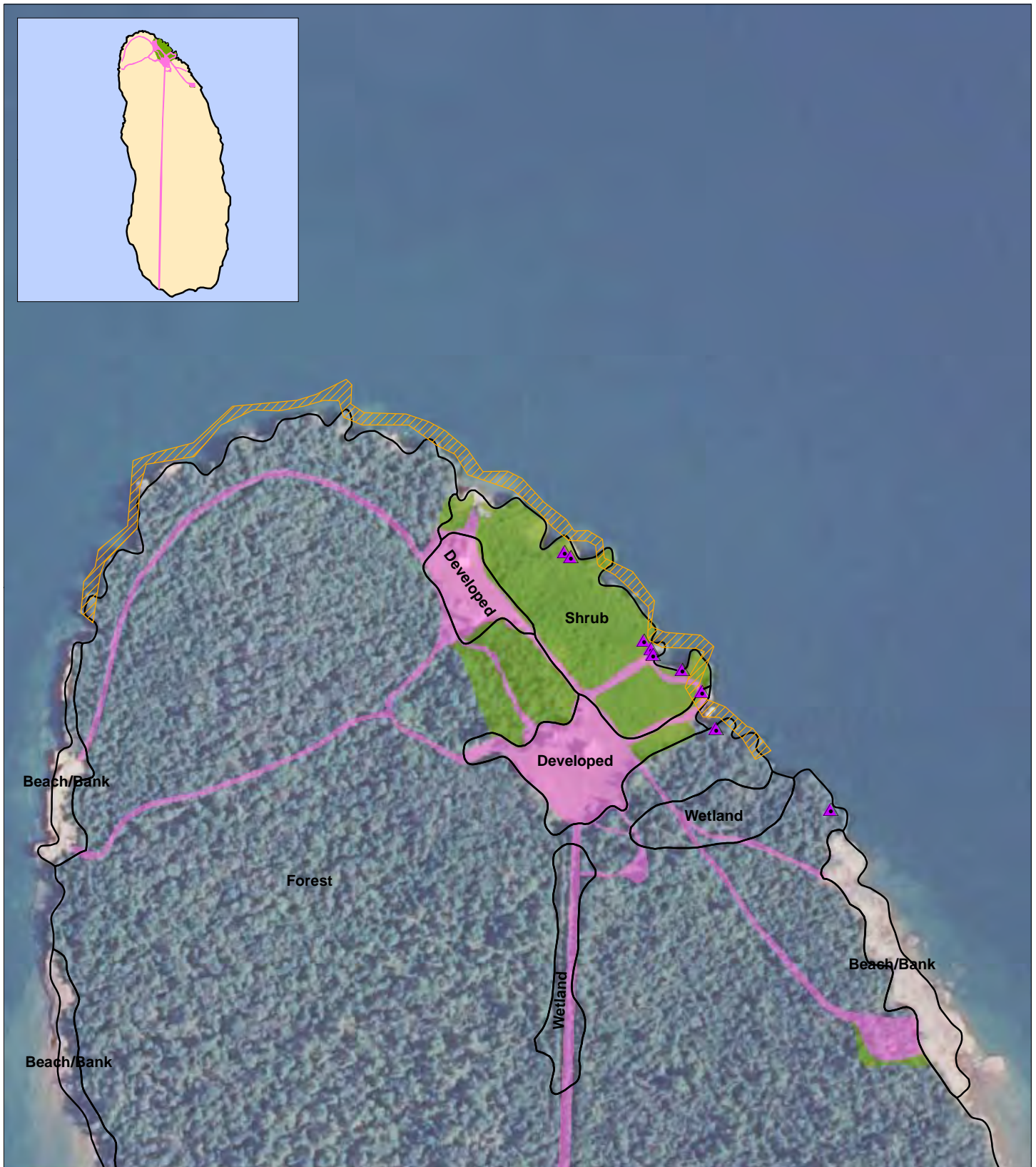
Image Source: USDA NAIP, 2008

Data Source: APIS Natural Resource Database - Plants, 2009



**Figure 51
Outer Island Treatment
Alternative 1**

File: 4532 - outer isle.mxd (WH)
March 2011



Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

- Lawn Clearing
- Low Brush Clearing
- Vegetation Community
- Low Northern Sedge (*Carex concinna*)
- Common Butterwort (*Pinguicula vulgaris*)

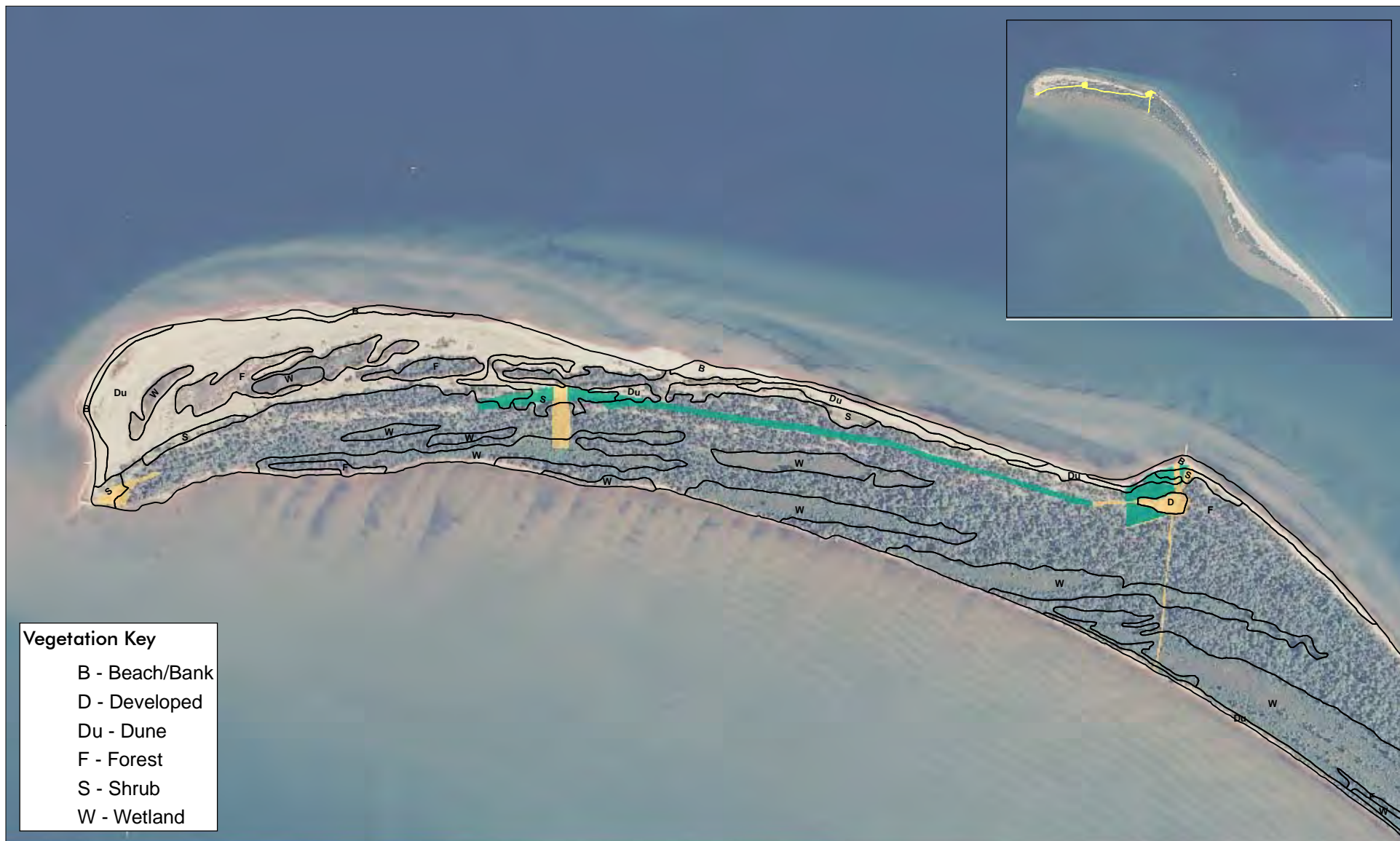
Image Source: USDA NAIP, 2008
Data Source: APIS Natural Resource Database - Plants, 2009

0 150 300 feet



Figure 52 Devils Island Treatment Alternative 1

File: 4532 - devils isle.mxd (WH)
March 2011



Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

Dune Vegetation (not managed)
 Managed Dune Vegetation
 Vegetation Community

Image Source: USDA NAIP, 2008
 Data Source: APIS Natural Resource Database - Plants, 2009

0 400 800 feet



Figure 53
Long Island
Treatment Alternative 1

File: 4532 - long isle.mxd (WH)
 March 2011



Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

- Dune Vegetation (not managed)
- Managed Dune Vegetation
- Vegetation Community

Image Source: USDA NAIP, 2008

Data Source: APIS Natural Resource Database - Plants, 2009

0 80 160
feet



Figure 54
Long Island - Lapointe Light
Station Treatment Alternative 1

File: 4532 - long isle lapointe.mxd (WH)
March 2011



Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

- Managed Dune Vegetation
- Dune Vegetation (not managed)
- Vegetation Community

Image Source: USDA NAIP, 2008

Data Source: APIS Natural Resource Database - Plants, 2009

Figure 55
Long Island - Original
Lapointe Light Station
Treatment Alternative 1

File: 4532 - long isle olh.mxd (WH)
March 2011



Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

- Managed Dune Vegetation
- Vegetation Community

Image Source: USDA NAIP, 2008
 Data Source: APIS Natural Resource Database - Plants, 2009

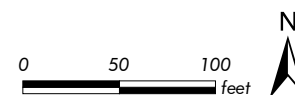


Figure 56
Long Island - Chequamegon
Light Station Treatment
Alternative 1

File: 4532 - long isle chequamegon.mxd (WH)
 March 2011



Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

Lawn Clearing
 Low Brush Clearing
 Vegetation Community

Image Source: USDA NAIP, 2008

Data Source: APIS Natural Resource Database - Plants, 2009

0 100 200
feet



Figure 57
Sand Island Light Station
Treatment Alternative 1

File: 4532 - sand isle.mxd (WH)
March 2011



Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

- Lawn Clearing
- Meadow Clearing
- Slope Stabilization
- Vegetation Community

Image Source: USDA NAIP , 2008

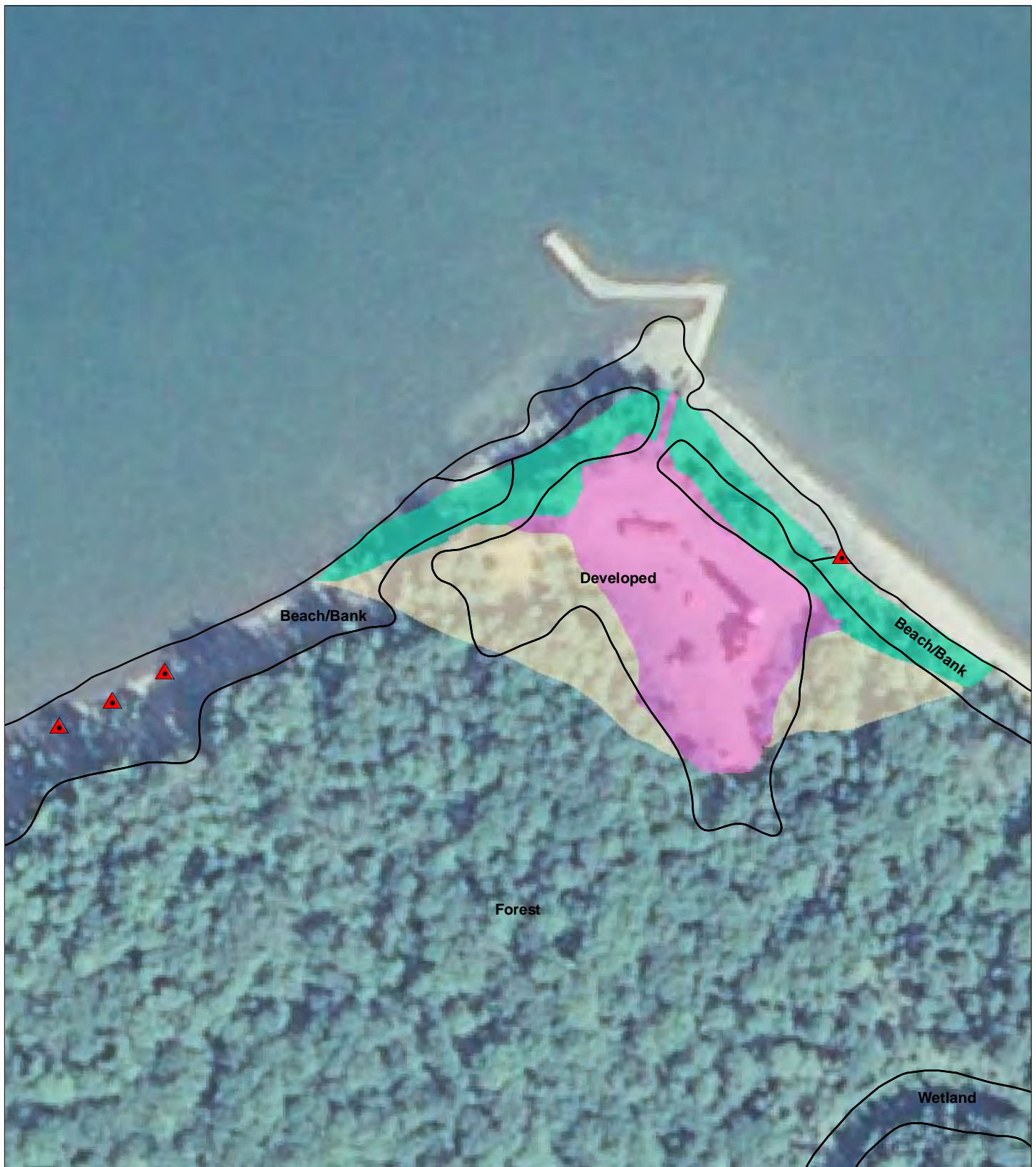
Data Source: APIS Natural Resource Database - Plants, 2009

0 150 300 feet



Figure 58 Michigan Island Preferred Treatment Alternative

File: 4532 - michigan isle.mxd (WH)
March 2011



Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

- Lawn Clearing
- Meadow Clearing
- Slope Stabilization
- Vegetation Community
- ▲ Marsh Grass of Parnassas (*Parnassia palustris*)

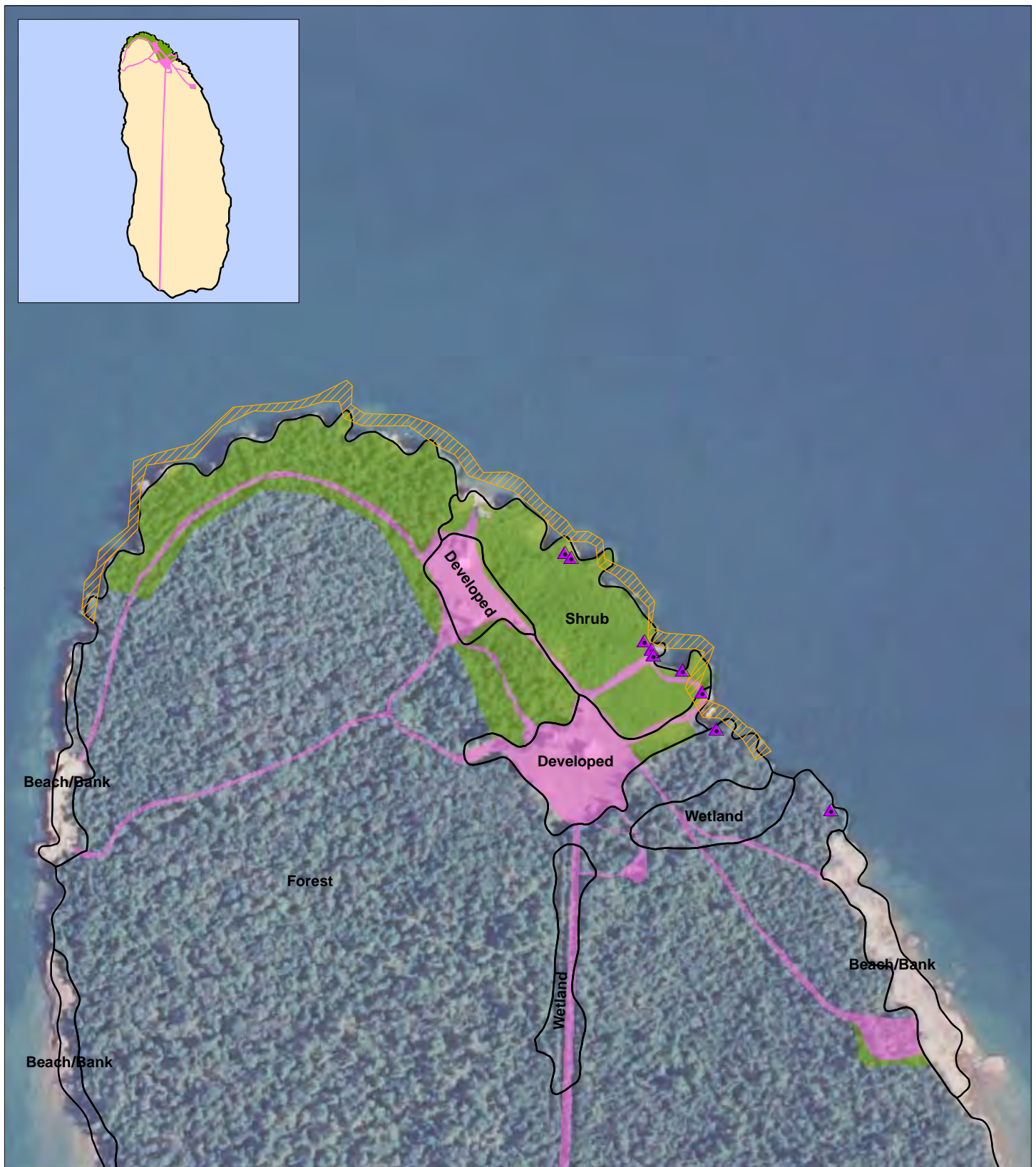
Image Source: USDA NAIP, 2008

Data Source: APIS Natural Resource Database - Plants, 2009



Figure 59
Outer Island Preferred Treatment Alternative

File: 4532 - outer isle.mxd (WH)
March 2011



Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

- Lawn Clearing
- Low Brush Clearing
- Vegetation Community
- Low Northern Sedge (*Carex concinna*)
- Common Butterwort (*Pinguicula vulgaris*)

Image Source: USDA NAIP, 2008
Data Source: APIS Natural Resource Database - Plants, 2009

0 150 300 feet



Figure 60 Devils Island Preferred Treatment Alternative

File: 4532 - devils isle.mxd (WH)
March 2011



Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

- Dune Vegetation (not managed)
- Managed Dune Vegetation
- Vegetation Community

Image Source: USDA NAIP, 2008
Data Source: APIS Natural Resource Database - Plants, 2009

0 400 800
feet



Figure 61
Long Island Preferred
Treatment Alternative

File: 4532 - long isle.mxd (WH)
March 2011



Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

- Dune Vegetation (not managed)
- Managed Dune Vegetation
- Vegetation Community

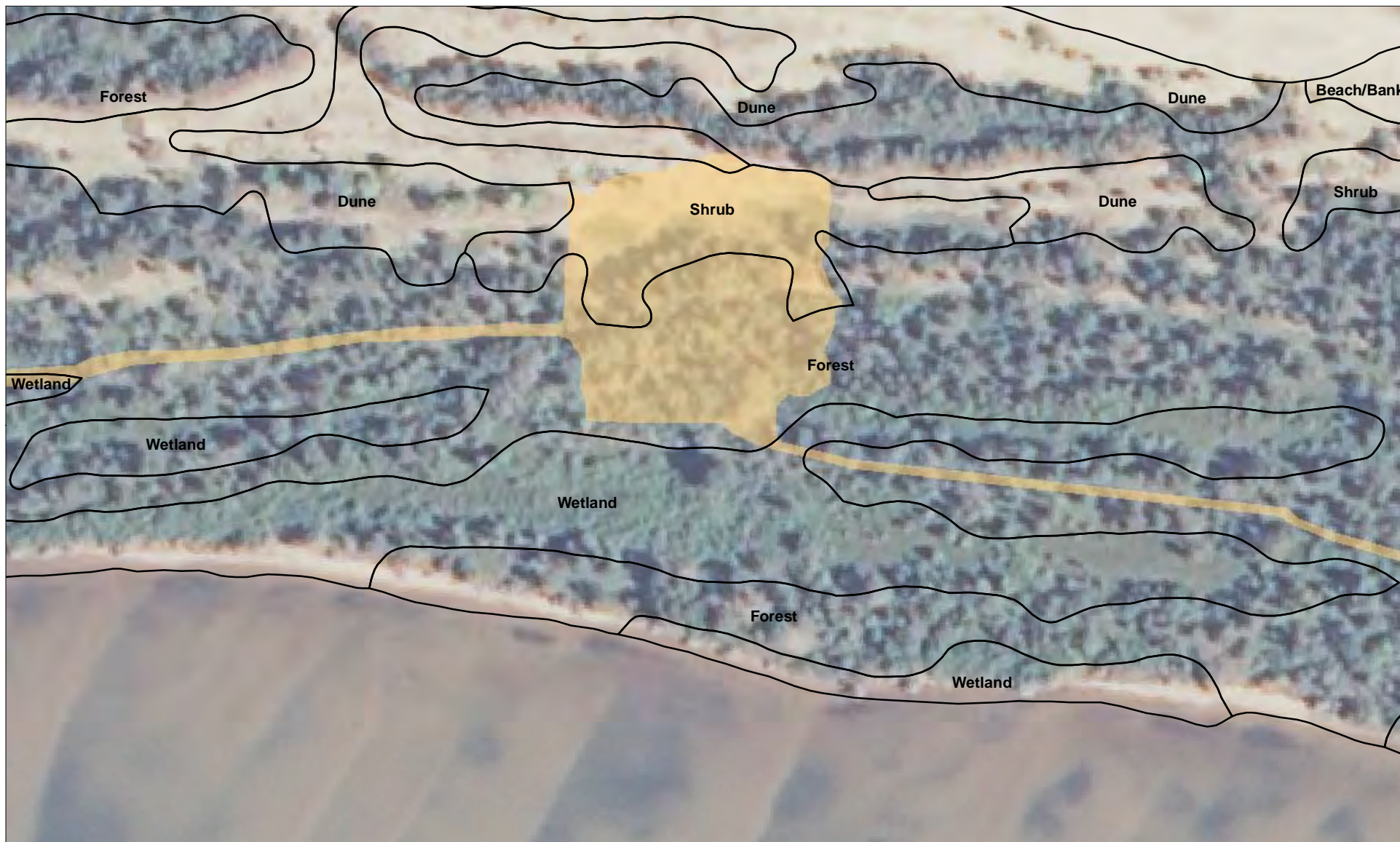
Image Source: USDA NAIP, 2008
Data Source: APIS Natural Resource Database - Plants, 2009

0 80 160
feet



Figure 62 Long Island - Lapointe Light Station Preferred Treatment Alternative

File: 4532 - long isle lapointe.mxd (WH)
March 2011



Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

- Managed Dune Vegetation
- Vegetation Community

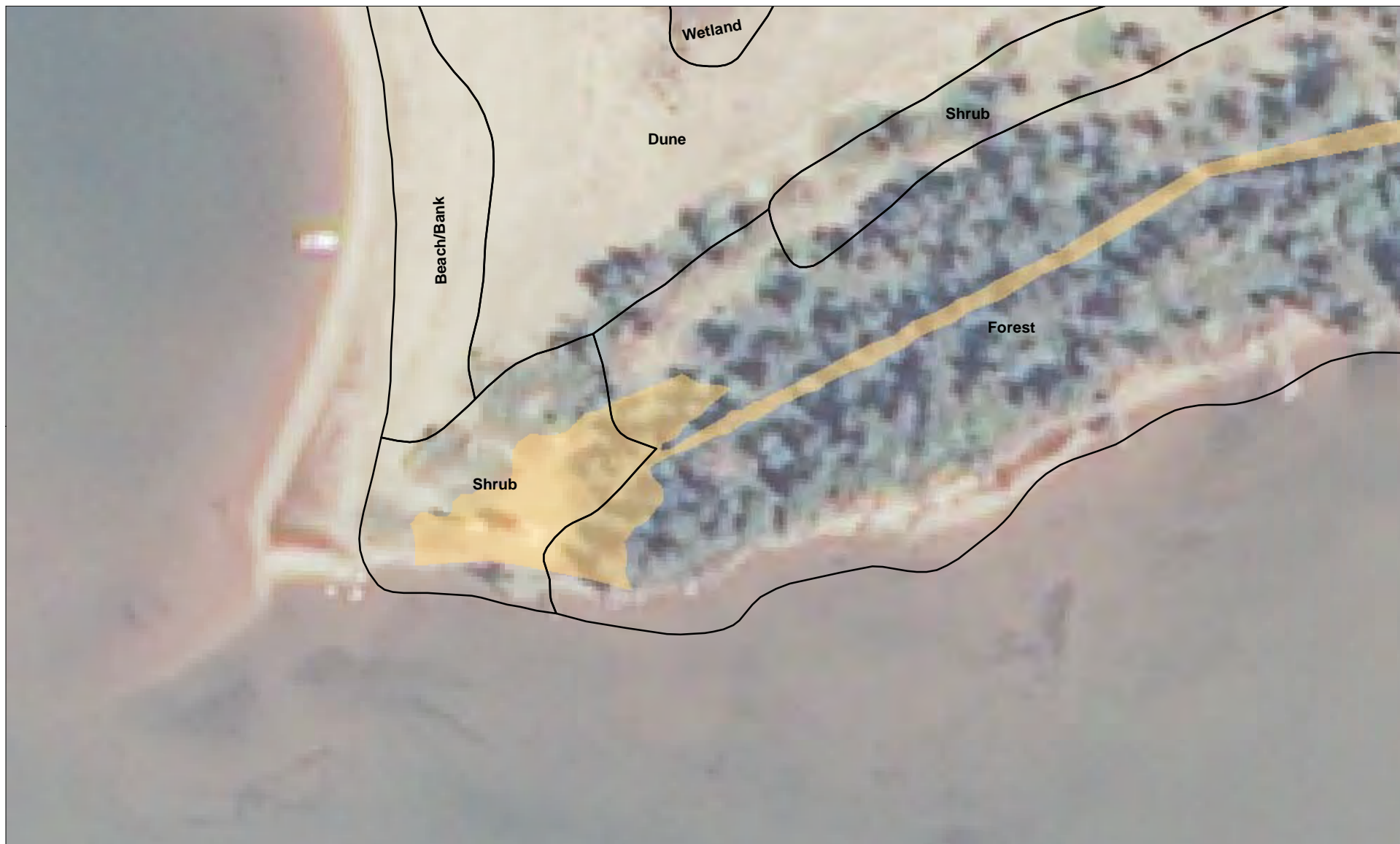
Image Source: USDA NAIP, 2008
Data Source: APIS Natural Resource Database - Plants, 2009

0 75 150
feet



Figure 63 Long Island - Original Lapointe Light Station Preferred Treatment Alternative

File: 4532 - long isle olh.mxd (WH)
March 2011



Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

- Managed Dune Vegetation
- Vegetation Community

Image Source: USDA NAIP, 2008
Data Source: APIS Natural Resource Database - Plants, 2009

0 50 100
feet



Figure 64
Long Island - Chequamegon
Light Station Preferred
Treatment Alternative

File: 4532 - long isle chequamegon.mxd (WH)
March 2011



Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

Lawn Clearing
 Low Brush Clearing
 Vegetation Community

Image Source: USDA NAIP, 2008

Data Source: APIS Natural Resource Database - Plants, 2009

0 100 200 feet



**Figure 65
Sand Island Light Station
Preferred Treatment
Alternative**

File: 4532 - sand isle.mxd (WH)
March 2011



Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

- Lawn Clearing
- Meadow Clearing
- Slope Stabilization
- Vegetation Community

Image Source: USDA NAIP , 2008

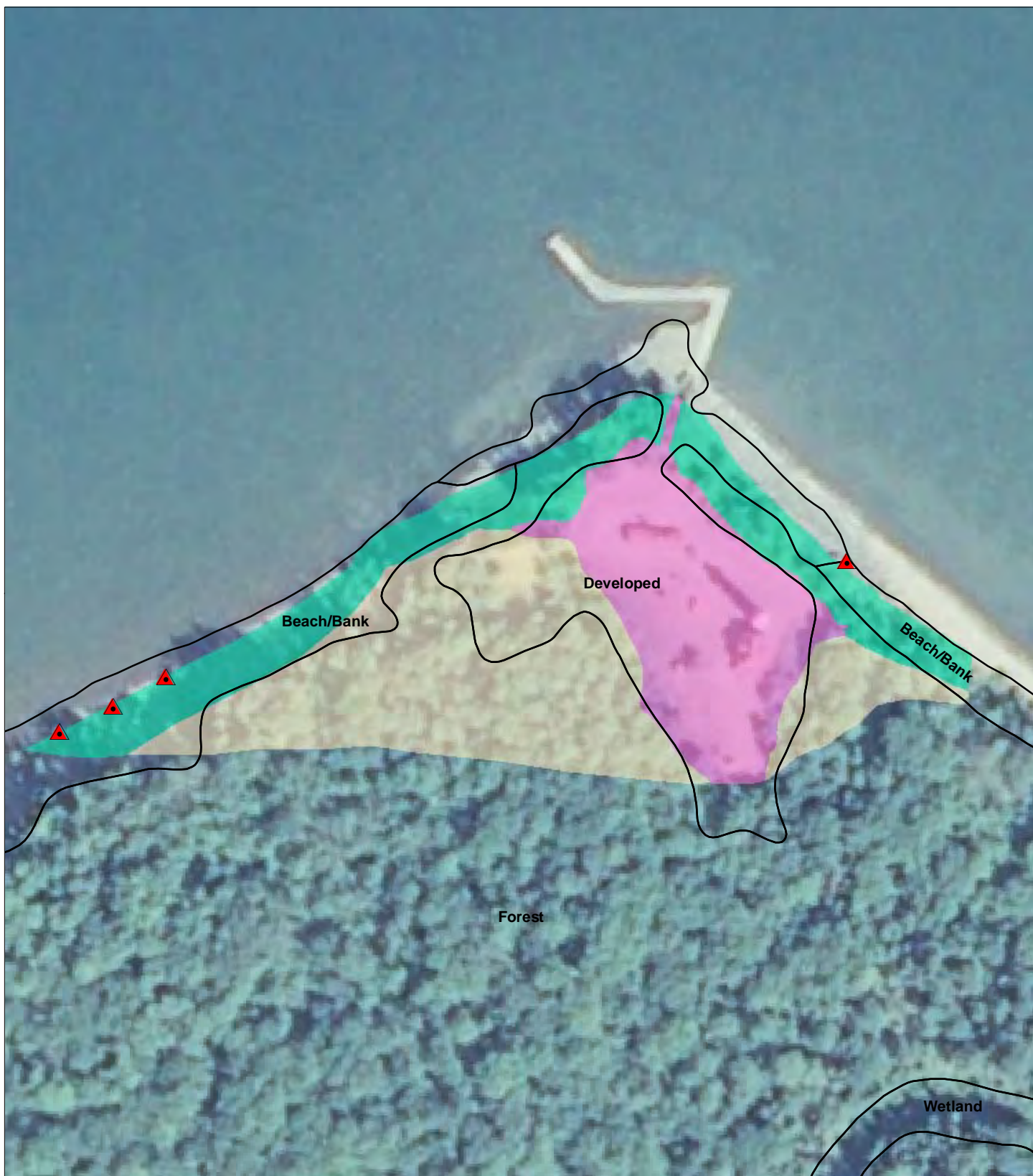
Data Source: APIS Natural Resource Database - Plants, 2009

0 150 300 feet



Figure 66 Michigan Island Treatment Alternative 3

File: 4532 - michigan isle.mxd (WH)
March 2011



Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

- Lawn Clearing
- Meadow Clearing
- Slope Stabilization
- Marsh Grass of Parnassas (*Parnassia palustris*)
- Vegetation Community

Image Source: USDA NAIP, 2008

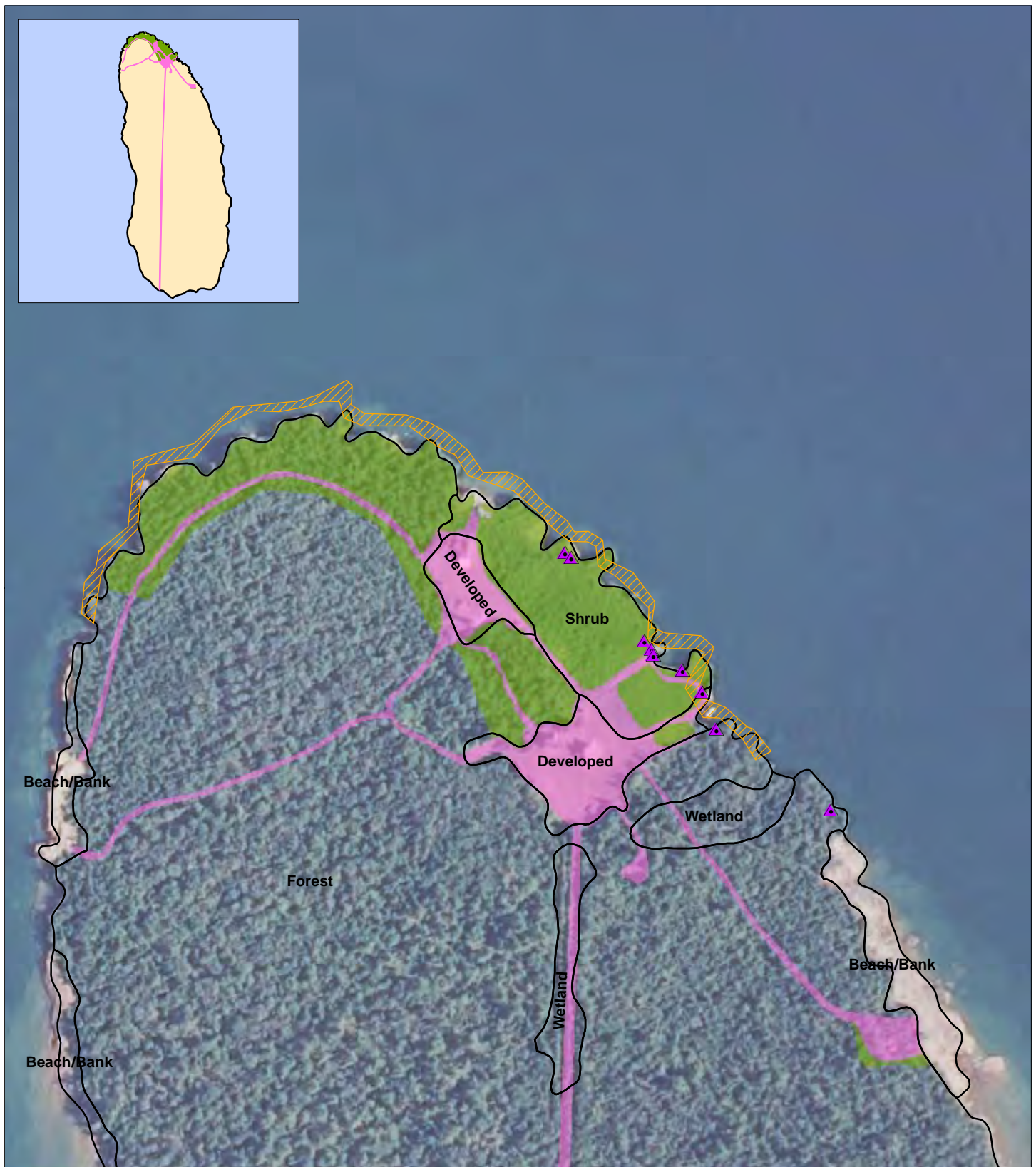
Data Source: APIS Natural Resource Database - Plants, 2009

0 75 150 feet



Figure 67 Outer Island Treatment Alternative 3

File: 4532 - outer isle.mxd (WH)
March 2011



Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

- Lawn Clearing
- Low Brush Clearing
- Vegetation Community
- Low Northern Sedge (*Carex concinna*)
- Common Butterwort (*Pinguicula vulgaris*)

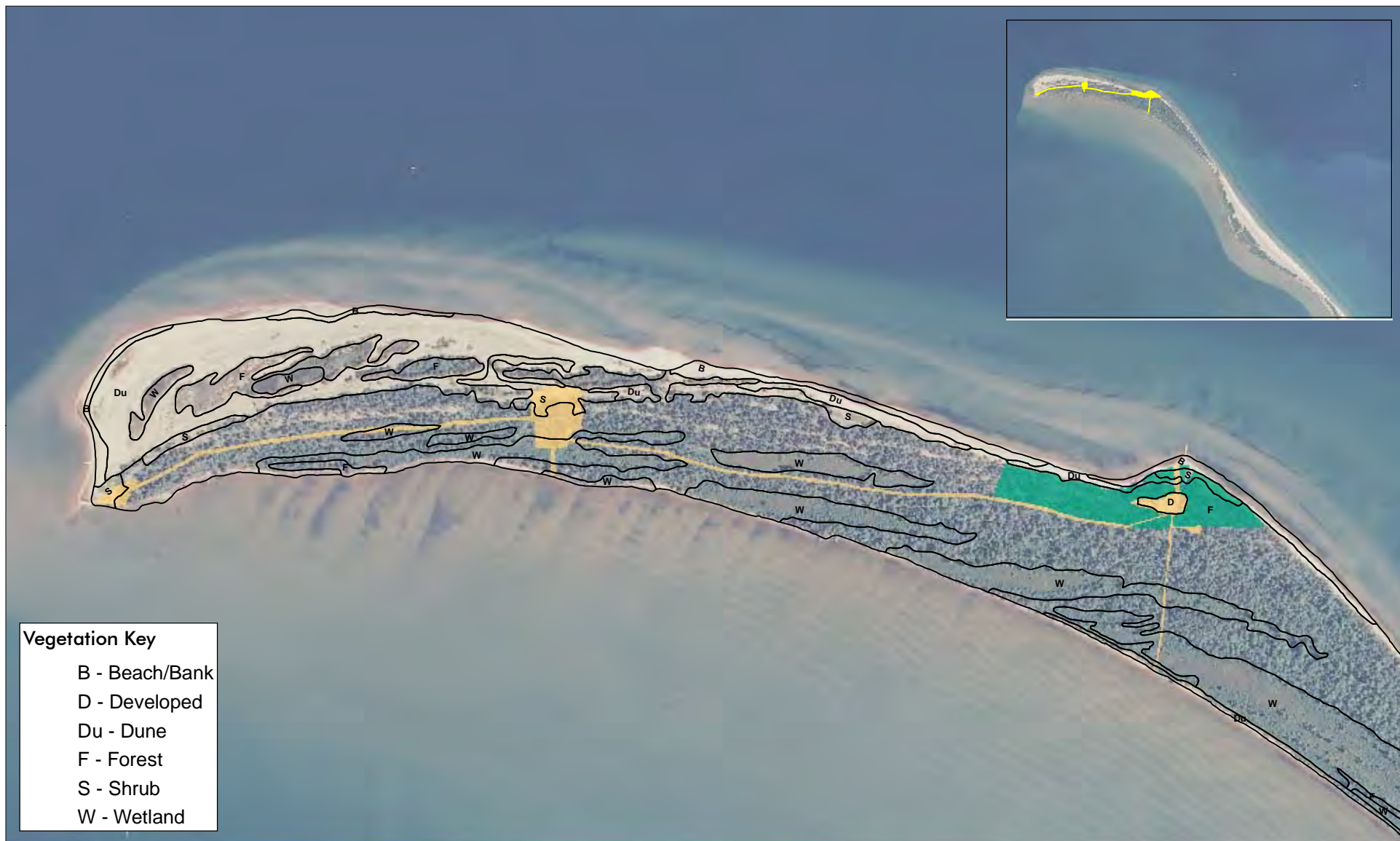
Image Source: USDA NAIP, 2008
Data Source: APIS Natural Resource Database - Plants, 2009

0 150 300 feet



Figure 68 Devils Island Treatment Alternative 3

File: 4532 - devils isle.mxd (WH)
March 2011



Vegetation Key

B - Beach/Bank
D - Developed
Du - Dune
F - Forest
S - Shrub
W - Wetland

Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

Dune Vegetation (not managed) Vegetation Community
 Managed Dune Vegetation

Image Source: USDA NAIP, 2008

Data Source: APIS Natural Resource Database - Plants, 2009

0 400 800
feet



Figure 69
Long Island
Treatment Alternative 3

File: 4532 - long isle.mxd (WH)
March 2011



Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

- Dune Vegetation (not managed)
- Managed Dune Vegetation
- Vegetation Community

Image Source: USDA NAIP, 2008
 Data Source: APIS Natural Resource Database - Plants, 2009

Figure 70
 Long Island - Lapointe Light
 Station Treatment Alternative 3

File: 4532 - long isle lapointe.mxd (WH)
 March 2011



Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

- Managed Dune Vegetation
- Dune Vegetation (not managed)
- Vegetation Community

Image Source: USDA NAIP, 2008

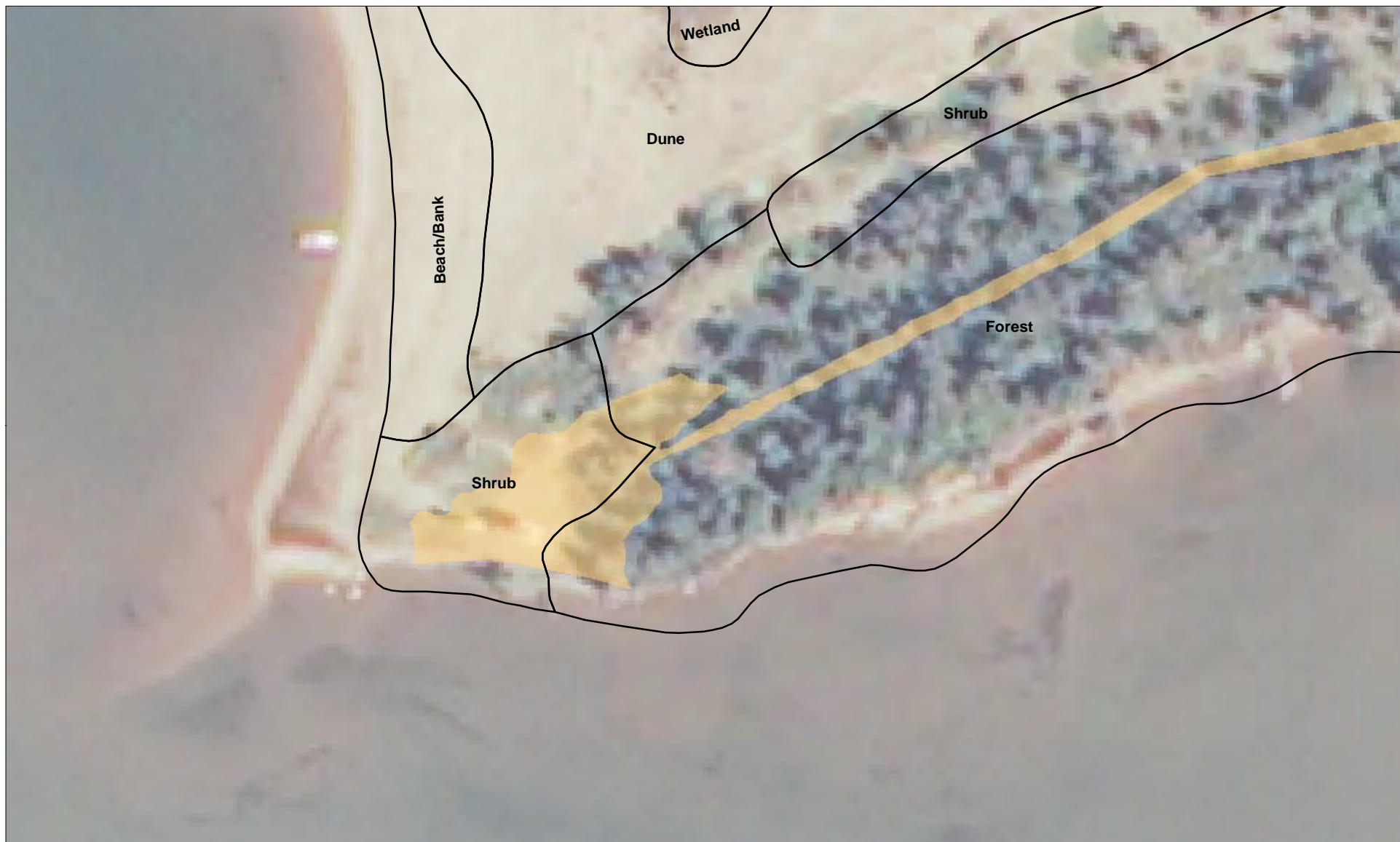
Data Source: APIS Natural Resource Database - Plants, 2009

Figure 71
Long Island - Original
Lapointe Light Station
Treatment Alternative 3

File: 4532 - long isle olh.mxd (WH)
 March 2011

0 75 150
 feet





Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

- Managed Dune Vegetation
- Vegetation Community

Image Source: USDA NAIP, 2008
Data Source: APIS Natural Resource Database - Plants, 2009

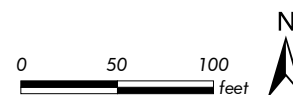


Figure 72
Long Island - Chequamegon
Light Station Treatment
Alternative 3

File: 4532 - long isle chequamegon.mxd (WH)
March 2011



Apostle Islands National Lakeshore EA - Existing Vegetation and Proposed Management Areas

- Lawn Clearing
- Low Brush Clearing
- Vegetation Community

Image Source: USDA NAIP, 2008

Data Source: APIS Natural Resource Database - Plants, 2009

0 100 200
feet



Figure 73
Sand Island Light Station
Treatment Alternative 3

File: 4532 - sand isle.mxd (WH)
March 2011

WILDLIFE

Affected Environment

Island biogeography plays a large role in the distribution and abundance of wildlife populations within the park. The islands are naturally isolated from the mainland, and Lake Superior is a barrier to movement for some animals. The majority of terrestrial wildlife became established on the islands about 9,500 years ago when the lake level dropped to about 450 feet above sea level and the current archipelago was part of the mainland. Vertebrate species are not uniformly distributed throughout the islands, with distribution generally influenced by the size of the island (NPS 2007a). More mobile species may have reached the islands by swimming (e.g., deer, bear, and beaver) or by crossing the ice in winter (e.g., deer, red fox, and coyote). In addition to geographic barriers that influence the demography of wildlife populations, island size can be a limiting factor for many species. Belant and Van Stappen (2002) studied the distribution of mammals among 20 islands within the park, finding that island area is strongly associated with the number of species present.

Thirty-seven species of mammals are known to occur in the park. Large mammals are not common on most of the islands and tend to be transient. Small mammal surveys have found that the southern red-backed vole is the most common small mammal on the islands. Mammals that occur on most of the islands include red squirrel, snowshoe hare, and deer mouse. Larger species, such as black bear and white-tailed deer, are locally common on certain islands. Other mammal species found on the islands less frequently include bobcat, fox, coyote, otter, and fisher. Some common mainland species that are less mobile or dormant in the winter (e.g., gray squirrel, least chipmunk, porcupine, skunk, raccoon, and possibly some species of amphibians and reptiles) are not present on the islands (NPS 2007a). However, Long Island, currently a barrier spit rather than an island, contains most species that occur on the mainland.

The park's monitoring programs have recorded 154 species of breeding birds (NPS 2009c). The islands are especially important as stopovers for migratory birds (NPS 2007a). The park provides important nesting habitat for colonial nesting birds including herring gulls, double-crested cormorants, cliff swallows, and great blue herons (NPS 2007a). The park also provides nesting habitat for bald eagles. Nesting piping plover (federally and state endangered) also are present on the islands (see the "Federal and State Threatened and Endangered Species" section). In recent years, piping plovers have successfully and consistently nested on Long Island. The Outer Island sandspit has occasionally had nesting piping plovers. The park provides the most important piping plover nesting location in the State of Wisconsin and the only area that has had recent nesting. The park, in cooperation with the Wisconsin DNR, Fish and Wildlife Service, Bad River Tribe, and The Nature Conservancy intensively monitor and protect plovers during the nesting period. Bald eagles began recolonizing the islands in the early 1980s and young have been produced annually since 1983 (NPS 2007a). Reproducing bald eagle populations occur in the park. The bald eagle population is monitored and tested for toxic chemical levels every other year by the Great Lakes Inventory and Monitoring Network. Hunting is not permitted during the peak visitor season, which coincides with nesting activity for bald eagles.

Six species of salamanders, 10 species of frogs and toads, and six species of reptiles are known to occur within the park (NPS 2009a). Eastern American toads are common in the park. Other amphibians include blue-spotted, spotted, eastern red-backed, and four-toed salamanders;

central newt; mudpuppy; northern spring peeper; eastern gray tree frog; green frog; northern leopard frog; mink frog; wood frog; chorus frog; and gray treefrog. Western painted turtles, eastern gartersnakes, and northern red-bellied snakes are common in the park. Additional reptile species include snapping turtle, northern ring-necked snake, and smooth green snake.

The draft general management plan (NPS 2009a) has more detailed information on wildlife on each island.

Impact Intensity Threshold

The NPS Organic Act, which directs parks to conserve wildlife unimpaired for future generations, is interpreted to mean that native animal life should be protected and perpetuated as part of the park's natural ecosystem. Natural processes are relied on to control populations of native species to the greatest extent possible; otherwise they are protected from harvest, harassment, or harm by human activities. According to *NPS Management Policies 2006*, the restoration of native species is a high priority (sec. 4.1). Management goals for wildlife include maintaining components and processes of naturally evolving park ecosystems, including natural abundance, diversity, and the ecological integrity of plants and animals. Information on park wildlife was taken from park documents and records, park natural resource management staff, and other sources. The thresholds of change for the intensity of impacts to wildlife are defined in Table 15.

TABLE 15. WILDLIFE IMPACT AND INTENSITY

Impact Intensity	Intensity Description
Negligible	There would be no observable or measurable impacts to native species, their habitats, or the natural processes sustaining them. Impacts would be well within natural fluctuations.
Minor	Impacts would be detectable and would not be expected to be outside the natural range of variability of native species' populations, their habitats, or the natural processes sustaining them. Mitigation measures, if needed to offset adverse effects, would be simple and successful.
Moderate	Breeding animals of concern are present; animals are present during particularly vulnerable life stages such as migration or juvenile stages; mortality or interference with activities necessary for survival would be expected on an occasional basis, but would not be expected to threaten the continued existence of the species in the park unit. Impacts on native species, their habitats, or the natural processes sustaining them would be detectable and would be outside the natural range of variability. Mitigation measures, if needed to offset adverse effects, would be extensive and likely successful.
Major	Impacts on native species, their habitats, or the natural processes sustaining them would be detectable and would be expected to be outside the natural range of variability. Key ecosystem processes might be disrupted. Loss of habitat might affect the viability of at least some native species. Extensive mitigation measures would be needed to offset any adverse effects and the success could not be guaranteed.

Short-term impact—recovers in less than one year

Long-term impact—takes more than one year to recover

Environmental Consequences

No Action Alternatives

Direct and Indirect Impacts of the Alternative. There would be no new impacts to wildlife or wildlife habitat from the no action alternative. Current vegetation management practices on the light stations would continue, so there would be no changes in habitat types or wildlife use of existing habitat.

Cumulative Impacts. Invasive plant species brought to the islands during construction or by visitors can have an adverse effect on native wildlife by creating unsuitable habitat, but some of this effect is offset by NPS efforts to manage invasive species. Wildlife is also being affected and will continue to be affected during routine repair and maintenance activities. Past, present, and reasonably foreseeable future actions have effects on wildlife, but the size of the areas in which the effects occur are minor when compared to habitat available on each island. For these reasons, past, present, and reasonably foreseeable future actions would have a local minor adverse effect on wildlife resources. Because the no action alternative would not add any effects to the effects of past, present, or reasonably foreseeable projects, the alternative would not have a cumulative effect on wildlife.

Conclusion. The no action alternative would have no new effects on wildlife or wildlife habitat, and would have no cumulative effects.

Alternative 1

Direct and Indirect Impacts of the Alternative. Short-term and long-term impacts to wildlife habitat would result from vegetation removal and management associated with alternative 1. In the short term, human presence and construction noise would temporarily disturb and displace resident wildlife. The impacts would be limited by restricting work to daylight hours. The construction contractor would be required to keep all garbage and food waste contained and removed periodically from the work site to avoid attracting wildlife into the construction zone. Construction workers would be instructed to remove food scraps and not feed or approach wildlife. Following construction, normal wildlife use of undisturbed habitat would resume. There would be additional additional periodic short-term effects when cleared areas are periodically maintained by mowing or brush removal.

In the long term, about 16 acres of habitat, including vegetation, beaches, and banks, would be permanently modified under alternative 1, which would result in habitat loss for some wildlife species, including species that prefer forest habitat, such as red squirrel and nuthatch, and an increase in habitat for other species, including species that prefer shrub and grassland habitat, such as mice and eastern meadowlark. Because species that prefer forest habitat are most common on the islands, greater numbers of them would be adversely affected by the habitat modification than individuals of species that prefer shrub and grassland habitat would experience beneficial effects. This would be a local minor adverse effect because displaced forest wildlife would be able to make use of much larger areas of similar habitat on each island. Overall, alternative 1 would result in local long-term minor adverse effects on wildlife that prefer forest habitat. Parkwide long-term adverse effects would be negligible.

Cumulative Impacts. As described under the no action alternative, past, present, and reasonably foreseeable future actions would have a local minor adverse effect on wildlife species that prefer forest habitat. Those impacts, in combination with the local long-term minor adverse effects of alternative 1, would result in local minor adverse cumulative impacts.

Conclusion. The additional noise and disturbance during construction would result in local short-term minor adverse effects on wildlife species that prefer forest habitat. The permanent modification of about 16 acres of forest and shrub habitat would result in local long-term minor adverse impacts to wildlife. Overall, cumulative effects would be local, minor, and adverse.

Alternative 2 (Preferred Alternative)

Direct and Indirect Impacts of the Alternative. The short-term and long-term adverse effects on wildlife that would result from vegetation removal and management associated with alternative 2 are the same as those under alternative 1, except that 25 acres of habitat would be modified by removing trees and trimming shrubs. These effects would be minor given the area of available habitat in each island. Overall, alternative 2 would result in local long-term minor adverse effects on wildlife species that prefer forest habitat.

Cumulative Impacts. As described under the no action alternative, past, present, and reasonably foreseeable future actions would have a local minor adverse effect on wildlife. Those impacts, in combination with the local long-term minor adverse effects of alternative 2, would result in local minor adverse cumulative effects.

Conclusion. The additional noise and disturbance during construction would result in local short-term minor adverse effects on wildlife species that prefer forest habitat. The permanent modification of about 25 acres of forest and shrub habitat would result in local long-term minor adverse effects on wildlife species that prefer forests. Overall, cumulative effects would be local, minor, and adverse.

Alternative 3

Direct and Indirect Impacts of the Alternative. The short-term and long-term adverse effects on wildlife that would result from vegetation removal and management associated with alternative 3 are the same as those under alternative 1 and alternative 2, except that 36 acres of habitat would be modified by removing trees and trimming shrubs. These effects would be minor given the area of available habitat in each island. Overall, alternative 3 would result in local long-term minor adverse effects on wildlife species that prefer forest habitat.

Cumulative Impacts. As described under the no action alternative, past, present, and reasonably foreseeable future actions would have a local minor adverse effect on wildlife. Those impacts, in combination with the local long-term minor adverse effects of alternative 3, would result in local minor adverse cumulative impacts.

Conclusion. The additional noise and disturbance during construction would result in local short-term minor adverse effects on wildlife species that prefer forest habitat. The permanent modification of about 36 acres of forest and shrub habitat would result in local long-term minor adverse effects on wildlife. Overall, cumulative effects would be local, minor, and adverse.

SPECIAL STATUS SPECIES

Affected Environment

A number of federal and state threatened and endangered species are known to occur, or have the potential to occur, in the park. The likelihood that species listed as threatened, endangered, or candidate under the Endangered Species Act may occur in the park is based on surveys, staff knowledge, USFWS data, available habitat, and known range (Table 16).

TABLE 16. FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES FOUND IN THE PARK

Common Name	Scientific Name	Federal Status	Found in Project Area?
Canada lynx	<i>Lynx canadensis</i>	Threatened	No
Fassett's locoweed	<i>Oxytropis campestris</i> var. <i>chartacea</i>	Threatened	No
Gray wolf	<i>Canis lupus</i>	Endangered	Transient only
Piping plover	<i>Charadrius melodus</i>	Endangered	Long and Outer islands

Source: NPS 2009a; Van Stappen, pers. comm. 2010.

Canada lynx and Fassett's locoweed are unlikely to occur in the park. The park falls within the potential range of the lynx; however, there has never been a verified sighting of a lynx in the park (NPS 2009a). In addition, there is only a limited amount of boreal forest habitat for Canada lynx in the park. Although the federally threatened Fassett's locoweed occurs in Bayfield County, it has not been reported in the park (Van Stappen, pers. comm. 2010). Because they are not known to occur in the park and are unlikely to be present and because there is no designated critical habitat in the park for Canada lynx and Fassett's locoweed, they are not addressed further in this EA.

Although transient, gray wolves do occur in the park and have recently occurred on Sand Island. During the spring of 2009, there were at least two animals on Sand Island (Van Stappen, pers. comm. 2010). A pack on the mainland has primary territory less than 1 mile from Sand Island.

Piping plovers have nested in the park since 1998. Nesting success was sporadic from 1998 to 2004. Since 2005, plovers have consistently nested on Long Island and there have been piping plover monitors stationed on Long Island during the nesting season since 2007. Piping plovers have nested on the Outer Island sandspit, but nesting has been very sporadic in that location. Monitoring and protection of plovers is a joint effort between the park, the Fish and Wildlife Service, the Wisconsin DNR, the Bad River Tribe, The Nature Conservancy, and the University of Minnesota. All of Long Island, including private and tribal lands, was designated as critical habitat in 2001. Although the Michigan Island sandspit has been designated critical habitat, there has not been any recent nesting by piping plovers. Piping plovers do not occur on Devils Island or Sand Island.

In addition to federally listed species, a number of wildlife species listed as threatened or endangered by the state of Wisconsin are at least occasionally present in the park (Table 17).

TABLE 17. STATE THREATENED AND ENDANGERED WILDLIFE SPECIES FOUND IN THE PARK

Common Name	Scientific Name	State Status	Found in Project Area?
Peregrine falcon	<i>Falco peregrinus</i>	Threatened	Migration only
Red-shouldered hawk	<i>Buteo lineatus</i>	Threatened	Migration only
Henslow's sparrow	<i>Ammodramus henslowii</i>	Threatened	Migration only
Loggerhead shrike	<i>Lanius ludovicianus</i>	Endangered	Migration only
Caspian tern	<i>Hydroprogne caspia</i>	Endangered	Migration only
Forster's tern	<i>Sterna forsteri</i>	Endangered	Migration only
Piping plover	<i>Charadrius melodus</i>	Endangered	Long and Outer islands
Common tern	<i>Sterna hirundo</i>	Endangered	Not known to nest within the park; however, there is a common tern nesting colony in nearby Chequamegon Bay
Red-necked grebe	<i>Podiceps grisegena</i>	Endangered	Migration only

Source: NPS 2009a, 2009b, Van Stappen 2010.

Peregrine falcons occur in the park during migration. During fall, the Outer Island sandspit is used by migrating peregrine falcons, but this species does not breed in the park. Red-shouldered hawk, Henslow's sparrow, loggerhead shrike, Caspian tern, Forster's tern, common tern, and red-necked grebe migrate through the park; however, all of these species are very rarely seen in the park, and none are known to nest in the park.

The park also hosts 18 plant species listed as threatened or endangered by the state of Wisconsin because of their limited distribution or because they are disjunct from more abundant population centers (Table 18). No federally listed plant species occur in the park.

TABLE 18. STATE THREATENED AND ENDANGERED PLANT SPECIES BY HABITAT TYPE AT THE PARK

Common Name	Scientific Name	Habitat	State Status	Found in Project Area?
Lake cress	<i>Armoracia lacustris</i>	Submerged aquatic found in estuaries and quiet waters of streams and lakes (probably extirpated from the park)	Endangered	No
Moonwort grape-fern	<i>Botrychium lunaria</i>	Small grassy gaps in moist, cool woods	Endangered	No
Fairy slipper	<i>Calypso bulbosa</i>	Old growth white cedar swamps (probably extirpated from the park)	Threatened	No
Beautiful sedge	<i>Carex concinna</i>	White cedar thickets and swampy swales along the Great Lakes	Threatened	Devils Island
Coast sedge	<i>Carex exilis</i>	Coastal Great Lakes bog and fen mats, where it can be locally abundant	Threatened	No
Shore sedge	<i>Carex lenticularis</i>	Rock splash pools on Lake Superior and inland on lake beaches	Threatened	Devils and Long islands
Michaux's sedge	<i>Carex michauxiana</i>	Bog and fen mats on and near Lake Superior	Threatened	No
Drooping sedge	<i>Carex prasina</i>	Shaded, seeping ravine bottoms in deciduous or mixed woods	Threatened	No
Linear leaved sundew	<i>Drosera linearis</i>	Cold, open peat on the edge of sphagnum bog mats, often on old logs	Threatened	No
Broad-lipped twayblade	<i>Listera convallarioides</i>	Seepage slopes and ravine bottoms in hardwood or mixed forests	Threatened	No
Marsh grass-of-parnassas	<i>Parnassia palustris</i>	Clay bluffs on Lake Superior, cold northern fens, calcareous sandy habitats, or gravel pits	Threatened	Outer Island
Common butterwort	<i>Pinguicula vulgaris</i>	Moist ledges and mossy fallen boulders on shaded brownstone cliffs	Endangered	Outer and Devils islands
Northern gooseberry	<i>Ribes oxycanthoides</i>	Cool open habitats such as talus forests, bluff edges, or sandscapes	Threatened	No
Satiny willow	<i>Salix pellita</i>	Sand-gravel shores, riverbanks and swamps	Endangered	No
Flat-leaved willow	<i>Salix planifolia</i>	Near Lake Superior, including bedrock shorelines in the Apostle Islands	Threatened	Outer and Devils islands

Common Name	Scientific Name	Habitat	State Status	Found in Project Area?
Plains ragwort	<i>Senecio Indecorus</i>	Along Lake Superior in brownstone crevices and on clay bluffs	Threatened	Outer Island
Spike trisetum	<i>Trisetum spicatum</i>	Moist shaded mossy brownstone ledges on Lake Superior	Threatened	Outer, Devils, and Sand islands
Mountain cranberry	<i>Vaccinium vitis-idaea</i> ssp. <i>minus</i>	Along the edge of the Lakeshore Trail on brownstone cliffs	Endangered	No

Source: Judziewicz and Koch 1993; NPS 2009b; Van Stappen, pers. comm. 2010.

Eleven of the state-listed threatened or endangered species (lake cress, moonwort grape-fern, fairy slipper, coast sedge, Michaux's sedge, drooping sedge, linear leaved sundew, broad-lipped twayblade, northern gooseberry, satiny willow, and mountain cranberry) have been documented in the park, but have not been found on Michigan, Outer, Devils, Long, and Sand islands (NPS 2009b). The other seven species (beautiful sedge, shore sedge, marsh grass-of-parnassus, butterwort, flat-leaved willow, plains ragwort, and spike trisetum) have been documented to occur on one or more of the five islands addressed by this EA.

Although not listed by the state as threatened or endangered, bird's eye primrose (*Primula mistassinica*) and hair-like sedge (*Carex capillaris*), two state species of concern, are present on Devils Island.

Federal and state threatened and endangered species on each of the five islands addressed in this EA are described in greater detail below.

Michigan Island

About 4 miles of the sandspit on western Michigan Island was designated critical habitat for piping plovers in 2001; however, there have been no recent nesting attempts by this species recorded on the island. Piping plovers could potentially nest on the sandspit in the future. No other federal or state threatened or endangered species are likely to occur on Michigan Island.

Outer Island

Outer Island is one of only two sites in Wisconsin where piping plovers have successfully nested in recent years. A pair of piping plovers nested on Outer Island in 2006 and 2007. In 2007, the nest was successful and two young were produced (NPS 2007a, 2009a).

Butterwort, flat-leaved willow, plains ragwort, and spike trisetum occur on ledges and cliffs on the eastern shoreline of Outer Island outside the project area (Judziewicz and Koch 1993). Marsh grass-of-parnassus occurs on Outer Island in front of the lighthouse in the project area, and on red clay bluffs to the west of the lighthouse (Van Stappen, pers. comm. 2010; Judziewicz and Koch 1993; NPS 2009b). Shore sedge occurs in a wetland near the southern tip of the island outside the project area (Judziewicz and Koch 1993).

Devils Island

Devils Island has several rare plant communities along the cliffs and bluffs on its shoreline. Beautiful sedge occurs on the northern shore of Devils Island in the project area, on bluff edges and krumholtz margins. Shore sedge and flat-leaved willow grow outside the project area on the wave-splashed western coast of the island (Judziewicz and Koch 1993). Butterwort occurs on the cliffs and bluff edges of the Devils Island formation brownstone, especially at the northern end of the island in the project area (Judziewicz and Koch 1993). Spike trisetum occurs on the southeastern shore of the island outside of the project area (NPS 2009b). Additionally, bird's eye primrose and hair-like sedge are present on the north end of the island.

Long Island

In 1998, a pair of piping plovers nested and successfully reared chicks on Long Island, the first nesting activity for this species in the park since 1983 (NPS 2007a). In 2006, three nests on Long Island were successful, producing a total of five fledglings. In 2007, 13 young were produced. In 2008, there were a total of five nests, of which three nests successfully fledged six young (NPS 2009a). In 2009, there were three successful nests that fledged six young and in 2010 there were two successful nests and seven fledged young. The majority of nesting has occurred near the southern end of the park's property; however, there has been recent nesting on the northern tip of the island near the Chequamegon Point Lighthouse (Van Stappen 2010). In 2001, about 16 miles of Lake Superior shoreline of Chequamegon Point were designated as critical habitat for the piping plover. About 7 miles of the shoreline are in the park, including the shoreline near the three lights.

Shore sedge occurs along the margins of ephemeral sand ponds among the dunes on the island's western tip. There are no ponds in the areas that would be affected by the proposed alternatives, but one of these ponds occurs within a few hundred feet of the Chequamegon Point Lighthouse on the western tip of the island.

Sand Island

Gray wolves have recently occurred on Sand Island, although they are transient. Spike trisetum occurs occasionally on Sand Island on the Orienta formation brownstone ledges outside of the project area, southeast of the lighthouse (Judziewicz and Koch 1993). Butterwort and bird's-eye primrose occur on Sand Island. No other federal or state threatened and endangered species are likely to occur on Sand Island.

Impact Intensity Threshold

Section 7 of the Endangered Species Act mandates all federal agencies to determine how to use their existing authorities to further the purposes of the Endangered Species Act to aid in recovering listed species, and to address existing and potential conservation issues. Section 7(a)(2) states that each federal agency shall, in consultation with the Secretary of the Interior, ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species, or result in the destruction or adverse modification of designated critical habitat. NPS *Management Policies 2006* state that potential effects of agency actions also

would be considered for state or locally listed species (i.e., special status species). The thresholds of change for the intensity of impacts to special status species are defined in Table 19.

TABLE 19. SPECIAL STATUS SPECIES IMPACT AND INTENSITY

Impact Intensity	Intensity Description
Negligible	The action would result in a change to a population or individuals of a species, but the change would not be of measurable or perceptible consequence, and would be well within natural variability. In the case of federally listed species, this impact intensity equates to a USFWS determination of "may affect, not likely to adversely affect."
Minor	The action would result in a change to a population or individuals of a species. The change would be measurable, but small and localized, and not outside the range of natural variability. Mitigation measures, if needed, would be simple and successful. In the case of federally listed species, this impact intensity equates to a USFWS determination of "may affect, not likely to adversely affect."
Moderate	Impacts on special status species, their habitats, or the natural processes sustaining them would be detectable and occur over a large area. Breeding animals of concern are present; animals are present during particularly vulnerable life stages; and mortality or interference with activities necessary for survival would be expected on an occasional basis, but is not expected to threaten the continued existence of the species in the park unit or conservation zone. Mitigation measures would be extensive and likely successful. In the case of federally listed species, this impact intensity equates to a USFWS determination of "may affect, likely to adversely affect."
Major	The action would result in noticeable effects to the viability of the population or individuals of a species. Impacts on special status species or the natural processes sustaining them would be detectable, both inside and outside of the park. Loss of habitat might affect the viability of at least some special status species. Extensive mitigation measures would be needed to offset any adverse effects, and their success could not be guaranteed. In the case of federally listed species, the impact intensity equates to a USFWS determination of "may affect, likely to jeopardize the continued existence of a species."

Short-term impact—recovers in less than one year

Long-term impact—takes more than one year to recover

Environmental Consequences

No Action Alternative

Direct and Indirect Impacts of the Alternative. Under the no action alternative, there would be no changes in habitat management or use of the light stations. Currently cleared areas would continue to be cleared and activities in or near habitat known to support or suitable for special status species would continue to be done with the approval of the park biologist; therefore, the no action alternative would have no new effect on special status species.

Cumulative Impacts. Nonnative species that have been introduced in the past, and that are likely to be introduced in the future, by NPS maintenance and repair activities and by visitors, have had, and will continue to have, a parkwide minor adverse effect on special status plants that are typically not well adapted for competition with introduced species. NPS management of noxious and invasive plant species has, and will continue to, offset some of the adverse effects of nonnative species. Past, present, and reasonably foreseeable future actions would have a local moderate adverse effects on special status species. Because the no action alternative would not add any effects to the effects of past, present, or reasonably foreseeable projects, the alternative would not have a cumulative effect on special status species.

Conclusion. Because there would be no new habitat-disturbing activities under the no action alternative, the alternative would have no new effect on special status species and no cumulative effects.

Alternative 1

Direct and Indirect Impacts of the Alternative. Because gray wolf is rarely present on the islands, increased levels of human activity and noise associated with alternative 1 would likely have no effect on the species.

Because the piping plover is known to have nested on three of the light stations islands, and because critical habitat has been designated on Michigan and Long islands, there is potential for the piping plover to be affected by alternative 1. Piping plover are not known to have nested on Michigan Island, and potentially suitable habitat is far enough away that activities occurring at the light station would not affect plover nesting. On Outer Island, nesting habitat is more than 7 miles from the light station. On Long Island, however, there has been recent nesting on the north end of the island. Activities at the light station, especially at the Chequamegon Point site, could affect nesting plovers.

Alternative 1 includes removing the existing boardwalk at the Long Island LaPointe site and constructing a new boardwalk in the alignment of the historic boardwalk. The new boardwalk would be about 170 feet long and about 4 feet wide and would have a footprint of about 680 square feet. It would not be in habitat typically used for nesting by piping plover and its location would be approved by the park biologist, so the boardwalk would have no effect on piping plover. The boardwalk would also not be likely to adversely modify critical habitat because it would not appreciably diminish the value of the habitat for either the survival or recovery of the piping plover.

Alternative 1 would also temporarily introduce noise and human disturbance during construction, some of which may be close enough to potential nesting areas that plovers may avoid nesting or may not successfully nest. Even the temporary reduction in successful nesting would reduce piping plover productivity, which would be an adverse effect on the species. Mitigation measures, such as preconstruction surveys and limiting construction to the nonnesting season, would avoid the potential for disturbing nesting piping plovers. Work would only proceed with a determination from the park biologist.

With mitigation measures, alternative 1 would have no effect on piping plover and would not be likely to adversely modify piping plover critical habitat.

Alternative 1 would likely have no effect on state-listed wildlife species because listed species potentially present are migrant birds that would easily avoid the small areas of disturbance at the light stations and on a regional scale the habitat modification would be insignificant.

Alternative 1 may affect some state-listed threatened and endangered plant species that are known to, or that may, occur in the areas of the light stations that would be disturbed. Alternative 1 would include modifying habitat on about 16 acres of vegetation that has encroached into the historically cleared areas of the light stations. Trees and shrubs would also be pruned and removed on Long Island to reestablish the historic walkway between the light station sites. In addition to larger areas in which vegetation would be removed or managed, there would

be small areas of disturbance associated with other treatment elements, including removing noncontributing features from the cultural landscape, and repairing or stabilizing buildings and other structures. Temporarily disturbed areas would be revegetated with native species.

State-listed threatened and endangered plant species potentially affected include beautiful sedge and common butterwort on Devils Island and marsh grass-of-parnassas on Outer Island. Bird's eye primrose and hair-like sedge are two state species of concern that are present on Devils Island and may be affected by alternative 1. Other listed species are known to be present outside of the areas of the light stations that would be disturbed under alternative 1; therefore, it is possible that some species are present that have not been observed. If included in areas proposed to be modified under alternative 1, individual plants may be damaged or destroyed, and suitable habitat may be lost. On Devils Island, beautiful sedge, common butterwort, bird's eye primrose, and hair-like sedge occur on cliff edges adjacent to areas of existing shrubland vegetation that would be trimmed more frequently than under the no action alternative. The marsh grass-of-parnassas on Outer Island is in an area currently managed as lawn and that would continue to be managed as lawn. The infestation and spread of invasive exotic plants also is possible. Weeds frequently invade disturbed ground where they easily become established and outcompete native species if left unchecked.

The potential effects of alternative 1 on state-listed plants would be mitigated in several ways. Construction activities would be confined to the smallest area necessary to complete the work, and all areas of disturbed vegetation would be restored with native vegetation following construction. Revegetation of disturbed areas is expected to take more than one year because of low soil fertility. Implementing best management weed control practices would minimize the potential for weed establishment and long-term adverse effects. Finally, surveys for state-listed and other rare plants would be performed prior to vegetation removal, and vegetation treatments would be altered, where practicable, to avoid disturbing populations. For example, on Devils Island a buffer of some width may be established within which shrubs would be trimmed less frequently than in other areas, reducing the chance of disturbance. Despite mitigation measures, the unintentional loss of some individual plants or small groups of plants may be unavoidable, but these losses would be a small part of larger populations and would not be enough to threaten the presence of the species on the islands.

With the described mitigation measures, alternative 1 would have no effect on gray wolf and piping plover and would not likely adversely modify designated critical habitat, would have no effect on state listed wildlife, and would have negligible effects on state listed plants. As a result, the overall effects on special status species would be local, long-term, negligible, and adverse.

Cumulative Impacts. As described under the no action alternative, past, present, and reasonably foreseeable future actions would have a local moderate adverse effects on special status species. Those impacts, in combination with the local long-term negligible adverse effects of alternative 1, would result in local moderate adverse cumulative impacts.

Conclusion. Alternative 1 would have local long-term negligible adverse effects on special status species. The alternative would have no effect on gray wolf and piping plover and would not likely adversely modify piping plover critical habitat. Cumulative effects would be local, minor, and adverse.

Alternative 2 (Preferred Alternative)

Direct and Indirect Impacts of the Alternative. The activities, effects, and mitigation measures of alternative 2 are the same as those of alternative 1, including reconstructing the LaPointe boardwalk, but about 25 acres of habitat would be modified.

The differences between the acres of impacts of alternative 1 and alternative 2 are minor when compared at the island scale. As a result, for the reasons described for alternative 1, alternative 2 would have no effect on gray wolf or piping plover and would not likely adversely modify piping plover critical habitat. The effects on state listed species would be local, long-term, negligible, and adverse.

Cumulative Impacts. As described under alternative 1, past, present, and reasonably foreseeable future actions would have local moderate adverse effects on special status species. Those impacts, in combination with the local long-term negligible adverse effects of alternative 2, would result in local minor adverse cumulative impacts.

Conclusion. The alternative would have no effect on gray wolf and piping plover and would not likely adversely modify piping plover critical habitat. Overall, alternative 2 would have local long-term negligible adverse effects on special status species. Cumulative effects would be local, minor, and adverse.

Alternative 3

Direct and Indirect Impacts of the Alternative. The activities, effects, and mitigation measures of alternative 3 are similar to those of alternative 1, except that the LaPointe site dock would be removed and rebuilt in the location of the historic dock and the boardwalk would extend all the way to the dock and about 36 acres of habitat would be modified.

The differences between the impacts of alternative 1 and alternative 3 are minor when compared at the island scale. As a result, for the reasons described for alternative 1, alternative 3 would have no effect on gray wolf and piping plover and would not likely adversely modify critical habitat. Overall, the effects on special status species of alternative 3 would be local, long-term, negligible, and adverse.

Cumulative Impacts. As described under alternative 1, past, present, and reasonably foreseeable future actions would have local moderate adverse effects on special status species. Those impacts, in combination with the local long-term negligible adverse effects of alternative 3, would result in local minor adverse cumulative impacts.

Conclusion. Alternative 3 would have no effect on gray wolf and piping plover and would not likely adversely modify piping plover designated critical habitat. Overall, the effects on special status species of alternative 3 would be local, long-term, negligible, and adverse. Cumulative effects would be local, minor, and adverse.

WETLANDS

Affected Environment

The park's inland surface water resources are not abundant, but include lagoons on Stockton, Michigan, and Outer islands; Sand River and Saxine Creek on the mainland; unnamed perennial streams on Stockton and Oak islands; and the Sand River estuary. Bogs, beaver ponds, and wetlands occur on many of the islands, as well as a number of ephemeral and intermittent streams. Bogs and wetlands within the park are associated with sandscapes, lagoons, alder thickets, and beaver flowages on the islands (NPS 2007b) and they generally have unique plants and animals adapted to these habitats, which increases the overall biodiversity of the islands.

According to recent park vegetation mapping, the five light station islands have wetlands, with Michigan, Outer, and Sand islands having the largest areas of wetlands. Wetlands on Devils and Long islands are limited by soil type and topography. Fen wetlands are present in Devils Island Light Station along the tram rail from the light station to the tramway engine building, and along the existing trail between Devils Island Light Station and the dock and boathouse on the southern end of the island. Fen wetlands are present in the vicinity of the original LaPointe Light Station, and along the alignment of the historic walkway between the three Long Island light stations. There are no wetlands in the Michigan, Outer, or Sand island light stations.

The wetlands on Devils Island tend to occur on wet, spongy, peat-forming ground and are entirely dependent on rainwater for their source of water and nutrients. These bogs tend to be very acidic and low in nutrients. Sphagnum mosses, black spruce (*Picea mariana*), and ericaceous shrubs (plants in the heath family) usually dominate this type of bog (NPS 2007b). The Long Island wetlands include herbaceous emergent wetlands, some of which are dominated by cattail (*Typha* spp.), and interdunal wetlands that are primarily dominated by rushes (*Juncus* spp.).

Impact Intensity Threshold

Available information on water quality in the project area was compiled. Potential impacts from the alternatives were based on professional judgment and experience with similar actions. The threshold of change for the intensity of an impact on water quality is defined in Table 20.

TABLE 20. WETLAND IMPACT AND INTENSITY

Impact Intensity	Intensity Description
Negligible	No measurable or perceptible changes in wetland size, integrity, or continuity would occur.
Minor	Any impact would be measurable or perceptible, but slight. A small change in size, integrity, or continuity could occur due to short-term indirect effects such as construction-related runoff. However, the overall viability of the resource would not be affected.
Moderate	Any impact would be sufficient to cause a measurable change in the size, integrity, or continuity of the wetland or would result in a small, but permanent, loss or gain in wetland acreage.
Major	The action would result in a measurable change in all three parameters (size, integrity, and continuity), or a permanent loss of large wetland areas. The impact would be substantial and highly noticeable.

Short-term impact—lasts one year or less, such as effects associated with construction

Long-term impact—lasts more than one year and could be permanent

Environmental Consequences

No Action Alternative

Direct and Indirect Impacts of the Alternative. Under the no action alternative, there would be no new temporary or permanent discharge of fill or dredged material into wetlands. Current management practices would continue. Vegetation along the existing trail corridor between Devils Island Light Station and the boathouse, which includes a reach of trail through a fen wetland, would continue to be managed as needed to maintain the corridor. Although not actively maintained, visitors would continue to walk down the Devils Island tram track between the light station and the Tramway Engine Building, which includes a reach through a fen wetland. Because the no action alternative would have no new wetland disturbance, there would be no new effects on wetlands.

Cumulative Impacts. Noxious and exotic species have had, and will continue to have, and adverse effect on native wetland communities. NPS management practices have offset some of these adverse effects. Because there are virtually no wetlands at the light stations, NPS maintenance and management activities at the stations have had and will continue to have negligible effects. Past, present, and reasonably foreseeable future actions would have negligible adverse effects on wetlands. Because the no action alternative would not add any new effects to the effects of past, present, or reasonably foreseeable actions, the alternative would not have a cumulative effect on wetlands.

Conclusion. The no action alternative would have no new effects on wetlands and would have no cumulative effects.

Alternative 1

Direct and Indirect Impacts of the Alternative. As under the no action alternative, vegetation along the existing trail corridor between Devils Island Light Station and the boathouse, which includes a reach of trail through a fen wetland, would continue to be managed as needed to maintain the corridor. This would have no new effect on wetlands. Additionally, vegetation on the grade of the Devils Island tram tracks would be pulled and pruned to maintain a clear corridor along the tramway. This would prevent vegetation from further deteriorating and obscuring the tracks. This treatment would be done on an ongoing basis as needed. The tram track grade crosses about 275 linear feet of fen wetland, but only vegetation on the fill for the tracks would be managed, which would have no new effect on wetlands.

Alternative 1 also includes maintaining the trail between the LaPointe site and Chequamegon Bay on Long Island by pruning and trimming vegetation along the existing corridor, which includes a short reach through a wetland. There would be no ground-disturbing activities associated with managing the vegetation, but clearing the trail would increase the likelihood of visitors occasionally trampling wetland vegetation, resulting in local short- to long-term negligible adverse effects.

Stabilizing the tram tracks and managing vegetation along the Long Island trail would not change the size, integrity, or continuity of wetlands in the project area, but increased visitor use along the Long Island trail would have local short- to long-term negligible adverse effects on wetlands.

Cumulative Impacts. As described for the no action alternative, past, present, and reasonably foreseeable future actions would have local negligible adverse effects on wetlands. Those effects, in combination with the local long-term negligible adverse effects of alternative 1, would result in local negligible adverse cumulative impacts.

Conclusion. Alternative 1 would have local short- to long-term negligible adverse effects on wetlands. Cumulative effects would be local, negligible, and adverse.

Alternative 2 (Preferred Alternative)

Direct and Indirect Impacts of the Alternative. The activities that would affect wetlands under alternative 2 would be similar to those under alternative 1, but in addition, a 10-foot-wide corridor would be established between the LaPointe, Original Lighthouse, and Chequamegon Point sites. The corridor would follow the historic alignment of the concrete walk between the areas, but the alignment would be adjusted to avoid wetlands and sensitive resources. Mitigation under alternative 2 would be the same as under alternative 1.

Stabilizing the tram tracks and managing vegetation along the Long Island trails would not change the size, integrity, or continuity of wetlands in the project area, so Alternative 2 would have local short- to long-term negligible adverse effects on wetlands.

Cumulative Impacts. As described for the no action alternative, past, present, and reasonably foreseeable future actions would have local negligible adverse effects on wetlands. Those effects, in combination with the local long-term minor adverse effects of alternative 2, would result in local minor adverse cumulative impacts.

Conclusion. Alternative 2 would have local short- to long-term minor adverse effects on wetlands. Cumulative effects would be local, minor, and adverse.

Alternative 3

Direct and Indirect Impacts of the Alternative. The activities that would affect wetlands under alternative 3 would be similar to those under alternative 1, but instead of stabilizing the Devils Island tram tracks, the tracks would be repaired to working condition by removing and replacing the timbers and bedding, replacing or straightening sections of bent rails, and resetting existing rails. Removing ties from the grade would result in temporary disturbance to up to 5 feet of wetlands on both sides of the tram tracks, for total disturbance of up to 2,750 square feet (0.06 acre). Effects would be temporary because disturbed areas would be restored following construction. Temporary wetland impacts would be minimized by identifying work limits.

Repairing the tram tracks and managing vegetation along the Long Island trails would not change the size, integrity, or continuity of wetlands in the project area, so Alternative 3 would have local short- to long- term minor adverse effects on wetlands.

Cumulative Impacts. As described for the no action alternative, past, present, and reasonably foreseeable future actions would have local negligible adverse effects on wetlands. Those effects, in combination with the local short- to long-term minor adverse effects of alternative 3, would result in local minor adverse cumulative impacts.

Conclusion. Alternative 3 would have local short- to long-term minor adverse effects on wetlands. Cumulative effects would be local, minor, and adverse.

NATURAL SOUNDSCAPE

Affected Environment

An important part of the NPS mission is preserving natural soundscapes associated with national park units, as indicated in *NPS Management Policies 2006* and *DO – 47: Sound Preservation and Noise Management*. Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all natural sounds within the park, together with the physical capacity for transmitting natural sound through air, water, or solid material. Acceptable frequencies, magnitudes, and durations of human-caused sound varies among national park units, as well as potentially throughout each park unit, but are generally greater in developed areas and less in undeveloped areas. The park strives to preserve the natural soundscape associated with the physical and biological resources of the park.

The undisturbed soundscape on the islands consists of natural sounds that include waves on the shoreline, wind blowing through the trees, and bird calls. The overall soundscape in the park is generally quiet with minimal intrusion from human-generated sources except near high use areas. The soundscape in the interior wilderness areas on the islands are the closest to undisturbed conditions. Effects of noise from the proposed alternatives on wilderness are described in the wilderness section of topics dismissed from further analysis. The most common human-caused sounds near the shoreline are from motorized watercraft, which is highest in the summer. Noise levels from motorboats can vary widely, from below 80 decibels (dBA) to 105 dBA or more. Other human-caused sounds heard in the park include vehicles (on the mainland), voices, and radios. Winters are generally quieter than summers because fewer people visit the park, but snowmobiles may be heard in the winter rather than motorized watercraft. Park operations, maintenance, and administration activities also contribute to noise generated in developed areas.

Impact Intensity Threshold

The methodology used to assess noise impacts is consistent with *NPS Management Policies 2006* and *DO – 47: Soundscape Preservation and Noise Management*. Soundscape impacts were evaluated based on anticipated noise levels generated by work activities in relation to nearby receptors such as campgrounds, trails, and boaters on Lake Superior. The thresholds of change for the intensity of an impact to the soundscape are described in Table 21.

TABLE 21. NATURAL SOUNDSCAPE IMPACT AND INTENSITY

Impact Intensity	Intensity Description
Negligible	The natural soundscape might be affected, but the effects would be at or below the level of audibility, or changes in the soundscape would be so slight they would not be of any measurable or perceptible consequence to wildlife or visitors.
Minor	A change in the natural soundscape would be audible, but the effects would be small, local, and of little consequence to wildlife or visitors.
Moderate	A change in the natural soundscape would be readily audible, affecting the behavior of wildlife or visitors in a large area.
Major	A severely adverse or exceptionally beneficial change in the natural soundscape would be obvious and would affect the health of wildlife or visitors; or cause a substantial, highly noticeable change in the behavior of wildlife or visitors in a local or regional area.

Short-term impact—lasts one year or less, such as effects associated with construction

Long-term impact—lasts more than one year and could be permanent

Environmental Consequences

No Action Alternative

Direct and Indirect Impacts of the Alternative. Because there would be no change to current sound-generating management, maintenance, or recreational activities under the no action alternative, there would be no new effect on the existing soundscape. Periodic maintenance and management activities, such as trail maintenance, grass mowing, pumping vault toilets, and restoration work on landscapes and buildings would continue to be conducted when necessary. Because there would be no change to current sound-generating management, maintenance, or recreational activities under the no action alternative, there would be no new effect on the existing soundscape.

Cumulative Impacts. Noise from past and present NPS management activities on the islands and noise from NPS and private boats have affected the park's soundscape in the past, and will continue to do so in the future. The intensity of the effects of these activities on individual islands and light stations is dependent on how frequently the islands are visited and the extent of management activities. In general, past, present, and reasonably foreseeable actions would have local minor adverse effects on the soundscape. Because the no action alternative would not add any effects to the effects of past, present, or reasonably foreseeable projects, the alternative would not have a cumulative effect on the natural soundscape.

Conclusions. The no action alternative would have no new effect on the existing soundscape and there would be no cumulative effects.

Alternative 1

Direct and Indirect Impacts of the Alternative. Project activities would result in temporarily elevated noise levels during vegetation removal and ongoing management, building repairs and rehabilitation, and occasionally operating generators for various uses. The use of chainsaws and chippers during vegetation removal would generate the highest noise levels, and is anticipated to last up to two weeks on each island, which is considered short term. Other equipment that would generate noise includes hand and power tools, boats coming to and from the islands when work is being done, and other smaller pieces of equipment or machinery. Most of the noise-generating activities would occur within the light stations, although boats to and from the islands would

generate noise during their trips. Construction noise would likely be buffered by natural terrain and distance.

Effects on the existing soundscape from work activities under alternative 1 would be local, short-term, minor, and adverse. There would be no long-term effects on the soundscape following construction activities. Considerations of noise impacts on wildlife, special status species, and visitors are addressed under the respective impact topic headings.

Cumulative Impacts. As described in the no action alternative, past, present, and reasonably foreseeable actions would have local minor adverse effects on the soundscape. Those effects, in combination with the local short-term minor adverse effects of alternative 1, would result in local minor adverse effects on the soundscape.

Conclusions. Because of temporary noise generated by various activities, alternative 1 would result in local short-term minor adverse effects on the soundscape in the vicinity of the light stations, but would have no long-term adverse effects. Cumulative effects would be local, minor, and adverse.

Alternative 2 (Preferred Alternative)

Direct and Indirect Impacts of the Alternative. The project activities and their effects on the soundscape under alternative 2 would be the same as those described in alternative 1. Because more vegetation would be removed under alternative 2 than alternative 1, the duration of the noise associated with vegetation removal would be up to four weeks on each island, which would be considered short-term effects. Effects on the existing soundscape from work activities under alternative 2 would be local, short-term, minor, and adverse. There would be no long-term effects on the soundscape following construction activities.

Cumulative Impacts. As described in the no action alternative, past, present, and reasonably foreseeable actions would have local minor adverse effects on the soundscape. Those effects, in combination with the local short-term moderate adverse effects of alternative 2, would result in local minor adverse effects on the soundscape.

Conclusions. Because of temporary noise generated by various activities, alternative 2 would result in local short-term minor adverse effects on the soundscape in the vicinity of the light stations, but would have no long-term adverse effects. Cumulative effects would be local, minor, and adverse.

Alternative 3

Direct and Indirect Impacts of the Alternative. The project activities and their effects on the soundscape under alternative 3 would be the same as those described for alternatives 1 and 2. Slightly more vegetation would be removed under alternative 3 than alternative 2, but the duration of the noise associated with vegetation removal is anticipated to remain up to four weeks on each island, which would be considered short-term effects. The effects on the existing soundscape from work activities under alternative 3 would be local, short-term, minor, and adverse. There would be no long-term effects on the soundscape following construction activities.

Cumulative Impacts. As described in the no action alternative, past, present, and reasonably foreseeable actions would have local minor adverse effects on the soundscape. Those effects, in combination with the local short-term minor adverse effects of alternative 3, would result in local minor adverse effects on the soundscape.

Conclusions. Because of temporary noise generated by various activities, alternative 3 would result in local short-term minor adverse effects on the soundscape in the vicinity of the light stations, but would have no long-term adverse effects. Cumulative effects would be local, minor to moderate, and adverse.

HISTORIC STRUCTURES / CULTURAL LANDSCAPES

Affected Environment

The following is a summary of the historic sites, structures, and cultural landscape features associated with the light stations. Other historic properties that are primarily associated with tourism and recreation, commercial fishing, farming, quarrying, and logging are present in the park, but they would not be affected by any of the alternatives and, therefore, are not addressed further in this EA.

All of the light stations in the park are listed on the national register. The five stations on Michigan, Outer, Devils, Sand, and Raspberry islands were nominated as one 33.8-acre unit (but not as a district). The stations were listed on March 8, 1977 with state level of significance in the areas of transportation and commerce, and varying periods of significance spanning from 1852 to 1929. Long Island was not part of the park until 1986; therefore, it was not included in the 1977 nomination. In 1979, the USCG prepared a nomination titled “Coast Guard Lighthouses and Light Stations on the Great Lakes,” including the Long Island station among a large collection of stations. This nomination was approved and placed on the national register on August 4, 1983. The listed period of significance was 1832 to 1919.

Cultural landscapes with varying degrees of integrity are associated with the light stations. Some of the cultural landscape features are relatively easy to observe (e.g., outbuildings and foundations, paths and roads, and garden areas), while in other cases, landscape features are obscured by encroaching forest vegetation and are more difficult to discern. Because of the close association of cultural landscapes to historic sites and structures at the light stations, these topics are presented together.

The light stations were constructed between 1856 and 1891 to aid navigation through this portion of Lake Superior. The overall period of historic significance (1856 to 1978) reflects the 122 years from construction of the first light station on Michigan Island to the automation of Devils Island Light Station, and consequent departure of its USCG crew. The light stations are the most visible historic resources in the national lakeshore. In addition to the lighthouses and keepers’ dwellings, the light stations retain a substantial number of auxiliary buildings (e.g., oil houses, privies, barns, and shops) and associated cultural landscape features that provide a more complete understanding of the nature of operations and the living conditions of the keepers and their families.

Michigan Island Light Station

The first Michigan Island Lighthouse, the oldest in the Apostle Islands, was constructed in 1856 at the island's southern point. The conical rubble-stone masonry structure is about 65 feet tall with an exterior railed walkway at the top. A rubble-stone 1½-story keeper's dwelling was attached to the lighthouse as part of the original construction, with dormers added to the single-gabled dwelling in 1914. The lighthouse was put into service in 1857, but ceased operation after only one year, and remained abandoned until it was refurbished and reoccupied in 1869.

Between 1869 and 1874 much of the bluff and reservation was cleared of trees to allow the lighthouse to be clearly seen by passing ships. The area immediately around the lighthouse was fenced and maintained as a lawn by the keepers. Just outside of this area forest vegetation was cleared and maintained as fields of grasses and wildflowers. Fences, walks, and other small scale features were added around the Old Michigan Island Lighthouse. Planted vegetation, including a small orchard, was established. Spatially, the Old Michigan Island Lighthouse was the central focus of the light station grounds, with improvements radiating from it. During this period, the primary access to the light station was via a wooden staircase connecting the shoreline to the top of the bluff near the lighthouse.

In the 1880s, concrete walks were introduced to the site and replaced wood plank walks in places. A concrete walk was built to connect the lighthouse to the privy. In 1894, a brick oil building was built west of the lighthouse. Over the next few years, the original domesticated or manicured area adjacent to the Old Michigan Island Lighthouse was expanded, and fences were removed and replaced so that the Oil Building was within the fenced area. A concrete walk was built leading from the lighthouse to the Oil Building. The area east of the lighthouse was cleared and maintained as a field of tall grasses and wildflowers during this period.

In 1919, efforts were made to increase the visibility of the light station. A cylindrical steel tower (built in 1880) that originally stood on the Delaware River near Philadelphia was disassembled and transported to the site on Michigan Island to replace the earlier lighthouse. However, the 112-foot-tall skeletal steel tower was not reassembled near the original lighthouse until 1929.

Other improvements to the light station between 1928 and 1929 included the construction of a new two-story brick Keepers Quarters; a 1½-story wood-framed assistant keeper's dwelling; a dock; and a brick building that housed an electric generator, radio fog beacon, and a hoist engine for a tramway. A dense stand of trees and vegetation has grown in the formerly cleared area between the light station and the shoreline, obscuring offshore views of the original lighthouse and all but the upper portion of the newer light tower (NPS 2009a).

Once the light station was no longer occupied after 1943, many of the ornamental plantings installed by the light keepers (such as flower beds and fruit trees) no longer received annual maintenance and slowly fell into disrepair or were eliminated. Without regular maintenance or a need for them, fences also deteriorated or were removed. During this period, the open, cleared area of the reservation was gradually reduced as the adjacent forest encroached into the light station grounds and reservation.

Once the park was established, the most significant change was the 1987 construction of a new boat dock and the rehabilitation of the lower portion of the tramway. This work connected the tramway directly to the boat dock. Other work has included the addition of visitor hiking trails,

park signage, a pit toilet restroom, a solar panel, and minor rehabilitation of the buildings and structures.

Outer Island Light Station

Outer Island Light Station was constructed in 1874. Distinctive features of the 90-foot-tall lighthouse include its iron spiral staircase, decorative brackets supporting the watch room walkway, and arched exterior windows. A three-story brick keeper's dwelling with an attached shed-roofed summer kitchen was built as part of the original 1874 construction of the lighthouse. The dwelling is attached to the lighthouse by a short passageway. Among the other structures contributing to the significance of the site are a concrete dock and breakwater, wood-framed fog signal building, oil house, and tramway with concrete steps.

The areas around the light station buildings and on the slope to the shore were cleared of trees to construct the station and to improve visibility of the light tower. An inclined tramway was built on the cliff and dock, and was used for transporting goods and fuel from the boat dock up to the light station. Early lighthouse keepers on the island raised farm animals and planted vegetable gardens. Following automation, the open, cleared area of the reservation was slowly reduced as the adjacent forest vegetation encroached into the area.

Because of its exposed location, Outer Island Light Station has faced intense storms, which has resulted in structural loss and damage. The dock washed away during the station's first year of operation, and the original Fog Signal Building was destroyed as a consequence of wave erosion at the base of the bluff embankment.

Ongoing shoreline erosion continues to threaten the light station's structures, and damage has occurred to the stairs and tramway that lead up the steep embankment from the dock. To protect the site, NPS stabilized the shoreline by placing riprap, bioengineering structures such as log cribs, and revegetating the slopes (NPS 2009a).

Devils Island Light Station

Devils Island Light Station, the sixth and last station established in the Apostle Islands, was put into operation in 1891 at the northern tip of the island. The initial funding proved inadequate for the construction of a permanent lighthouse; but to avoid delays, the U.S. Lighthouse Board opted for the placement of the light in a temporary wood skeleton-frame tower. The principal keeper's dwelling, with attached rear kitchen, was completed in 1896. An Assistant Keepers Quarters (completed in 1897) was constructed as a 2½-story Queen Anne style brick house with a second-story bay window, molded brackets, and ornamental curved windows. A third wood-framed keeper's dwelling (intended for the second keeper's assistant) was removed by the USCG in 1956.

In 1898, a permanent steel light tower was constructed, but was not put into operation until 1901 when a third-order Fresnel lens was installed. In 1914, a skeletal steel framework was added to the 82-foot-tall cylindrical tower to brace it against high winds. Devils Island was the last manned station in the Apostle Islands, and its light tower was not automated until 1978. The original Fresnel lens is no longer operative, but remains on display in the tower. In 2003, NPS carried out a lead abatement project on the tower.

Additional contributing structures include a one-story wood-framed fog signal building, two square brick oil buildings, a pumphouse, a tramway engine building (tramway track and tram cart are also present), a hoist house, and a radio tower. Also contributing to the site significance are a boathouse, dock, and breakwater at the southern end of the island. The latter structures are connected to the lighthouse area by an unpaved, approximately 1-mile-long service road built by the USCG in 1960 (NPS 2009a).

LaPointe (Long Island) Light Station

LaPointe Light Station consists of three distinct sites—the Chequamegon Point Lighthouse, a steel skeleton-frame lighthouse at the western tip of Long Island; the new LaPointe light complex (about 4,000 feet east) with a cast-iron light tower, oil house, and triplex keeper's dwelling; and the ruins of the original LaPointe Lighthouse, approximately midway between the other two lighthouses, and nearly obscured by dense vegetation.

The original LaPointe Lighthouse, a wood-framed schoolhouse-style building, was built in 1858. An area to the west was cleared and fenced for farm animals. In 1896, the original lighthouse was converted to a keeper's dwelling and the tower was removed. Also at that time, a new LaPointe Light Tower was constructed about 1,500 feet to the east of the original site, and the Chequamegon Point Lighthouse was constructed about 2,500 feet to the west. A concrete walkway linked the lighthouses to facilitate transport of supplies and the long walk of the keeper who operated both lights.

The altered keeper's quarters at the original site was used until 1938, when it was replaced by a new two-story wood-framed triplex constructed with Works Progress Administration funding at the new eastern site. LaPointe Light Station was listed in the national register in 1983 (NPS 2009a).

Other than clearing trees to improve visibility of the lighthouses, very little was done to modify the landscapes on Long Island. The sandy soil and constantly changing shoreline made it too difficult to establish plantings or gardens.

Sand Island Light Station

In 1881, Sand Island Light Station was constructed on the northern tip of the westernmost island in the Apostle Islands chain. About 8 acres of forest was cleared to build the station grounds and its buildings. Also at this time, a boat landing and associated trail was built about 0.5 mile south of the station in a sheltered bay on the west side of the island.

The 44-foot-tall light tower and attached Keepers Quarters were constructed of locally quarried brownstone. Distinctive elements include rounded arch window sashes, flared eaves, and decorative carved wood trim at the gable end of the Keepers Quarters. The lower portion of the light tower is square and transitions upward to an octagonal shape at the second floor level, surmounted by the walkway and lantern room. An original shed-roofed summer kitchen is attached to the southern end of the building. A full basement and interior brick chimney are other notable elements. The station included a fenced garden.

The lighthouse was automated in 1921, after which the boathouse and garden area deteriorated, and previously cleared areas were encroached upon by forest.

The building is in good condition, although the formerly cleared area around the station has rapidly revegetated (principally with balsam fir) since clearing activities were last conducted in the early 1990s. In 1933, the U.S. Lighthouse Service erected a 50-foot-tall steel tower in front of the lighthouse and placed the beacon on top. The USCG returned the signal to the lighthouse in 1985 and removed the steel tower. Other contributing buildings at the station are a square brick oil house with metal hipped roof (1901) and a brick metal-roofed privy (1881) (NPS 2009a).

Impact Intensity Threshold

Section 106 of the NHPA of 1966, as amended (16 USC 470, et seq.) and its implementing regulations under 36 CFR 800 require all federal agencies to consider effects of federal actions on cultural properties eligible for or listed in the national register. In order for a structure or building to be listed in the national register, it must be associated with an important historic event, person(s), or that embodies distinctive characteristics or qualities of workmanship. Cultural landscapes are the result of the long interaction between people and the land, and the influence of human beliefs and actions over time on the natural landscape. The thresholds of change for the intensity of an impact on historic structures and the cultural landscape are defined in Table 22.

TABLE 22. HISTORIC STRUCTURES AND CULTURAL LANDSCAPE IMPACT AND INTENSITY

Impact Intensity	Intensity Description
Negligible	Impacts would be at the lowest level of detection with neither adverse nor beneficial consequences. The determination of effect for section 106 would be no adverse effect.
Minor	Alteration of a historic structure or a pattern(s) or feature(s) of the landscape would not diminish the overall integrity of the resource. The determination of effect for section 106 would be no adverse effect.
Moderate	Alteration of a historic structure or a pattern(s) or feature(s) of the landscape would diminish the overall integrity of the resource. The determination of effect for section 106 would be adverse effect. A programmatic agreement is executed among NPS and applicable state or tribal historic preservation officer and, if necessary, the advisory council, in accordance with 36 CFR 800.6(b). Measures identified in the programmatic agreement to minimize or mitigate adverse impacts reduce the intensity of the impact under NEPA from moderate to minor.
Major	Alteration of a historic structure or a pattern(s) or feature(s) of the landscape would diminish the overall integrity of the resource. The determination of effect for section 106 would be adverse effect. Measures to minimize or mitigate adverse impacts cannot be agreed on, and NPS and applicable state or tribal historic preservation officer and/or advisory council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).

Short-term impact—following project completion, effects would remain less than one year

Long-term impact—following project completion, effects would remain more than one year

Environmental Consequences

No Action Alternative

Direct and Indirect Impacts of the Alternative. The no action alternative would result in the continuation of existing park building and landscape management approaches. In most cases, existing conditions would be maintained through stabilization, ongoing preservation maintenance, and repair of historic materials and features. Without an identified treatment, incompatible features and inappropriate materials and vegetation would continue to be incorporated into the buildings and landscapes and vegetation would continue to encroach into

cultural landscapes. These changes would diminish the overall integrity of the resources. Because management practices would not change under the no action alternative, historic structures and cultural landscapes would continue to deteriorate, resulting in local long-term moderate adverse effects.

Cumulative Impacts. An inability to satisfactorily address maintenance and repair needs in the past have contributed to the deterioration of the historic structures and cultural landscapes and the lack of a treatment approach has resulted in incremental changes to historic resources. Past, present, and reasonably foreseeable actions would result in local minor to moderate adverse impacts on historic structures and cultural landscapes. These impacts, along with the local long-term moderate adverse effects of the no action alternative, would result in local moderate adverse effects.

Conclusions. Because current management practices and maintenance capabilities would continue under the no action alternative, the alternative would have local long-term moderate adverse effects on historic structures or cultural resources. Cumulative effects would be local, moderate, and adverse.

Alternative 1

Direct and Indirect Impacts of the Alternative. The emphasis of alternative 1 is preservation. Existing structures and landscape features would be stabilized and protected. Some noncompatible features would be removed. Where needed, compatible features would be added to meet building codes and maintain safety. About 19 acres of vegetation would be managed to better represent the extent of clearing in the light stations during the period of significance. Views of the light stations from Lake Superior would be slightly improved on Michigan and Outer islands. Stabilizing and protecting structures and landscape features under alternative 1 would result in local long-term beneficial effects on historic structures and cultural landscapes.

Cumulative Impacts. As described under the no action alternative, past, present, and reasonably foreseeable actions would result in local minor to moderate adverse impacts on historic structures and cultural landscapes. Those impacts would be partially, but not totally, offset by the beneficial activities associated with implementing alternative 1, reducing the intensity of the local adverse cumulative impacts to minor impacts.

Conclusions. Under alternative 1, there would be local long-term beneficial effects as a result of preservation and stabilization measures. With long-term beneficial effects contributed from alternative 1, cumulative impacts would be local, minor, and adverse.

Alternative 2 (Preferred Alternative)

Direct and Indirect Impacts of the Alternative. The emphasis of alternative 2 is rehabilitation. Existing contributing structures and landscape features would be repaired or altered, and missing historic features would be restored. Some noncompatible features would be removed. Where needed, compatible features would be added to meet building codes and maintain safety. About 28 acres of vegetation would be managed to better represent the extent of clearing in the light stations during the period of significance. Views of the light stations from Lake Superior would be slightly improved on Michigan and Outer islands.

Rehabilitating structures and landscape features under alternative 2 would result in long-term beneficial effects on historic structures and cultural landscapes. Because of the rehabilitation focus, the beneficial effects of alternative 2 would be greater than those for alternative 1.

Cumulative Impacts. As described under the no action alternative, past, present, and reasonably foreseeable actions would result in local minor to moderate adverse impacts on historic structures and cultural landscapes. Those impacts would be partially, but not totally, offset by the beneficial activities associated with implementing alternative 1, reducing the intensity of the local adverse cumulative impacts to minor impacts.

Conclusions. Under alternative 2, there would be local long-term beneficial effects as a result of rehabilitation measures. Cumulative impacts would be local, minor, and adverse, with a local beneficial contribution from alternative 2.

Alternative 3

Direct and Indirect Impacts of the Alternative. The emphasis of alternative 3 is rehabilitation and restoration. The treatment elements for the historic structures are very similar to those under alternative 2. Existing contributing structures and landscape features would be repaired or altered, and missing historic features would be restored. Some noncompatible features would be removed. Where needed, compatible features would be added to meet building codes and maintain safety. Alternative 3 would manage about 45 acres of vegetation to better represent the extent of clearing in the light stations during the period of significance. Views of the light stations from Lake Superior would be substantially improved on Michigan and Outer islands.

Under alternative 3, rehabilitating and restoring structures and landscape features would result in long-term beneficial effects on historic structures and cultural landscapes. Because of the rehabilitation and restoration focus, the beneficial effects of alternative 3 would be somewhat greater than alternative 2.

Cumulative Impacts. As described under the no action alternative, past, present, and reasonably foreseeable actions would result in local minor to moderate adverse impacts on historic structures and cultural landscapes. Those impacts would be partially, but not totally, offset by the beneficial activities associated with implementing alternative 1, reducing the intensity of the local adverse cumulative impacts to minor impacts.

Conclusions. Under alternative 3, local long-term impacts would be beneficial as a result of rehabilitation and restoration measures. Cumulative impacts would be local, minor, and adverse, with a local beneficial contribution from alternative 3.

ARCHEOLOGICAL RESOURCES

Affected Environment

There are 66 known prehistoric and historic archeological sites in the park (NPS 2009a). Approximately 25% of the park has been surveyed, with surveys focusing on areas considered

likely to yield archeological resources, or conducted in response to compliance requirements for development of other projects.

The park and surrounding area has a long history of use by American Indians. Paleo-Indian hunters and gatherers inhabited the area from about 11,000 to 7,000 years ago, although no Paleo-Indian sites have been confirmed within the park (NPS 2009a). One site dating from the Archaic period (8,000 to 2,000 years ago) has been found within the park on Stockton Island (NPS 2009a) and there is also evidence for occupation during the Archaic period at Quarry Bay, on the Presque Isle tombolo, and on the interior of Oak Island. No sites from the Initial Woodland period (2,000 to 1,000 years ago) have been found in the park (NPS 2009a). Most prehistoric sites in the park are from the Terminal (or Late) Woodland period from 1,300 to 500 years before present (BP).

Several small hunting and fishing camps have been documented in the park from the early historic period (beginning in the mid-17th century). Archeological surveys in the park in the 1970s and 1980s documented several historic archeological sites on the islands, including former farmsteads, logging camps, and European-American settlements (NPS 2009a). Several historic shipwrecks have been recorded within or just outside the boundaries of the park, including the *R.G. Stewart* off the eastern shore of Michigan Island, the *Pretoria* off the northeastern shore of Outer Island, the *Lucerne* off Long Island, the *Noquebay* at Julian Bay, Stockton Island, and the *Sevona* off Sand Island (NPS 2009a). The five wrecks are listed in the national register.

Archeological studies specific to the light stations include a series of test trenches excavated in 1988 at Michigan, Devils, Sand, and Raspberry light stations to determine if proposed drainage improvements at these sites would impact subsurface cultural remains (Noble 1993). The trenches yielded minimal cultural material within the small areas tested, but the test areas were not representative of the potential for buried cultural material at each of the stations. A number of areas, such as dumps, privies, and building foundations, would probably yield extensive buried materials (Noble 1993). In 1992, an archeological survey of Long Island was conducted to obtain basic data as to the nature of and potential for buried cultural resources (Noble 1996). The survey added no new sites to the few sites known to occur on the island. There is great potential for future archeological research and interpretation of the original Long Island Light Station (Noble 1996).

In addition to formally documented sites, several known dump sites are associated with the light stations. Scattered dump sites on Outer and Sand islands are within currently forested areas. At the time the dumps were in use, it is likely they were just outside the limit of vegetation cleared at the time. LaPointe Light Station includes a rubble pile just east of the fog signal foundation. Given the long history of occupation of the light stations, it is likely that a variety of scattered artifacts are present at or just below the soil surface.

Impact Intensity Threshold

Section 106 of the National Historic Preservation Act, and its implementing regulations under 36 CFR 800, require all federal agencies to consider effects of federal actions on cultural properties eligible for or listed in the national register. In order for an archeological site to be listed in the national register, it must be associated with an important historic event, person(s), or embodies distinctive characteristics or qualities of workmanship. The thresholds of change for the intensity of an impact on archeological sites are defined in Table 23.

TABLE 23. ARCHEOLOGICAL SITES IMPACT AND INTENSITY

Impact Intensity	Intensity Description
Negligible	Impacts would be at the lowest level of detection with neither adverse nor beneficial consequences. The determination of impact for section 106 would be no adverse impact.
Minor	Alteration of an archeological site would not diminish the overall integrity of the resource. The determination of impact for section 106 would be no adverse impact. Monitoring may be required if a proposed activity occurs near an archeological site.
Moderate	Alteration of an archeological site would diminish the overall integrity of the resource. The determination of impact for section 106 would be adverse impact. A programmatic agreement is executed among NPS and applicable state or tribal historic preservation officer and, if necessary, the advisory council, in accordance with 36 CFR 800.6(b). Measures identified in the memorandum of agreement to minimize or mitigate adverse impacts reduce the intensity of the impact under NEPA from moderate to minor.
Major	Alteration of an archeological site would diminish the overall integrity of the resource. The determination of impact for section 106 would be adverse impact. Measures to minimize or mitigate adverse impacts cannot be agreed on, and NPS and applicable state or tribal historic preservation officer and/or advisory council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).

Short-term impact—following project completion, effects would remain less than one year

Long-term impact—following project completion, effects would remain more than one year

Environmental Consequences

No Action Alternative

Direct and Indirect Impacts of the Alternative. Under the no action alternative, there would be no new ground-disturbing activities that would potentially affect archeological resources. Current levels of maintenance and repairs to historic structures and landscapes would continue, and the existing trail corridor on Devils Island would be maintained. These activities do not typically include excavation, but excavation would be required for occasional work such as septic system repairs. Under current management practices, impacts to archeological resources are avoided or minimized by performing surveys prior to ground disturbing and by having park resource specialists monitor the work. Because current management practices would continue, there would be no new impacts to archeological sites and artifacts in the light stations.

Cumulative Impacts. Management of the light stations has had, and will continue to have, local negligible to minor adverse impacts on archeological resources as a result of ground and vegetation disturbing activities. Past, present, and reasonably foreseeable future actions would have local minor adverse impacts on archeological resources. Because the no action alternative would not add any impacts to the impacts of past, present, or reasonably foreseeable projects, the alternative would not have a cumulative effect on archeological resources.

Conclusions. There would be no new impacts on archeological resources under the no action alternative and the alternative would not contribute to cumulative impacts.

Alternative 1

Direct and Indirect Impacts of the Alternative. In addition to ongoing activities described under the no action alternative, alternative 1 includes activities such as more extensive vegetation removal and constructing a new foundation for a shed on Michigan Island that may expose previously unknown archeological resources (most likely artifacts associated with occupation of

the light stations). No known archeological sites, including dump sites, would be disturbed by the alternative. To minimize potential adverse impacts, surveys for visible archeological resources would be conducted prior to ground-disturbing activities. Monitoring for subsurface artifacts would be conducted during ground-disturbing activities in areas likely to contain high densities of artifacts, such as around foundations and historic edges of clearings. In the event archeological resources are encountered, work would be stopped immediately and the park cultural resource specialist would be contacted. If necessary, the SHPO would be consulted on potential adverse impacts and additional mitigation measures.

Alternative 1 includes ground-disturbing activities with the potential to encounter and adversely affect previously unknown archeological resources. Potential adverse impacts would be minimized by preconstruction surveys and monitoring in areas with high potential for artifacts. With the mitigation measures, alternative 1 would have local long-term minor adverse impacts on archeological resources.

Cumulative Impacts. As described under the no action alternative, past, present, and reasonably foreseeable actions would have local minor adverse impacts on archeological resources. Those impacts, in combination with the local long-term minor adverse impacts of alternative 1, would result in local minor adverse cumulative impacts.

Conclusions. Because activities under alternative 1 have the potential to encounter archeological resources, with mitigation, the impacts would be local, long-term, minor, and adverse. Cumulative impacts would be local, minor, and adverse.

Alternative 2 (Preferred Alternative)

Direct and Indirect Impacts of the Alternative. The activities and their impacts on archeological resources under alternative 2 would be similar to those under alternative 1. Alternative 2 would be more likely to encounter archeological resources than alternative 1 because the area of total disturbance would be greater. Additionally, two unrecorded dump sites are within forest vegetation that would be removed under alternative 2. The dumps would then be more exposed to the elements and to potential disturbance by visitors. No other known archeological sites would be affected by the alternative. Mitigation measures described for alternative 1 are also included under alternative 2, as well as monitoring the dump sites for deterioration or disturbance.

Alternative 2 includes ground-disturbing activities with the potential to encounter and adversely affect previously unknown archeological resources, and would modify vegetation around two unrecorded dump sites from forest to maintained shrublands. Potential adverse impacts would be minimized by preconstruction surveys and monitoring in areas with high potential for artifacts. With the mitigation measures, alternative 2 would have local long-term minor adverse impacts on archeological resources.

Cumulative Impacts. As described under the no action alternative, past, present, and reasonably foreseeable actions would have local minor adverse impacts on archeological resources. Those impacts, in combination with the local long-term minor adverse impacts of alternative 2, would result in local minor adverse cumulative impacts.

Conclusions. Because activities under alternative 2 have the potential to encounter archeological resources, with mitigation, the impacts would be local, long-term, minor, and adverse. Cumulative impacts would be local, minor, and adverse.

Alternative 3

Direct and Indirect Impacts of the Alternative. The activities and their impacts on archeological resources under alternative 3 would be similar to those under alternatives 1 and 2. Alternative 3 would be slightly more likely to encounter archeological resources than alternative 2 because the area of total disturbance would be slightly greater. Additionally, three unrecorded dump sites are within forest vegetation that would be removed under alternative 3, one more than under alternative 2. The dumps would then be more exposed to the elements and to potential disturbance by visitors. No other known archeological sites would be affected by the alternative. Mitigation measures described for alternative 2 are also included under alternative 3.

Alternative 3 includes ground-disturbing activities with the potential to encounter and adversely affect previously unknown archeological resources, and would modify vegetation around three dump sites from forest to maintained shrublands. Potential adverse impacts would be minimized by preconstruction surveys and monitoring in areas with high potential for artifacts. With the mitigation measures, alternative 3 would have local long-term minor adverse impacts on archeological resources.

Cumulative Impacts. As described under the no action alternative, past, present, and reasonably foreseeable actions would have local minor adverse impacts on archeological resources. Those impacts, in combination with the local long-term minor adverse impacts of alternative 3, would result in local minor adverse cumulative impacts.

Conclusions. Because activities under alternative 3 have the potential to encounter archeological resources, with mitigation, the impacts would be local, long-term, minor, and adverse. Cumulative impacts would be local, minor, and adverse.

VISITOR EXPERIENCE

Affected Environment

The park hosts 150,000 to 180,000 visitors annually. Long-term trends suggest that visitation to the park will be steady or increase slightly over the next 25 years. Most visits to the park occur during the summer months (June through August) when weather and lake conditions are most favorable (NPS 2009a). Winter visitors come mostly to view the sea caves, which is dependent on the timing and duration of ice cover on Lake Superior. Ice fishing is also a significant source of winter visitation. Most visitors report being highly satisfied with the visitor experience at the park (NPS 2009a). Frequently enjoyed activities include lighthouse tours, visiting historic sites, hiking, camping, wildlife watching, sailing, boating, sea kayaking, and cruise boat tours. The islands that have the most secure docks (e.g., Michigan and Sand islands), have the most visitor facilities (Raspberry Island), and are on the tour boat circuit receive the most visitors. Islands that are further from the mainland (e.g., Outer Island) receive less use. Currently, none of the islands with light stations are accessible to visitors with disabilities.

Recreational opportunities on the islands include lighthouse tours, hiking on the beach or trails, swimming, camping, hunting, visiting historic sites, and participating in guided tours. Boating, sailing, kayaking, and fishing are popular activities in the park and surrounding waters of Lake Superior. Most people who visit the islands stay near the beaches and other developed areas, especially in areas with campsites or lighthouses. Cruise boat, motorboat, and sailboat visitors tend to come on shore for a relatively short time to use park facilities. Kayakers tend to camp on the islands, stay longer, and explore the interior of the islands more. The most popular activities on the islands tend to be sightseeing, lighthouse tours, day hikes, and camping; although many visitors who come to the park participate in more than one activity.

Access to the islands is generally unregulated, with the exception of camping, which requires a permit. There are 65 developed campsites on the islands. The number of camping permits issued annually has increased in recent years, with more than 1,500 camping permits issued annually since 1998. Islands closer to the mainland (including Sand) receive relatively more campers, while islands further from the mainland (including Michigan, Outer, and Devils) receive fewer campers.

A total of about 55 miles of trails are actively maintained on 12 islands. Outer and Sand islands have well-developed trail systems. Michigan and Devils islands have minor trail systems. These trails provide hiking opportunities for visitors, as well as opportunities to experience and enjoy a variety of natural and historic features.

Opportunities to Understand the Significant Stories of the Apostle Islands

The park has many stories, covering a wide range of topics. Many visitors seek out and enjoy opportunities to hear these stories. In this regard, the park offers interpretive facilities and programs for visitors. Most of these facilities are on the mainland or Stockton Island. The park's main visitor center is in the City of Bayfield. Visitor centers also are at Little Sand Bay on the mainland, Stockton Island, and near the City of Ashland (the Northern Great Lakes Visitor Center). The visitor center on Stockton Island is staffed intermittently and has exhibits on natural and cultural history. No visitor centers are on Michigan, Outer, Devils, Long, and Sand islands. Park staff and volunteers offer lighthouse tours to visitors arriving by private boat at Michigan, Devils, and Sand islands.

Impact Intensity Threshold

NPS Management Policies 2006 state that the enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks, and that NPS is committed to providing appropriate high quality opportunities for visitors to enjoy the parks. Part of the purpose of the park is to offer opportunities for recreation, education, inspiration, and enjoyment. Consequently, one of the park's management goals is to ensure that visitors safely enjoy and are satisfied with the availability, accessibility, diversity, and quality of park facilities, services, and appropriate recreational opportunities.

Scoping input and observation of visitation patterns, combined with assessment of amenities available to visitors under current park management, were used to estimate the effects of the alternatives. Impacts on the ability of visitors to experience a full range of park resources was analyzed by examining resources and objectives presented in the park significance statements, as derived from its enabling legislation. The potential for change in visitor experience proposed by the alternatives was evaluated by identifying projected increases or decreases in access and other

visitor uses, and determining whether or how these projected changes would affect the desired visitor experience, to what degree, and for how long. The thresholds of change for the intensity of an impact to visitor experience and recreational resources are described in Table 24.

TABLE 24. VISITOR EXPERIENCE IMPACT AND INTENSITY

Impact Intensity	Intensity Description
Negligible	Changes in visitor experience would be below or at an imperceptible level of detection. The visitor would not likely be aware of the effects associated with the action.
Minor	Changes in visitor experience would be detectable, although the changes would be slight. Most visitors would be aware of the effects associated with the action, but would be unlikely to express an opinion about the changes.
Moderate	Changes in visitor experience would be readily apparent. The visitor would be aware of the effects associated with the action and would likely express an opinion about the changes.
Major	Changes in visitor experience would be readily apparent and severely adverse or exceptionally beneficial. The visitor would be aware of the effects associated with the action and would likely express a strong opinion about the changes.

Short-term impact—occurs only during project construction

Long-term impact—continues after project construction

Environmental Consequences

No Action Alternative

Direct and Indirect Impacts of the Alternative. There would be no change in the fundamental nature and quality of the visitor experience within the park under the no action alternative. Other than routine preservation and maintenance, no improvements would be made to the historic structures or cultural landscapes of the light stations, and NPS would maintain the light stations in their current condition. Visitor access would remain at 6 buildings. There would be no improvements to water or sanitation facilities. Because current management practices would continue, the no action alternative would have no new effect on visitor experience.

Cumulative Impacts. Past and ongoing NPS management of the stations has maintained, but not greatly improved, the conditions of the light stations. The current conditions of the light stations affect visitor enjoyment because of obscured views. Past, present, and reasonably foreseeable actions would have local minor adverse effects on visitor experience. Because the no action alternative would not add any effects to the effects of past, present, or reasonably foreseeable projects, the alternative would not have a cumulative effect on visitor experience.

Conclusion. The no action alternative would have no new effect on visitor experience and would not contribute to cumulative effects.

Alternative 1

Direct and Indirect Impacts of the Alternative. Under alternative 1, visitor access to the light stations would be restricted during vegetation clearing, and access to buildings would be limited during exterior and interior work. The restricted access would have local short-term minor adverse effects on visitor experience.

Like the no action alternative, the number of buildings open to the public would remain at 6 and there would be no improvements to water and sanitation facilities. Unlike the no action alternative, visitor experiences would improve under alternative 1 because repairing and

preserving some buildings, removing some noncontributing features, and rehabilitating some of the cleared areas would result in a more authentic visitor experience. Adding compatible features to meet building and safety codes also would improve visitor experience. Finally, clearing vegetation would improve visitor views of the light stations from Lake Superior and views of the lake from the light towers.

Temporary restrictions on visitor access would have local short-term minor adverse effects on visitor experience, but overall, the building and cultural resource treatments under alternative 1 would have long-term beneficial effects on visitor experience.

Cumulative Impacts. As described under the no action alternative, past, present, and reasonably foreseeable actions would have local minor adverse effects. Those effects, in combination with the local short-term minor adverse effects and local long-term beneficial effects of alternative 1, would result in local beneficial cumulative effects.

Conclusion. Limits on visitor use of the light stations during implementation of alternative 1 would have local short-term minor adverse effects on visitor experience. Improvements to historic structures and cultural landscapes would have local long-term beneficial effects on visitor experience. Alternative 1 would have local beneficial cumulative effects.

Alternative 2 (Preferred Alternative)

Direct and Indirect Impacts of the Alternative. Activities under alternative 2 would be the similar to those under alternative 1, but with a focus on rehabilitation, alternative 2 would have greater long-term beneficial effects on visitor experience than alternative 1. Alternative 2 would expand visitor access and use to 13 buildings, investigate improved accessibility to 6 buildings, and upgrade one water and sanitation facility. Alternative 2 provides a more authentic experience and would expand cleared areas more than alternative 1. As with alternative 1, under alternative 2, visitor access to the light stations would be restricted during vegetation clearing, and access to buildings would be limited during exterior and interior work. The restricted access would have local short-term minor adverse effects on visitor experience.

Temporary restrictions on visitor access would have local short-term minor adverse effects on visitor experience, but overall, the building and cultural resource treatments under alternative 2 would have local long-term beneficial effects on visitor experience.

Cumulative Impacts. As described under the no action alternative, past, present, and reasonably foreseeable actions would have local minor adverse effects. Those effects, in combination with the local short-term minor adverse effects and local long-term beneficial effects of alternative 2, would result in local beneficial cumulative effects.

Conclusion. Limits on visitor use of the light stations during implementation of alternative 2 would have local short-term minor adverse effects on visitor experience. Improvements to historic structures and cultural landscapes would have local long-term beneficial effects on visitor experience. Alternative 2 would have local beneficial cumulative effects.

Alternative 3

Direct and Indirect Impacts of the Alternative. Activities and effects under alternative 3 would be very similar to those under alternative 2. Alternative 3 would have slightly greater long-term beneficial effects on visitor experience than alternative 2. Alternative 3 would expand visitor access and use to 17 buildings, investigate improvements to accessibility to 10 buildings, and improve three water and sanitation facilities. Alternative 3 provides a more authentic experience and would expand cleared areas more than alternatives 1 and 2. As with alternatives 1 and 2, under alternative 3 visitor access to the light stations would be restricted during vegetation clearing, and access to buildings would be limited during exterior and interior work. The restricted access would have local short-term minor adverse effects on visitor experience.

Temporary restrictions on visitor access would have local short-term minor adverse effects on visitor experience, but overall, the building and cultural resource treatments under alternative 3 would have long-term beneficial effects on visitor experience.

Cumulative Impacts. As described under the no action alternative, past, present, and reasonably foreseeable actions would have local minor adverse effects. Those effects, in combination with the local short-term minor adverse effects and local long-term beneficial effects of alternative 3, would result in local beneficial cumulative effects.

Conclusion. Limits on visitor use of the light stations during implementation of alternative 3 would have local short-term minor adverse effects on visitor experience. Improvements to historic structures and cultural landscapes would have the greatest local long-term beneficial effect on visitor experience of the action alternatives. Alternative 3 would have local beneficial cumulative effects.

PUBLIC HEALTH AND SAFETY

Affected Environment

The park presents many potential hazards and risks to visitors and employees; therefore, safety is an important concern. NPS strives to ensure that visitors are aware of the risks of travel on the lake and islands. The park is a challenging place to access and explore. Boating on Lake Superior presents hazards such as cold temperatures, rough seas, fog, storms, tripping and slipping hazards, hazardous ice, hazardous ledges/cliffs, and lack of cell phone/radio communications in many parts of the park. Response times to portions of Lake Superior can be much greater than for similar distances on the mainland.

In addition to general hazards, virtually all of the structures at the light stations include materials that are hazardous to public health. Some materials, such as asbestos and lead-based paint, were used throughout the structures for construction and repairs prior to regulatory restrictions on their use and handling. Bat guano and mold are health hazards that were introduced to the structures following the end of light station occupation. Any work on the structures requires consideration of the potential for these materials to affect the health of workers and visitors.

Impact Intensity Threshold

Public health and safety refers to the ability of NPS to provide a healthy and safe environment for visitors and park staff, to protect human life, and to provide for injury-free visits and appropriate responses when accidents and injuries occur. The thresholds of change for the intensity of an impact to public health and safety are described in Table 25.

TABLE 25. PUBLIC HEALTH AND SAFETY IMPACT AND INTENSITY

Impact Intensity	Intensity Description
Negligible	The effects would be at low levels of detection and would not have appreciable effects on public health and safety.
Minor	The effects would be detectable, and would be of a magnitude that would not have appreciable effects on public health and safety. If mitigation is needed to offset adverse effects, it would be simple and likely successful.
Moderate	The effects would be readily apparent and would result in a change in public health and safety that would be noticeable to park staff and the public. Mitigation measures would be necessary to offset adverse effects and would likely be successful.
Major	The effects would be readily apparent; and would result in a substantial change in public health and safety in a manner noticeable to staff and the public; and would be markedly different from existing operations. Mitigation measures to offset adverse effects would be necessary and extensive, and success could not be guaranteed.

Short-term impact—effects lasting for the duration of the treatment action

Long-term impact—effects continuing after the treatment action

Environmental Consequences

No Action Alternative

Direct and Indirect Impacts of the Alternative. Under the no action alternative, the presence of hazardous materials in the structures would continue to be a threat to the health of visitors and workers, including volunteer staff that stay for extended periods. Additionally, hazardous materials, particularly bat guano and mold, would continue to accumulate, increasing the risk to public health and safety. Additionally, some existing minor safety hazards, such as deteriorating walkways, would not be addressed under the no action alternative.

The continued presence of unaddressed and accumulating hazardous materials and conditions under the no action alternative would have local long-term minor adverse effects on public health, safety, and park operations.

Cumulative Impacts. There are no known reasonably foreseeable actions that would have a new effect on public health and safety, so there would be no cumulative effects.

Conclusion. The no action alternative would have no new effect on public health and safety. There would be no cumulative effects.

Alternative 1

Direct and Indirect Impacts of the Alternative. Hazardous materials would be addressed under alternative 1 by removing bat guano in areas frequented by visitors and staff, removing and stabilizing lead-based paint and asbestos, and improving ventilation to reduce mold. Alternative 1 also would address existing minor safety issues by repairing handrails and concrete walkways.

Addressing hazardous materials and safety issues under alternative 1, would have local long-term beneficial effects on public health and safety.

Cumulative Impacts. As described under the no action alternative, because there are no known reasonably foreseeable actions that would affect public health and safety, there would be no cumulative effects.

Conclusion. Alternative 1 would have local long-term beneficial effects on public health and safety. There would be no cumulative effects.

Alternative 2 (Preferred Alternative)

Direct and Indirect Impacts of the Alternative. Hazardous materials would be addressed under alternative 2 in ways similar to those described for alternative 1. More hazardous materials and unsafe conditions would be addressed under alternative 2 than alternative 1 because treatment elements, particularly elements in building interiors, are more extensive.

Addressing hazardous materials and safety issues under alternative 2 would have local long-term beneficial effects on public health and safety.

Cumulative Impacts. As described under the no action alternative, because there are no known reasonably foreseeable actions that would affect public health and safety, there would be no cumulative effects.

Conclusion. Alternative 2 would have local long-term beneficial effects on public health and safety. There would be no cumulative effects.

Alternative 3

Direct and Indirect Impacts of the Alternative. Hazardous materials would be addressed under alternative 3 similar to alternatives 1. More hazardous materials and unsafe conditions would be addressed under alternative 3 than alternative 1 because the treatment elements, particularly elements in building interiors, are more extensive. The extent of hazardous materials and unsafe conditions addressed in alternative 3 would be about the same as under alternative 2.

Addressing hazardous materials and safety issues under alternative 3 would have local long-term beneficial effects on public health and safety.

Cumulative Impacts. As described under the no action alternative, because there are no known reasonably foreseeable actions that would affect public health and safety, there would be no cumulative effects.

Conclusion. Alternative 2 would have local long-term beneficial effects on public health and safety. There would be no cumulative effects.

PARK OPERATIONS

Affected Environment

Ongoing park operations have strived to maintain park physical, natural, and cultural resources, while providing recreational opportunities for park visitors. Park operations include interpretation and education, protection, planning and resource management, business services, and facility management. Under the proposed alternatives, including the no action alternative, there would be either no effect or negligible effects on interpretation and education, protection, planning and resource management, and business services; therefore, these aspects of park operations are not addressed further in this EA.

The facility management staff are responsible for maintaining park developments and cultural resources, including more than 160 historic buildings and the largest collection of lighthouses in the national park system. Facility management staff maintain hiking trails and campsites; repair docks; and maintain grounds, utility systems, and visitor facilities throughout the park. Facility management staff also are responsible for maintaining the park's fleet of more than 20 boats in safe working order. The park's natural resource staff is responsible for monitoring and controlling exotic species, plant restoration, and addressing bluff erosion.

Impact Intensity Threshold

Park operations, for the purposes of this EA, refers to the quality and effectiveness of the infrastructure, and the ability of park staff to maintain the infrastructure used in the operation of the park to protect and preserve vital resources, and provide for a high quality visitor experience. Facilities in the analysis include the historic structures and cultural landscapes of the light stations. The thresholds of change for the intensity of an impact to park operations use are described in Table 26.

TABLE 26. PARK OPERATIONS IMPACT AND INTENSITY

Impact Intensity	Intensity Description
Negligible	The effects would be at low levels of detection and would not have appreciable effects on park operations.
Minor	The effects would be detectable, and would be of a magnitude that would not have appreciable effects on park operations. If mitigation is needed to offset adverse effects, it would be simple and likely successful.
Moderate	The effects would be readily apparent and would result in a change in park operations that would be noticeable to park staff and the public. Mitigation measures would be necessary to offset adverse effects and would likely be successful.
Major	The effects would be readily apparent; and would result in a substantial change in park operations in a manner noticeable to staff and the public; and would be markedly different from existing operations. Mitigation measures to offset adverse effects would be necessary and extensive, and success could not be guaranteed.

Short-term impact—effects lasting for the duration of the treatment action

Long-term impact—effects continuing after the treatment action

Environmental Consequences

No Action Alternative

Direct and Indirect Impacts of the Alternative. The continuation of current management practices at the light stations would result in continued levels of maintenance, which may not be

adequate over time to protect and preserve the features of the historic structures and the cultural landscapes. The estimated number of hours required for maintaining the light stations would remain the same. Ongoing maintenance actions would be conducted without the benefit of additional guidance on maintenance, rehabilitation, or restoration of historic structural and cultural landscape features. Because current operation and management practices would continue, there would be no new effect on park operations under the no action alternative.

Cumulative Impacts. There are no known reasonably foreseeable actions that would have a new effect on park operations so there would be no cumulative effects.

Conclusion. The no action alternative would have no new effect on park operations and there would be no cumulative effects.

Alternative 1

Direct and Indirect Impacts of the Alternative. Under alternative 1, there would be guidance on maintenance, repair, and rehabilitation of historic structures and cultural landscapes. Implementing alternative 1 would address many of the deteriorated historic features of the light stations, which would reduce the need for maintenance of those features; however, that reduced maintenance would be more than offset by increased needs for landscape maintenance. Maintaining the light stations after implementing alternative 1 would require an estimated 0.6 full-time-equivalent (FTE) per year over the baseline FTEs of the no action alternative. Most of the hours would be associated with maintaining the cleared areas.

Increased hours necessary for maintaining the light stations under alternative 1 would have local long-term minor adverse effects on park operations. Having guidance on treatments under alternative 1, would have local long-term beneficial effects on park operations.

Cumulative Impacts. As described under the no action alternative, there would be no cumulative effects.

Conclusion. Alternative 1 would result in local long-term minor adverse effects on park operations by increasing maintenance hours. Having treatment guidance would have local long-term beneficial effects. There would be no cumulative effects.

Alternative 2 (Preferred Alternative)

Direct and Indirect Impacts of the Alternative. The elements of alternative 2 are the same as those described for alternative 1; however, because the elements are more extensive than under alternative 1, they would have greater reductions on maintenance on deteriorated features, and greater increases for landscape maintenance. Maintaining the light stations after implementing alternative 2 would require an estimated 1.2 FTE per year over the baseline FTEs of the no action alternative, and 0.6 more FTEs than alternative 1.

The increased hours necessary for maintaining the light stations under alternative 2 would have local long-term moderate adverse effects on park operations. Having guidance on treatments under alternative 2 would have local long-term beneficial effects on park operations.

Cumulative Impacts. As described under the no action alternative, there would be no cumulative effects.

Conclusion. Alternative 2 would result in local long-term moderate effects on park operations by increasing maintenance hours. Having treatment guidance would have local long-term beneficial effects. There would be no cumulative effects.

Alternative 3

Direct and Indirect Impacts of the Alternative. The elements of alternative 3 are the same as those described for alternatives 1 and 2, but because the elements are more extensive than in alternatives 1 and 2, they would have greater reductions on maintenance on deteriorated features, and greater increases for landscape maintenance. Maintaining the light stations after implementing alternative 3 would require an estimated 1.9 FTEs per year over the baseline hours of the no action alternative, 1.3 more FTEs than alternative 1, and 0.7 more FTEs than alternative 2.

Increased hours necessary for maintaining the light stations under alternative 3 would have local long-term moderate adverse effects on park operations. Having guidance on treatments under alternative 3 would have local long-term beneficial effects on public park operations.

Cumulative Impacts. As described under the no action alternative, there would be no cumulative effects.

Conclusion. Alternative 3 would result in local long-term moderate effects on park operations by increasing maintenance hours. Having treatment guidance would have local long-term beneficial effects. There would be no cumulative effects.

CONSULTATION AND COORDINATION

SCOPING/CONSULTATION

The park will send letters describing the proposed action and asking for comments to interested individuals; organizations; state, county, and local governments; and federal agencies. American Indian tribes also were sent an informational letter describing the project and asking for comments.

Section 106 Consultation

Agencies that have direct or indirect jurisdiction over historic properties are required by section 106 of the National Historic Preservation Act of 1966, as amended (16 USC 470, et seq.), to take into account the effect of any undertaking on properties listed in or eligible for listing in the national register. To meet the requirements of 36 CFR 800, on November 9, 2010, NPS met with the Wisconsin SHPO to discuss the proposed project and solicit comment on the alternatives. These officials also received a copy of the draft EA for review and comment. The park will coordinate with the SHPO in the development of mitigation measures for historic and archeological resources. Affiliated tribal representatives were also consulted, in fulfillment of section 106 requirements. (See the “Consultation with American Indians” section below.)

Consultation with American Indians

The Chippewa/Ojibwe Indian people traditionally occupied vast lands that ranged from both shores of Lakes Superior and Huron in the east to the North Dakota area in the west. The Chippewa/Ojibwe hunted, fished, gathered wild rice and various fruits, and engaged in some horticulture. The descendant entity today is the Lake Superior Tribe of Chippewa/Ojibwe Indians with different Chippewa/Ojibwe bands as independent tribal governments in what are now Wisconsin, Michigan, and Minnesota. NPS forwarded this EA to the following federally recognized American Indian tribes and tribal governments that are traditionally associated with the area now containing the park:

- Red Cliff Band of Lake Superior Chippewa
- Bad River Band of Lake Superior Chippewa
- Mille Lacs Band of Ojibwe
- Fond du Lac Band of Lake Superior Chippewa
- Lac du Flambeau Band of Lake Superior Chippewa Indians
- Lac Courte Oreilles Band of Ojibwe
- Keweenaw Bay Indian Community
- Sokaogon Chippewa Community
- St. Croix Chippewa Indians
- Lac Vieux Desert Band of Lake Superior Chippewa Indians

None of the proposed actions being considered in this EA would impede, prevent, or in any way negate treaty rights. The options being proposed here would not affect the harvesting of plants or plant materials, hunting, fishing (including commercial fishing in Lake Superior), or trapping rights. For Apostle Islands National Lakeshore, these rights are reserved for the tribes and guaranteed by the United States of America in the Treaties of 1842 and 1854, and these rights have been affirmed in a number of court cases, including *State of Wisconsin v. Gurnoe* and *Lac Courte Oreilles Band of Chippewa Indians v. Voigt*.

U.S. Fish and Wildlife Service, Section 7 Consultation

In accordance with section 7 of the Endangered Species Act, the park will forward this EA to the Fish and Wildlife Service for review and comment. The Fish and Wildlife Service, in coordination with NPS, will determine the level of consultation needed for potential effects on threatened and endangered species for the proposed project. The Fish and Wildlife Service will review this EA to determine if they concur with the park's findings of effect, and whether additional conservation measures are needed to protect listed species.

Coastal Zone Consistency Determination

Federal agency activities in or affecting Wisconsin's coastal zone must comply with §307 of the Coastal Zone Management Act and implementing regulations, which require that such federal activities be conducted in a manner consistent to the maximum extent practicable with Wisconsin's Coastal Management Program.

Although all of Apostle Islands National Lakeshore is federal land and excluded from Wisconsin's coastal zone, the park is geographically within the coastal zone. NPS has determined that the preferred alternative described in this document is consistent with Wisconsin's Coastal Management Program, including the state's goals and policies for this area.

This EA provides the substantive basis for NPS's consistency determination and will be submitted to the Wisconsin Coastal Management Council for its concurrence. This consistency determination and the council's concurrence comply with the requirements of the Coastal Zone Management Act. If the state of Wisconsin concurs with NPS's consistency determination, it will transmit its formal concurrence to NPS.

COMPLIANCE WITH FEDERAL AND STATE REGULATIONS

NPS would comply with all applicable federal and state regulations when implementing the preferred alternative. Permitting and regulatory requirements for the preferred alternative are listed in Table 27.

TABLE 27. ENVIRONMENTAL COMPLIANCE REQUIREMENTS

Agency	Statute, Regulation, or Order	Purpose	Project Application
Federal			
National Park Service	National Environmental Policy Act	Applies to federal actions that may significantly affect the quality of the environment.	Environmental review of proposed action and decision to prepare a FONSI or EIS.
	National Historic Preservation Act, section 106	Protection of historic and cultural resources.	The park is consulting with the SHPO to address anticipated effects and mitigation for cultural resources.
	EO 11990, "Protection of Wetlands," and NPS 77-1: <i>Wetland Protection</i>	Requires avoidance of adverse wetland impacts where practicable and mitigation, if necessary.	The preferred alternative would have negligible effects on wetlands and would not include the discharge of fill material into wetlands.
	EO 11988, "Floodplain Management"	Requires avoidance of adverse floodplain impacts where practicable and mitigation, if necessary.	The preferred alternative would have no effect on floodplains.
	NPS 77-2: <i>Floodplain Management</i>	Protection of natural resources and floodplains.	The preferred alternative would have no effect on floodplains.
U.S. Army Corps of Engineers (Corps)	Clean Water Act – section 404 Permit to discharge dredge and fill material	Authorizes placement of fill or dredge material in waters of the U.S. including wetlands.	The preferred alternative would not discharge fill material into wetlands.
U.S. Fish and Wildlife Service	Endangered Species Act	Protection of federally listed threatened or endangered species.	The park is consulting with the Fish and Wildlife Service as part of the NEPA process.
State of Wisconsin			
Wisconsin Division of Water Quality	Wisconsin Pollutant Discharge Elimination System (WPDES) Storm Water General Permit for Construction Activities	Erosion control and water quality protection.	The preferred alternative would not disturb more than 1 acre of ground at a site, so a WPDES is not required.
	WPDES General Permit for construction dewatering	Water quality protection associated with discharge of intercepted ground water.	A permit application would be submitted if excavation activities anticipate the interception and discharge of ground water.

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APPENDIXES

APPENDIX A. DRAFT IMPAIRMENT DETERMINATION

In addition to determining the environmental consequences of alternatives to proposed actions, NPS *Management Policies 2006* and DO-12 require an analysis of potential effects to determine if actions would impair park resources. Impairment is an impact that would, in the professional judgment of the responsible NPS manager, harm the integrity of park resources or values, including opportunities that would otherwise be present for the enjoyment of those resources or values. A determination of impairment is made for particular resource impact topics carried forward and analyzed in the environmental assessment for the preferred alternative. The preferred alternative for meeting the objectives established in Apostle Islands National Lakeshore Treatments for Cultural Landscapes and Historic Structures of the Light Stations of Michigan, Outer, Devils, Long, and Sand Islands Environmental Assessment (EA) is described in chapter 2 of the EA. The EA also includes detailed information on existing conditions of resources (EA Chapter 3) and the effects the preferred alternative would have on those resources (EA Chapter 3). Existing conditions and effects are briefly summarized in this impairment determination.

The description of park significance in chapter 1 of the EA was used as a basis for determining if a resource is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park, or
- key to the natural or cultural integrity of the park, or to opportunities for enjoyment of the park, or
- identified in the park's general management plan or other relevant National Park Service (NPS) planning documents as being of significance.

Impairment determinations are not necessary for some impact topics such as visitor experience, socioeconomics, public health and safety, environmental justice, land use, and park operations because impairment findings relate back to park resources and values. These impact areas are not generally considered park resources or values according to the Organic Act, and cannot be impaired the same way that an action can impair park resources and values. The impact topics relevant to this impairment determination are geology and coastal processes, soils, vegetation, wetlands, wildlife, special status species, natural soundscape, historic structures and cultural landscapes, and archeological resources.

This impairment determination is based on current NPS guidance on determining impairment of park resources and values. The impairment determination for each resource and value includes:

- a brief description of the condition of the resource;
- whether the resource is necessary to fulfill the purposes for which the park was established;
- whether the resource is key to the natural or cultural integrity of the park or to the opportunity for enjoyment of the park;
- whether the resource is identified as a significant resource in the park's planning documents; and

- a statement as to why the action will or will not result in impairment of the resource, including a discussion of the context, severity, duration, and timing of any impacts, and any mitigation measures, if applicable.

Based on the aforementioned guidelines and basis for determining impairment of park resources and values, a determination of impairment is made for each of the resource impact topics carried forward and analyzed in the environmental assessment for the preferred alternative.

GEOLOGY AND COASTAL PROCESSES

Many of the soils of the Apostle Islands were formed from glacial deposits of sands, or till, left during the Pleistocene glaciation. The islands continue to be affected by deposition and erosion and weathering from waves, wind, and weather, especially sandstone cliffs and bluffs. The bluffs formed from glacial till are particularly susceptible to erosion. The park's many sandscapes depend upon wave action and wind to transport and deposit sand. Coastal processes, such as erosion of bluffs and sandscapes, are influenced by Lake Superior water levels. Docks and other developments also may affect coastal processes.

Severe erosion has occurred on the slopes in front of the lighthouses on Michigan and Outer islands. Forest clearing, building construction, and alteration of natural drainage has helped destabilize these banks. The slopes in front of the Michigan Island Lighthouse are currently somewhat stable, but due to severe erosion, NPS staff implemented an erosion-control project from 2004 to 2006 to protect the Outer Island Lighthouse and the shoreline below the lighthouse. Shoreline stabilization measures at Outer Island have included constructing a drain parallel to the top of the slope to redirect surface flows; installing riprap; and using bioengineering measures, including log cribs and revegetating slopes using native plant species.

The park's geologic features and associated coastal processes are necessary to fulfill the purpose of the park, are key to the cultural integrity of the park, and are considered significant park resources.

Under the preferred alternative, the Long Island LaPointe site dock would be repaired and maintained and a new unanchored boardwalk would be constructed in its current alignment. These activities would have only negligible effects on coastal processes because the location and configuration of the dock would not change and because the boardwalk would end above the active shoreline and would not be anchored.

In addition to activities at the shoreline of the LaPointe site, about 3.1 acres of vegetation on the shoreline bluffs of the light stations at Michigan and Outer islands would be managed to open up views to the light stations. The bluff vegetation would be managed by selectively removing trees that extend more than 20 feet above the top of the slope and trimming the tops of shrubs as needed. Periodic maintenance would include evaluating the effectiveness of the biostabilization efforts and thinning trees to lower, but not remove, unstable or overcrowded elements.

Managing the vegetation on the shoreline bluffs would expose soils on the slope to precipitation, and soil would be disturbed by crews removing trees. The clearing would be done incrementally so that only small areas of slope would be potentially destabilized at one time. Disturbed areas would be biostabilized using native species adapted for the specific conditions of the site.

Soil erosion would be minimized by monitoring the slopes and implementing erosion-control measures based on site-specific needs. Erosion-control measures may include constructing a subdrain at the top of the Michigan Island slope (one is already in place on Outer Island), placing erosion-control fabric, and revegetating with shrubs or herbaceous ground cover.

Activities proposed along the shore of Long Island would have negligible effects on geology and coastal processes, and vegetation management on the shoreline bluffs of Michigan and Outer islands would result in local long-term minor adverse effects on geology and coastal processes.

Although areas of shoreline bluffs would be exposed to the potential for higher erosion, the effects would be minimized by monitoring the slopes and implementing erosion-control measures, including biostabilization. For these reasons, the impacts to geology and coastal processes from the preferred alternative would be local, long-term, minor, and adverse. Although impacts on geology and coastal processes from the preferred alternative would be minor, they would be localized and would not impair the resources.

SOILS

Shoreline erosion has been a concern in the park. Wave action has eroded steep bluffs on the islands and has been a threat to park attractions, including campgrounds and lighthouses. Soils on Long Island are derived from sandy outwash and lacustrine deposits. The soils on Long Island occur on beach ridges, sand dunes, and beaches, and are highly susceptible to erosion. Severe erosion has occurred at the toe of the slopes in front of the lighthouses on Michigan and Outer islands. NPS staff implemented an erosion-control project from 2004 to 2006 to protect the Outer Island Lighthouse and the shoreline below the lighthouse.

Although soil resources are not specifically mentioned as being necessary to fulfill the purpose of the park, intact soil resources are a key aspect of maintaining the integrity of the park's outstanding collection of scenic, scientific, biological, geological, historical, archeological, cultural, and wilderness features and values. Soils are not identified as a significant park resource.

The preferred alternative would affect about 31 acres of land. The activities would include clearing trees and/or trimming shrubs that have encroached into the historically cleared areas of the light stations. Although understory vegetation would remain, removing the tree canopy and/or trimming the shrub layer would expose soils more directly to precipitation, which may increase erosion. Because most of the light stations are in relatively level areas, increased erosion would likely be minor. Vegetation also would be cleared on Long Island to reestablish the historic walkway between the lights. The sandy soils along the walkway would be vulnerable to erosion.

Erosion-control best management practices (BMPs) for drainage and sediment control, as identified and used by NPS, including those in NPS Procedural Manual #77-1: Wetland Protection, would be implemented to prevent or reduce nonpoint source pollution and minimize soil loss and sedimentation in drainage areas. The walkway on Long Island would be monitored to determine if unacceptable levels of erosion were occurring and if revegetation or visitor management was necessary.

Although areas of soil would be exposed to the potential for higher erosion, the effects on soils would be minimized by the flat topography of the light stations, the remaining ground cover, and

implementing erosion-control measures. For these reasons, the impacts to soils from the preferred alternative would be local, short-term, minor, and adverse. Because impacts on soil resources from the preferred alternative would be minor, the preferred alternative would not impair soil resources.

VEGETATION

More than 750 plant species occur in the park, including 26 rare species of concern. The park is at the northwestern limits of the hemlock-white pine-northern hardwood forest, and also contains elements of boreal forest.

The park's rare plant communities, habitats, and species are necessary to fulfill the purpose of the park, are key to the natural integrity of the park, and are considered a significant park resource.

The preferred alternative would include managing vegetation, including clearing trees and/or trimming shrubs, on about 23 acres of vegetation, including about 18 acres of forest that has encroached into the historically cleared areas of the light stations. The vegetation managed on each island would represent a small fraction of the total vegetation on the island. The alternative would affect about 4% of the vegetation on Devils Island, about 2% on Long Island, and less than one-half of 1% on the remaining islands. In all, managed areas would be less than one-quarter of 1% of the approximate 13,141 acres of vegetation present on the five islands. The infestation and spread of invasive exotic plants, including plants in the cultural landscape, is possible.

To minimize adverse effects on vegetation, several mitigation measures would be implemented. Construction activities would be confined to the smallest area necessary to complete the work, and all areas of disturbed vegetation would be restored with native vegetation following construction. Weed control BMPs would be implemented to minimize the potential for weed establishment and long-term adverse effects. BMPs would include using native species, monitoring for infestations and spread, and using an integrated pest-management approach to controlling invasive exotics. Native species will be used to the maximum extent possible, however, in cultural resource clearings, noninvasive nonnative grasses might be necessary. Revegetation of disturbed areas is expected to take more than one year because of the low soil fertility and water holding capacity of the soils.

Because the preferred alternative would include the permanent modification of about 23 acres of vegetation and the likely introduction and spread of nonnative species, the effects would be local, long-term, minor to moderate, and adverse. Because the adverse effects would be local, long-term, minor, and adverse, and would primarily occur in areas of the park that have been previously disturbed, rather than in rare communities, the preferred alternative would not impair vegetation resources.

WETLANDS

According to recent park vegetation mapping, wetlands are present on the five light station islands, but Devils and Long islands are the only islands with wetlands present in areas addressed by the preferred alternative. Wetlands on Devils and Long islands are limited by soil type and topography. Fen wetlands are present in Devils Island Light Station along the tram rail from the light station to the tramway engine building, and along the existing trail between Devils Island

Light Station and the dock and boathouse on the southern end of the island. Interdunal and herbaceous emergent wetlands are present in the vicinity of the original LaPointe Light Station, and along the alignment of the historic walkway between the three Long Island light stations. There are no wetlands at Michigan, Outer, or Sand island light stations.

Although not specifically mentioned, wetlands are part of the park's rare plant communities, habitats, and species, which are necessary to fulfill the purpose of the park, are key to natural integrity, and are a significant park resource.

Under the preferred alternative, vegetation along the trail corridors between the LaPointe, Original Lighthouse, and Chequamegon Point site and between the LaPointe site and Chequamegon Bay would be managed as needed to maintain the corridors.

In addition to managing vegetation along trails, under the preferred alternative, the Devils Island tram tracks would be stabilized and trees and shrubs would be pruned to maintain a clear corridor along the tramway. The tram track grade crosses about 275 linear feet of fen wetland. Because the top of the grade would be stabilized, wetland areas adjacent to the tracks and the hydrology supporting the wetlands would not be disturbed.

Stabilizing the tram tracks and managing vegetation along the Long Island trails would not change the size, integrity, or continuity of wetlands in the project area, so the preferred alternative would have local short- to long-term negligible adverse effects on wetlands. Because the effects would be local, short- to long-term, and negligible, the preferred alternative would not impair wetland resources.

WILDLIFE

Island biogeography plays a large role in the distribution and abundance of wildlife populations within the park. The islands are naturally isolated from the mainland, and Lake Superior is a barrier to movement for some animals. The islands are especially important as stopovers for migratory birds. The park also provides nesting habitat for bald eagles.

Although not mentioned specifically, wildlife species are part of the park's outstanding biological features and values, the protection and conservation of which is one of the park's purposes. Wildlife species are also key to natural integrity, and are part of the park's significant rare communities and species.

Short-term and long-term impacts to wildlife habitat would result from vegetation removal and management associated with the preferred alternative. In the short term, human presence and construction noise would temporarily disturb and displace resident wildlife. There would be additional periodic short-term effects when cleared areas are periodically maintained by mowing or brush removal.

In the long term, about 25 acres of habitat, including vegetation, beaches, and banks, would be permanently modified under the preferred, which would result in habitat loss for some wildlife species, including species that prefer forest habitat, such as red squirrel and nuthatch, and an increase in habitat for other species, including species that prefer shrub and grassland habitat, such as mice and eastern meadowlark.

The additional noise and disturbance during construction would result in local short-term minor adverse effects on wildlife species that prefer forest habitat. The permanent modification of about 25 acres of forest and shrub habitat would result in local long-term minor adverse effects on wildlife species that prefer forests. Because the effects would be local, long-term, and minor, the preferred alternative would not impair wildlife resources.

SPECIAL STATUS SPECIES

A number of federal and state threatened and endangered species are known to occur, or have the potential to occur, in the park. Although transient, gray wolf does occur in the park and has recently occurred on Sand Island. During the spring of 2009, there were at least two animals on Sand Island (Van Stappen, pers. comm. 2010). A pack on the mainland has primary territory less than a mile from Sand Island. Piping plovers have nested in the park since 1998. All of Long Island, including private and tribal lands, was designated as critical habitat in 2001. Piping plovers do not occur on Devils Island or Sand Island.

In addition to federally listed species, a number of wildlife species listed as threatened or endangered by the state of Wisconsin are at least occasionally present in the park. The park also hosts 18 plant species listed as threatened or endangered by the state of Wisconsin.

Eleven of the state-listed threatened or endangered species have been documented in the park, but have not been found on Michigan, Outer, Devils, Long, and Sand islands.

The other seven species have been documented to occur on one or more of the five islands addressed by this EA.

The park's rare communities, habitats, and species are necessary to fulfill the purpose of the park, are key to the natural integrity of the park, and are considered a significant park resource.

The preferred alternative would have no effect on gray wolf because it is present so rarely in areas that would be affected by the proposed activities.

Piping plover is known to have nested on three of the light stations islands, and because critical habitat has been designated on Michigan and Long islands, so there is potential for the piping plover to be affected by the preferred alternative. The preferred alternative includes removing the existing boardwalk at Long Island LaPointe Light Station and constructing a new boardwalk in the alignment of the historic boardwalk. The permanent loss of 680 square feet within the Long Island critical habitat unit would be negligible, and would not likely adversely modify critical habitat because it would not appreciably diminish the value of the habitat for either the survival or recovery of the piping plover.

The preferred alternative would also temporarily introduce noise and human disturbance during construction, some of which may be close enough to potential nesting areas that plovers may avoid nesting or may not successfully nest.

Mitigation measures, such as preconstruction surveys and limiting construction to the nonnesting season, would avoid the potential for disturbing nesting piping plovers. Work would only proceed with a determination from the park biologist.

With mitigation measures, the preferred alternative would have no effect on piping plover and would not likely adversely modify piping plover critical habitat.

The preferred alternative would likely have no effect on state-listed wildlife species because listed species potentially present are migrant birds that would easily avoid the small areas of disturbance at the light stations and on a regional scale the habitat modification would be insignificant.

The preferred alternative may affect some state-listed threatened and endangered plant species that are known to, or that may, occur in the areas of the light stations that would be disturbed. The preferred alternative would include modifying habitat on about 25 acres of vegetation that has encroached into the historically cleared areas of the light stations. The infestation and spread of invasive exotic plants also is possible.

The potential effects of the preferred alternative on state-listed plants would be mitigated in several ways. Construction activities would be confined to the smallest area necessary to complete the work, and all areas of disturbed vegetation would be restored with native vegetation following construction. Implementing best management weed control practices would minimize the potential for weed establishment and long-term adverse effects. Finally, surveys for state-listed and other rare plants would be performed prior to vegetation removal, and vegetation treatments would be altered, where practicable, to avoid disturbing populations.

The preferred alternative would have no effect on gray wolf or piping plover and would not likely adversely modify piping plover critical habitat. The effects on state listed species would be local, long-term, negligible, and adverse. Because the preferred alternative would have no effect on gray wolf or piping plover and effects on state-listed species would be local, long-term, and negligible, the preferred alternative would not impair special status species resources.

NATURAL SOUNDSCAPES

The undisturbed soundscape on the islands consists of natural sounds that include waves on the shoreline, wind blowing through the trees, and bird calls. The overall soundscape in the park is generally quiet with minimal intrusion from human-generated sources except near high use areas. The soundscape in the interior wilderness areas on the islands are the closest to undisturbed conditions. The most common human-caused sounds near the shoreline are from motorized watercraft, which is highest in the summer. Park operations, maintenance, and administration activities also contribute to noise generated in developed areas.

A natural soundscape is necessary to fulfill the park's purpose of protecting and conserving the park's wilderness character and values, is key to the natural integrity of the park, and is part of the significant "island experience" of the Apostle Islands.

Project activities would result in temporarily elevated noise levels during vegetation removal and ongoing management, building repairs and rehabilitation, and occasionally operating generators for various uses. Because of temporary noise generated by various activities, the preferred alternative would result in local short-term minor adverse effects on the soundscape in the vicinity of the light stations, but would have no long-term adverse effects. Because the effects would be local, short-term, and minor, the preferred alternative would not impair the natural soundscape.

HISTORIC STRUCTURES AND CULTURAL LANDSCAPES

All of the light stations in the park are listed on the national register. Cultural landscapes with varying degrees of integrity are associated with the light stations. The light stations were constructed between 1856 and 1891 to aid navigation through this portion of Lake Superior. The light stations are the most visible historic resources in the national lakeshore. In addition to the lighthouses and keepers' dwellings, the light stations retain a substantial number of auxiliary buildings (e.g., oil houses, privies, barns, and shops) and associated cultural landscape features that provide a more complete understanding of the nature of operations and the living conditions of the keepers and their families.

The park's historic structures and cultural landscapes are necessary to fulfill the purpose of the park, are key to the cultural integrity of the park, and are considered significant park resources.

The emphasis of the preferred alternative is rehabilitation of historic structures and cultural landscapes. Existing contributing structures and landscape features would be repaired or altered, and missing historic features would be restored. Some noncompatible features would be removed. Where needed, compatible features would be added to meet building codes and maintain safety. About 28 acres of vegetation would be managed to better represent the extent of clearing in the light stations during the period of significance. Views of the light stations from Lake Superior would be slightly improved on Michigan and Outer islands.

Rehabilitating structures and landscape features under the preferred alternative would have long-term beneficial impacts on historic structures and cultural landscapes. Because the effects would be long-term and beneficial, the preferred alternative would not impair historic structure or cultural landscape resources.

ARCHEOLOGICAL RESOURCES

There are 66 known prehistoric and historic archeological sites in the park (NPS 2009a). Approximately 25% of the park has been surveyed, with surveys focusing on areas considered likely to yield archeological resources, or conducted in response to compliance requirements for development of other projects. The park and surrounding areas have a long history of use by American Indians. Several small hunting and fishing camps have been documented in the park from the early historic period (beginning in the mid-17th century).

In addition to formally documented sites, several known dump sites are associated with the light stations. Scattered dump sites on Outer and Sand islands are within currently forested areas. LaPointe Light Station includes a rubble pile just east of the fog signal foundation.

The park's archeological resources are necessary to fulfill the purpose of the park, are key to the cultural integrity of the park, and are considered significant park resources.

Maintenance and repairs to historic structures and landscapes would continue following implementation of the preferred alternative, and the existing trail corridor on Devils Island would be maintained. Most activities do not typically include excavation, but excavation would be required for work at the Long Island Triplex, possibly at the Devils Island Light Tower, and occasional work such as septic system repairs.

Two unrecorded dump sites are within forest vegetation that would be removed under the preferred alternative. The dumps would then be more exposed to the elements and to potential disturbance by visitors. No other known archeological sites would be affected by the alternative, but it is likely that unknown sites are present within the light stations.

To minimize potential adverse impacts, surveys for visible archeological resources would be conducted prior to ground-disturbing activities. Monitoring for subsurface artifacts would be conducted during ground-disturbing activities in areas likely to contain high densities of artifacts, such as around foundations and historic edges of clearings. In the event archeological resources are encountered, work would be stopped immediately and the park cultural resource specialist would be contacted. If necessary, the SHPO would be consulted on potential adverse impacts and additional mitigation measures.

The preferred alternative would have local long-term minor adverse impacts on archeological resources. Because the effects would be local, long-term, and minor, the preferred alternative would not impair archeological resources.

APPENDIX B. CONSULTATION LETTERS



United States Department of the Interior

NATIONAL PARK SERVICE

Apostle Islands National Lakeshore

415 Washington Avenue

Bayfield, Wisconsin 54814-4809

September 20, 2010

H3015(APIS)

Reid Nelson
Director, Office of Federal Agency Programs
Advisory Council on Historic Preservation
Old Post Office Building
1100 Pennsylvania Avenue North West, Suite 803
Washington, D.C. 20004

Dear Mr. Nelson:

The Apostle Islands National Lakeshore is initiating a major historic structure and cultural landscape preservation project at five historic light stations; Outer, Sand, Michigan, Devils, and Long Islands in Ashland County, Wisconsin. The project will begin with a combined historic structures report (HSR) and cultural landscape report (CLR) for each station, as well as an accompanying environmental assessment (EA). The overall goal of the project is to restore, preserve, and interpret the light stations and their cultural landscapes for the visiting public.

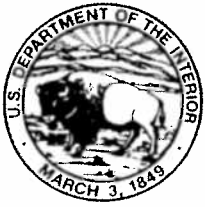
We recognize that the scale of this undertaking, both the combined HSR/CLR/EA and the implementation of preferred treatment alternatives, will require extra levels of effort to ensure smooth coordination with Advisory Council on Historic Preservation (ACHP), tribal governments, State Historic Preservation Officer, and other interested parties. For example, the draft HSR/CLR/EA which will be placed on public review is expected to reach seven volumes in size, one volume for introductory materials, one volume to cover the EA, and five volumes to cover each light station. Reviewing such a document in detail could pose a serious burden during the normally allotted 30 day review period.

For this reason, we would like to inquire whether the ACHP is interested in reviewing and commenting on this large document at its 75% draft stage, or whether you would simply like to receive the full public draft when it is completed. We are also interested in learning of your other interests or concerns during the project's early stages.

If you would like to discuss the project in more detail, Cultural Resource Specialist David Cooper (715-779-3398) will be pleased to furnish additional information.

Sincerely,

Myra Foster
Superintendent (Acting)



United States Department of the Interior

NATIONAL PARK SERVICE

Apostle Islands National Lakeshore
415 Washington Avenue
Bayfield, Wisconsin 54814-4809

September 20, 2010

H3015(APIS)

Michael Stevens
State Historic Preservation Officer
Wisconsin Historical Society
816 State Street
Madison, Wisconsin 53706

Dear Dr. Stevens:

The Apostle Islands National Lakeshore is initiating a major historic structure and cultural landscape preservation project at five historic light stations; Outer, Sand, Michigan, Devils, and Long Islands in Ashland County, Wisconsin. The project will begin with a combined historic structures report (HSR) and cultural landscape report (CLR) for each station, as well as an accompanying environmental assessment (EA). The overall goal of the project is to restore, preserve, and interpret the light stations and their cultural landscapes for the visiting public.

We recognize that the scale of this undertaking, both the combined HSR/CLR/EA and the implementation of preferred treatment alternatives, will require extra levels of effort to ensure smooth coordination with the State Historic Preservation Officer, tribal governments, Advisory Council on Historic Preservation (ACHP), and other interested parties. The draft HSR/CLR/EA which will be placed on public review is expected to reach seven volumes in size, one volume for introductory materials, one volume to cover the EA, and five volumes to cover each light station. Reviewing such a document in detail could pose a serious burden during the normally allotted 30 day review period.

For this reason, we would like to submit this project for your review at the 75% draft stage, which will give you the opportunity to review the document before the first full draft is publicly released. We are also interested in learning of your other interests or concerns during the project's early stages.

If you would like to discuss the project in more detail, Cultural Resource Specialist David Cooper (715-779-3398) will be pleased to furnish additional information.

Sincerely,

Myra Foster
Superintendent (Acting)

PERC 29408

HP-05-07 (8/15/03)

For SHPO Use Only. Case #

16-1225/BA AS

REQUEST FOR SHPO COMMENT AND CONSULTATION ON A FEDERAL UNDERTAKING

Submit one copy with each undertaking for which our comment is requested. Please print or type. Return to:

RECEIVED

Wisconsin Historical Society, Division of Historic Preservation, Office of Preservation Planning, 816 State Street, Madison, WI 53706

SEP 24 2010

Please Check All Boxes and Include All of the Following Information, as Applicable:

I. GENERAL INFORMATION

DIV HIST PRES

- ☒ This is a new submittal.
☐ This is supplemental information relating to Case #: _____ and title: _____
☐ This project is being undertaken pursuant to the terms and conditions of a programmatic or other interagency agreement.
 The title of the agreement is _____

- a. Federal Agency Jurisdiction (Agency providing funds, assistance, license, permit): _____
 b. Federal Agency Contact Person: David Cooper, Cultural Resource Specialist Phone: 715-779-3398 X221
 c. Project Contact Person: David Cooper, Cultural Resource Specialist Phone: 715-779-3398 X221
 d. Return Address: 415 Washington Avenue, Bayfield WI Zip Code: 54814
 e. Email Address: david_j_cooper@nps.gov
 f. Project Name: Light Stations of Michigan, Outer, Devils, Long, and Sand islands HSR/CLR/EA
 g. Project Street Address: 415 Washington Avenue
 h. County: ASHLAND+ Bayfield City: Bayfield Zip Code: 54814
 i. Project Location: Township _____, Range _____, E/W (circle one), Section _____, Quarter Sections _____
 j. Project Narrative Description—Attach Information as Necessary.
 k. Area of Potential Effect (APE). Attach Copy of U.S.G.S. 7.5 Minute Topographic Quadrangle Showing APE.

II. IDENTIFICATION OF HISTORIC PROPERTIES

- ☒ Historic Properties are located within the project APE per 36 CFR 800.4. Attach supporting materials.
☐ Historic Properties are not located within the project APE per 36 CFR 800.4. Attach supporting materials.

III. FINDINGS

- ☐ No historic properties will be affected (i.e., none is present or there are historic properties present but the project will have no effect upon them). Attach necessary documentation, as described at 36 CFR 800.11.
☒ The proposed undertaking will have no adverse effect on one or more historic properties located within the project APE under 36 CFR 800.5. Attach necessary documentation, as described at 36 CFR 800.11.
☐ The proposed undertaking will result in an adverse effect to one or more historic properties and the applicant, or other federally authorized representative, will consult with the SHPO and other consulting parties to resolve the adverse effect per 36 CFR 800.6. Attach necessary documentation, as described at 36 CFR 800.11, with a proposed plan to resolve adverse effect(s).

Authorized Signature: [Signature] Date: 09/17/2010
 Type or print name: David J. Cooper

IV. STATE HISTORIC PRESERVATION OFFICE COMMENTS

- ☒ Agree with the finding in section III above.
☐ Object to the finding for reasons indicated in attached letter.
☐ Cannot review until information is sent as follows: _____

Authorized Signature: [Signature] Date: 12/9/10



United States Department of the Interior

NATIONAL PARK SERVICE
Apostle Islands National Lakeshore
415 Washington Avenue
Bayfield, Wisconsin 54814-4809

September 20, 2010

H3015(APIS)

Mr. Larry Balber
Tribal Historic Preservation Officer
Red Cliff Band of Lake Superior Chippewa
88385 Pike Road, Highway 13
Bayfield, Wisconsin 54814

Dear Mr. Balber:

The Apostle Islands National Lakeshore is initiating a major historic structure and cultural landscape preservation project at five historic light stations; Outer, Sand, Michigan, Devils, and Long Islands in Ashland County, Wisconsin. The project will begin with a combined historic structures report (HSR) and cultural landscape report (CLR) for each station, as well as an accompanying environmental assessment (EA). The overall goal of the project is to restore, preserve, and interpret the light stations and their cultural landscapes for the visiting public.

We recognize that the scale of this undertaking, both the combined HSR/CLR/EA and the implementation of preferred treatment alternatives, will require extra levels of effort to ensure smooth coordination with tribal governments, Advisory Council on Historic Preservation (ACHP), the State Historic Preservation Officer, and other interested parties. For example, the draft HSR/CLR/EA which will be placed on public review is expected to reach seven volumes in size, one volume for introductory materials, one volume to cover the EA, and five volumes to cover each light station. Reviewing such a document in detail could pose a serious burden during the normally allotted 30 day review period.

For this reason, we would like to inquire whether the Red Cliff Band of Lake Superior Chippewa is interested in reviewing and commenting on this large document at its 75% draft stage, or whether you would simply like to receive the full public draft when it is completed. We are also interested in learning of your other interests or concerns during the project's early stages.

If you would like to discuss the project in more detail, Cultural Resource Specialist David Cooper (715-779-3398) will be pleased to furnish additional information.

Sincerely,

Myra Foster
Superintendent (Acting)



United States Department of the Interior

NATIONAL PARK SERVICE

Apostle Islands National Lakeshore
415 Washington Avenue
Bayfield, Wisconsin 54814-4809

September 20, 2010

H3015(APIS)

Ms. Edith Leoso
Tribal Historic Preservation Officer
Bad River Band of Lake Superior Chippewa
Post Office Box 39
Odanah, Wisconsin 54861

Dear Ms. Leoso:

The Apostle Islands National Lakeshore is initiating a major historic structure and cultural landscape preservation project at five historic light stations; Outer, Sand, Michigan, Devils, and Long Islands in Ashland County, Wisconsin. The project will begin with a combined historic structures report (HSR) and cultural landscape report (CLR) for each station, as well as an accompanying environmental assessment (EA). The overall goal of the project is to restore, preserve, and interpret the light stations and their cultural landscapes for the visiting public.

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For this reason, we would like to inquire whether the Bad River Band of Lake Superior Chippewa is interested in reviewing and commenting on this large document at its 75% draft stage, or whether you would simply like to receive the full public draft when it is completed. We are also interested in learning of your other interests or concerns during the project's early stages.

If you would like to discuss the project in more detail, Cultural Resource Specialist David Cooper (715-779-3398) will be pleased to furnish additional information.

Sincerely,

Myra Foster
Superintendent (Acting)



As the nation's principal conservation agency, the Department of the Interior has the responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.