

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, cusate forelands, tombolos, barrier spits, and beaches. Cusate 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
 Slope Stabilization
 Vegetation Community
 Marsh Grass of Parnassas (*Parnassia palustris*)

Image Source: USDA NAIP, 2008

Data Source: APIS Natural Resource Database - Plants, 2009

0 75 150 feet



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
- Common Butterwort (*Pinguicula vulgaris*)
- Low Northern Sedge (*Carex concinna*)

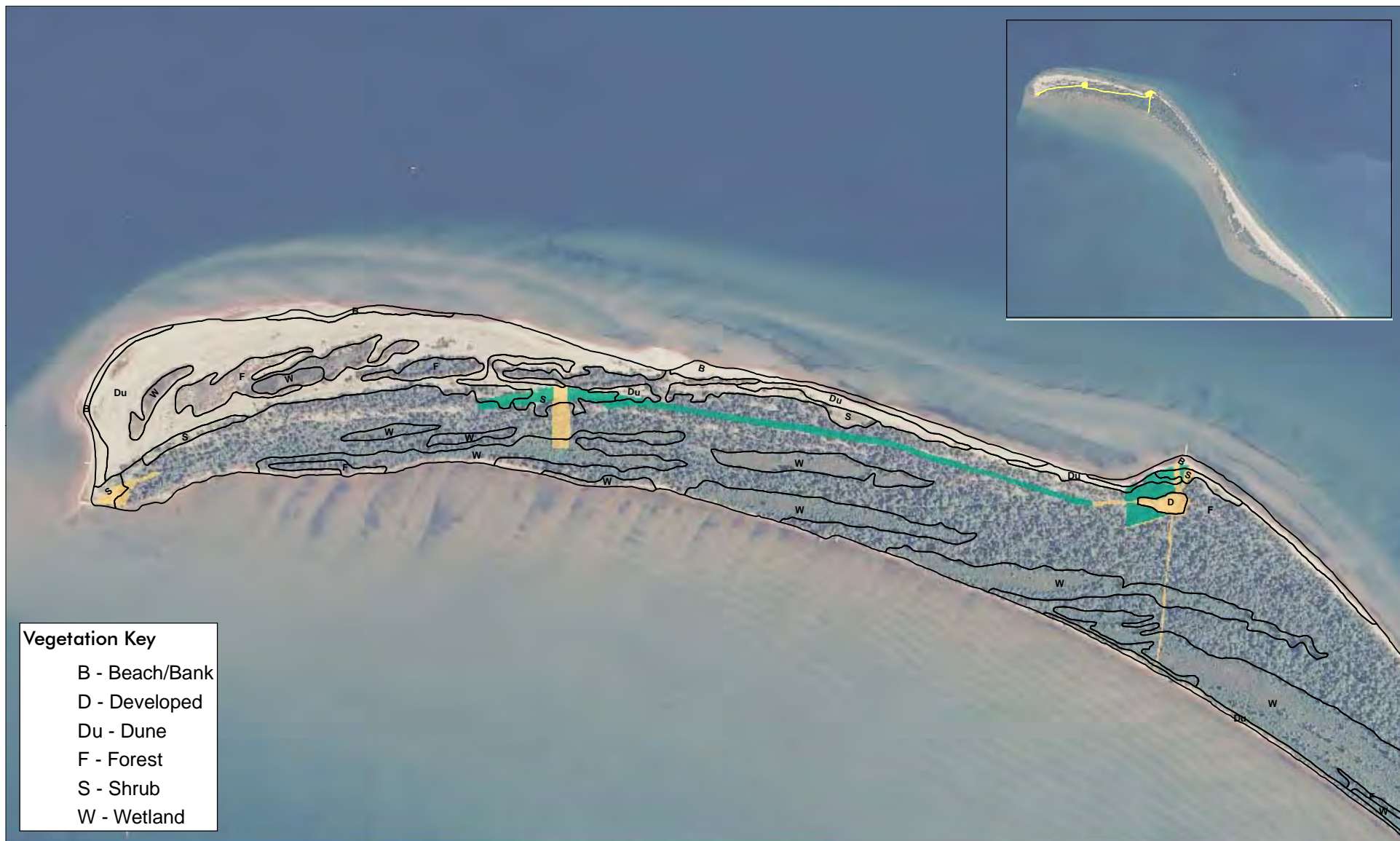
Image Source: USDA NAIP, 2008
Data Source: APIS Natural Resource Database - Plants, 2009

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

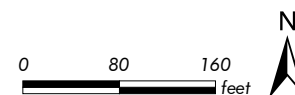


Figure 54
Long Island - Lapointe Light
Station Treatment Alternative 1

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

0 75 150
feet



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

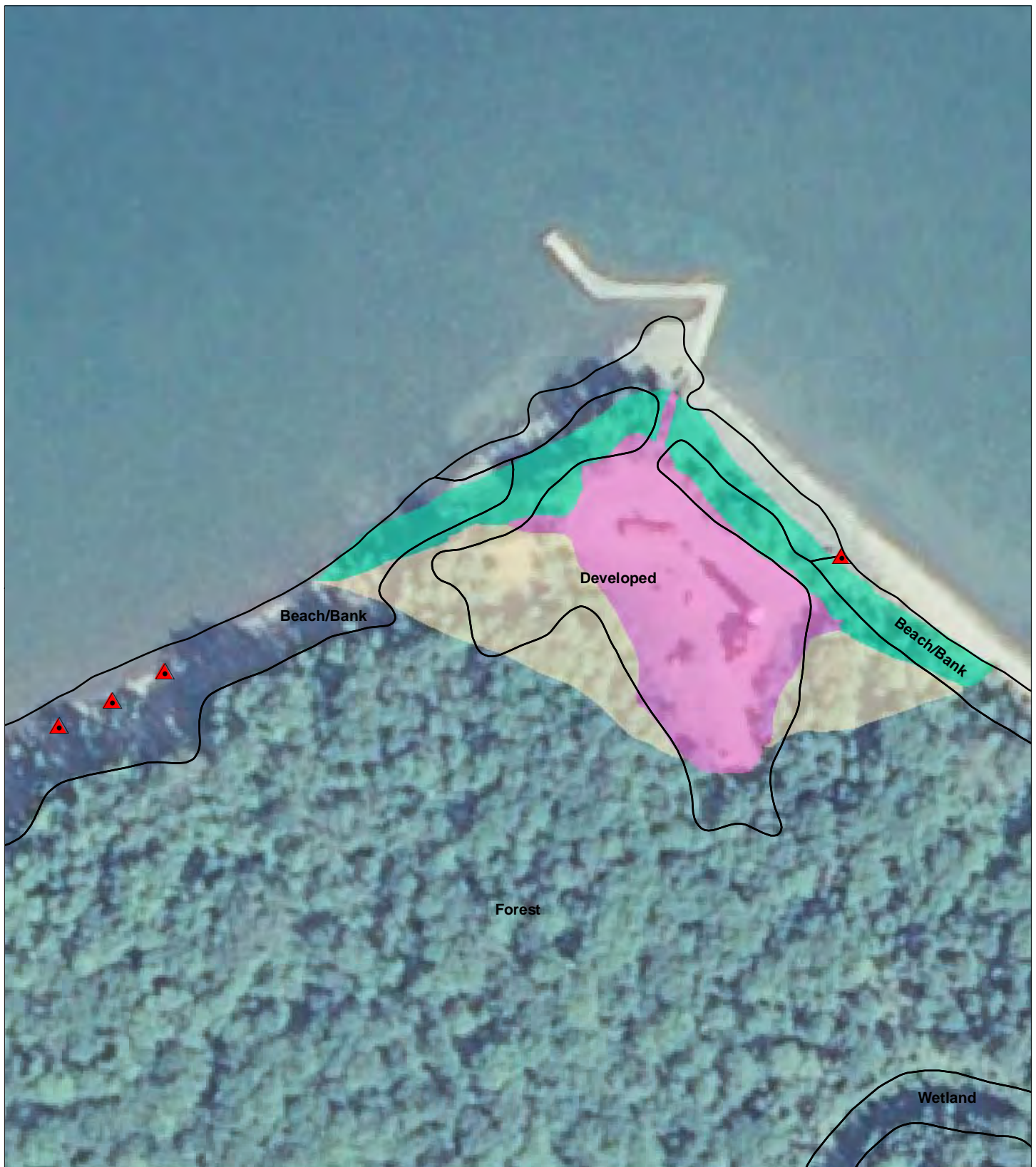
Data Source: APIS Natural Resource Database - Plants, 2009

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

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

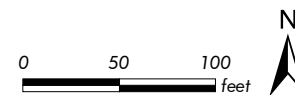


Figure 64
Long Island - Chequamegon
Light Station Preferred
Treatment Alternative

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

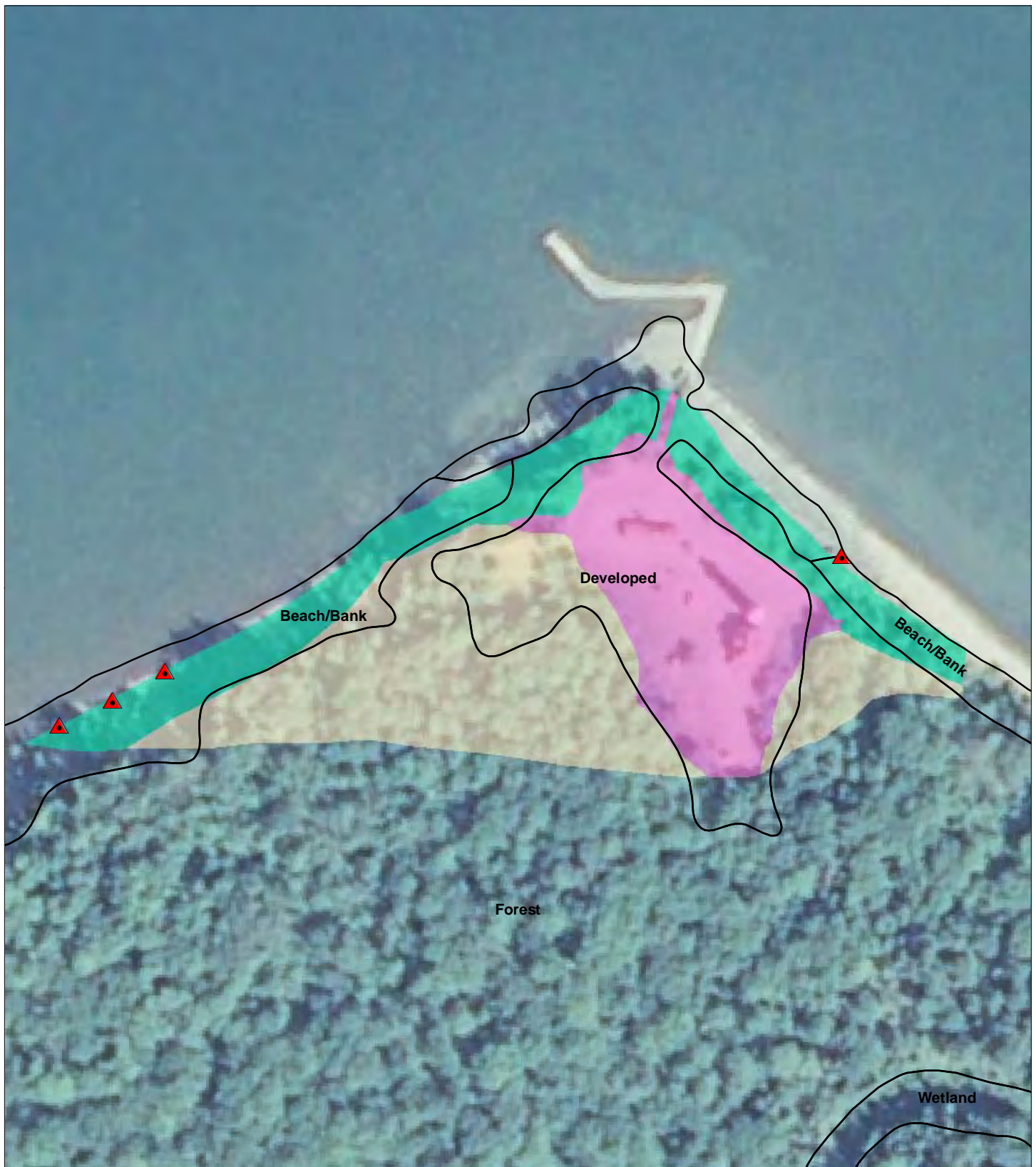
Data Source: APIS Natural Resource Database - Plants, 2009

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

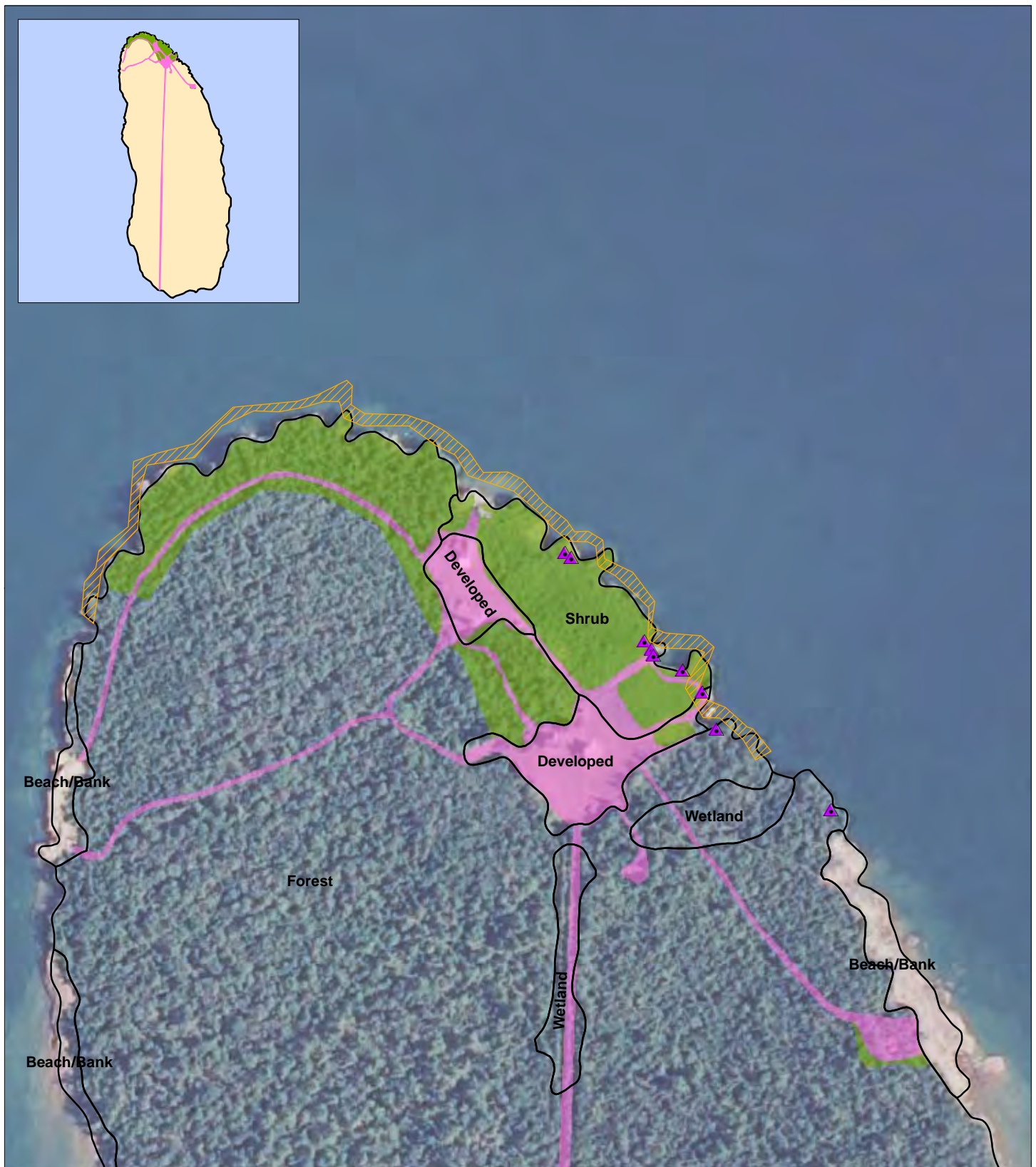
Data Source: APIS Natural Resource Database - Plants, 2009

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
- Common Butterwort (*Pinguicula vulgaris*)
- Low Northern Sedge (*Carex concinna*)

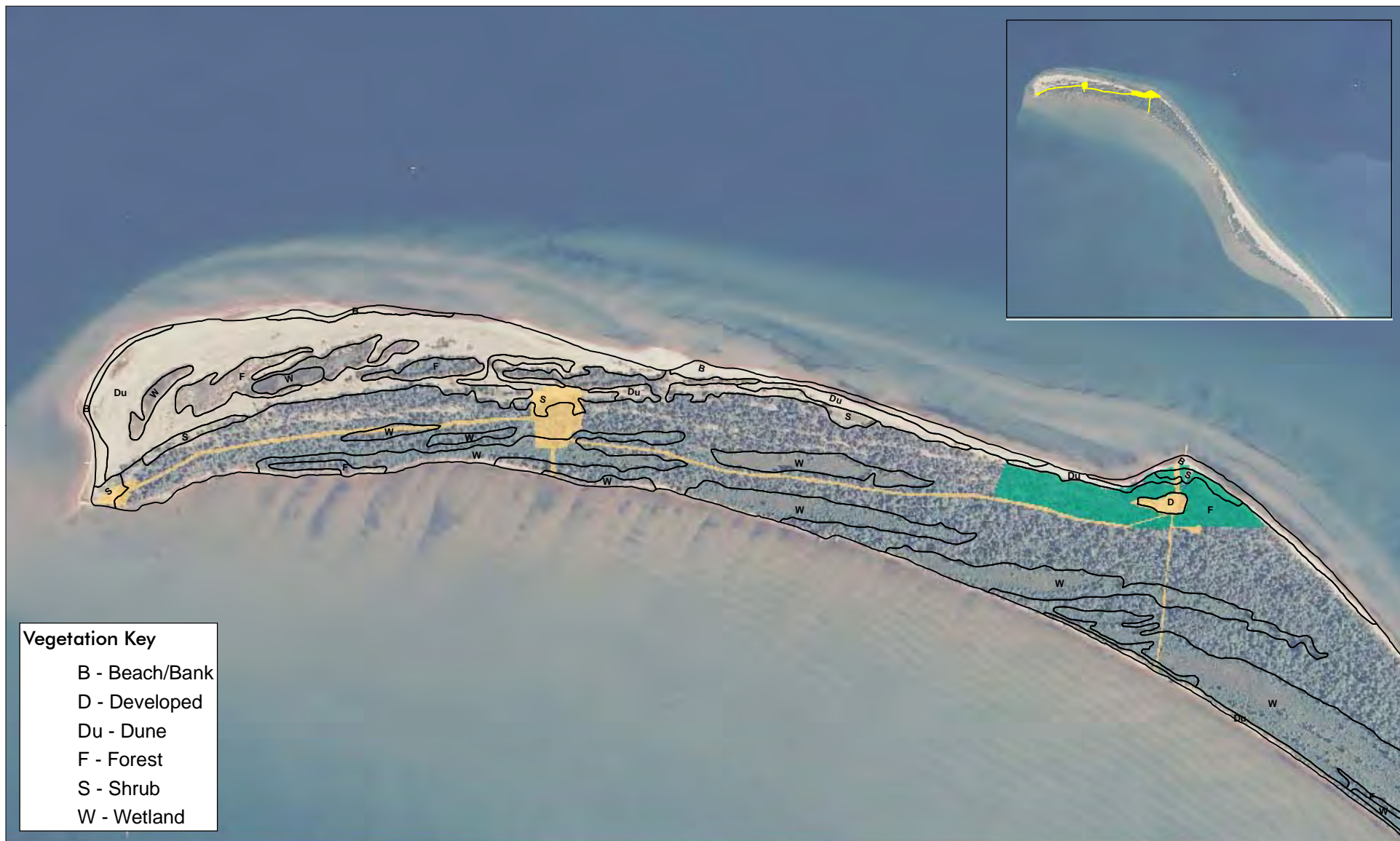
Image Source: USDA NAIP, 2008
Data Source: APIS Natural Resource Database - Plants, 2009

0 150 300
feet



Figure 68 Devils Island Treatment Alternative 3

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



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

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

0 80 160
 feet



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

0 75 150
feet



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

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

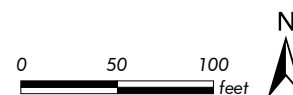


Figure 72
Long Island - Chequamegon
Light Station Treatment
Alternative 3

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-parnassus	<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.

LIST OF PREPARERS AND CONTRIBUTORS

NATIONAL PARK SERVICE, APOSTLE ISLANDS NATIONAL LAKESHORE

Bob Krumenaker, Park Superintendent
Dave Cooper, Branch Chief, Cultural Resources
Julie Van Stappen, Chief of Planning and Resource Management
Jim Nepstad, Former Chief of Planning and Resource Management
Randy Ross, Facility Manager
Christy Baker, Former Branch Chief, Cultural Resources
Myra Foster, Chief of Interpretation and Education
Doug Pratt, Supervisor, Historic Structure Preservation Team

NPS MIDWEST REGIONAL STAFF NATIONAL PARK SERVICE

Bill Harlow, Chief of Historic Architecture and Landscapes
Marla McEnaney, Historical Landscape Architect

NATIONAL PARK SERVICE, DENVER SERVICE CENTER

Nancy Baker, Project Manager
Bari Hahn, Project Specialist
Margo Brooks, Cultural Resource Specialist

ANDREWS & ANDERSON ARCHITECTS

Nanon Adair Anderson, Principal
Elizabeth Hallas, Project Manager
Adrienne Antonucci, Intern

MUNDUS BISHOP LANDSCAPE ARCHITECTS

Tina Bishop, Principal
Pat Mundus, Principal
Taran Jensvold, Landscape Architect in-training

ERO RESOURCES CORPORATION

Mary Powell, Natural Resource Specialist
Wendy Hodges, GIS
Kay Wall, Technical Editor

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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.

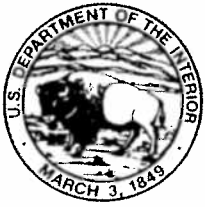
For this reason, we would like to inquire whether the ACHP is interested in reviewing and commenting on this large document at its 75% draft stage, or whether you would simply like to receive the full public draft when it is completed. We are also interested in learning of your other interests or concerns 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.

National Park Service
U.S. Department of the Interior

Apostle Islands National Lakeshore
Wisconsin



Apostle Islands National Lakeshore
415 Washington Avenue
Bayfield, WI 54814

EXPERIENCE YOUR AMERICA