NATIONAL PARK SERVICE • U.S. DEPARTMENT OF THE INTERIOR

RESOURCE STEWARDSHIP STRATEGY SUMMARY

APOSTLE ISLANDS (WENABOZHO OMINISAN) NATIONAL LAKESHORE

WISCONSIN









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ACKNOWLEDGMENTS

First, we'd like to acknowledge the gifts of life that fill this special place known as Wenabozho ominisan, Apostle Islands—the clean air, the fresh water, the solid earth, the trees, the plants, the four-legged creatures, the birds, the fish, and all the other beings that live on and around the islands on Gitchigami (Lake Superior).

Next, we acknowledge and thank our tribal neighbors, who are the original stewards of this place and who willingly gave their time and voices to create this resource stewardship strategy for Apostle Islands National Lakeshore. As we make decisions about the care of this land, we will remember and respect their reserved treaty rights and long-term relationships with this place. We acknowledge the importance of respecting Ojibwe values when making decisions.

We acknowledge the importance of restoring and maintaining Ojibwemowin (Ojibwe language) so that it is always spoken and heard in this park. We acknowledge the trauma caused to generations of Ojibwe people, many of whom were forbidden from learning their language, and pledge that the Ojibwe language will forever exist here. We will work together with our tribal neighbors to integrate the language into our planning efforts, public programs and exhibits, and educational outreach efforts, as is identified in this resource stewardship strategy.

We acknowledge the people who have lived on this land and suffered hardships to protect this place and to maintain their lifeways. We thank them for holding on to their knowledge, and we strive to respect this knowledge when stewarding this land. We honor the Ojibwe people by learning from the losses they suffered when the national lakeshore was established and by trying not to create more losses as future decisions are made.

We acknowledge the subject matter specialists who shared their expertise and perspectives. We appreciate their ideas and contributions to this process. Stewardship is only possible when communities of people work together with clear priorities and pathways for moving forward together. We acknowledge the planners who built this strategy framework to make these shared outcomes possible.

Last, we acknowledge the people in our community who remain eager to care for this special place—people who have given their time as volunteers, researchers, employees, and visitors. This place exists for all living things, and stewardship is the responsibility of everyone.

Chii-Migwech

INTRODUCTION

PURPOSE OF A RESOURCE STEWARDSHIP STRATEGY

A resource stewardship strategy (RSS) is a strategic plan intended to help park managers achieve and maintain desired resource conditions over time (see NPS *Management Policies 2006* [§2.3.2]). As part of a park's planning portfolio, a resource stewardship strategy serves as a bridge between the park's foundation document, other plans, and everyday management of its natural and cultural resources.

More specifically, a resource stewardship strategy is a dynamic planning tool used to set stewardship goals and track progress in achieving and maintaining desired natural and cultural resource conditions. All resource stewardship goals and activities should be based on science, law, NPS management policies, and the long-term public interest.

Essentially, a resource stewardship strategy establishes a framework and a coordinated process for

1. evaluating and summarizing existing information about priority park resources (including key issues, stressors, and threats),
2. using science, scholarship, and traditional knowledge to establish stewardship goals for priority resources,
3. integrating natural and cultural resource management to achieve stewardship goals, and
4. determining what stewardship activities are needed to get us "from where we are to where we want to be."

This information provides a basis for making informed resource management decisions for specific project proposals and for developing and revising annual work plans over time.

A resource stewardship strategy is not a static document or one-time effort. Rather, it is a dynamic framework that should be routinely updated as conditions change; new issues, stressors, or threats are identified; and activities are accomplished. A resource stewardship strategy is reviewed by NPS subject-matter experts and decision makers; however, it is not a publicly reviewed decision document.

The RSS process also provides an opportunity for a park to take an integrated approach to resource management by capitalizing on overlapping opportunities among and within disciplines, identifying stewardship activities that benefit multiple resources, or addressing larger parkwide issues. Taking an integrated approach can result in more effective stewardship for resources through the use of science, scholarship, research, policy, interpretation, and direct management.

INTENT OF THIS SUMMARY DOCUMENT

This summary document is intended to provide readers with a snapshot of the resource stewardship strategy for Apostle Islands National Lakeshore. For the sake of simplification and abbreviation, this unit of the national park system will also be referred to as "the park" or Apostle Islands in this document. The document serves as a communication tool that complements the dynamic and evolving RSS desktop application that is actively used for resource management. This summary is not intended to describe all of the elements in the resource stewardship strategy, but instead focuses on those components of the strategy that are essential for communicating information about the park's plan to address key management issues and seize opportunities for those resources identified as priority natural and cultural resources.

This document includes a summary of key issues, stressors, and threats affecting park resources; brief descriptions of the park's priority resources and their components; and stewardship goals for priority resources and stewardship activities determined to be high priorities for the next 3 to 5 years. The document concludes with a brief description of future RSS implementation.

It is important to remember that implementation of the resource stewardship strategy is an ongoing process, with necessary updates and revisions occurring as resource and management conditions change and stewardship activities are carried out.

BRIEF DESCRIPTION OF APOSTLE ISLANDS (WENABOZHO OMINISAN) NATIONAL LAKESHORE

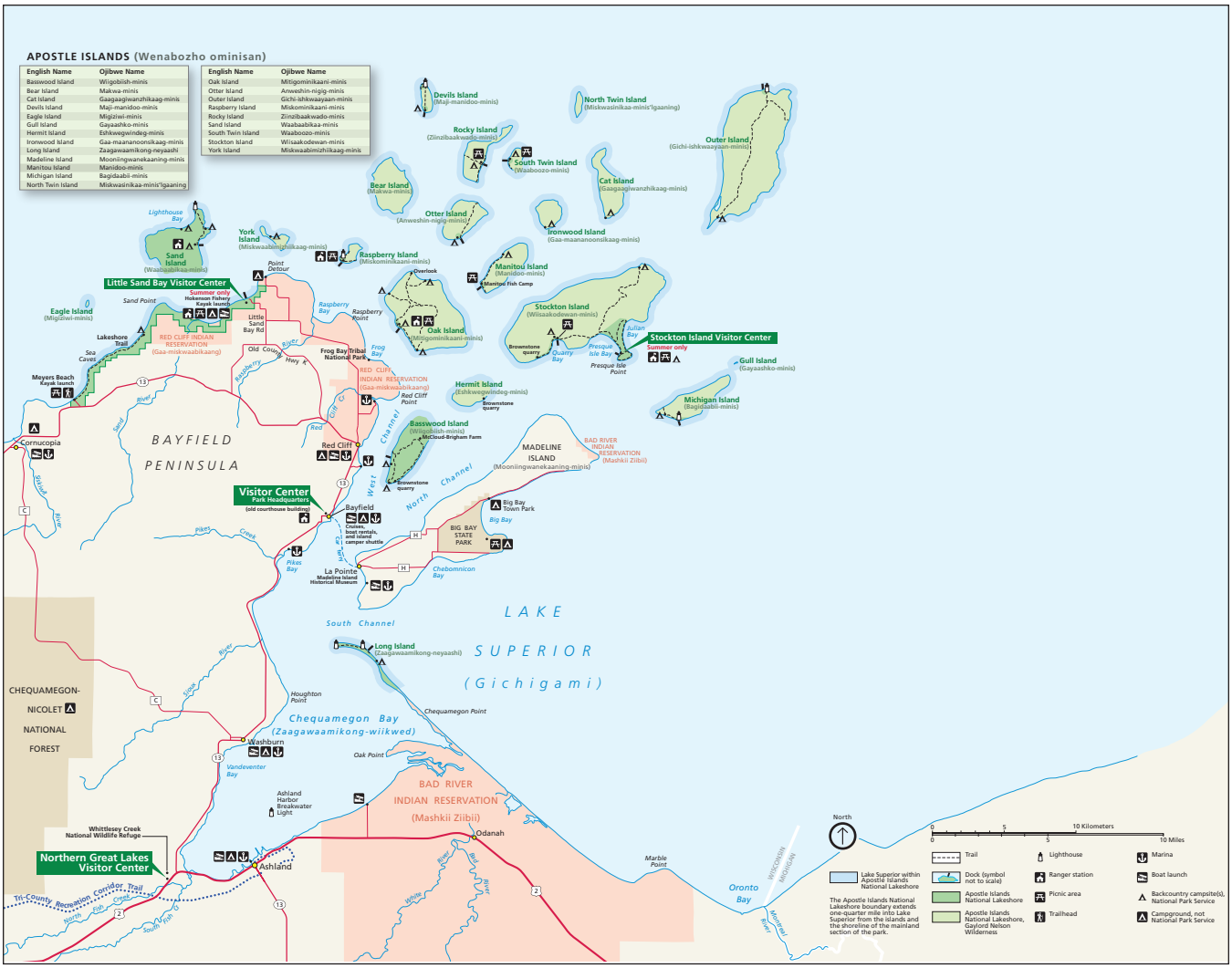
Apostle Islands National Lakeshore, near the tip of the Bayfield Peninsula in northern Wisconsin, includes 21 islands in Lake Superior and a 12-mile-long narrow strip of mainland shoreline. The park is located in Bayfield and Ashland Counties, within the homelands of the Ojibwe people. Established by an act of Congress (Public Law 91-424) on September 26, 1970, the purpose of the park is "to conserve and develop for the benefit, inspiration, education, recreational use, and enjoyment of the public" the islands and their related geographic, scenic, and scientific values.

Apostle Islands National Lakeshore encompasses 69,372 acres, of which 27,323 acres are submerged lands in Lake Superior; the park boundary extends a quarter mile from the shore of the mainland and from each island. Eighty percent of the park's land area was designated as wilderness in December 2004 and named the Gaylord Nelson Wilderness. The islands range in size from the 3-acre Gull Island to the 10,054-acre Stockton Island. The islands are spread over a portion of Lake Superior that is nearly 290,000 acres in size—an area larger than Rocky Mountain National Park or Mount Rainier National Park.

A variety of scenic features can be found on the islands, including examples of some of the earliest and latest events of geologic history in the lower 48 states. The park features pristine stretches of sand beaches and coves; spectacular sea caves; some of the highest quality stands of remnant old-growth forests in the upper Midwest; a diverse population of birds, mammals, amphibians, and fish; and the largest collection of national register lighthouses and lighthouse complexes in the national park system. The National Park Service and the US Coast Guard transitioned the ninth lighthouse, the Ashland Harbor Breakwater Light, to NPS control after it was added to the park in the 2015 National Defense Authorization Act. Park volunteers live on Sand and Michigan Islands in the summer to provide public access to those lighthouses. Efforts are underway to create a wheelchair-accessible boardwalk from the Sand Island East Bay dock to the historic Hansen farm, located by the Justice Bay sea caves, and ending at the Sand Island Light Station. This light station would be the first to be accessible to visitors of all abilities. Park staff provides tours of the Raspberry Island light station during the summer, which is a popular destination for the concession boat tours.

People have used the islands and surrounding shorelines on Lake Superior for thousands of years. According to their written and oral history, the Ojibwe were the original inhabitants of this area. They traveled throughout the islands to gain the food and materials they needed to survive. However, Madeline Island is referred to as their main village and is known as Moningwunakauning, which means, "Home of the yellow breasted woodpecker." For many Ojibwe people who live along the shores of Lake Superior, Apostle Islands continue to provide access to and shelter from the lake, a protected habitat for all living beings on Lake Superior, and a homeland for continuing their knowledge, language, and traditions. Both the Red Cliff Band of Lake Superior Chippewa (the Miskwaabikaang) and the Bad River Band of Lake Superior Chippewa (the Mashkiiziibii) neighbor the park and share shoreline boundaries.

Figure 1. Apostle Islands National Lakeshore Map



In the late 1800s and early 1900s, European settlers and other groups of people constructed residences and started farms, fishing operations, brownstone quarries, and logging camps on the islands. Several of these historic sites are listed in the National Register of Historic Places. Two of these historic districts, on Sand and Rocky Islands, have families that have continuously resided in these communities and have use and occupancy agreements with the park today.

As a unit of the National Park Service, Apostle Islands attracts visitors to Lake Superior's shore to enjoy world-class opportunities for a variety of recreational experiences. The islands' natural resources, and their location on Lake Superior, are suitable for recreational fishing, hiking, kayaking, hunting, and scuba diving, among other activities. During 2021, the year for which the most recent visitor statistics are available, the park recorded nearly 290,962 recreational visits. This was a 33% increase over 2020 visitation and a 37% increase over the park's 30-year average annual visitation.

DEVELOPMENT OF THE RESOURCE STEWARDSHIP STRATEGY FOR APOSTLE ISLANDS NATIONAL LAKESHORE

This resource stewardship strategy represents the collaborative efforts of National Park Service (NPS) personnel from the park; cultural and natural resource specialists from the Red Cliff and Bad River Bands of Lake Superior Chippewa and from the Great Lakes Indian Fish and Wildlife Commission (GLIFWC); the NPS Region Office for Interior Regions 3, 4 and 5, the NPS Cultural Resources, Partnerships and Science Directorate; the NPS Natural Resource Stewardship and Science Directorate; and the NPS Denver Service Center, Planning Division. It is based on information about park resources that was available at the time of RSS development and on the experience and professional judgment of resource specialists.

In developing the resource stewardship strategy, the project team followed a five-step process established by a national NPS working group that formed to provide direction and oversight for RSS efforts nationwide.

First, the team gathered and evaluated existing information about park resources to determine the current condition of resources and status of information. This included review and integration of tribal resource stewardship documents. Next, the team identified and assessed key issues, stressors, and threats that are impacting park resources or could do so in the future. The team then identified priority resources and their components for this resource stewardship strategy. The team subsequently set stewardship goals for each priority resource. The team identified stewardship activities aimed at achieving those goals and prioritized activities to implement within the next 3 to 5 years (see appendix A). This process included ongoing consultation with tribal resource specialists and Tribal Historic Preservation Officers at the beginning, in the middle, and at the end of the process (see appendix B, which includes management activities to be conducted by park and tribal partners). The process also included the development of new sections of the plan addressing the cultural context and future actions needed to continue to coordinate stewardship efforts with tribal neighbors and partners. The organization of this summary document parallels this RSS development process, which is described in more detail in internal NPS documents, including the RSS Development Guide prepared in 2019. Some key terms that are used throughout this summary document are defined below.

DEFINITIONS OF KEY TERMS

Priority Resource: A cultural or natural resource or value that the National Park Service manages or monitors to maintain a park unit's purpose and significance, to address policy/law mandates, or to address scholarly and scientific research needs or findings.

Priority Resource Component: An aspect or attributing resource that is integral to the functionality, importance, or condition of a priority resource and can be managed or monitored practically over the next 5-year horizon. A priority resource component is included, or nested, under the associated priority resources.

Stewardship Activity: One or more initiatives that lead to the achievement of a short-term stewardship goal. On its own, a stewardship activity should produce a specific deliverable or outcome. Activities may include assessments, documentation, identification, maintenance, operations, resource protection, thematic studies, cataloging, evaluation, interpretation, planning, training, data recovery, education, inventory, monitoring, research, survey, treatment, restoration, or other types of management.

Stewardship Goal: A description of what resource condition or information that managers are working to achieve for a particular priority resource or component. Stewardship goals guide the National Park Service in its aim to enhance information; improve or maintain resource conditions; address issues, stressors, or threats; or achieve other park stewardship needs related to the priority resource such as increasing collaboration with partners or expanding education, interpretation, and other programming.

Strategy: A tactical path forward defined through achievable actions that maintain or improve aspects of a priority resource / component. Strategies start with a stewardship goal and include a comprehensive set of activities to achieve that goal. Strategies are logically organized, science/scholarship-based, well documented, and reviewed by subject-matter experts. The typical timeframe for executing a strategy is short term, typically 3 to 5 years depending on a park's needs.

CULTURAL PRIMER AND PARK MANAGEMENT PHILOSOPHY

Apostle Islands National Lakeshore has a management philosophy premised on the conviction that in order to be effective "land managers" and "stewards of our resources"—our charge as NPS employees—staff must understand and respect the long relationships that have existed between people and the land that is now included in the park. These are ancient relationships that continue to the present day. In recent times, designations have been added to this land, such as national lakeshore, wilderness, and state natural area. These designations are all human constructs for expressing the importance of this place to many people. But these designations cannot supersede preexisting relationships, and stewards of the land must acknowledge and respect their role in the current and future significance given to this land. Ultimately, stewardship is only successful when one considers the role of all relationships to a place: past, present, and future.

The northern one-third of Wisconsin, including Apostle Islands National Lakeshore, is within ceded territory for 11 Ojibwe (Anishinaabe) nations. The park neighbors the reservation of the Red Cliff Band of Lake Superior Chippewa and includes an inholding within the reservation that provides the only marina access for the western side of the park. The park also shares a boundary along Long Island with the Bad River Band of Lake Superior Chippewa. These relationships require a very high standard of care related to reserved treaty rights for stewardship of all cultural and natural resources, and for access by tribal members to those resources for cultural uses, including hunting and gathering. The National Park Service has entered into an agreement through the Great Lakes Indian Fish and Wildlife Commission, the Red Cliff Band, and other interested member tribes to protect and sustain the lakeshore's natural resources for present and future generations in a way that recognizes and implements the tribes' ceded territory rights for hunting and gathering.

Understanding Ojibwe cultural perspectives and respecting their relationships to this landscape and the lake is critical to the successful stewardship of Apostle Islands National Lakeshore. In resource management undertakings, as well as planning activities such as this resource stewardship strategy, it is essential that the park understand and make use of the resource management work undertaken and published by both the Red Cliff and Bad River nations and the Great Lakes Indian Fish and Wildlife Commission. These documents include the following (see also the References section):

- GLIFWC Climate Change Vulnerability Assessment: Integrating Scientific and Traditional Ecological Knowledge (April 2018)
- GLIFWC Dibaginjigaadeg Anishinaabe Ezhitwaad (Tribal Climate Adaptation Menu/"TAM"), "Caring for those who take care of us" (2019)
- Red Cliff Ganawenjigaade Treaty Natural Resources Division Comprehensive Plan 2020–2030, "It is taken care of, protected… We take care of, protect, keep it" (2020)
- Miskwaabikaang Ojibwemodaa Endaaso Giizhik Red Cliff Ojibwe language 5-year comprehensive plan (May 2020)
- Bad River Reservation Seventh Generation Climate Change Monitoring Plan (no date)

The relationships between tribal members and this landscape have existed for hundreds, if not thousands, of years and have given rise to a way of understanding that has become embedded in Ojibwe traditional culture—commonly called today, "Native Ecological Knowledge" (NEK). Much of that knowledge is oral and shared between individuals who have specific relationships with each other and with the landscape. The knowledge is carried by the Ojibwe elders and was a key influence on the development of resource management documents at Red Cliff. These documents embody perspectives of some members of that community—it should be understood that one Ojibwe person cannot speak for all Ojibwe people—and must be a consideration in the management of Apostle Islands inholding and of ceded territories.

Finally, another aspect of respecting cultural connections on this landscape is to acknowledge the importance of language. Every word has many meanings, so how they are used in this document needs careful consideration. To this end, a glossary of cultural terms has been carefully created and included as appendix C.

The purpose of this cultural context and glossary is to broaden the focus of this resource stewardship strategy beyond using only a European mindset to define what is important or not. The National Park Service needs to be careful with how it provides a framework of understanding, especially since most of history is recorded from only a European perspective and most government processes are Eurocentric and linear. Cultural sensitivity refers to a set of skills that allows an understanding and education about people whose cultural background is different than one's own. Not all individuals within a specific community are the same, and so speaking in generalities can be harmful.

The RSS team has endeavored to apply this management philosophy to this project. The team recognizes that the distinction between "natural resources" and "cultural resources"—the framework within which federal agencies manage these resources—is contrary to the way in which the Ojibwe have long understood and stewarded these resources. In this project, the team has attempted to draw inspiration from these different worldviews. For example, the project team identified "Terrestrial Ecosystem Wildlife" as a priority resource, and many of the components and stewardship goals it developed reflect the fact that the NPS funds and manages it as a "natural resource." But the team also included "Animals of Cultural Concern" as a component of this priority resource and developed stewardship goals that acknowledge the traditional importance of wildlife species in Ojibwe culture and that acknowledge the universal value in managing these resources with an understanding of their cultural significance. This philosophy was also applied to other priority resources. Furthermore, traditional approaches to resource stewardship (Native Ecological Knowledge) were incorporated into stewardship goals and activities. The RSS team also recognized that there is great value in integrating interpretation, education, and outreach initiatives into resource management programs. This was done in part to educate the public about the Ojibwe worldview and the long connection between land and people. It was also done to generally engage the public, promote visitor safety, discourage visitor actions that are harmful to resources, and to gain acceptance for park management objectives and actions. The team therefore created a robust "Interpretation, Education, and Outreach" component under the "Cross-Program Resources" priority resource.

Finally, the park consulted with its tribal partners about the draft outcomes of this RSS process and together converted many of the RSS priority resources, goals, and activities into proposed management actions to be jointly executed by the park and tribal partners. The process outlined in the RSS Development Guide does not include consultation with tribes over RSS outcomes because that document is considered an internal planning tool and not a publicly reviewed decision document. However, the RSS team made the decision to consult with tribal partners to remain consistent with NPS management philosophy and to reinforce and enhance its existing working relationships with tribal partners. This decision was supported by the rest of the RSS team. Appendix B lists the final outcomes of this consultation. Because individual priority resources, goals, and activities were reworked during the consultation process into outcomes that best suited park–tribe cooperation, the outcomes were not always compatible with the structure of the resource stewardship strategy as developed by the entire RSS project team. To the extent possible, the consultation outcomes were incorporated back into the document, including improved goal or activity language and new joint activities. While appendix B captures the consultation outcomes completely and intact, the joint park–tribe activities that were reincorporated in this document are coded throughout this summary document and in the desktop application with a "J." The activity prioritization codes for this document, including the joint activity indicator, are discussed in the "High-Priority Stewardship Activities" section.

AIRO Brulé

KEY PARK ISSUES, STRESSORS, AND THREATS

Apostle Islands National Lakeshore faces a variety of issues, stressors, and threats that affect park resources or may potentially affect park resources in the future (table 1). These factors include those that are related to climate change and those that are unrelated. Key issues are management concerns that directly relate to park resources and their conditions. Stressors are factors that exacerbate change in resource conditions, while threats are immediate or potential factors that may negatively impact park resources in the future but do not currently affect park resources. The identification of key issues, stressors, and threats helped drive the selection of priority resources for this resource stewardship strategy. Furthermore, the National Park Service considered key issues, stressors, and threats when setting stewardship goals for priority resources and when developing and prioritizing stewardship activities that respond to those goals.



CLIMATE CHANGE NARRATIVE

Apostle Islands National Lakeshore has already experienced significant and rapid human-caused climate change (USGCRP 2017). By surface areas, Lake Superior is the largest lake in the world and is among the fastest warming lakes in the world. The lake's waters have warmed more rapidly than the overlying air, which has reduced a temperature gradient between the two zones and caused windspeeds to increase at a rate of 5% per decade since mid-1980s (Desai et al. 2009). Mean annual temperatures for the national lakeshore demonstrate a significant increasing trend since 1970, and recent temperatures have been "extremely warm," compared to 20th-century averages (Monahan and Fisichelli 2014). Although no significant trends in annual precipitation have occurred, warming temperatures increase evaporation demands and can reduce available water for plants, groundwater recharge, and surface flows. These types of climate change effects frequently act as stress multipliers and exacerbate existing threats to historic structures and cultural landscapes.

The most extreme temperature trend has been in average minimum (overnight) temperatures since 1970, which have increased 0.66°F per decade (Analyses: NPS Climate Change Response Program, [CCRP]), but no significant trend in maximum (daytime) temperatures is evident. A winter warming trend is reflected in the below-average number of very cold nights (minimum temperature below 0°F) since 1990. Average summer nighttime temperatures have increased since the beginning of the 20th century (Runkle et al. 2017). Looking forward, all climate models project hotter temperatures in mid-century (ca. 2040), relative to the 1950–1999 baseline (Analyses: NPS CCRP). To bracket the range of ways climate might change at Apostle Islands, the NPS Climate Change Response Program produced two divergent and plausible climate futures (for more about climate futures, see Lawrence et al. 2021) specific to the park for this RSS process: climate future 1, also known as "Warm Wet" because it is moderately warmer than late-20th-century conditions but substantially wetter, and climate future 2, known as "Hot Dry" because precipitation is similar to late-20th-century values but temperature is substantially higher (leading to overall drier conditions). Specifically, under a Warm Wet future, mean annual temperatures are projected to rise 3°F by 2040 and mean annual precipitation would increase by 6.9 inches, whereas under a Hot Dry future, mean annual temperatures are projected to increase 8.8°F and mean annual precipitation would increase by 1.3 inches (figure 2).

Potential change in the average number of extremely hot days (above 95°F) per year by mid-century ranges from little change in relation to 20th-century averages (Warm Wet) to an increase of seven days (Hot Dry).

Mean annual precipitation at Apostle Islands has increased at an average rate of 0.43 inches per decade since 1895 (Analyses: NPS CCRP). Annual precipitation is projected to increase across much of the range of climate futures bookended by this document's two futures, with winter and spring precipitation projected to increase in both climate futures and summer precipitation projected to decrease under the Hot Dry future. The Warm Wet future projects the greatest increase in spring (39%) and summer (14%), while the Hot Dry future shows essentially no change in annual precipitation but a slight increase in precipitation in winter (25%) and fall (8%). Additionally, there is an upward trend in number of extreme precipitation events per year (i.e., events > 2 inches) for the Warm Wet future and a decrease in extreme precipitation events in the Hot Dry future. Several of these types of events have occurred (100-year events in 2011 and 2016; a 500-year event in 2012, and a 1,000-year event in 2018) in the region. Models also project that precipitation may occur during higher-intensity one- or two-day events throughout the Midwest due to the higher water vapor content of the atmosphere with increasing temperature (USGCRP 2017).

Warming temperatures are predicted to increase evapotranspiration, drying forest vegetation, reducing streamflow, and increasing wildfire risk, and a comprehensive recent vulnerability assessment—the Climate Change Vulnerability Assessment for Terrestrial Ecosystems at Apostle Islands National Lakeshore (Handler et al. 2020)—details the natural resource implications of a warming climate. Ongoing research in the park continues to expand on this understanding of vulnerability; for instance, a recent, park-commissioned study of a long-term fire record (>5000 years) from Stockton Island bog (Booth et al. 2021) shows that (1) frequent low-intensity fires and occasional higher-intensity or stand-replacing fires have been associated with the pine-dominated vegetation of Stockton Island tombolo since its origin, and (2) major fire episodes were significantly more likely to occur during dry time periods, such as might become more likely under the Hot Dry climate future. Tree habitat suitability is projected to change, resulting in shifts in species composition (Fisichelli et al. 2014; Handler et al. 2020).

Longer growing seasons will increase the risk of insect outbreaks and expand the ranges of some species such as scale insects and cankerworm (Frank 2014). Climate change may increase risk from invasive plant species at Apostle Islands. Longer growing seasons and shorter cold snaps may allow invaders to expand into new ranges. Similar to changing tree suitability, climate change is expected to alter the bird community at the park, potentially extirpating a number of currently occurring species while new species arrive, with greater changes anticipated under higher greenhouse gas emissions scenarios (Wu et al. 2018).

These changes have the potential to impact cultural resources through a variety of mechanisms (NPS 2016). Changing lake levels and storm conditions, for example, are likely to strongly impact park shorelines and associated cultural resources (Handler et al. 2020). In cultural landscapes, the changing forest composition and increased invasive species may cause the decline of critical vegetation species and degrade viewsheds, and potential increases in wildfire risk pose risks to cultural resources, particularly historic structures in forested landscapes.

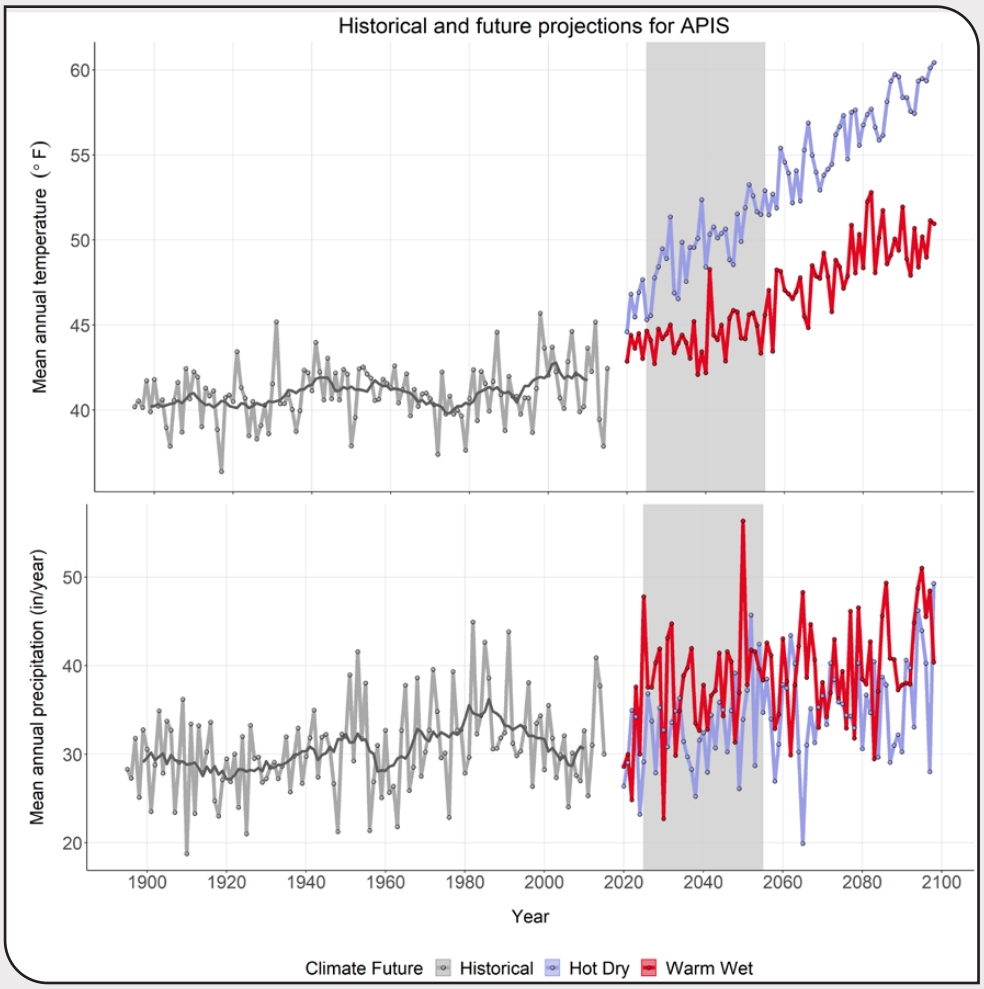


Figure 2. Historical and Future Projections for Apostle Islands (Wenabozho ominisan) National Lakeshore

Note: Historical observed data (gray lines; PRISM records from 1895–2017) and future projections (blue and red lines; multivariate adaptive constructed analog downscaling for global climate model projections from 2020 to 2099) for annual mean temperature and precipitation in Apostle Islands National Lakeshore. The dark gray line running through the historical time series is the 10-year running average. The blue and red lines represent two contrasting climate projections—GFDL-ESM2G RCP 8.5 (NOAA Geophysical Fluid Dynamics Laboratory, USA) and MIROC-ESM RCP 8.5 (Japan Agency for Marine-Earth Science and Technology, Atmosphere and Ocean Research Institute [The University of Tokyo], and National Institute for Environmental Studies)—that bracket the range of ways that climate is expected to change at the park in the future. The gray shaded area represents the future (2025–2055) time period for which projections are compared against the historical (late-20th-century) baseline.

Table 1. Key Issues, Stressors, and Threats; Potential Implications; and Affected Resources

ISSUES, STRESSORS, OR THREATS	POTENTIAL IMPLICATIONS	RESOURCE TYPES AFFECTED
NONNATIVE AND INVASIVE SPECIES (INCLUDES INVERTEBRATES, PLANTS, FUNGUS, AND EARTHWORMS)	- Nonnative and invasive plant species introductions and their persistence can displace native vegetation, alter forest canopy structure and composition, and interrupt natural disturbance dynamics (e.g., fire return intervals, sand dune aeolian and sediment resuspension processes, establishment in recent forest openings), causing various levels of negative vegetative transformation, as well as threaten native and rare plant communities. In addition, exotic plants have the potential to negatively impact wildlife species through habitat transformation. - Introduced nonnative and invasive insect and other invertebrate species can have major short- and long-term impacts on forest ecosystem processes, such as productivity, nutrient cycling, and trophic food webs (e.g., exotic earthworm species, pale juniper webworm [*Aethes rutilana*], gypsy moths [present] emerald ash borer, oak wilt, and hemlock woolly adelgid [expected]). - Exotic and invasive aquatic invertebrate species can severely impact aquatic and shoreline biodiversity and native fisheries and present a host of management problems (e.g., zebra and quagga mussels). - Changing climate conditions are likely to increase the occurrence and abundance of nonnative and invasive species, resulting in additional resource threats.	- Terrestrial ecosystem vegetation - Plant communities, general/all - Rare plant species, general/all - Terrestrial ecosystem wildlife - Wildlife species - Plants of cultural interest and use - Aquatic systems - Wetlands (including groundwater) - Nearshore - Geology, coastal features and processes - Glacial-till bluffs sandscapes
VISITOR USE (CONCENTRATED)	- Concentrated visitor use patterns, including pedestrian traffic, camping activity, and kayak activity, expands the human footprint (e.g., social trailing, kayak take outs, noise, concentrated nodes of visitors and brightly colored gear, refuse) and related impacts into natural and culturally sensitive areas. - Climate change is likely to cause resource impacts from visitor use in a number of ways. For example, moderation of the climate is already extending the visitor season and the park is experiencing concurrent visitation increases; increased drought makes high visitor use areas, such as sandscapes, more sensitive to human traffic; and high lake levels and intense storms decrease heavily used beach and sandscape areas, concentrating use and associated impacts. - Sandscape/dune vegetation is especially sensitive to human traffic. Impacts include erosion and loss of native vegetation critical to maintaining the stability of sandspit ecosystems. Visitor use can also result in soil compaction and erosion on heavily used trails and erosion with the potential for gullying on coastal bluffs. Visitor use can disrupt wildlife activity, increases the potential for human-bear conflicts, and can influence persistent (native) scavenger animal ecology and population dynamics. - Visitation may result in conflicts or misunderstandings if visitors are not educated about tribal culture and rights. - Concentrated visitation may also be disruptive to *in situ* archeological resources and historic features and context.	- Terrestrial ecosystem vegetation - Plant communities, general/all - Rare plant species, general/all - Plants of cultural interest and use - Geology, coastal features and processes - Sandspit and beaches coastal features - Sandstone bluffs and sea/ice cave - Terrestrial ecosystem wildlife - Birds - Mammals - Rare wildlife species - Animals of cultural interest and use - Natural soundscape - Scenic views - Wilderness character - Archeology and resources of cultural interest and use - Cultural landscapes and historic structures - Light stations

Table 1. Key Issues, Stressors, and Threats; Potential Implications; and Affected Resources (continued)

ISSUES, STRESSORS, OR THREATS	POTENTIAL IMPLICATIONS	RESOURCE TYPES AFFECTED
INTERNAL AND EXTERNAL FACILITIES AND DEVELOPMENT	- The development of facilities and infrastructure and the provision of recreational accommodations can have wide-ranging impacts to resources that are significant for the park. - These components include disturbance, such as infrastructure, to accommodate visitors (e.g., docks, comfort stations, picnic shelters, boardwalks, campsites) and legacy disturbance, such as old roads that can cause hydrologic disruption, maintain conditions for invasive plant dispersal, and provide artificial corridors for wildlife movement. Docks and other hardened coastal facilities and engineered features (both within and outside NPS management) can impact coastal processes, such as sand accretion and drift, natural rates of erosion, and impacts to aquatic habitat. Development can also impact a variety of natural and cultural resources, including cultural landscapes, wildlife habitat, and sound and dark night sky values. External threats include cruise ships (beginning in 2022); major upstream oil pipeline; cell towers; potential concentrated animal feeding operation; cell towers; wind turbines; and upstream mining operations.	- Terrestrial ecosystem vegetation - Plant communities, coastal wetlands - Plant communities, deep ravine forests - Rare plant species, wetlands - Plants of cultural interest and use - Geology, coastal features and processes - Sandspit and beaches coastal features - Terrestrial ecosystem wildlife - Rare wildlife species - Aquatic systems, genera/all - Archeology and resources of cultural interest and use - Wilderness character - Dark night skies - Natural soundscape - Scenic views

Table 1. Key Issues, Stressors, and Threats; Potential Implications; and Affected Resources (continued)

ISSUES, STRESSORS, OR THREATS	POTENTIAL IMPLICATIONS	RESOURCE TYPES AFFECTED
DEPARTURES FROM PAST HUMAN USES OF FIRE	- Fire-adapted or fire-dependent communities occur within the park and compose approximately 5% of the park forests. Examples include the Stockton Island tombolo and areas on Long Island. Forests within the fire adapted areas are partially dependent upon fire for regeneration and creating forest variability in terms of ages of forest stands (successional forest variation) and vegetation community composition. In other areas of the park, natural lightning-caused fires tend to be occasional in frequency and small in acreage but can be long in duration if they smolder in the duff layer. Changing climate conditions are likely to impact fire frequency and intensity throughout the park. - Historically, Native Americans used fire (ishkode) for many reasons, including resource stewardship, spiritual values and the promotion of various species of vegetation. These practices were halted in the mid-20th century, concurrent with wide-ranging fire suppression practices. In 2017, park staff started working with tribal partners to reinstate these historic practices through the collaborative use of prescribed fire on the Stockton tombolo. - Anthropogenically (European American) caused post-logging (early/mid-20th century) slash fires had large-scale and long-lasting impacts to the park's vegetation communities. On a much smaller scale, European Americans used fire as a tool for brush clearing and farming. In addition, historic light station landscapes were often maintained through burning practices. Park staff currently uses prescribed fire for pile burning to assist with cultural landscape maintenance, including light station grounds.	- Terrestrial ecosystem vegetation - Plant communities, Great Lakes pine forests and barrens - Plant communities, mixed conifer and hardwoods - Plants of cultural interest and use - Terrestrial ecosystem wildlife - Birds - Mammals - Rare wildlife species - Animals of cultural interest and use - Scenic views - Archeology and resources of cultural interest and use - Cultural landscapes and historic structures - Light stations
WHITE-TAILED DEER IMPACTS	- In addition to other browse-sensitive species, many of the Apostle Islands have landscape scale Canada yew, reminiscent of historic forests. The islands provide a refuge for these species. Canada yew is a highly favored browse species that has become nearly extirpated on the mainland. There have been at least two time periods when the islands have experienced rapid deer population increases—following large-scale habitat changes due to logging in the mid-1900s and on Sand and York Islands in the early 2000s. Significant impacts from the early time period were widespread and resulted in significant impacts to Canada yew, especially on Rocky Island. More than 70 years later, yew has yet to fully recover. On Sand and York Islands, management control of overabundant deer was successful in minimizing long-term resource damage. Climate-related changes to habitat are predicted to increase deer populations. The availability of timely deer occurrence and population trends is critical to facilitate effective management actions.	- Terrestrial ecosystem vegetation - Plant communities, boreal forests - Plant communities, deep ravine forests - Plant communities, Great Lakes pine forests and barrens - Plant communities, mixed conifer and hardwoods - Rare plant species, ravines - Terrestrial ecosystem wildlife - Mammals (including harvested species) - Rare wildlife species - Animals of cultural interest and use

Table 1. Key Issues, Stressors, and Threats; Potential Implications; and Affected Resources (continued)

ISSUES, STRESSORS, OR THREATS	POTENTIAL IMPLICATIONS	RESOURCE TYPES AFFECTED
LARGE-SCALE PEST OUTBREAKS (NATIVE SPECIES)	- Large-scale native insect outbreaks impact native forest community and structure. Mortality to trees from native insect outbreaks primarily occurs on trees that are growing in crowded conditions, are drought stressed, and that may occur in stands that are shifting toward less diverse community structure (monoculture and/or even-aged stands). Weakened trees not killed by pests are vulnerable to other insects and diseases, which can cause additional mortality. Insects in this category include eastern larch beetle (*Dendroctonus simplex*), tamarack sawfly (*Pristiphora erichsonii*), forest tent caterpillar (*Malacosoma disstria*) and spruce budworm. Pale juniper webworm (*Aethes rutilana*) causes partial defoliation of juniper species; however, long-term effects are unclear.	- Terrestrial ecosystem vegetation - Plant communities, boreal forests - Plant communities, interior peat swamps and bogs - Plant communities, mixed conifer and hardwoods - Rare plant species, wetlands
INFORMATION NEEDS	- Lack of baseline information and other types of knowledge gaps can challenge park managers to plan, anticipate and mitigate stressors and threats, improve resource condition, and maintain beneficial relationships with external partners. For Apostle Islands, knowledge gaps were identified for future lake system dynamics and its impacts on terrestrial plant ecology; insect and pollinator assemblages and ecology; rare plant genetics and ecology; wilderness character; and cultural resource condition, protection, and preservation.	- Terrestrial ecosystem vegetation - Rock cliffs and ledges - Rare plant species - Terrestrial ecosystem wildlife - Insects and pollinators - Rare wildlife species - Wilderness - Resources of tribal/cultural interest and use - Archeological resources

Table 1. Key Issues, Stressors, and Threats; Potential Implications; and Affected Resources (continued)

ISSUES, STRESSORS, OR THREATS	POTENTIAL IMPLICATIONS	RESOURCE TYPES AFFECTED
AIR POLLUTION	- Based on published research findings and spatial patterns in pollutant load and resource sensitivity, the air pollution effects of greatest concern to Great Lakes Inventory and Monitoring Network (GLKN) parks appear to include mercury contamination and nutrient enrichment of wetlands. - Natural communities are at risk from the nutrient enrichment and acidification effects of excess nitrogen and sulfur deposition. Nitrogen-critical loads are exceeded for lichen and some forest vegetation, which may be affecting the growth and survival of certain tree species. Sugar maple trees and green ash are especially sensitive and are among 23 acid-sensitive plant species in the park. - Airborne toxics, including mercury, deposited with rain and snow can accumulate in the food chain and affect both wildlife and human health. Elevated levels of mercury were detected in park dragonfly larvae during 2015–2020 ongoing sampling in the park lagoons and in samples taken from fish and eagles. The Wisconsin Department of Natural Resources have statewide and regional fish consumption advisories, including park waters, due to mercury and polychlorinated biphenyl contamination. - Without the effects of air pollution, visual range is between 80 and 185 miles. However, scenic views are diminished by pollution-caused haze, reducing visibility to between 50 and 170 miles. At night, particulates scatter artificial light, increasing the impact of light pollution to night skies. - In addition to weathering, air pollution contributes to deterioration of lighthouses and other historic structures made from stone, paint, and metal.	- Air quality - Scenic views - Dark night skies - Wilderness - Terrestrial ecosystem vegetation - Rare plant species, general/all - Terrestrial ecosystem wildlife - Amphibians and reptiles - Birds - Mammals - Insect and pollinators - Aquatic systems - General/all - Cultural landscapes and historic structures
HIGH LAKE LEVELS	- The levels of Lake Superior are impacted primarily by precipitation and evaporation. The ability for humans to control Lake Superior water levels is very limited. High water levels, especially combined with increasing storm intensity, have accelerated erosion and caused impacts. - Climate change affects lake levels through changing the balance between precipitation and evaporation (e.g., increases in frequency and intensity of major storm events, increased lake and air temperatures). - Impacts have resulted in increased shoreline erosion and loss of coastal habitat, including nesting shorebird habitat and archeological resources; acceleration of erosion rates to clay-till bluffs, sandscapes, and beaches; and impacts to coastal historic structures. Significant impacts also occur to park infrastructure, including docks.	- Terrestrial ecosystem vegetation - Plant communities—maritime bluffs - Aquatic systems - Water quality and levels - Geology, coastal features and processes - General/all - Cultural landscapes and historic structures - Archeology and resources of cultural interest and use - Archeological resources - Terrestrial ecosystem wildlife - Birds

Table 1. Key Issues, Stressors, and Threats; Potential Implications; and Affected Resources (continued)

ISSUES, STRESSORS, OR THREATS	POTENTIAL IMPLICATIONS	RESOURCE TYPES AFFECTED
DEFERRED MAINTENANCE AND BACKLOG AND INADEQUATE CURATORIAL AND STORAGE FACILITY CONDITIONS	- A lack of financial and staff resources to support maintenance activities for cultural landscapes, historic structures, and curatorial facilities is causing a gradual but steady deterioration in cultural resource condition over time. Specific issues identified for Apostle Islands include a large deferred maintenance backlog on both historic structures and landscapes (such as vegetation encroachment at light stations, vernacular structures, and farming, fishing, quarrying and logging landscapes); a need for technical expertise in historic preservation; a lack of baseline information on resource condition and needs; and the urgent need for the occupation and use of historic structures to mitigate otherwise costly maintenance and preservation (unoccupied historic structures deteriorate rapidly without the regular preventative maintenance, cleaning, and daily ventilation that comes with human occupancy). Similarly, limited resources are available for appropriate curatorial environments and collection management tasks related to the park museum and archives (including staff, facilities, artifact housing) for the wide variety of materials that the park is obligated to curate (e.g., metal, wood, paper, glass, stone, textiles). - Much of the collection is curated outside of the park, which limits access by researchers and the public (although natural history specimens at universities are more accessible).	- Cultural landscapes and historic structures - General/all - Museum collection
OBLIGATION TO FULFILL TRUST RESPONSIBILITY WITH TRIBES FOR CEDED LANDS AND INHOLDINGS	- Intentional engagement with tribes is fundamental to strengthen the relationship between tribes and park managers. Partnering and collaboration needs consistent and ongoing efforts at all levels, not just for establishing a government-to-government relationship. - Apostle Islands National Lakeshore is within ceded territory of the Anishinaabeg (also known as Ojibwe and Chippewa). Within this territory, 11 federally recognized tribes retain treaty related rights. Building upon existing relationships between the tribes and national lakeshore, the National Park Service and member tribes entered into an agreement in 2013 to protect and sustain the lakeshore's natural resources for the present and future generations in a way that recognizes and implements the tribes' ceded territory rights. - The park has Red Cliff tribal neighbors to the west and Bad River to the east. Park and tribal staff collaborate on a variety of issues and projects, including protection and management of federally endangered piping plover (Bad River). - Within the Red Cliff reservation, there is a park inholding that includes two-thirds of its mainland unit that requires close coordination.	- Terrestrial ecosystem vegetation - Plants of cultural interest and use - Terrestrial ecosystem wildlife - Animals of cultural interest and use - Archeology and resources of cultural interest and use - Resources of tribal/cultural interest and use - Ceded territory - Park inholding within the Red Cliff Indian Reservation

Table 1. Key Issues, Stressors, and Threats; Potential Implications; and Affected Resources (continued)

ISSUES, STRESSORS, OR THREATS	POTENTIAL IMPLICATIONS	RESOURCE TYPES AFFECTED
THE ABSENCE OF SUCCESSION PLANNING AND ADEQUATE FINANCIAL RESOURCES MAY COMPROMISE LONG-TERM STEWARDSHIP OF HISTORIC STRUCTURES CURRENTLY UNDER LIFE LEASES (RESERVATIONS OF USE AND OCCUPANCY)	- The terms of each reservation of use and occupancy (RUO—see description under "Priority Resource Summaries") stipulate that the leaseholder is responsible for the care and upkeep of historic structures for the duration of the lease. Since leases terminate upon the death of the leaseholder, the date of termination is uncertain. Furthermore, there is no mechanism to plan for succession of resource stewardship nor for the leaseholders and the lakeshore to cooperate in planning for the future of the historic properties and in allocating the necessary funding. - This leads to complications and delays in needed preservation maintenance upon expiration of each lease. Frequently, a leaseholder will suddenly pass away, and RUO buildings come to the lakeshore with no funding, plans or provisions for their maintenance, leading to a sustained period of neglect and emergency repairs while the park tries to "catch up" with the needs of the historic property. Inadequate ONPS funding exists to take on these new responsibilities, and due to the structure of NPS funding cycles, it may take 3–5 years between a request for funding and funding allocation. - Successional planning is needed to avoid gaps in critical preservation maintenance. This effort will require robust partnerships to succeed (see further discussion under "Priority Resource Summaries").	- Archeology and resources of cultural interest and use - Archeological resources - Cultural landscapes and historic structures - Use and occupancy structures

PRIORITY RESOURCES AND COMPONENTS

Priority resources drive the entire RSS process by focusing attention on those park resources that are critical and could most benefit from management direction within the next 3 to 5 years. Typically, the priority resources for a resource stewardship strategy may include those that are defined in a foundation document as fundamental or other important resources, as well as additional resources that park staff believes are necessary to maintain the park's purpose and significance, address policy or legal mandates, or address scholarly and scientific research needs. Certain priority resources are standalone, while others may be subdivided into one or more components. The identification of priority resources and components guides the development of stewardship goals and activities in subsequent steps of RSS development. Parsing out the components of each priority resource helps resource managers tailor these goals and activities to more directly target the resource condition or understanding of its constituent parts. Collectively, this component-level stewardship works to improve the condition or understanding of the priority resource.









Table 2 includes a list of priority resources and their components for the Apostle Islands resource stewardship strategy. Each priority resource is described in greater detail in a summary narrative that follows the table.

Table 2. Priority Resources and Their Components

PRIORITY RESOURCE	COMPONENT(S)
GEOLOGY AND COASTAL FEATURES AND PROCESSES	- Sandstone bluffs and sea/ice caves - Sandspit beach coastal features - Glacial till bluffs
AQUATIC SYSTEMS	- Wetlands - Nearshore aquatics - Streams - Water quality and water quantity
TERRESTRIAL ECOSYSTEM VEGETATION	- Native plant communities, including rare species - Plants of cultural concern
TERRESTRIAL ECOSYSTEM WILDLIFE	- Amphibians and reptiles - Birds - Mammals (including harvested species) - Rare wildlife species - Insects and pollinators - Animals of cultural concern
SCENIC VIEWS	- No components identified
NATURAL SOUNDSCAPE	- No components identified
AIR QUALITY	- No components identified
DARK NIGHT SKY	- No components identified
WILDERNESS	- No components identified
HISTORIC STRUCTURES AND THEIR ASSOCIATED HISTORICAL LANDSCAPES	- Light stations - Vernacular properties - Use and occupancy structures
ARCHEOLOGY AND RESOURCES OF CULTURAL INTEREST AND USE	- Archeological resources - Resources of tribal/cultural interest and use
MUSEUM COLLECTION	- Collection objects (general) - Archives - Imagery (including digital media)
CEDED TERRITORY	- Islands - Mainland unit
PARK INHOLDING WITHIN THE RED CLIFF INDIAN RESERVATION	- Gathering - Hunting - Wildlife monitoring - Watershed management
CROSS-PROGRAM RESOURCES	- Partnerships - Parkwide remote sensing data - Citizen science programs - Interpretation, education, and outreach

PRIORITY RESOURCE SUMMARIES

GEOLOGY AND COASTAL FEATURES AND PROCESSES



Home to a highly diverse and stunningly beautiful array of coastal landforms, the islands and mainland coast continue to be shaped by wave and wind energy generated by Lake Superior and by weathering from precipitation, frost, wind, and sun. The Apostle Islands archipelago's sandstones were deposited during the late Precambrian era (one billion years before present). Sandstone, such as the Devils Island formation, forms shelves and cliffs on the islands and the on the northern shore of the Bayfield Peninsula. The reddish till found on most of the islands was deposited from Pleistocene glaciation starting around three million years ago and ending about 10,000 years before present. Steep bluffs formed where till was exposed.

Coastal features in the park include sandstone cliffs, sandy or silty bluffs, and sandscapes (sand-based landforms). Sandstone cliffs and bluffs, continually eroded by lake waves, are culturally significant for the Ojibwe nations. Natural forces have also sculpted the sandstone of the Devils Island Formation to create extensive sea caves on the mainland near Meyers Beach and on Devils and Sand Islands. Winter brings a wonderland of ice pillars, hardened waterfalls and frozen lake water, and ice caves.



Sand in Apostle Islands comes from bluffs of soft glacial deposits that are eroded by wave action. Not all the islands have sandscapes; small islands generally do not have enough glacial deposits to provide the needed sand, and the inner islands may not have the energy to move sufficient sand. Nonetheless, the lakeshore contains one of the most diverse aggregations of sandscapes, which are classified into five categories: beaches, sand spits (long, narrow projections of sand deposits), barrier spits (long ridges of sand deposits following the contours of the coastline), cuspate forelands (wedge-shaped reaches of sand deposits), and tombolos (deposits of sand connecting two islands together).

These dynamic, sandy environments have been the subject of scientific monitoring since 1988. Their sand-dominated features provide important habitat (e.g., piping plover, migratory birds), serve as barriers to high wave activity, protect fragile environments that lay further inland (e.g., marshes, tidal flats, and lagoons), and contribute to high levels of biodiversity. These features are also extremely popular with park visitors, though they are easily impacted by high levels of human use.



Factors within and outside the control of the National Park Service influence coastal processes. Lake Superior water levels affect erosion rates on bluffs and sandscapes. Water levels are primarily influenced by precipitation and evaporation but also partially regulated through orders of the International Joint Commission. Climate change is impacting Lake Superior's coastal processes, especially during high water levels. This impact is compounded by rapidly increasing lake temperatures, more frequent and intense storms, and decreasing ice coverage during the winter. Modern developments such as docks may also affect local coastal processes, altering movement of sand or currents and longshore drift.







AQUATIC SYSTEMS

Among the most noticeable and unique ecosystems at the park is the interface between land and water. Lake Superior, dynamic and uncontrollable, is the largest and one of the cleanest freshwater lakes in the world. The Great Lakes region is one of the most water-rich locations in the world and host to substantial, diverse aquatic habitats.

Water quality of Lake Superior and its tributaries is relatively high. Water quality in and around Apostle Islands reflects the general oligotrophic character of Lake Superior. Sand River, Raspberry River, and Red Cliff River represent the three main streams that discharge to the lakeshore area of Lake Superior from the Bayfield Peninsula. These three watersheds influence the quality of the lake in the Apostle Islands area. Visitor use in shallow-water, heavy-use areas has shown relatively minimal effects to water quality. On the mainland, future mines and concentrated animal feeding operations are potential sources of threats to water quality. Established long-term water quality sampling sites continue to provide valuable data on physical, chemical, and biological changes in lakeshore waters. Lake Superior is experiencing significant impacts from climate-related changes. Lake Superior is one of the fastest warming lakes in the world (Sharma et al. 2021), with lake temperatures facing increases of from 6.5°C to 10°C by the end of the century (Notaro et al. 2015). Current impacts include previously unprecedented algal blooms, recent detection of zebra mussels, and increased severe storms.

The Apostle Islands hold an impressive variety of aquatic habitats. Wetlands within the lakeshore include bogs associated with sandscapes, perched bogs, lagoons, alder thickets, and beaver flowages. Small wetlands are present on most of the islands and the mainland unit. The mainland unit, Stockton, Outer, and Michigan Islands contain unique lagoons formed by coastal processes. Inflow sources of lagoon water are precipitation, wave wash-over, and seepage from adjacent bogs or wetlands. Evaporation, surface discharge to bog and groundwater are the main outflow methods. Rock pools are another, lesser understood, ecosystem. Small, sometimes ephemeral, water pools have diverse chemical, biological, and ecological features. Rock pools on Devil's Island contained salamander larvae and eggs, and spring peeper eggs. Other rock pools have documented stoneflies and predacious diving beetles.

Small perennial and intermittent streams are found on many islands; few named streams occur at the park. Apostle Islands has 28 miles of intermittent streams and 12 miles of perennial streams. Streamflow is characterized by typical seasonal fluctuations. Oak Island streams yield more baseflow runoff than Stockton Islands streams. Baseflow of Oak Island streams is dominated by groundwater discharge. Stockton Island stream baseflow is sustained by seepage from wetlands and beaver ponds. These examples demonstrate the variability in baseflow sources.

Forty-four different species of fish exist within and around Apostle Islands, including recreationally and commercially important species such as lake trout (*Salvelinus namaycush*), lake whitefish (*Coregonus clupeaformis*), lake sturgeon (*Acipenser fulvescens*) and smallmouth bass (*Micropteris dolomieu*). The waters are home to lesser-known fish, such as spoonhead sculpin, trout-perch (*Percopsis omiscomaycus*), and Johnny Darter (*Etheostoma nigrum*). Humans have a long relationship with fishing in Apostle Islands, going back potentially 10,000 years or more. Fishing is what brought people to the islands and continues to bring successive generations to the islands.

Both Native Americans and fur traders engaged in fishing for subsistence and trade. In the mid-19th century, an extensive European American commercial fishing industry developed, which had a huge impact on fish populations. Following a 1950s-era crash in native fish populations, Apostle Islands fish populations began a slow recovery. Subsistence fishing continues today for the Ojibwe nations, and a strong state and tribal-licensed commercial fishery also continues in the area. Gull and Devil's Island shoals provide refuges and habitat protection for lake trout. Harvest limits and monitoring also help maintain fisheries. Comparatively tiny in size, the benthic macroinvertebrates also inhabit the water of Lake Superior from shallow high-use areas to deep, open waters. Many groups of macroinvertebrates are ecologically sensitive to disturbance and have similar ecological functions.

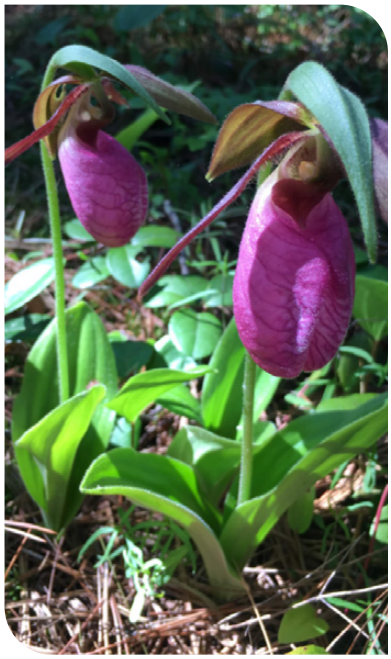


Cold temperatures, rough seas, fog, high wind and sudden squalls can be common on Lake Superior, many of which influence aquatic resource qualities. Regardless of the conditions, the shorelines and waterways continue to attract visitors to world-class opportunities for water-based recreation, such as kayaking, sailing, and motorized boating.

TERRESTRIAL ECOSYSTEM VEGETATION



Apostle Islands is at the continental northwestern limits of the hemlock-white pine-northern hardwood forest and the southern edge of the boreal forest. The area is on or near the ecotones of several continental biomes. In combination, these features result in Apostle Islands National Lakeshore's unique ecosystems that include diverse and rare plant communities. Many plant species are culturally significant for the Ojibwe nations, including berries, sugar maple, and birch, cedar, and ash trees. For hundreds, or perhaps thousands, of years, these plants have been harvested for food, for medicinal and ceremonial purposes, or for other uses such as canoe building. Centuries-old management practices include the use of fire (ishkode) to promote blueberry growth. Over 750 plant species occur within the park, including 26 rare species of concern. Because the Apostle Islands are at the extreme northern part of Wisconsin, its habitats are not found elsewhere in the state. Many of the rare plants in the park are arctic relicts, such as butterwort and arctic primrose.



Prior to European American logging operations, about 90% of the islands were covered by hemlock, sugar maple, white pine, and yellow and white birch. Boreal elements included white spruce, balsam fir, tamarack, white cedar, aspen, and birch trees. Logging occurred in stages and focused on specific species with white pine (late 1800s) removal followed by large hemlocks, yellow birch, and sugar maple. Although some logging continued into the early 1970s, the majority of logging occurred between the 1880s and 1920s. As a result of logging, the abundance of hemlock and white pine was greatly reduced and forest dominance shifted to white birch, sugar and red maples, balsam fir, and aspen. Aspens and beaver are now in decline, forest cover has increased, and the forests have matured. Although many of the forested areas within the park have been moving toward their pre-logging composition, some forest communities may take hundreds of years to recover, if at all.

Small stands of old-growth forests were spared from logging, largely because they were part of the tract of land set aside as lighthouse reservations. One of the highest-quality old-growth stands in the Great Lakes is on the north end of Outer Island. This stand is unique, not only because it doesn't have a history of logging, but because it is also a rare "unbrowsed" forest.

Non-logged sections of islands retain some of the largest stands of remnant old-growth forests in the upper Midwest, such as the northern hardwood hemlock forest on Outer Island. The most abundant tree species in the archipelago are now white birch, sugar and red maples, balsam fir, and white cedar. In the mainland unit, the forest now consists of pole-sized quaking aspen, sugar maple, balsam fir, and some white spruce. The mainland and islands remain largely covered in forest, with exceptions such as small wetlands and abandoned agricultural fields.

Rare habitats in the park include globally imperiled Great Lakes barrens (the only example in the state, found on the Stockton Island tombolo) and pine forest; globally vulnerable Great Lakes dune and beach; maritime forests and cliffs; and krummholz. The Wisconsin Department of Natural Resources Natural Areas Program recognized the special qualities of Apostle Island's vegetation and landscapes, designating the Maritime Forest, Maritime Cliff, and Sandscape State Natural Areas in 1992. Apostle Islands Yew Forest State Natural Area was designated in 2010. The Maritime Forest State Natural Area includes high-quality old-growth remnants on Outer, Sand, Bear, Devils and Raspberry Islands. The Yew Forest State Natural Area recognizes the island's varying history of deer population, management, and associate vegetation impacts, most notably on Canada yew. The Maritime Cliff State Natural Area includes exposed sandstone cliffs, bluff edges, and sea caves on Devils and Otter Islands that provide semi-shaded and wave-splashed habitat needed for rare plant species, including rare arctic remnants (e.g., butterwort [*Pinguicula vulgaris*], bird's-eye primrose [*Primula mistassinaca*]). The Sandscape State Natural Area recognizes and protects a variety of unique sand-based landforms, including dunes, beaches, sandspits, cuspate forelands, and tombolos. The park's rich assemblage of sandscapes and associated microhabitats host many rare and geographically restricted plant communities. These include plants adapted to survive harsh conditions, including shifting sands, strong winds, and nutrient-poor soils. They are dominated by dune vegetation such as American beach grass, beach pea, hairgrass, beach heather, dwarf juniper, and smooth wild rose, which stabilize the sandscape environment. The park and partners have conducted sandscape monitoring since 1988.

Apostle Islands is part of the NPS Great Lakes Inventory and Monitoring Network's (GLKN) long-term multipark forest vegetation program that conducts monitoring on a nine-year rotation. Monitoring was completed in the park in 2011, with fieldwork for the second survey scheduled in 2022.

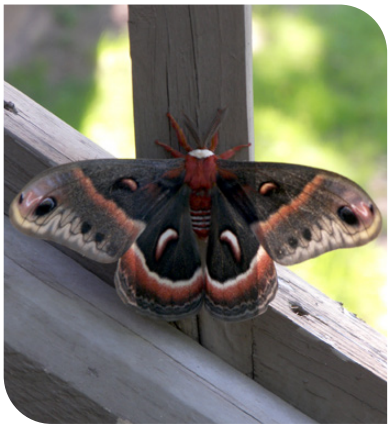
Apostle Islands National Lakeshore supports several types of coastal wetlands, including lagoons, bogs, freshwater estuaries, marshes and peatlands that provide important ecological functions, increase diversity, and provide habitat for a variety of plant and wildlife species. These wetlands are unique and vulnerable and are among the highest-quality wetlands within the Great Lakes Basin (Handler et al. 2020); Stockton and Michigan Island Lagoons also have exceptional floristic quality.

Lichen surveys conducted in 1987, 1995, and 2001 documented 310 species of lichens in the park. Lichens are sensitive to atmospheric pollution, as all their nutrients and water are received from wet and dry atmospheric deposition and have been used as an indicator of air quality (see the Air Quality section). Nonnative vegetation in the park is confined primarily to disturbed landscapes, including park infrastructure, old logging camps, farmsteads, fishing camps, light station grounds, and quarries. Eroding clay bluffs tend to have fairly high numbers of nonnative plants. Invasive nonnative species that are of most concern to the park's native vegetation include purple loosestrife, tansy, thistles, spotted knapweed, cattails, and an invasive species of rose. Garlic mustard is a significant threat as it is in adjacent lands and is a species that can invade forests, something not occurring with current invasions. Other nonnative species of lesser concern occur in the park, and new invasions are sometimes found, especially in areas with new development or disturbance.

TERRESTRIAL ECOSYSTEM WILDLIFE



Many wildlife species found in the park are culturally significant for the Ojibwe nations, including marten (waabezheshi), black bear (makwa), wolf (ma'iingan), loon (maang), bald eagle (migizi), bobcat (gidagaa-bizhiw), sandhill crane (ajijaak), and turtle (miskwaadesi). Deer (waawaashkeshi), snowshoe hare (waabooz), ruffed grouse (Bine), and other species continue to be observed or harvested for a variety of cultural usages. For example, some species are culturally important as furbearers, others as representatives of traditional social structures (clans), while others provide materials for ceremonial purposes, such as porcupine quills, feathers, and deer hooves.



Island biogeography plays a large role in the distribution and abundance of wildlife populations within the park. During the end of the last glacial period (11,500 years before present), the islands were covered by Lake Superior. When the lake level dropped to 450 feet above sea level, around 9,500 years before present, the current archipelago was part of the mainland, and the majority of terrestrial vertebrates and plant life became established. Currently, the archipelago includes 22 islands, 21 of which are in the park. The park also includes a 13-mile strip of Lake Superior coastline on the mainland—in essence, 22 discreet "patches."



Apostle Islands provides a variety of habitats for insects and other invertebrates, including rare species (e.g., beach-dune tiger beetles [*Cicindela hirtocollis rhodensis*]). These habitats serve as a biological foundation for terrestrial and aquatic ecosystems within the park; however, the park's knowledge of these taxonomic groups is limited. Specific studies have focused on Lepidoptera (butterflies, moths), Hymenoptera (bees, wasps, ants), and Odonata (dragonflies, damselflies). Lepidoptera are sensitive indicators of the integrity and continuity of native ecosystems. Surveys of lepidoptera were conducted by Ferge (1996, 2001) on Outer, Stockton, Raspberry, and Rocky Island sandscapes, and additional surveys are planned for 2023. Bees (Hymenoptera) are important pollinators for native plants and play a major role in the functioning of ecosystems. At Apostle Islands, bee surveys done in cooperation with the US Geological Survey found 54 species in the Little Sand Bay area. Continued surveys for bees are carried out in cooperation with University of Wisconsin–Green Bay. Dragonfly nymphs (immature dragonflies) are excellent indictors of mercury contamination and have been used to monitor mercury levels in multiple parks by the NPS Great Lakes Inventory and Monitoring Network. This activity is also supported by the NPS Air Resources Division and has occurred annually at the park since 2016.



Habitat for amphibians within the park includes mixed hardwood and boreal forests, bog, lagoons, and streams. Typical species of the mixed hardwood forest found in the park include the spotted salamander, gray treefrog, and northern red-bellied and northern ringneck snakes. Wood frogs, blue-spotted salamanders, and red-backed salamanders are found in the moister forest, while mink frogs and northern leopard frogs inhabit pond and lake edges. Some of the hardy amphibians and reptiles that survive in a variety of habitat types within national lakeshore are northern spring peeper, American toad, painted turtle, and common garter snake. Common mudpuppies are restricted to Lake Superior and its river mouths. Some species, like central newt and mink frog, are only found on islands with lagoons. The distribution of eastern red-backed salamander is particularly interesting in being absent from many islands with suitable habitat. Various surveys have been completed for amphibian and reptile species, long-term acoustic monitoring has been done annually by the NPS Great Lakes Inventory and Monitoring Network/park since 2006, and in-person acoustic surveys consistent with statewide surveys were conducted prior to 2006.

In recognition of the important habitat Apostle Islands provides for breeding and migratory birds, neotropical migrants, colonial birds, and rare species, the area has been designated an Audubon Important Bird Area. The park's 21 islands (ranging from 3 to 10,000 acres) are spread out in a matrix in Lake Superior the size of Rocky Mountain National Park. The Apostle Islands have a strategic geographical location and a diverse mosaic of habitats that provide refuge for a wide variety of bird species. The park provides habitat for over 160 species of breeding birds. Some of the most important habitats within the park include deciduous forest, wetlands, mixed forest, and lowland conifer. Breeding bird surveys have been conducted on the mainland unit and seven islands of Apostle Islands National Lakeshore since 1990 (Devils, Long, Oak, Outer, Raspberry, Sand, Stockton). Over 89% of the breeding birds in the lakeshore are migrants and approximately 60% are neotropical. Five species (ovenbird, red-eyed vireo, black-throated green warbler, Nashville warbler, and American redstart) account for over 40% of all surveyed breeding birds. Of the islands surveyed, Stockton, the largest island (10,000 acres) and Long, a barrier spit, have the highest relative number of birds (NPS 2021).

The park provides important nesting habitat in Wisconsin for the federally and state-endangered piping plover. The Great Lakes population of piping plovers was listed as state endangered by the State of Wisconsin in 1979 and by the US Fish and Wildlife Service as federally endangered in 1985. In Apostle Islands National Lakeshore, critical habitat for the piping plover has been designated by the US Fish and Wildlife Service on Long Island and the Michigan Island sandspit. Piping plovers have also successfully nested on Outer and Stockton Islands. Piping plovers are protected in the park through the joint efforts of the National Park Service, Bad River Tribe, Wisconsin Department of Natural Resources, US Fish and Wildlife Service, University of Minnesota researchers, and volunteers. The Bad River Tribe plays and critical role in protection efforts on Long Island. In addition to general cooperation, Bad River tribal staff lead the piping plover monitor program during the field season, a key component to plover nesting success.

Two "colonial bird" islands are within the park, Gull and Eagle, that provide important habitat for herring gulls and double-crested cormorants. Ten additional islands provide habitat for smaller numbers of colonial birds along their rocky shorelines. The Wisconsin Department of Natural Resources has collaborated with the park since 1974 to complete colonial surveys every five years. In 2024, colonial bird monitoring will have been in place for 40 years. Eagle Island had a great blue heron colony that declined from 46 nests in 1989 to 0 nests in 2014. The double-crested cormorant colony may have also become extinct on Eagle Island, declining from a high of 151 in 1997 to 0 in 2019, and herring gulls have also experienced a significant decline. The cause(s) is unknown.

The Apostle Islands provide important habitat for migratory birds, most notably concentration areas on the Outer Island sandspit and Long Island. Long Island is especially important for spring migration of shorebirds, and Outer Island has an exceptional fall migration. In 1990, over 140,000 birds were counted during the month of September (Van Stappen and Doolittle 1993). Subsequent surveys (1990, 1991, 1998) averaged 41,000 birds in a similar time frame. Over 93% of migrants were passerines, and a strong falcon migration occurred. Harris (1980) discovered two types of passerine migrations in the fall. Day migrants avoided crossing open water, whereas night migrants readily crossed the open lake.

The distribution and abundance of mammal species in Apostle Islands is influenced by Lake Superior, which acts as a large barrier to immigration and emigration, as well as size and island connectivity. Some species swim, others cross the ice, and some manage to "hitchhike" to the islands on boats.

With warming conditions, the thickness and duration of ice within the islands is declining. Research is underway to study the potential effects of changing ice conditions on wildlife.

Thirty-four species of mammals are known to occur in the park; 12 additional species are probably present but have not been verified. The islands tend to have a lower diversity and abundance of mammals compared to the mainland unit—approximately 25% more species are found on the mainland unit than on the islands. However, the park has a surprisingly rich carnivore community that includes all but two of the terrestrial carnivore species found in Wisconsin (Allen et al. 2019). In addition to American marten, carnivores include black bear, coyote, red fox, gray fox, fisher, bobcat, otter, raccoon, and weasel.

The park's enabling legislation permits hunting, fishing, and trapping (NPS 2014). Species that may be hunted and trapped in the park include white-tailed deer, black bear, fox, coyote, beaver, otter, mink, fisher, muskrat, snowshoe hare, waterfowl, woodcock, and ruffed grouse.

The history of white-tailed deer on the islands is complex. Deer occurrence and abundance greatly increased in the Lake Superior region following habitat changes resulting from extensive logging and associated slash fires. Prior to that time, deer numbers were low. Within Apostle Islands, the 1950s saw large increases in colonization and white-tailed deer abundance; however, it varied from island to island, ranging from absent to high density. Islands with high Canada yew populations (candy to deer), appear to have flashier deer populations. On Rocky Island in the 1950s, deer colonization and a rapid increase in abundance resulted in significant impacts from over-browsing, especially to Canada yew. More than 70 years later, yew has yet to fully recover. Apostle Islands provides a "refuge" for Canada yew, a species that has become nearly extinct on the mainland. A similar "explosion" in deer numbers occurred in the early 2000s on Sand and York Islands, two islands without known historic deer populations and widespread Canada yew. To assist in managing deer populations, the park's harvestable species plan (NPS 2014) established two deer management zones for the park's islands (except Long)—one for islands that had historic deer populations and another for islands without a known history of populations of deer. The park also worked closely with the Wisconsin Department of Natural Resources to establish hunting regulations that provide the park with additional tools to control overabundance deer on the park's islands. Long Island and the park's Mainland unit are managed as part of larger deer management units.

Six species of small mammals occur in the park, including red-backed vole (*Myodes gapperi*), white-footed mouse (*Peromyscus leucopus*), red squirrel (*Tamiasciurus hudsonicus*), deer mouse (*Peromyscus maniculatus*), eastern meadow vole (*Microtis pennsylvanicus*), masked shrew (*Sorex cinereus*), short-tailed shrew (*Blarina brevicauda*). Red-backed vole is the most widespread and abundant small mammal in the islands over time yet is low in abundance on the mainland. Two species significantly changed over time (1961–2004) as habitat changes occurred. Eastern meadow vole abundance dramatically declined, while masked shrew abundance increased (Mallinger et al. 2021). Island size is an important predictor of small mammal community diversity. The Apostle Islands are at the southern range of snowshoe hare (*Lepus americanus*) habitat (Reibel 2019). Hares are vulnerable to climate change. As duration of snow cover decreases, hares are experiencing camouflage mismatch, making them more vulnerable to predation.

Up to seven bat species occur in the park: little brown bat (*Myotis lucifugus*), big brown bat (*Eptesicus fuscus*), eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), silver-haired bat (*Lasionycteris noctivagans*), northern long-eared bat (*Myotis septentrionalis*), and potentially tricolored bat (*Perimyotis subflacus*) (Kruger and Peterson 2008). The big brown bat, little brown bat, and tricolored bat are listed as threatened in the state of Wisconsin, while the northern long-eared bat is listed as both state and federally threatened. Based on acoustic activity levels, big brown bat, eastern red bat, hoary bat, and silver-haired bat appear to be stable or increasing slightly. However, activity levels for the little brown bat, northern long-eared bat, and tricolored bat indicate decreasing trends (Goodwin and Kirschbaum 2021). The most significant threat to cave dwelling bats (e.g., little brown) is white-nosed syndrome, a fungal disease that is known to have a 75%–98% mortality rate. Other threats include climate change, increased wind, and habitat loss. Acoustic monitoring of bats was done at Apostle Islands from 2015 to 2021 as part of a multipark project.

The Apostle Islands provide important habitat for state-endangered American marten (*Martes americana*), which were extirpated in Wisconsin in the 1930s. Mainland reintroduction efforts have been marginally successful. Within Apostle Islands, martens were "rediscovered" in 2014, after more than a 40-year absence and have since been documented on nearly half of the park's islands (Van Deelen et al. 2021). Genetic-based research (Smith et al. 2021) has found that marten naturally recolonized the islands and now act as a source back to reintroduction sites on the mainland, highlighting the importance of the park to population recovery in the state. Gray wolves (ma'iingan) occur on the park's mainland unit and travel across winter ice between the mainland and park's inner islands. They are tribal wolves, as their territories include both reservation and NPS lands. Ma'iingan have very high cultural importance to the Ojibwe and are considered their brother. Gray wolves were listed on the federal endangered species list in 1974. Between 2003 and 2021, their listing status frequently changed. In January 2021, the wolves were removed from federal listing. The park maintains a zero-hunting quota for areas in which tribal wolves occur, including the park's Mainland unit, Sand and Long Islands.



SCENIC VIEWS

The majesty of Apostle Islands National Lakeshore prevails in cultural and natural scenic views unrestrained by time—from examples of some of the earliest and latest events of geologic history in the lower 48 states to cultural landscapes associated with light stations. Located near the tip of the Bayfield Peninsula, Apostle Islands provides panoramic views of Lake Superior from the mainland to prominent vantage points found among the 21 islands, including submerged lands below the water. Awe-inspiring and humbling, the vast, boundless scenic views over the lake at Apostle Islands are one of the park's priority resources. Long expanses of windswept beaches; coves and shoreline, carved-out caves of brilliant orange-red colors and remnant old growth forests; national register lighthouses, and historic sites highlight a few of the park's scenic views. Some of the most spectacular scenery occurs where the forces of nature interact with the sandstone of the Devils Island Formation to create extensive sea caves, many delicate arches, vaulted chambers, and honeycombed passageways.

Scenic views abound from all types of recreation from the mainland to the islands or on the water. Repeat visitors are common at shoreline campsites for their outstanding lake views. Apart from the recreational appeal, historically, the location of the mainland and islands made the area an important site for lighthouse placement to aid in navigation through this portion of Lake Superior and for its observation and vantage points.

Scenic views continue to be a primary objective for visitation to the park, regardless of the season. The skies are constantly changing from dramatic sunrises to sunsets and into the evening with phenomenal views of the dark night sky. While daytime views are diminished by pollution-caused haze, visibility is still between 50 and 170 miles, depending on pollution levels. Spectacular views span the entire year, including exceptional ice formations in the winter months.



NATURAL SOUNDSCAPE

Apostle Islands' natural soundscape is one of the resources that makes this park a special place and is an important wilderness quality. National Park Service managers strive to preserve the natural soundscape associated with the physical and biological resources. Natural soundscapes also include "natural quiet" that occurs in the absence of natural or human-caused sound. Most of Apostle Islands creates opportunities to hear natural sounds, such as wind in the trees, wildlife, or the murmur of water against rock. Winter is often much quieter in the park, when fewer people are present than in the summer.

Exceptions to this natural soundscape include sounds of civilization at developed areas and shorelines; motorized watercraft is the loudest and most frequently heard noise on the islands. Human sounds are not unexpected or inappropriate in the non-wilderness portions of the park but are part of the overall soundscape in an area where water activities, picnicking, camping, and other recreational uses are part of the visitor experience in the park. Unreasonable noise from motorized equipment, including motor vehicles, is prohibited. Noise can adversely affect the natural soundscape and other park resources. Noise in and outside the park also may affect wildlife. Many animals depend on acoustic communication for finding food, avoiding predators, establishing territory, courting and mating, and nurturing young.

Unique sounds such as the "cave wave chorus" travels through the landscape at Apostle Islands and may even startle a hiker on the trail. When waves crash into and through caves and smaller openings in the sandstone, the boom or popping sounds of the "cave wave chorus" sings its song. Large waves can generate plumes of spray and thunderous explosions as they surge into sea caves. The wind and warm spring days lead to warming of lake ice, making crackling sounds. All these sounds provide an important visitor perspective on the vastness of the environment, often beyond the visual boundaries of trees and terrain. Quiet is also an important element of the feeling of solitude. The opportunity to experience natural sounds and quiet is an enjoyable part of some visitor experiences at Apostle Islands National Lakeshore.



AIR QUALITY



Apostle Islands National Lakeshore is classified as a class II area, and as such, has a degree of protection under the Clean Air Act (42 USC 7401 et seq.). The legislation aims to limit the level of additional pollution allowed in all NPS units (class I and class II areas), and potential impacts to air quality, sensitive ecosystems, and clean, clear views of these areas are to be considered.

Clean air enhances the depth, color, and contrast of Lake Superior, the islands, and shoreline features; enhances views of the night skies; and contributes directly to ecosystem, visitor, and staff health. Overall park air quality is in fair condition according to NPS Air Resources Division methods. The overall condition is a combination of air quality indicators for visibility (fair condition), ozone human health (fair condition), ozone vegetation health (good condition), and pollutant deposition including nitrogen (poor condition), sulfur (poor condition), and mercury contamination. No trends for mercury contamination are available due to the lack of in-park or nearby representative air quality monitors. Air quality indicator conditions are interpolated from more distant monitors. Based on published research findings and spatial patterns in pollutant load and resource sensitivity, the air pollution effects of greatest concern to the Great Lakes Inventory and Monitoring Network parks appear to include mercury contamination and nutrient enrichment of wetlands (NPS ARD 2022).



Natural communities are at risk from the nutrient enrichment and acidification effects of excess nitrogen and sulfur deposition. Nitrogen critical loads are exceeded for lichen and some forest vegetation, which may be affecting the growth (six species, including eastern hemlock) and survival (10 species) of certain tree species. Nutrient inputs from excess nitrogen deposition are altering water chemistry, increasing decomposition rates in peat swamps and bogs, and reducing biodiversity in nitrogen-limited boreal lakes. Sugar maple trees and green ash are especially sensitive to acidification from both nitrogen and sulfur deposition and are among 23 acid-sensitive plant species in the park. In addition to weathering, air pollution can contribute to the deterioration of lighthouses and other historic structures made from stone, paint, and metal.



Airborne toxics, including mercury deposited with rain and snow, can accumulate in the food chain and affect both wildlife and human health. Within northern portions of the Great Lakes Inventory and Monitoring Network, mercury contamination is known as a substantial risk to wildlife health; accumulation can lead to reduced foraging efficiency, survival, and reproductive success. Much of the landscape is conducive to the transformation of mercury to the toxic methylmercury that can fuel bioaccumulation in the food chain. Elevated levels of mercury were detected in park dragonfly larvae during 2015–2020 ongoing sampling in the park lagoons (Little Sand Bay, Stockton, Outer) and in samples taken from fish and eagles.

The Wisconsin Department of Natural Resources, have statewide and regional fish consumption advisories, including park waters, due to mercury and polychlorinated biphenyl contamination.

Without the effects of pollution, visual range is between 80 and 185 miles. However, scenic views are diminished by pollution-caused haze, reducing visibility in the park to between 50 and 170 miles, depending on pollution levels. On clear days, the Porcupine Mountains in the Upper Peninsula of Michigan to the east and the north shore of Minnesota to the west can be seen. At night, particulates also scatter artificial light, increasing the impact of light pollution on the night skies. While ground-level ozone, a respiratory irritant, can reach levels that can that affect breathing for sensitive user groups, cumulative ozone exposure to the park's 33 ozone-sensitive plants is relatively low and unlikely to cause injury.

Most of the air pollution affecting the park comes from regional emission sources outside park boundaries, including vehicle exhaust, agriculture (livestock and crop production), consumer and commercial solvent use, coal-fired power plants, residential heating, smoke from fires, and industrial boilers. Air quality stewardship strategies include implementing goals and activities to improve understanding of conditions and impacts (including smoke), sharing information and collaborating with stakeholders, and improving park environmental leadership.

DARK NIGHT SKY

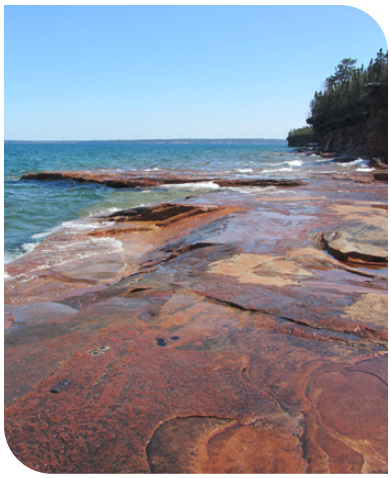
Far from light pollution, Apostle Islands offers wide-open views of Wisconsin night skies. The night sky varies, depending on the time of the year, and the path of the Milky Way arcs across the southern horizon in the spring and summer. On clear nights with low humidity and a new moon, visitors can see many stars and planets. The sky of the aurora borealis is a treasure of the dark sky over these islands, with bright ribbons of green and spikes or orange and red. Apostle Islands lies at the southern edge of the "auroral zone."

The night sky plays a role in the natural resource processes and the evolutionary function of species and is a feature that contributes to the visitor experience. In natural areas, artificial outdoor lighting is limited to meet basic safety requirements and will be shielded when possible. Apostle Islands staff continues to evaluate impacts to the park's night skies and will work to minimize the intrusion of artificial light from outside the park. Air pollution particles also scatter artificial light, increasing the impact of light pollution on the night skies.

Dark night skies are culturally significant for the Ojibwe nations. For millennia, Native Americans have paired phenological events coupled with traditional knowledge to track time and seasons. For the Ojibwe, the happenings of the world influence the naming of the months of the year. Traditionally, the Ojibwe follow a 13-moon (*giizis*) lunar cycle. The timing of each *giizis* corresponds to important events in the cycle of life and nature.



WILDERNESS





The Gaylord Nelson Wilderness, established on December 8, 2004, includes 80% of the land area of the park (approximately 33,500 acres of the park's 42,160-acre land base). The wilderness includes all of Bear, Cat, Eagle, Gull, Hermit, Ironwood, North Twin, and York Islands and most of Michigan, Otter, Outer, Raspberry, Rocky, South Twin, Devils, Manitou, Oak, and Stockton Islands. The waters of Lake Superior within the park are not included in the wilderness area, nor are the lighthouses or other existing developed areas of the park. Sand, Basswood, and Long Islands, as well as the park's 12-mile mainland strip, are also outside of wilderness. Wilderness values identified for Apostle Islands include wilderness qualities (a high degree of naturalness and primitive recreation opportunities), such as the phenomenon of re-wilding; lands that were settled, logged, and quarried naturally returning to their former condition; a sense of discovery associated with viewing and learning about the historical and continuing relationship between humans and the natural resources of the islands; and a sense of adventure and challenge where "the lake is the boss." Cultural resources such as archeological sites, cultural landscapes, and structures that have been included within wilderness are protected and maintained using methods that are consistent with preservation of wilderness character and values.

Untrammeled, natural, undeveloped, solitude or primitive and unconfined recreation, and other features of value represent wilderness character qualities preserved in the Gaylord Nelson Wilderness. Natural processes, native species, and the interrelationships among them are protected, maintained, and/or restored to the extent possible, while providing opportunities for their enjoyment as wilderness. The natural character of the wilderness area is mostly preserved today. Forms of development are relatively sparse; hiking trails and campsites are present, as are some historic structures, but for the most part, they are consistent with the Wilderness Act of 1964 and NPS wilderness management policies. Little if any noticeable human imprint is present in much of the wilderness area other than these developments. Opportunities for primitive and unconfined recreation exists on every island in the wilderness area. The isolation and remoteness of the archipelago of Gaylord Nelson Wilderness Area has many opportunities for solitude. Except for camping, which requires a permit, recreation on the islands is largely unconfined. The vast majority of the wilderness area is untrammeled. However, trammeling activities have occurred in the past and some activities continue to occur, including control of nonnative species. Active restoration activities also occur on some sites, such as the sandscapes.

Other unique qualities in the Gaylord Nelson Wilderness area are risk, challenge, discovery, and observation of an untrammeled ecosystem. Apostle Islands manages the Gaylord Nelson Wilderness to leave the area unimpaired for future use and enjoyment. The park recognizes the intangible values of wilderness and in implementing this strategy, foregoes actions that have no obvious physical impact but which detract from the idea of wilderness as a place set apart; a place where human uses, convenience, and expediency do not dominate; and a place where visitors can know themselves as part of something beyond modern society and its creations.







HISTORIC STRUCTURES AND THEIR ASSOCIATED HISTORICAL LANDSCAPES

The cultural landscapes at Apostle Islands and their contributing historic structures are numerous and complex and reflect the working nature and maritime significance of Lake Superior's southern shoreline. The variety of these resources includes ethnographic landscapes that reflect traditional Ojibwe usage, remnants of hardscrabble immigrant farmsteads and fish camps, and the neatly kept stations of the US Lighthouse Service. The lakeshore's network of seven light stations is considered one of the nation's best-preserved collections of lighthouses. These structures and their associated landscapes are well-documented and their condition is stable. A much deeper legacy is represented by the ethnographic landscapes. These landscapes include areas of traditional harvesting (berries, fish, game, medicinal plants, maple sugar) and anthropogenic fire (ishkode), which has recently been reintroduced as a management tool, and new research and collaboration with tribal partners is informing the park about the important role of native people in stewarding the landscape of the islands.

The park has documented 11 of the 32 cultural landscapes listed in its cultural landscape inventory. Treatment guidance has been completed for the lighthouses themselves (historic structure reports) and for six light station landscapes (cultural landscape reports), as well as for the Sand Island East Bay fishing, farming, and recreational historic district cultural landscape. Documentation and treatment guidance is generally lagging for the park's vernacular commercial and recreational properties' structures and landscapes. Park staff faces difficult preservation challenges with these resources. They are typically remote with only seasonal access (i.e., by boat), are subject to extreme environmental conditions, and require regular maintenance despite these logistical challenges. More significant, however, is that completion of needed treatment is limited by the requirements and priorities for steady funding from NPS repair/rehabilitation and cyclic funding programs, which make it difficult to fund historic properties that don't also house other park functions with year-long uses.

A notable subset of the historic structures in the park are those held under reservations of use and occupancy (i.e., RUOs life estates) by several of the islands' historical families. These locations are in use as private residences and support summer recreation and deep island connections, as they have (in some cases) for over a century. Currently, 30 national register-listed historic buildings and docks (and an additional 23 nonhistoric support structures, such as privies and storage sheds) are held under reservations of use and occupancy at Shaw Point Historic District (Sand Island) and the Rocky Island Historic District that date back to the creation of the lakeshore in the 1970s.

The absence of succession planning and adequate financial resources may compromise long-term stewardship of these historic properties (see "Key Park Issues, Stressors, and Threats" above). The RUO holders, who are generally the historic families associated with each property, are key to addressing this issue, along with historic preservation stakeholder and partner organizations. The park recognizes a critical need to partner with interested parties and organizations to help steward the many historic buildings (and associated landscapes, records, and objects) in the park that do not have an active NPS use or adequate maintenance funding. Empty historic buildings rapidly deteriorate, and historic buildings without an active use and purpose to the park mission are in danger of being lost through neglect.

The many historic families with past and present ties to the islands are important allies in the efforts to preserve and interpret these historic resources. Every effort should be made to retain the interest and support of historic families, including past and present RUO holders, in the future public stewardship of historic properties.

A "use and occupancy structures" component was created under this RSS priority resource to capture administrative issues and needs specific to these resources.

ARCHEOLOGY AND RESOURCES OF CULTURAL INTEREST AND USE

Apostle Islands National Lakeshore is situated on traditional Ojibwe lands and specifically within the boundaries of the Treaty with the Chippewa, 1842, which recognizes Ojibwa rights for certain resource gathering and use. The park maintains constructive relationships with neighboring Red Cliff and Bad River Bands of Lake Superior Ojibwe and with the 11 member nations of the Great Lakes Indian Fish and Wildlife Commission (GLIFWC). A memorandum of agreement (2013) between the park and GLIFWC member tribes recognizes and implements treaty-guaranteed rights to hunt, fish, and gather in the ceded territory within the lakeshore.

Although the park lacks formal NPS cultural anthropology documentation—an ethnographic overview and assessment and traditional use studies—it nevertheless invests significant energy into relationship building and active collaboration with associated tribes. Significant examples of partnership initiatives include the gathering and preservation of traditional ecological knowledge, as well as reintroducing cultural use of fire in the lakeshore to support blueberry regeneration. Another important area is helping support the preservation, advancement, and teaching of Ojibwemowin (the Ojibwe language), based on the principal that understanding the Ojibwe language is essential to understanding the Ojibwe world view and approach to land and water stewardship. The lakeshore funds an Ojibwe educator position, who works to educate lakeshore staff and the general public about tribal perspectives and issues, as well as developing educational materials and outreach in the Ojibwe language.

One subset of resources within the park that is significant to tribal partners and the National Park Service is archeological resources. Known archeological sites and finds span much of the Holocene, including chipped stone and fired-rock concentrations, fishing camps (both precontact and historic), and a wide spectrum of historic sites ranging from individual dwellings and farmsteads to large-scale logging camps and sandstone quarries. The archeological record of Apostle Islands preserves evidence from as early as 4,300 years ago, although the first human usage of the area was probably much earlier, as far back as 10,000 years ago based on regional evidence. The record continues through to modern times and the extensive landscape changes wrought by resource extraction and the Industrial Revolution.

Approximately 7% of park's terrestrial lands have been surveyed for archeological resources. The percentage of key landforms and underwater lands that have been surveyed are unknown. Archeological field studies have been conducted in recent years, but the reports need to be finalized. In general, the park faces two sets of challenges in managing archeological resources: limitations on resource knowledge (reporting backlogs, sparse chronological data, limited geographic sample) and active resource threats and impacts (visitor-related impacts; increased intensity of storms, which increases tree blowdowns and intrusive shoreline erosion).





MUSEUM COLLECTION

The park's museum collection includes park records, historical images, artwork, archeological material and other scientific specimens, and objects reflecting the history of the lighthouses, commercial fishing, quarrying, logging, island farming, and island recreation. A portion of the collection is on long-term exhibit at the Hokenson Fishery at Little Sand Bay, and a small number of objects are on exhibit at the Bayfield headquarters (including the Michigan Island Lighthouse Fresnel lens). Other objects are exhibited seasonally at Raspberry Light, Michigan Light, and Manitou Fish Camp, and a rotating temporary kiosk exhibit is located at the Bayfield headquarters.

The annual museum reporting requirements are consistently completed and submitted by due dates, but the museum program faces certain management challenges. One is the archival backlog, which needs to be addressed in order to make the documents accessible to park staff and researchers. The park supports robust scientific research from outside researchers. Another challenge involves curation facilities. The current facility at Little Sand Bay is at risk due to lack of staffing, remote location, and environmental factors. Other facilities are historic structures that house exhibits or *in situ* objects. All of these facilities are exposed to storms on the lakeshore, which are becoming stronger each year, with the potential to be more destructive than in recent history. The *in situ* Fresnel lens on Devils Island was recently damaged during a storm event.

CEDED TERRITORY

This priority resource captures administrative issues and needs related to the fact that the park lies on land ceded by the Treaty with the Chippewa, 1842. Resources on ceded territory have unique management requirements related to treaty rights (see also "Archeology and Resources of Cultural Interest and Use" above). For additional information and useful resources, visit the GLIFWC website at http://glifwc.org/TreatyRights/.

PARK INHOLDING WITHIN THE RED CLIFF INDIAN RESERVATION

This priority resource captures administrative issues and needs related to park lands located with the Red Cliff Indian Reservation. About two-thirds of NPS-owned lands in the park's mainland unit are within the reservation.

CROSS-PROGRAM RESOURCES

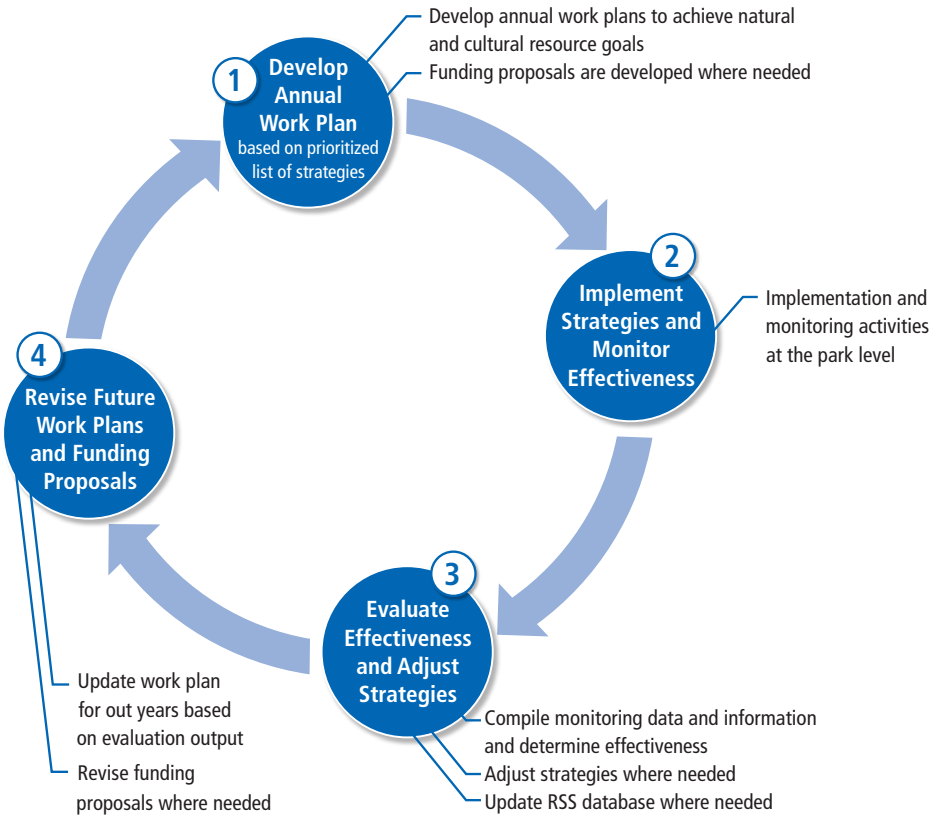
This priority resource captures resource issues and needs that apply across multiple resource management areas or programs. The resource has several components that are topic-based rather than resource-based: parkwide remote sensing data; citizen science programs; and interpretation, education, and outreach.

ONGOING IMPLEMENTATION OF THE RESOURCE STEWARDSHIP STRATEGY

The stewardship goals, activities, and other pertinent information of the resource stewardship strategy is managed and updated regularly using the RSS desktop application. This information will assist resource managers in determining what, how, when, and where resource management occurs in the park and will assist the park's resource management staff in developing annual work plans. These work plans will be an important planning tool for park staff to determine what they will be able to realistically tackle over the coming years.

Long-term implementation of the resource stewardship strategy includes park managers monitoring resource information and conditions in order to evaluate the effectiveness of resource stewardship strategies over time. Regular monitoring of RSS progress will provide park managers an opportunity to evaluate whether the stewardship activities are making progress towards identified goals and consider whether adjustments are needed. See figure 3 for more information on the cyclical nature of this process. In addition, routine communication with the public is another important aspect of the implementation process. These outreach efforts are intended to improve public awareness about the science and strategies used to protect the park's diverse resources and values over time.

Figure 3. RSS Implementation Process



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APPENDIX A: APOSTLE ISLANDS NATIONAL LAKESHORE ACTIVITY PRIORITIZATION SCHEME

The following activity tier and activity type codes apply to prioritized activities in appendix A.

ACTIVITY TIER CODE:

(H) Tier 1 – short term (1–3 years)

(M) Tier 2 – medium term (4–6 years)

(L) Tier 3 – long term (7–10 years)

ACTIVITY TYPE CODE:

C - Collaboration—coordination

D – Data collection, studies, scoping

P – Planning

I – Implementation

M – Monitoring

L – Legislated (e.g., threatened and endangered, mandated)

JOINT ACTIVITY INDICATOR:

Joint – Activity conducted jointly by the park and tribal partners

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
GEOLOGY AND COASTAL FEATURES AND PROCESSES—Sandstone Bluffs and Sea/Ice Caves, Sandspit Beach Coastal Features, Glacial Till Bluffs	Support the continuance of natural geologic processes—to the extent possible—in a way that protects coastal features and embedded cultural resources, while preparing for potentially severe climate-driven effects on sandspits, bluffs, and beaches. Recognize that coastal features and cultural resources may be irreparably damaged or lost, which could deter active management objectives in the future.	**IMPROVE KNOWLEDGE**—Improve the understanding of the park's geological resources and processes, including shoreline coastal dynamics and changing lake levels, to better inform geologic resource management.	- Inventory key coastal geologic features and implement shoreline change monitoring. (H-joint) - Study past geomorphological changes to sandscapes. (M) - Conduct engineering analysis before new dock construction, dock replacement, or repair or replacement projects on tramways to evaluate potential erosion impacts and/or effects on coastal processes. (H-joint) - Monitor erosion implications in areas with rare plant communities and archeological resources to determine if mitigations are needed. (H-joint) - Monitor human impacts on geologic resources in areas of heaviest public use (e.g., sea caves, shorelines around campsites, Meyer's Beach and mainland trail, and sandscapes). (L)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
GEOLOGY AND COASTAL FEATURES AND PROCESSES—Sandstone Bluffs and Sea/Ice Caves, Sandspit Beach Coastal Features, Glacial Till Bluffs	Support the continuance of natural geologic processes—to the extent possible—in a way that protects coastal features and embedded cultural resources, while preparing for potentially severe climate-driven effects on sandspits, bluffs, and beaches. Recognize that coastal features and cultural resources may be irreparably damaged or lost, which could deter active management objectives in the future.	**STRATEGIES**—Minimize adverse effects of park facilities (e.g., docks) from damaging coastal and geologic processes.	- Develop mitigation measures, where possible, for geomorphological changes to sandscapes. (M)
GEOLOGY AND COASTAL FEATURES AND PROCESSES—Sandstone Bluffs and Sea/Ice Caves, Sandspit Beach Coastal Features, Glacial Till Bluffs	Support the continuance of natural geologic processes—to the extent possible—in a way that protects coastal features and embedded cultural resources, while preparing for potentially severe climate-driven effects on sandspits, bluffs, and beaches. Recognize that coastal features and cultural resources may be irreparably damaged or lost, which could deter active management objectives in the future.	**STRATEGIES**—Minimize erosion in areas that are creating potential resource damage to cultural assets and landscapes (e.g., Michigan light and Raspberry Stairs).	- Develop mitigation measures, where feasible and appropriate, to address coastal erosion impacts. (H-joint) - Implement erosion mitigation measures as part of dock replacement and tramway maintenance or replacement. (H) - Partner with Sea Grant, coastal management, and the Wisconsin Department of Natural Resources to assist with evaluation and implementation of erosion mitigation measures to protect the lights. (H)
GEOLOGY AND COASTAL FEATURES AND PROCESSES—Sandstone Bluffs and Sea/Ice Caves, Sandspit Beach Coastal Features, Glacial Till Bluffs	Support the continuance of natural geologic processes—to the extent possible—in a way that protects coastal features and embedded cultural resources, while preparing for potentially severe climate-driven effects on sandspits, bluffs, and beaches. Recognize that coastal features and cultural resources may be irreparably damaged or lost, which could deter active management objectives in the future.	**CLIMATE CHANGE RESPONSE**—Ensure that appropriate actions and protocols are in place and implemented to protect geologic resources and processes in relation to exposure to climate change-enhanced fire, coastal erosion, and lake-level rise.	- Conduct modeling on key coastal geologic features to predict future coastal changes in light of climate change (e.g., higher/lower lake levels, more frequent and intense storm events, increases to wind speed). (M-joint) - Develop climate change-related materials to inform Julian Bay interpretive efforts and other outreach/education efforts. (L)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
AQUATIC SYSTEMS—Wetlands	Steward and manage wetland ecosystems through partnerships that focus on recognizing their ecological and cultural importance, improving knowledge of hydrologic processes and wetland dynamics to preserve native species diversity and composition while recognizing the potential for consequential changes to this ecosystem.	**IMPROVE KNOWLEDGE**—Improve the understanding of wetland ecosystem dynamics and water levels to better inform wetland management.	- Repeat comprehensive wetland survey (Cooper et al. 2020), including long-term vegetation transects, on a 5–7 year rotation to provide trend information needed for management decision-making. (M-joint) - Work with partners (including coastal management academic partners) to assist with monitoring. (L-joint)
AQUATIC SYSTEMS—Wetlands	Steward and manage wetland ecosystems through partnerships that focus on recognizing their ecological and cultural importance, improving knowledge of hydrologic processes and wetland dynamics to preserve native species diversity and composition while recognizing the potential for consequential changes to this ecosystem.	**STRATEGIES**—Maintain floristic diversity in wetlands by mitigating the effects of invasive species (aquatic and terrestrial) and contaminant levels and protecting fish nursery habitat. Collaborate with park partners, where appropriate.	- Conduct exotic species surveys on all coastal wetlands every 2–3 years. (H-joint) - Implement early detection, early control to minimize impacts from invasive exotic species. (H-joint) - Work with partners (including the Great Lakes Indian Fish and Wildlife Commission, tribal partners, the Wisconsin Department of Natural Resources, and the North Woods Weed Management Cooperative Area) to assist with weed monitoring and treatment. (M-joint) - Conduct survey/monitoring to determine the effectiveness of invasives treatments. (H) - Determine restoration needs on sand barriers that buffer coastal wetlands from Lake Superior storm impacts. (H)
AQUATIC SYSTEMS—Wetlands	Steward and manage wetland ecosystems through partnerships that focus on recognizing their ecological and cultural importance, improving knowledge of hydrologic processes and wetland dynamics to preserve native species diversity and composition while recognizing the potential for consequential changes to this ecosystem.	**CLIMATE CHANGE RESPONSE**—Ensure that appropriate actions and protocols are in place and implemented to protect wetland biota, hydrologic processes and function – while recognizing the potential for consequential changes to this ecosystem.	- Conduct rapid recon and response after major wind events to assess damage. (H)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
AQUATIC SYSTEMS—Nearshore Aquatics, Streams, Water Quality and Water Quantity	Collaborate on existing interorganizational efforts to steward and manage Lake Superior with a focus on nearshore aquatic ecosystems and streams within the Apostle Islands and work towards a focus on maintaining or improving water quality, fisheries, food webs, and native species diversity and composition. Recognize the potential for consequential changes to these resources from climate change and other stressors.	**IMPROVE KNOWLEDGE**—Improve the understanding of nearshore aquatic ecosystems, water quality, and water levels to better inform nearshore aquatics management (including algal blooms and exotic invasive species).	- Continue to collaborate with partners to support real-time wave monitoring. (M-joint) - Work with tribal and other partners to address threats that may impact water resources of the park. (H-joint) - Work with partners in continuing to monitor nearshore water quality conditions. Incorporate water temperature monitoring in more locations. (H-joint) - Use existing benthic mapping data to identify likely native mussel refugia, invasive mussel habitats, and fish spawning habitats. Work with the Wisconsin Department of Natural Resources to protect areas within state jurisdiction. (M-joint) - Work with Red Cliff tribal staff to collaboratively manage the aquatic systems on the inholding within the reservation; and survey/monitor island and mainland streams/drainages. (M-joint) - Work with the Great Lakes Network and other partners to survey/monitor island streams/drainages for general condition, including geomorphological changes and water quality, and to implement a wadeable streams program. (M-joint)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
AQUATIC SYSTEMS—Nearshore Aquatics, Streams, Water Quality and Water Quantity	Collaborate on existing interorganizational efforts to steward and manage Lake Superior with a focus on nearshore aquatic ecosystems and streams within the Apostle Islands and work towards a focus on maintaining or improving water quality, fisheries, food webs, and native species diversity and composition. Recognize the potential for consequential changes to these resources from climate change and other stressors.	**STRATEGIES**—Maintain the ecological integrity of nearshore and stream ecosystems by working with partners and the public to protect water quality and mitigate impacts from stressors (e.g., direct and indirect sources of pollution, sediment and nutrient input, turbidity, algal blooms, exotic species).	- Continue to monitor high-risk sites for invasive mussel establishment/ expansion. (H) - Implement control efforts at high-risk sites, where feasible, against invasive species establishment/expansion. (H) - Leverage or expand existing technologies (e.g., crowdsourcing apps) and programs (e.g., citizen scientists, youth programs) to augment monitoring capabilities (e.g., for water clarity monitoring and algal bloom reporting/response). Encourage the use of apps preferred for park purposes and engaging with community stewardship campaigns. (M/H) - Partner with Lake Superior Collaborative and others on regionwide watershed stewardship. (M) - Participate in binational efforts to maintain high water quality and eliminate algal blooms from Lake Superior. (M) - Work with partners to identify, respond, and provide public notification on algal blooms and other water quality issues (e.g., E. coli). (M-joint) - Work with partners to develop strategies to prevent the introduction and spread of exotic species (e.g., boat washing stations). (H)
TERRESTRIAL ECOSYSTEM VEGETATION—Native Plant Communities, including Rare Species	Conserve the biodiversity of native plant communities that are rare, significant, or of cultural importance to maintain native species abundance, diversity, composition, and function while recognizing the potential for consequential changes to these resources from climate change and other stressors, with a focus on those that are rare, significant, or of cultural importance.	**IMPROVE KNOWLEDGE**—Improve the understanding of spatial distribution, abundance, and function of native plant communities.	- Use existing monitoring data (e.g., Great Lakes Inventory and Monitoring Network [GLKN] forest vegetation long-term monitoring) to assess changes in distribution and abundance of species and species groups. Determine if a plan is needed to better manage jack pine, white cedar, eastern hemlock, and yellow birch. (1D-joint) - Continue long-term forest vegetation monitoring through collaboration with the National Park Service and the Great Lakes Inventory and Monitoring Network. (3M-joint) - Collect better data on the impacts of blowdown events and disturbance regimes. Increase the understanding of how these events are changing native plant communities. (1D-joint) - Develop a comprehensive vegetation management plan that ties together all of the various park vegetation management strategies. (1P)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
TERRESTRIAL ECOSYSTEM VEGETATION—Native Plant Communities, including Rare Species	Conserve the biodiversity of native plant communities that are rare, significant, or of cultural importance to maintain native species abundance, diversity, composition, and function while recognizing the potential for consequential changes to these resources from climate change and other stressors, with a focus on those that are rare, significant, or of cultural importance.	**IMPROVE KNOWLEDGE**—Obtain rare plants species information needs (e.g., data on breeding system, genetic structure, physiological requirements, nonnative and exotic species threats).	- Continue park-led annual rare plant monitoring of high-priority key species to determine status and trends. Develop mitigation measures, where feasible, for rare species that are declining due to climate changes. (1M) - Continue contracted rare plant surveys (5–10 years) that are more comprehensive than annual park led surveys, include analysis of long-term trends, and provide recommendations for mitigation measures, where feasible, for rare species that are declining due to climate changes. (3M) - Collaborate with tribal and other partners to monitor phenology. (3M-joint) - Increase the understanding of rare ravine species, including disturbance, protection, and restoration needs. (2D)
TERRESTRIAL ECOSYSTEM VEGETATION—Native Plant Communities, including Rare Species	Conserve the biodiversity of native plant communities that are rare, significant, or of cultural importance to maintain native species abundance, diversity, composition, and function while recognizing the potential for consequential changes to these resources from climate change and other stressors, with a focus on those that are rare, significant, or of cultural importance.	**IMPROVE KNOWLEDGE**—Obtain current information on nonvascular plants to improve knowledge and relationships with other vegetation in the Great Lakes region, particularly for peatlands, rockscapes, and old-growth forests.	- Conduct a nonvascular plant survey, building on past surveys and focusing on high-priority locations. (2D)
TERRESTRIAL ECOSYSTEM VEGETATION—Native Plant Communities, including Rare Species	Conserve the biodiversity of native plant communities that are rare, significant, or of cultural importance to maintain native species abundance, diversity, composition, and function while recognizing the potential for consequential changes to these resources from climate change and other stressors, with a focus on those that are rare, significant, or of cultural importance.	**IMPROVE KNOWLEDGE**—Knowledge would be improved for old growth forest remnants and sandscapes.	- Update information on the status and distribution for old-growth forest remnants within the park. Determine changes to old-growth remnants, vulnerability to climate changes and potential mitigation measures. (2D) - Continue contracted sandscape surveys (5–10 years) that are more intensive and comprehensive than annual park led surveys, include analysis of long-term trends, and provide recommendations for mitigation measures, where feasible, for species that are declining due to climate changes. (3M)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
TERRESTRIAL ECOSYSTEM VEGETATION—Native Plant Communities, including Rare Species	Conserve the biodiversity of native plant communities that are rare, significant, or of cultural importance to maintain native species abundance, diversity, composition, and function while recognizing the potential for consequential changes to these resources from climate change and other stressors, with a focus on those that are rare, significant, or of cultural importance.	**IMPROVE KNOWLEDGE**—Improve the understanding of fire history, including paleoecology in Great Lakes pine forests and barrens (e.g., perched bog on Bear Island).	- Increase the understanding of fire history in and how climate change may alter fire regimes within the park. (2P) - Develop desired future conditions for Great Lakes pine barrens and pine forest communities. (1P)
TERRESTRIAL ECOSYSTEM VEGETATION—Native Plant Communities, including Rare Species	Conserve the biodiversity of native plant communities that are rare, significant, or of cultural importance to maintain native species abundance, diversity, composition, and function while recognizing the potential for consequential changes to these resources from climate change and other stressors, with a focus on those that are rare, significant, or of cultural importance.	**CLIMATE CHANGE RESPONSE**—Increase the understanding of natural disturbance processes that affect vegetation (e.g., the impacts and implications of increased storm events and storm intensities that cause severe blowdown).	- Continue annual and long-term monitoring of rare plants and develop mitigation measures, where feasible, for rare species that are declining due to climate changes. (3M-joint) - Develop climate-smart management responses to environmental impacts to resources. Conduct assessment at key focal areas in the park that are at higher risk of climate change impacts (e.g., Julian Bay, pine barrens). (1D) - Incorporate the assessment of climate change into existing vegetation research/ surveys/monitoring (e.g., rare plants, forest vegetation, sandscapes). (1M)
TERRESTRIAL ECOSYSTEM VEGETATION—Native Plant Communities, including Rare Species	Conserve the biodiversity of native plant communities within potential ranges and maintain natural disturbance processes affecting native vegetation while recognizing the potential for consequential changes to these resources from climate change and other stressors.	**STRATEGIES**—Conduct restoration as a mitigation tool for visitor and climate changes. Use locally collected plant materials whenever possible.	- Based on monitoring results, conduct active restoration, as needed, to mitigate human impacts. Add language about "favor historically occurring species that do well under emerging/projected climate." (1I)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
TERRESTRIAL ECOSYSTEM VEGETATION—Native Plant Communities, including Rare Species	Conserve the biodiversity of native plant communities within potential ranges and maintain natural disturbance processes affecting native vegetation while recognizing the potential for consequential changes to these resources from climate change and other stressors.	**STRATEGIES**—Preserve native seed genetics.	- Consider seed banking for species vulnerable to climate change and consider translocation options. (2D-joint) - Develop seed banking and assisted translocation options for potential management integration between Apostle Islands National Lakeshore and Isle Royale National Park. (3P)
TERRESTRIAL ECOSYSTEM VEGETATION—Native Plant Communities, including Rare Species	Conserve the biodiversity of native plant communities within potential ranges and maintain natural disturbance processes affecting native vegetation while recognizing the potential for consequential changes to these resources from climate change and other stressors.	**STRATEGIES**—Continue to use fire as a vegetative and cultural resource management tool.	- Continue to implement prescribed burning on the Stockton tombolo to maintain pine forest, savanna, and barrens communities. (1I) - Identify other areas where prescribed burning would be appropriate to inform natural/cultural resource and fire management planning. (2P)
TERRESTRIAL ECOSYSTEM VEGETATION—Native Plant Communities, including Rare Species	Conserve the biodiversity of native plant communities within potential ranges and maintain natural disturbance processes affecting native vegetation while recognizing the potential for consequential changes to these resources from climate change and other stressors.	**STRATEGIES**—Work with partners to steward plant communities and species, with a focus on special vegetation communities and species of concern because of their significance and rarity.	- Continue to work with partners to accomplish restoration projects. (1C) - Continue to coordinate with the State of Wisconsin on strategies for stewardship of state natural areas. (1C) - Coordinate with tribal partners, friends groups, academia, and public watch programs. (1C)
TERRESTRIAL ECOSYSTEM VEGETATION—Native Plant Communities, including Rare Species	Conserve the biodiversity of native plant communities within potential ranges and maintain natural disturbance processes affecting native vegetation while recognizing the potential for consequential changes to these resources from climate change and other stressors.	**STRATEGIES**—Protect native plant species and communities from deer overbrowsing.	- Monitor deer population to determine the potential for overbrowsing on Canada yew and other preferred browse species, and implement deer management best practices from the Harvestable Species Plan, Apostle Islands National Lakeshore (2014), as needed. (1M)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
TERRESTRIAL ECOSYSTEM VEGETATION—Native Plant Communities, including Rare Species	Minimize impacts to ecosystem function and biodiversity from invasive plant and animal species and diseases through efforts to eliminate or minimize introduction and spread, as well as targeted control.	**IMPROVE KNOWLEDGE**—Increase the understanding of nonnative invasive species, pests, and disease threats.	- Implement mitigation measures to minimize impact and threats to forest health (e.g., emerald ash borer, buckthorn, other exotic invasive species). (1I) - Determine threat of garlic mustard to park forest communities, including its potential to spread in forests with understories of Canada yew and identify mitigation measures. (1D) - Determine the extent and abundance of earthworms, especially closer to shorelines and human use areas, where higher incidences of earthworms are known to occur. Determine which native plant communities are at risk from earthworms and identify mitigating measures. (1D) - Conduct forest health monitoring, including early detection of invasive pests (e.g., emerald ash borer, hemlock wooly adelgid). (1M)
TERRESTRIAL ECOSYSTEM VEGETATION—Native Plant Communities, including Rare Species	Minimize impacts to ecosystem function and biodiversity from invasive plant and animal species and diseases through efforts to eliminate or minimize introduction and spread, as well as targeted control.	**STRATEGIES**—Increase outreach efforts with a broad range of park partners to promote and enhance local biodiversity objectives.	- Consider options for citizen science efforts, especially in surrounding communities. (1P)
TERRESTRIAL ECOSYSTEM VEGETATION—Native Plant Communities, including Rare Species	Minimize impacts to ecosystem function and biodiversity from invasive plant and animal species and diseases through efforts to eliminate or minimize introduction and spread, as well as targeted control.	**STRATEGIES**—Maintain partnerships to monitor and control invasive species at a regionwide level. Mitigate impacts of invasive plants and animals on native species at multiple scales. Increase the understanding of new invasive species threats due to climate change impacts.	- Continue to work with the Northwood Cooperative Weed Management Area and other partners to address exotic plant threats. (3I)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
TERRESTRIAL ECOSYSTEM VEGETATION—Native Plant Communities, including Rare Species	Minimize impacts to ecosystem function and biodiversity from invasive plant and animal species and diseases through efforts to eliminate or minimize introduction and spread, as well as targeted control.	**STRATEGIES**—Establish and implement early detection/ rapid response strategies for various invasive species.	- Develop and implement an early notification protocol to increase collaboration with tribal and other partners. (1M-joint) - Implement early detection/rapid response strategies for various invasive species. (1I-joint) - Incorporate the requirement for exotic species inspections and mitigation measures for projects that have the risk of spreading exotic invasive species (e.g., construction, ground disturbance). (1I-joint)
TERRESTRIAL ECOSYSTEM VEGETATION—Plants of Special Cultural Interest	Increase the understanding of past and present uses of plant resources in the park, including historic gathering (e.g., blueberries and other foods, medicines).	**IMPROVE KNOWLEDGE**—Obtain information on plant species of cultural interest and use that were present in the park before European contact.	- Consult with tribal partners to identify vegetation resources (including communities and individual species) of cultural interest. (1C)
TERRESTRIAL ECOSYSTEM VEGETATION—Plants of Special Cultural Interest	Increase the understanding of past and present uses of plant resources in the park, including historic gathering (e.g., blueberries and other foods, medicines).	**IMPROVE KNOWLEDGE**—Identify and determine the potential for restoration of species that have been lost due to human activities.	- Gather elder traditional knowledge of past and current use with science to develop an approach to vegetation management. (1D-joint)
TERRESTRIAL ECOSYSTEM VEGETATION—Plants of Special Cultural Interest	Increase the understanding of past and present uses of plant resources in the park, including historic gathering (e.g., blueberries and other foods, medicines).	**IMPROVE KNOWLEDGE**— Obtain information on past and current use and distribution of plants of special cultural interest, including the use of TEK/NEK.	- Consult with tribal partners to obtain knowledge of past and current uses of plants within the park, while maintaining protection of sensitive information, to inform vegetation management. (1D-joint) - Conduct field mapping and GIS development showing past and current distributions of vegetative communities. (1D-joint)
TERRESTRIAL ECOSYSTEM VEGETATION—Plants of Special Cultural Interest	Increase the understanding of past and present uses of plant resources in the park, including historic gathering (e.g., blueberries and other foods, medicines).	**IMPROVE KNOWLEDGE**—Obtain information on the prevalence of plant species that are not considered "rare" but that need to be accessible and of an appropriate condition or quality for traditional use.	- Inventory plants of special cultural interest and use (e.g., berries, sugar maple, birch, cedar, ash, medicinal and ceremonial plants). (2D-joint)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
TERRESTRIAL ECOSYSTEM VEGETATION—Plants of Special Cultural Interest	Steward and manage plants of cultural significance to Ojibwe nations for gathering and cultural uses.	**STRATEGIES—**Work with tribes to protect plant species of special cultural interest from threats, including invasive species and climate change.	- Identify the intersection of plants of special cultural interest and known invasive threats. (2D) - Adjust invasive species management to consider vegetation resources of cultural interest and concern as feasible and desirable. (2I) - Collaborate with tribal partners to monitor species of special concern and use (e.g., birch, ash). (1M-joint)
TERRESTRIAL ECOSYSTEM VEGETATION—Plants of Special Cultural Interest	Steward and manage plants of cultural significance to Ojibwe nations for gathering and cultural uses.	**STRATEGIES—**Work with tribal partners to steward plant communities and species in a way that is informed by TEK/NEK.	- Continue fire treatment (prescription) project at Stockton tombolo with the goal of an initial burn in four tombolo fire units and a five-year rotation for successive fire treatments. (1I) - Continue collaboration with tribal partners to implement prescribed burning on the Stockton tombolo. (1I-joint)
TERRESTRIAL ECOSYSTEM WILDLIFE—All Components	N/A	Work with partners and the public to help steward park wildlife.	- Work with park partners to develop a fundraising strategy for at-risk or high-visibility species (i.e., adoption campaigns for the plover, meet a scientist speaker series w/fee, bears, wolves, marten). (1C) - Continue to partner and model state or local monitoring programs/protocols to include NPS resources in regional/statewide efforts and data. (1C)
TERRESTRIAL ECOSYSTEM WILDLIFE—All Components	N/A	Work with partners and the public to minimize human/wildlife conflicts.	- Continue implementing a suite of management and interpretive/education strategies to protect habitat and reduce bear-visitor conflict. (1I-joint) - Work with tribal and state partners to help resolve situations of human/wildlife conflict. (1I-joint) - Consider incorporating traditional tribal practices of thanks/apologies/offerings in situations of human/wildlife conflict. (1I-joint) - Search for and learn from strategies being implemented elsewhere that prove effective, such as the bear aware campaign. (1I-joint) - Continue to monitor, survey, and control invasive and exotic species to protect amphibians, reptiles, and their habitat. (1I-joint)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
TERRESTRIAL ECOSYSTEM WILDLIFE—Amphibians and Reptiles	Improve the knowledge of abundance, distribution, and population trends of amphibians and reptiles, including long-term changes to habitat and key indicators for sensitivity to climate change. Steward and manage amphibian and reptile habitat to preserve native species abundance, diversity, and composition.	**IMPROVE KNOWLEDGE**—Assess and analyze information on population trends, long-term changes to habitat and identify potential mitigation actions (e.g., focus amphibian monitoring on species that are rare, at their range limits, or dependent on ephemeral wetlands to allow correlation with a changing climate).	- Conduct periodic reptile surveys to determine status and trends. (2D) - Continue monitoring calling amphibians through acoustic monitors. (1M-joint) - Conduct periodic monitoring of non-calling amphibians and reptiles. (2D-joint) - Conduct inventory of acoustic conditions related to the breeding ecology of amphibians/reptiles to identify changes in sounds that potentially correlate to environmental changes or threats. (3D) - Implement adaptive management actions, as needed. (2I-joint)
TERRESTRIAL ECOSYSTEM WILDLIFE—Birds	Conserve the biodiversity of bird habitat with a focus on keystone bird species and species of concern that are rare, significant, or of cultural importance, while recognizing the potential for consequential changes to birds from climate change and other stressors.	**STRATEGIES**—Continue exotic vegetation species management (e.g., to support ground nesting birds).	- Increase monitoring and education efforts to ensure that populations of exotic species that may impact bird habitat (e.g., buckthorn and garlic mustard) are identified and treated. (1M)
TERRESTRIAL ECOSYSTEM WILDLIFE—Birds	Conserve the biodiversity of bird habitat with a focus on keystone bird species and species of concern that are rare, significant, or of cultural importance, while recognizing the potential for consequential changes to birds from climate change and other stressors.	**STRATEGIES**—Protect nesting bird habitat.	- Continue long-term efforts to protect bird habitat (e.g., seasonal visitor use closures of colonial bird nesting habitat during sensitive periods). (1I)
TERRESTRIAL ECOSYSTEM WILDLIFE—Birds	Conserve the biodiversity of bird habitat with a focus on keystone bird species and species of concern that are rare, significant, or of cultural importance, while recognizing the potential for consequential changes to birds from climate change and other stressors.	**STRATEGIES**—Partner with and model state or local monitoring programs/protocols to include NPS resources in regional/statewide efforts and data.	- Continue to use protocols that allow for comparison of park-specific surveys and contribute to regional and national long-term monitoring (e.g., breeding bird survey). (1I)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
TERRESTRIAL ECOSYSTEM WILDLIFE—Birds	Steward and manage bird habitat and maintain native species abundance, diversity and composition, with a focus on keystone wildlife species and species of concern that are rare, significant, or of cultural importance. Research long-term trends to breeding, migratory, and colonial bird populations, with emphasis on those that are key indicators of climate change.	**IMPROVE KNOWLEDGE**—Research long-term trends and threats to breeding and migratory and colonial bird populations, with emphasis on those that are key indicators of climate change.	- Gather baseline data for acoustic conditions related to the breeding ecology of birds to identify changes in sounds that potentially correlate to environmental changes or threats. (3D) - Determine the feasibility and potential value of using acoustic monitoring of breeding birds. (2P) - Continue long-term monitoring of breeding birds (nationwide effort) in collaboration with the Great Lakes Inventory and Monitoring Network. (1M) - Conduct periodic monitoring of migratory birds. (2M-joint) - Continue long-term monitoring of colonial birds in collaboration with the Wisconsin Department of Natural Resources. (2M-joint) - Work with regional partners to identify cause(s) of a recent (2019) crash of colonial bird populations within the park. (1D)
TERRESTRIAL ECOSYSTEM WILDLIFE—Birds	Steward and manage bird habitat and maintain native species abundance, diversity and composition, with a focus on keystone wildlife species and species of concern that are rare, significant, or of cultural importance. Research long-term trends to breeding, migratory, and colonial bird populations, with emphasis on those that are key indicators of climate change.	**CLIMATE CHANGE RESPONSE**—Identify climate-sensitive bird species (per the Audubon Society protocol) and potential mitigation actions. Ensure that climate-sensitive bird species are part of parkwide bird monitoring efforts.	- Identify and monitor climate-sensitive bird species. (1D-joint) - Implement adaptive management actions, as needed. (2I-joint)
TERRESTRIAL ECOSYSTEM WILDLIFE—Mammals (including Harvested Species)	Steward and manage native mammals and their habitat to maintain native species abundance, diversity, and composition, with a focus on keystone wildlife species and species of concern that are rare, significant, or of special cultural interest.	**STRATEGIES**—Manage populations of harvestable species consistent with the 2014 Harvestable Species Plan.	- Implement techniques from the 2014 wildlife management plan for harvestable species, as needed, to reduce severe impacts of overbrowsing, including robust hunting quotas. (1I)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
TERRESTRIAL ECOSYSTEM WILDLIFE—Mammals (including Harvested Species)	Steward and manage native mammals and their habitat to maintain native species abundance, diversity, and composition, with a focus on keystone wildlife species and species of concern that are rare, significant, or of special cultural interest.	**STRATEGIES**—Collaborate with state and tribal partners to manage harvestable species.	- Meet regularly and consult with tribal partners about status and management of harvestable species. (1C-joint) - Consult with tribal partners about alternative management strategies when science-based strategies regarding harvestable species might conflict with cultural and spiritual well-being. (1C-joint)
TERRESTRIAL ECOSYSTEM WILDLIFE—Mammals (including Harvested Species)	Steward and manage native mammals and their habitat to maintain native species abundance, diversity, and composition, with a focus on keystone wildlife species and species of concern that are rare, significant, or of special cultural interest.	**STRATEGIES**—Protect black bear habitat and reduce human-bear conflicts via proper visitor use management.	- In collaboration with tribal and other partners, monitor black bear, white-tailed deer, and furbearer population dynamics. (1M-joint) - Periodically conduct population genetic studies in collaboration with tribal and other partners on black bear population dynamics. (3D) - Explore opportunities to crowdsource information and otherwise promote information sharing about bear behavior opportunistically observed throughout the park (e.g., from bear activity logs). (2C) - Expand the use of apps like iNaturalist in support of wildlife monitoring goals. (IC-joint)
TERRESTRIAL ECOSYSTEM WILDLIFE—Mammals (including Harvested Species)	Steward and manage native mammals and their habitat to maintain native species abundance, diversity, and composition, with a focus on keystone wildlife species and species of concern that are rare, significant, or of special cultural interest.	**STRATEGIES**—Protect bat populations, with a focus on species at risk.	- Monitor bats to identify status and trends of populations in the park, with a focus on identifying white-nose syndrome, in collaboration with Great Lakes Inventory and Monitoring Network. Participate in regionwide bat monitoring programs, as appropriate. (1M) - Continue working with experts in the US Fish and Wildlife Service, Wisconsin Department of Natural Resources, and the National Park Service to assist the park with bat-related issues. (1C)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
TERRESTRIAL ECOSYSTEM WILDLIFE—Mammals (including Harvested Species)	Improve the knowledge of abundance, distribution, and population trends of nongame and game species, long-term changes to habitat, and species that are key indicators of climate change.	**IMPROVE KNOWLEDGE**—Increase the understanding of the broader mammal community, including baseline information to build long-term trends, trophic linkages and dynamics, impacts from lake ice cover loss, connectivity, phenological irregularities in the timing of food needs and food availability, and the status of equilibrium within the system.	- Continue to monitor wildlife communities, including the carnivore community, and bear and deer using noninvasive techniques (e.g., remote cameras) to inform management and work with partners to refine population data (e.g., use of genetic data). (1M) - Conduct long-term monitoring of small mammals as key indicators (e.g., includes snowshoe hare). (1D) - Determine population status and distribution of semi-aquatic mammals (e.g., beaver, otter, muskrat, mink). (2M) - Research and document dynamics of wolf/deer interactions between the mainland and nearshore islands and how changes to ice connectivity may impact this predator/prey relationship. (2D) - Identify keystone species, determine their vulnerability to climate change, and identify any additional associated monitoring or research needs. (2D)
TERRESTRIAL ECOSYSTEM WILDLIFE—Mammals (including Harvested Species)	Improve the knowledge of abundance, distribution, and population trends of nongame and game species, long-term changes to habitat, and species that are key indicators of climate change.	**CLIMATE CHANGE RESPONSE**—Determine how climate change impacts to habitat may impact wildlife species.	- Monitor ice cover dynamics and determine trends. Determine which species are most vulnerable to ice cover connectivity changes; the implications to their population viability; and their mitigation options. (1D) - Determine which species are most vulnerable to climate-related changes (e.g., snowshoe hare, marten) and can serve as indicator species. Monitor population trends of climate change indicator species. (2M) - Conduct ecosystem modeling to determine how climate-related changes to habitat may impact wildlife species. (3D) - Implement adaptive management actions for mammals, as appropriate, based on monitoring trends. (3I) - Identify and mitigate, where possible, climate change impacts to bats. (2D)
TERRESTRIAL ECOSYSTEM WILDLIFE—Rare Wildlife Species	Meet recovery goals for rare wildlife species through joint efforts of park staff and partners, including the State of Wisconsin, the US Fish and Wildlife Service, and tribal partners.	**IMPROVE KNOWLEDGE**—Research connectivity and population change dynamics for American marten.	- Continue to monitor and support research needed to determine the ecology and trends of American marten in the park. (partners include State of Wisconsin). (1M)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
TERRESTRIAL ECOSYSTEM WILDLIFE—Rare Wildlife Species	Meet recovery goals for rare wildlife species through joint efforts of park staff and partners, including the State of Wisconsin, the US Fish and Wildlife Service, and tribal partners.	**IMPROVE KNOWLEDGE**—Increase the understanding of the status and threats to bat communities. Identify protection and mitigation strategies. Identify high-priority habitat for rare bat species and protection strategies.	- Protect high-priority habitat for rare bat species. (1I) - Continue rare bat monitoring to determine population status and trends. (1M) - Continue to implement mitigation measures for rare bats, where effective (e.g., bat houses near historic structures). (1I)
TERRESTRIAL ECOSYSTEM WILDLIFE—Rare Wildlife Species	Meet recovery goals for rare wildlife species through joint efforts of park staff and partners, including the State of Wisconsin, the US Fish and Wildlife Service, and tribal partners.	**IMPROVE KNOWLEDGE**—Identify species at risk of becoming rare due to climate change or other threats.	- Determine which species are most vulnerable to ice cover connectivity changes, the implications for population viability, and mitigation options. (1C)
TERRESTRIAL ECOSYSTEM WILDLIFE—Rare Wildlife Species	Meet recovery goals for rare wildlife species through joint efforts of park staff and partners, including the State of Wisconsin, the US Fish and Wildlife Service, and tribal partners.	**STRATEGIES**—Work with the statewide marten committee on marten protection and restoration efforts.	- Work with the Wisconsin Marten Recovery Team and tribal partners on marten protection and restoration efforts, including needed monitoring and research. (1C-joint)
TERRESTRIAL ECOSYSTEM WILDLIFE—Rare Wildlife Species	Meet recovery goals for rare wildlife species through joint efforts of park staff and partners, including the State of Wisconsin, the US Fish and Wildlife Service, and tribal partners.	**STRATEGIES**—Work with partners and park staff to provide protection for rare bat species, consistent with federal and state goals. Develop options to provide both natural and cultural stewardship goals. Collaborate on state and regional efforts.	- Develop and implement a programmatic approach to rare bat management, working with partners on a regionwide approach to monitoring rare bats. (1C) - Continue collaboration between natural resource and cultural resource staff to seek solutions for populations of rare bats roosting in historic structures. Identify structures in the park being used by rare bats and coordinate with facility management on proposed projects. (1I) - Identify partners and funding sources to help the effort of encouraging rare bat populations to relocate out of historic structures. (2C)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
TERRESTRIAL ECOSYSTEM WILDLIFE—Rare Wildlife Species	Meet recovery goals for rare wildlife species through joint efforts of park staff and partners, including the State of Wisconsin, the US Fish and Wildlife Service, and tribal partners.	**IMPROVE KNOWLEDGE**—Improve the understanding of plovers and plover habitat to guide management via monitoring and research.	- Support efforts by the Bad River Tribe to research food webs on Long Island to better understand plover ecology. (1C) - Study and monitor the impacts of high water levels and storms on plover habitat and nesting behaviors, and, where possible, mitigate impacts. Expand plover survey locations based on potential habitat changes due to lake levels and storm effects. (1D) - Conduct predictive modeling for comprehensive plover management and habitat considerations—consider dynamics of the rapidly changing sandscape plover habitat. Potential for basin-wide model. Consider suboptimal habitat and most important factors under various lake levels (e.g., diet breadth model). Analyze shifting plover ranges/habitat. (2D)
TERRESTRIAL ECOSYSTEM WILDLIFE—Rare Wildlife Species	Meet recovery goals for rare wildlife species through joint efforts of park staff and partners, including the State of Wisconsin, the US Fish and Wildlife Service, and tribal partners.	**STRATEGIES**—Protect and manage piping plover populations in collaboration with tribal, state, and other partners.	- Collaborate with tribes on direct management actions that benefit plover protection and management (e.g., predator management, habitat improvement, storm mitigation). (1I) - Continue to collaborate with the Bad River Tribe, Wisconsin Department of Natural Resources, US Fish and Wildlife Service, and other partners to protect and manage piping plovers, including needed monitoring and research (e.g., food web, predictive modeling of habitat suitability). (1C) - Use existing plover education resources from other parks and organizations (Sleeping Bear Dunes National Lakeshore, plover survival lesson plan, Audubon resources at https://www.allaboutbirds.org/news/#). (1C)
TERRESTRIAL ECOSYSTEM WILDLIFE—Insects and Pollinators	Obtain trophic dynamics and knowledge of insect and pollinator populations within the park to understand and best inform future management strategies.	**IMPROVE KNOWLEDGE**—Monitor and assess insect and pollinator populations to gain an improved understanding of status, threats, and trends.	- Conduct pollinator surveys (e.g., bees, and lepidoptera), with a focus on proposed fire units and park sandscapes. (1D-joint)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
TERRESTRIAL ECOSYSTEM WILDLIFE—Insects and Pollinators	Obtain trophic dynamics and knowledge of insect and pollinator populations within the park to understand and best inform future management strategies.	**STRATEGIES**—Where feasible, park lands are managed to allow for a diverse community of native vegetation that provide quality habitat for pollinators and other species.	- Adjust landscape management as appropriate to benefit pollinators and coordinate closely with cultural resources staff if cultural landscapes are involved. (3I-joint) - Explore the potential for working with the US Fish and Wildlife Service and other agencies to protect pollinators during prescribed fire. (1C-joint)
TERRESTRIAL ECOSYSTEM WILDLIFE—Culturally Important, Non-Game, Threatened and Endangered Species	Manage and steward wildlife of importance to Ojibwe nations for harvest and cultural uses to acknowledge and respect cultural and spiritual values.	**STRATEGIES**—Incorporate long-term tribal perspectives in wildlife stewardship activities—understand that all species are of cultural significance.	- Continue and expand collaborative wildlife research and monitoring (e.g., marten, black bear, wolves). (1C)
TERRESTRIAL ECOSYSTEM WILDLIFE—Culturally Important, Non-Game, Threatened and Endangered Species	Manage and steward wildlife of importance to Ojibwe nations for harvest and cultural uses to acknowledge and respect cultural and spiritual values.	**STRATEGIES**—Collaborate with Red Cliff Band and tribal partners to develop and implement wildlife management strategies within the reservation, including research needs and species of cultural interest (e.g., harvesting activities for deer, bear, furbearers, waterfowl, and small game, such as snowshoe hare, and grouse).	- Work with tribes to establish, support, and recognize opportunities for beings or sites of concern to the community to withstand climate change. (1C)
TERRESTRIAL ECOSYSTEM WILDLIFE—Culturally Important, Non-Game, Threatened and Endangered Species	Manage and steward wildlife of importance to Ojibwe nations for harvest and cultural uses to acknowledge and respect cultural and spiritual values.	**STRATEGIES**—Acknowledge and respect the cultural and spiritual values of Ojibwe nations related to the harvest and cultural uses of wildlife (e.g., bear, wolves, sandhill crane, marten, eagle, otter).	- Continue to coordinate with tribal cultural practitioners for ceremonial support for park activities as appropriate (e.g., deer culling). Include wildlife harvested for cultural and ceremonial purposes (e.g., porcupine quills, furbearers, feathers, deer hooves and antlers). (1C-joint) - Develop internal best practices and training based on conversations with tribal members, both formal and informal. (1P-joint)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
SCENIC VIEWS—N/A	Protect, improve, and monitor the condition of views important for natural scenery and cultural resources both within and across park boundaries, while collaborating with partners for cooperative conservation of the park's visual character.	**IMPROVE KNOWLEDGE**—Inventory and assess park views over time to monitor changes in condition.	- Submit a technical assistance request to the NPS Air Resources Division (ARD) Visual Resources Program for visual resource inventory. (1D) - Identify views important to the park purpose, visitor, and tribal values. (2D) - Conduct a visual resource inventory using the ARD process to establish baseline condition of selected views by documenting scenic quality and view importance. (2D) - Conduct a visual impact assessment of proposed project(s) (i.e., Penokee Mine and future proposals) that would have impacts to views. (2D) - Repeat a visual resource inventory every 5–10 years, or as landscape changes are observed, to monitor changes in condition. (3D)
SCENIC VIEWS—N/A	Protect, improve, and monitor the condition of views important for natural scenery and cultural resources both within and across park boundaries, while collaborating with partners for cooperative conservation of the park's visual character.	**PROTECT AND IMPROVE INTERNALLY**—Minimize changes, visual contrast, and intrusions to views to the extent possible within the park.	- Adopt ARD recommendations or develop park visual resource best practices and facility design guidelines in order to minimize the impacts of existing and new park infrastructure including docks, restrooms, picnic shelters, boardwalks, campsites, and staff housing (e.g., Meyer's Beach). (1I) - Include and conduct cyclic maintenance of views through the Facility Management Software System (FMSS) (e.g., enter activities such as clearing vegetation and infrastructure maintenance at viewpoints). (1I) - Manage vegetation to improve views, including restoration, screening, and clearing obstructions. (1I) - Remove unused facilities, nonhistoric structures, signs, and other visual intrusions within the park. (1I)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
SCENIC VIEWS—N/A	Protect, improve, and monitor the condition of views important for natural scenery and cultural resources both within and across park boundaries, while collaborating with partners for cooperative conservation of the park's visual character.	**IMPROVE EXTERNALLY**—Collaborate with adjacent landowners, municipalities, developers, and other stakeholders to promote cooperative conservation of views across park boundaries.	- Build/maintain partnerships with tribal partners, park neighbors, developers, and other stakeholders to develop an understanding of shared visual values and educate about the scenic view protection. (1C) - In partnership with stakeholders (including tribal partners and the Town of Russell), establish best practices and/or design guidelines for adjacent landowners. (2C) - Engage partners, including tribal partners and the Town of Russell, to maintain or improve view character (e.g., develop zoning ordinances). (2C) - Collaborate with the cruise ship industry to minimize impacts such as overnighting near islands. (1C) - Collaborate with owner(s) of existing cell tower(s) to minimize impacts to views. (2C)
NATURAL SOUNDSCAPE—N/A	Assess soundscape quality in the park, especially wilderness areas, and reduce nonnatural and inappropriate noise in and around the park to protect and enhance the condition of the natural soundscape.	**IMPROVE KNOWLEDGE**—Better understand and characterize the baseline acoustic environment and soundscape, as well as the relationship to other resources.	- Conduct a terrestrial acoustic inventory (e.g., submit technical assistance to the NPS Natural Sounds and Night Skies Division, establish an in-house inventory program, develop a scope of work for contractors). (2D) - Gather available acoustic information from external partners, including GIS data, or update/reorganize existing data that inform an acoustic inventory (e.g., park transportation routes layer) to determine if sufficient data already exists for the inventory or if a new park inventory is needed. (2D)
NATURAL SOUNDSCAPE—N/A	Assess soundscape quality in the park, especially wilderness areas, and reduce nonnatural and inappropriate noise in and around the park to protect and enhance the condition of the natural soundscape.	**STRATEGIES**—Minimize noise impacts from administrative and visitor activity in the park.	- Ensure that natural soundscape impacts are considered in park planning and mitigated to the extent possible. Contact the NPS Natural Sounds and Night Skies Division for advice/support. (1P) - Consider quieter technology when making purchases and negotiating contracts with concessionaires and contractors. Pursue opportunities to retrofit park equipment and infrastructure. (1P)
NATURAL SOUNDSCAPE—N/A	Assess soundscape quality in the park, especially wilderness areas, and reduce nonnatural and inappropriate noise in and around the park to protect and enhance the condition of the natural soundscape.	**STRATEGIES**—Partner with neighboring communities, landowners, and other entities to minimize impacts from artificial sound and improve regional soundscape.	- Work with the cruise ship industry to mitigate noise from ships. (1C)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
AIR QUALITY—N/A	Work to improve the understanding of air quality condition and trend and air pollution impacts.	**IMPROVE KNOWLEDGE**—Improve the understanding of air quality through compiling existing information, identifying sensitive resources, and assessing future research needs.	- Become familiar with existing online park air quality information provided by the NPS Air Resources Division, including monitoring locations, park and regional conditions and trends, park sensitive species, and nearby sources of air pollution. (1D) - Develop a park air quality summary, including a compilation of existing data, condition, threats, sensitive resources, and research. (2P-joint) - Connect with Isle Royale and Voyageurs National Parks' park air quality specialists to better understand regional air quality issues and conduct stewardship activities. (1C) - Continue participation in the national dragonfly mercury project (Great Lakes Inventory and Monitoring conducts these studies). (1M-joint) - Explore the possibility of joining the Air Resources Division's smoke monitoring network through the use a "PurpleAir" monitor to improve understanding of smoke contributions to regional haze. (1M) - Conduct resampling of lichen for airborne pollutants of concern, a form of passive monitoring, and evaluate the use of moss/lichens as composite air quality indicators. (2M-joint) - Increase collaboration with tribal partners and other partners to improve the understanding of air quality and trends related to monitoring and protection of air quality. (1C-joint) - Work with the Air Resources Division to assess future needs in air quality research and ecosystem responses to identify and improve the understanding of impacts to sensitive resources. (2P) - Subscribe to Wisconsin's Department of Natural Resources air quality notices to stay current on new and existing sources of air pollution by receiving public notices, division updates, and regulator information. (1C)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
AIR QUALITY—N/A	Seek to perpetuate the best possible air quality for the protection of resources affected by air pollution, reducing pollutant deposition to below vegetation critical loads a wildlife thresholds, eliminating human-caused visibility impairment by 2064, and remain in attainment for the EPA National Ambient Air Quality Standards.	**INTERNAL IMPROVEMENT**—Be an environmental leader by reducing park air pollutant emissions; improving park sustainability and environmental management; and demonstrating the park's commitment to do its part for air/water quality, night sky, and climate change.	- Continue implementing the park's Climate Friendly Parks action plan with an environmental management system. (1I) - Update the park's greenhouse gas inventory to assess progress (2006 to present) and set new goals for the park's Climate Friendly action plan. (1L) - Develop park energy, waste, Water, and lighting guidelines for park staff and volunteers. (1L) - Reassess the status of the green team (i.e., should the team remain distributed among other teams or be consolidated as a stand-alone team?) (1C) - Use available Clean Air Act settlement funds through the NPS Natural Resource Stewardship and Science Directorate, the Air Resources Division, and the Midwest Region to develop restoration plans and completion reports for appropriate mitigation, restoration, and improvement of local air quality. (1P)
AIR QUALITY—N/A	Seek to perpetuate the best possible air quality for the protection of resources affected by air pollution, reducing pollutant deposition to below vegetation critical loads a wildlife thresholds, eliminating human-caused visibility impairment by 2064, and remain in attainment for the EPA National Ambient Air Quality Standards.	**EXTERNAL IMPROVEMENT**—Collaborate with federal, state, regional, and local planning organizations and stakeholders to reduce air quality impacts in the park from sources of air pollution.	- Partner with nearby developers, planners, counties, and industry to increase awareness about the importance of park air quality, scenic views, natural sounds, and night sky protection. (2C) - With assistance from the NPS Air Resources Division and the Midwest Region, work cooperatively with federal, state, and local air quality agencies and stakeholders to share and reduce air quality impacts in the park from sources of air pollution. (2L) - Participate/support a process to improve air quality, including the Bad River transition from Clean Air Act class II to class I status. (1C) - Be alert for and seek out information about potential threats, such as development or industrial threats, from the external environment. (1C)
DARK NIGHT SKY—N/A	Assess night sky quality in the park and work within boundaries and with neighboring communities/partners to raise awareness and improve conditions of the nocturnal environment.	**IMPROVE KNOWLEDGE**—Better understand and characterize baseline existing night sky environment and lightscape, as well as the relationship to other resources.	- Coordinate with Voyageurs and Isle Royale National Parks and Pictured Rocks National Lakeshore and the NPS Natural Sounds and Night Skies Division (joint baseline night sky inventory data collected in 2012) to develop a monitoring plan that includes the flexibility to respond to emerging compliance needs. (2P)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
DARK NIGHT SKY—N/A	Assess night sky quality in the park and work within boundaries and with neighboring communities/partners to raise awareness and improve conditions of the nocturnal environment.	**STRATEGIES**—Maintain and improve high-quality night skies by implementing fully sustainable lighting throughout park.	- Review current lighting within the park and identify locations where best management practices retrofits can be implemented. Use fully sustainable lighting practices in future park developments. (2P)
DARK NIGHT SKY—N/A	Assess night sky quality in the park and work within boundaries and with neighboring communities/partners to raise awareness and improve conditions of the nocturnal environment.	**STRATEGIES**—Partner with neighboring communities, landowners, and other entities to reduce impacts from artificial light and improve regional night skies.	- Explore dark sky partnership opportunities (e.g., International Dark Sky Association's Starry Skies Lake Superior group and Heart of the Continent Partnership). (1C) - Work with Friends of the Apostle Islands (FAINL) and regional partners on an International Dark Sky Park designation (www.darksky.org) like Voyageurs National Park (2020). (1C) - Work with the cruise ship industry to mitigate light and view impacts (not just during the night) from ships. (1C)
WILDERNESS—N/A	Steward the human history story as well as its natural history story, as this wilderness has been shaped by hundreds of years of human presence.	Manage activities to maintain and restore resource conditions, protect visitor experiences, and protect and restore wilderness character.	- Continue to use minimum requirements analysis to evaluate the necessity of actions and inform selection of least impactful methods. (1L)
WILDERNESS—N/A	Retain and protect wilderness characteristics and values to the extent possible under a changing climate.	Enhance the appreciation of and assist in the protection of wilderness values by providing education/interpretive programs, which tell the park's wilderness story from the perspective of both its natural and human history.	- Implement a program to inform visitors of wilderness ethics and how to minimize impacts in wilderness before receiving a camping permit (e.g., Leave No Trace, Boundary Waters). (2C)
WILDERNESS—N/A	Retain and protect wilderness characteristics and values to the extent possible under a changing climate.	Facilitate collaboration between the park operations and wilderness management functions to manage and protect natural and cultural resources in wilderness.	- Submit a Solution for Technical Assistance Request to assist the park with wilderness character baseline assessment and monitoring database, including the refinement of the character indicators. (2D) - Complete a wilderness character baseline assessment. (2D) - Use the Interagency Wilderness Character Monitoring Database at https://wilderness.net/practitioners/toolboxes/wilderness-character/default.php to monitor wilderness character indicators. (2D)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
HISTORIC STRUCTURES AND THEIR ASSOCIATED HISTORICAL LANDSCAPES—Light Stations, Vernacular Properties, Use & Occupancy Structures	Identify priority historic structures and landscapes and target properties are documented and maintained according to Secretary of the Interior and NPS standards such as to preserve their historic character and ensure the integrity of building envelopes and the stability of historic vegetation patterns against a high-energy and changing environment.	**DOCUMENTATION**—Complete basic section 110 documentation and treatment plans for structures and landscapes, scaled to meet the particular needs of each property.	- Develop and implement treatment records for all current and past landscape treatments. (1D) - Develop a preservation treatment guide for Hansen Farm (structures and landscapes). (2P) - Complete and implement a historic structure report for West Bay Club (PMIS 191296, FY 2022). (1P) - Collect oral histories related to use and occupancy and island history to better understand history and stewardship of resources. (2D) - Pursue funding for park administrative history to better understand the history of management decisions and implementation. (3D) - Develop a list of priority properties that will compete for funding for full historic structure report or cultural landscape report baseline documentation. Other properties will instead receive smaller-scale historic preservation guides and records of treatments (e.g., tracking spreadsheets) customized to meet their needs. (1P)
HISTORIC STRUCTURES AND THEIR ASSOCIATED HISTORICAL LANDSCAPES—Light Stations, Vernacular Properties, Use & Occupancy Structures	Identify priority historic structures and landscapes and target properties are documented and maintained according to Secretary of the Interior and NPS standards such as to preserve their historic character and ensure the integrity of building envelopes and the stability of historic vegetation patterns against a high-energy and changing environment.	**TREATMENT STRATEGIES**—Develop and implement strategies for addressing preservation maintenance challenges for structures that don't compete well for deferred maintenance funding because their only current usage is "preserve."	- Implement fuels reduction projects at Raspberry Island, Michigan Island, and Hansen Farm. (1I) - Implement fuels reduction projects at DE, LO, and Noreng Farm. (2I) - Implement fuels reduction projects at SA and McCloud Farm. (3I) - Expand the cultural landscape report vegetation treatment recommendations to include OU light and West Bay Club. (2I) - Continue to use prescribed burning (pile burns) as a cultural resource management tool. (2I)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
HISTORIC STRUCTURES AND THEIR ASSOCIATED HISTORICAL LANDSCAPES—Light Stations, Vernacular Properties, Use & Occupancy Structures	Identify priority historic structures and landscapes and target properties are documented and maintained according to secretary of the interior and NPS standards such as to preserve their historic character and ensure the integrity of building envelopes and the stability of historic vegetation patterns against a high-energy and changing environment.	**STRATEGIES**—Develop partnerships and agreements with past and current use and occupancy holders to ensure the long-term stewardship and maintenance of use and occupancy properties according to the secretary of the interior's standards and that maintain good relationships with these historic families.	- Complete and implement preservation treatment recommendations for Wellisch Cabin (Sand East Bay) in partnership with historic preservation partners (PMIS 313578, FY 2022). (1I) - Develop partnership agreement with historic preservation partners for the long-term management and preservation of West Bay, Wellisch, Hansen Farm, Benson Camp, and use and occupancy resources. (1P) - Identify strategies with current and past use and occupancy holders for long-term sustainability and care of the most historically significant use and occupancy structures on Sand and Rocky Islands. (2P) - Implement formulated PMIS cyclic and projects on historic structures. Projects include Hokenson Dock and Herring Shed (PMIS 219006, FY 2022); Michigan Barn and Privy (PMIS 245560, FY 2022); Museum Building (PMIS 254819, FY 2022); Raspberry Light (PMIS 254879, FY 2023); Hokenson House (PMIS 256307, FY 2023); Ashland Harbor Light (PMIS 257837, FY 2023); Hansen Farmhouse (PMIS 218012, FY 2024); Devils Dock and Boathouse (PMIS 159793). (1I)
HISTORIC STRUCTURES AND THEIR ASSOCIATED HISTORICAL LANDSCAPES—Light Stations, Vernacular Properties, Use & Occupancy Structures	Identify priority historic structures and landscapes and target properties are documented and maintained according to secretary of the interior and NPS standards such as to preserve their historic character and ensure the integrity of building envelopes and the stability of historic vegetation patterns against a high-energy and changing environment.	**STRATEGIES**—Facilitate collaboration between cultural resource staff and facilities staff to develop better project funding standard practices in order to improve the success rate in procuring preservation maintenance funding for historic properties that are most in need.	- Reexamine and reprioritize current FMSS Asset Priority Index scoring for properties in need of preservation funding (revisiting assets whose public use has changed). (1P) - Be more strategic about choosing projects to which to apply and cyclic funding (e.g., fee funding) to align them with long-term preservation goals. (1P)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
HISTORIC STRUCTURES AND THEIR ASSOCIATED HISTORICAL LANDSCAPES—Light Stations, Vernacular Properties, Use & Occupancy Structures	Identify priority historic structures and landscapes and target properties are documented and maintained according to secretary of the interior and NPS standards such as to preserve their historic character and ensure the integrity of building envelopes and the stability of historic vegetation patterns against a high-energy and changing environment.	**STRATEGIES**—Prioritize resources for management and develop a communication strategy to inform upper management and the public about the reality of the park's capacity to perform needed preservation activities for some structures, but not all.	- Prioritize preservation projects as part of annual work planning and three-year combined call cycles. (1P) - Conduct annual financial planning to identify and prioritize historic properties most suited for PMIS/FMSS funds, partnership projects, or historic leasing opportunities. (1P) - Provide semiannual briefings to the Apostle Islands Historic Preservation Conservancy and Friends on funded and planned park historic preservation projects and highlight levels of effort/ workload. (1C) - Work with stakeholders to develop alternatives for preservation and visitor use at Wellisch Cabin and West Bay Lodge. (1P)
HISTORIC STRUCTURES AND THEIR ASSOCIATED HISTORICAL LANDSCAPES—Light Stations, Vernacular Properties, Use & Occupancy Structures	Identify priority historic structures and landscapes and target properties are documented and maintained according to secretary of the interior and NPS standards such as to preserve their historic character and ensure the integrity of building envelopes and the stability of historic vegetation patterns against a high-energy and changing environment.	**CLIMATE CHANGE**—Identify, prioritize, and develop a suite of needed climate resiliency plans for the highest-risk structures and landscapes.	- Review and identify those cultural resources most threatened by climate change. (1P) - Identify resiliency needs and priority responses for individual resources. (2P) - Work with the NPS Climate Change Response Program to assist with analysis and response recommendations. (2P)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
ARCHEOLOGY AND RESOURCES OF CULTURAL INTEREST AND USE— Archeological Resources	Improve the knowledge of archeological resources, and minimize impacts from natural and human-caused harm, including potential threats due to climate change.	**IMPROVE KNOWLEDGE—** Improve knowledge of archeological resources in/around the park, prioritizing current coastal sites and sites along post-glacial shorelines.	- Collaborate with partners outside of the National Park Service, especially academic and tribal partners, to study and better understand the post-glacial shoreline. (1C) - Conduct additional chronological study, including ground truthing, of landforms after completing the LiDAR study. (2P) - Conduct additional chronological study by analyzing existing samples from known shoreline sites (as part of shoreline model development). (1D) - Complete additional archeological surface survey and testing based on results of new LiDAR data, prioritizing modern and relic shorelines. (2D) - Work with the Midwest Archeological Center to complete survey reports from the CS14 and Tombolo archeological survey projects. (1D) - Work with the Midwest Archeological Center to complete survey reports from the historic logging archeological survey. (1D) - Work with the Midwest Archeological Center to complete survey reports for the archaic and historic, Native American, and undocumented site data from the 2004–2010 field studies (including sugar bush). (2D)
ARCHEOLOGY AND RESOURCES OF CULTURAL INTEREST AND USE— Archeological Resources	Improve the knowledge of archeological resources, and minimize impacts from natural and human-caused harm, including potential threats due to climate change.	**DOCUMENTATION AND RESOURCE PROTECTION—** Identify archeological resources in the highest threat areas, determine National Register of Historic Places eligibility, evaluate threats, and develop strategies to mitigate adverse visitor impacts to archeological resources.	- Obtain funding to identify and inventory high-priority landforms. (1D) - Seek funding to evaluate and treat sites in high-risk zones, including shoreline zones and sites potentially threatened by future development (e.g., Stockton Island Visitor Center Complex). (2I) - Continue to develop and implement strategies to mitigate visitor impacts to archeological sites (e.g., historic logging camps). (2I) - Improve the park's monitoring methods for historic logging camps. (2M) - Improve the protection ranger presence on historic logging camp sites. (1M) - Focus monitoring efforts on the historic logging camps where threatened diagnostic material is likely. (2M) - Systematically identify and prioritize sites (top 10–20) for focused management that are at high risk/high threat from human activities. (2M)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
ARCHEOLOGY AND RESOURCES OF CULTURAL INTEREST AND USE—Archeological Resources	Improve the knowledge of archeological resources, and minimize impacts from natural and human-caused harm, including potential threats due to climate change.	**STRATEGIES**—Develop strategies for working with the State of Wisconsin over submerged resources.	- Reengage with the State of Wisconsin about management and visitor access to state-managed submerged resources. (3C)
ARCHEOLOGY AND RESOURCES OF CULTURAL INTEREST AND USE—Resources of Tribal/ Cultural Interest and Use	Manage resources of cultural interest and use in partnership with tribes, tribal efforts to maintain and restore their cultural connections to park lands are supported, and implement public outreach programs to foster a better understanding of tribal perspectives and treaty rights and to reduce inadvertent public interference with resources and practices.	**IDENTIFY STRATEGIES**—Remove barriers preventing tribal members from accessing park resources as a way to support tribal efforts to maintain, restore, and foster their relationships to the landscape and the nurturing of TEK/NEK.	- Through formal and informal consultation with tribal partners, identify barriers to accessing park resources and appropriate management responses and actions. (IC-joint) - Expand elder access to areas identified as being important for bridging loss of knowledge. (1I-joint)
ARCHEOLOGY AND RESOURCES OF CULTURAL INTEREST AND USE—Resources of Tribal/ Cultural Interest and Use	Manage resources of cultural interest and use in partnership with tribes, tribal efforts to maintain and restore their cultural connections to park lands are supported, and implement public outreach programs to foster a better understanding of tribal perspectives and treaty rights and to reduce inadvertent public interference with resources and practices.	**RESOURCE PROTECTION**—Identify and implement processes for protecting TEK/ NEK and resources of cultural significance, including public education.	- Collaborate with the interpretation division to incorporate additional topics into the interpretive program that leverage visitor education towards resource protection. (1C) - Through formal and informal consultation with tribal partners, identify at-risk resources of cultural interest, including TEK/NEK. (1C-joint) - Through formal and informal consultation with tribal partners, prioritize resources for focused management activity, including protection and visitor education. (1C-joint) - Develop education materials/events for park staff to better inform them about resources of cultural interest and TEK/NEK. (1C) - Promote cross-discipline education and cooperation between resource management and interpretation division staff to promote collaboration, including through fieldwork. (1C)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
ARCHEOLOGY AND RESOURCES OF CULTURAL INTEREST AND USE—Resources of Tribal/ Cultural Interest and Use	Manage resources of cultural interest and use in partnership with tribes, tribal efforts to maintain and restore their cultural connections to park lands are supported, and implement public outreach programs to foster a better understanding of tribal perspectives and treaty rights and to reduce inadvertent public interference with resources and practices.	**IMPROVE KNOWLEDGE**—Improve knowledge of prior use, present use, and desired future use of resources of cultural interest by tribal members.	- Based on consultation and feedback from tribal partners, scope and complete collaborative ethnographic resource inventories and/or traditional use studies. (2D-joint)
ARCHEOLOGY AND RESOURCES OF CULTURAL INTEREST AND USE—Resources of Tribal/ Cultural Interest and Use	Manage resources of cultural interest and use in partnership with tribes, tribal efforts to maintain and restore their cultural connections to park lands are supported, and implement public outreach programs to foster a better understanding of tribal perspectives and treaty rights and to reduce inadvertent public interference with resources and practices.	**CLIMATE CHANGE**—Improve knowledge about how climate change is impacting the relationships between tribal members and the park.	- Develop an interpretive project examining the likely impacts of climate change on Ojibwe culture and language (from loss of key species; shifts in plant phenology; seasonality of harvests and plant availability; changes in wildlife habitat and behavior; and changes in precipitation, snowfall, and lake ice cover). (3C) - Work with tribal partners to understand and implement strategies related to mitigating impacts of climate change (e.g., Tribal Adaptation Menu, Bad River Climate Change Monitoring Plan). (1I-joint) - Continue to coordinate conversations through annual meetings regarding climate change impacts (e.g., coordinate with Wisconsin's new science center). (1C-joint)
MUSEUM COLLECTION—Collection Objects (General), Archives, Imagery (including Digital Media)	Keep museum collections relevant to the park's purpose, accession and catalog collections, curate collections to NPS standards, and preserve collections in good condition.	**STRATEGIES**—Develop strategies to expand collection storage capacity and staffing. Curate collection objects in facilities with adequate environmental controls and other preventive conservation systems	- Study options for expanding physical space and quality of collection storage, including both on- and off-site options. (2P) - Identify potential off-site storage spaces that meet NPS curation standards and develop partnerships to access them. (3P) - Study shortfalls in curation facility environmental controls and develop strategies to mitigate them. (2P)
MUSEUM COLLECTION—Collection Objects (General), Archives, Imagery (including Digital Media)	Keep museum collections relevant to the park's purpose, accession and catalog collections, curate collections to NPS standards, and preserve collections in good condition.	**DOCUMENTATION**—Update or complete needed core museum baseline documents.	- Complete an updated scope of collection statement. (1P) - Complete an updated integrated pest management plan and updated housekeeping plan. (2P) - Identify and fund new plans or plan updates as needed, as strategies to improve curations facilities or move collections are developed and implemented. (3P)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
MUSEUM COLLECTION—Collection Objects (General), Archives, Imagery (including Digital Media)	Maintain and improve the organization of and access to collection objects and archives for park staff and the public.	**STRATEGIES**—Accession/catalog collection objects and make them accessible to researchers and park visitors.	- Develop partnerships for digitizing historic photos and making them available online. (2C) - Develop partnerships for doing virtual tours of historic buildings and objects. (1C) - Identify financial strategies (e.g., grant funding) to support enhanced display and care for collection objects. (2P) - Pursue funding for addressing backlog of non-accessioned archival collection materials. (1I)
MUSEUM COLLECTION—Collection Objects (General), Archives, Imagery (including Digital Media)	Maintain and improve the organization of and access to collection objects and archives for park staff and the public.	**STRATEGIES**—Retain analog and digital archives and other media accessible as older technologies become obsolete.	- Work with park information technology staff and Harpers Ferry Center staff to ensure the migration of collection electronic records, with concern for digital decay. (3I) - Retain older technology, where possible, to ensure access to older collection media types. (1I)
CEDED TERRITORY—N/A	Recognize and fully support the federal Trust Responsibility for ceded tribal territory through park policies and programs, and expand relationships with tribal partners to include collaborative stewardship of park resources.	**STRATEGIES**—Maintain agreements for treaty rights, including hunting and gathering, usual rights of occupancy (including a range of traditional ceremonies and other usage), and other rights.	- Continue maintaining the existing agreement with Great Lakes Indian Fish and Wildlife Commission member tribes and the National Park Service to meet treaty-related rights (e.g., conduct annual meetings; review and update addendums, as needed; meet on specific issues and concerns, as needed). (1I-joint) - Collaborate with tribal partners and the Wisconsin Department of Natural Resources on wolf protection and management, including formally establishing zero-quota zones for areas that provide habitat for wolves considered to be "tribal wolves." (Note: Wolves that use the park are likely "reservation" wolves and may be considered and extension of reservations.) (1C-joint) - Increase collaboration between NPS and tribal resource management programs, including working together on surveys, monitoring, and research of common interest (e.g., piping plover management, wildlife research, and management). (1C-joint)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
CEDED TERRITORY —N/A	Recognize and fully support the federal Trust Responsibility for ceded tribal territory through park policies and programs, and expand relationships with tribal partners to include collaborative stewardship of park resources.	Advocate changes to NPS/DOI policy to better address tribal sovereignty advocated.	- Advocate for NPS policies that would allow tribes to administrate their own tribal members rather than the US government (e.g., issuing permits for special use or research within the park, managing law enforcement related to hunting within the park). (1I)
CEDED TERRITORY —N/A	Recognize and fully support the federal Trust Responsibility for ceded tribal territory through park policies and programs, and expand relationships with tribal partners to include collaborative stewardship of park resources.	Identify and implement processes for protecting TEK/ NEK, and resources of cultural significance.	- Investigate and implement ways to normalize the alignment and integration of TEK/NEK and science into park resource management best practices. (1I-joint) - Conduct informal consultations with tribal leaders to share information about park resource management practices for purposes of gaining feedback. (1C-joint) - Support (e.g., seek funding for) projects that facilitate direct cooperation between park staff and tribal staff. (1C-joint)
PARK INHOLDING WITHIN THE RED CLIFF INDIAN RESERVATION —N/A	Improve the knowledge of resources in the inholding, and execute agreements to facilitate collaborative stewardship and decision-making with Red Cliff and better access to the inholding by tribal members.	**IMPROVE KNOWLEDGE—** Improve knowledge of the abundance and distribution of resources within the inholding.	- Continue collaboration with the Red Cliff Band related to natural and cultural research and information needs (e.g., research related to archeology, bears, martens, and wolves). (1C-joint)
PARK INHOLDING WITHIN THE RED CLIFF INDIAN RESERVATION —N/A	Improve the knowledge of resources in the inholding, and execute agreements to facilitate collaborative stewardship and decision-making with Red Cliff and better access to the inholding by tribal members.	**STRATEGIES—** Collaborate with the Red Cliff Band to steward the connectivity of natural resources, with success influenced by the strength of the relationships between the park and Red Cliff leaders and resource managers. Park staff considers ways to integrate the long-term Red Cliff natural resource management strategy, where possible.	- Continue and expand collaboration with the Red Cliff Band (e.g., protection, restoration, surveys, monitoring, research, information needs). (1C-joint) - Develop, if mutually beneficial, an NPS/Red Cliff agreement related to management of the NPS inholding within the Red Cliff Reservation to address issues such as harvestable species, rights of use, and occupancy, collaboration, access and usage. (1C-joint) - Formalize an annual coordination/ information sharing meeting. (1C-joint)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
PARK INHOLDING WITHIN THE RED CLIFF INDIAN RESERVATION —N/A	Improve the knowledge of resources in the inholding, and execute agreements to facilitate collaborative stewardship and decision-making with Red Cliff and better access to the inholding by tribal members.	Develop management priorities and funding strategies collaboratively between park and tribal staffs to ensure shared decision-making, shared funding, and shared prioritization for resource stewardship.	- Collaborate over project funding for repairing collapsed culverts. (1C) - Develop an agreement that promotes collaborative projects, including funding, shared knowledge, and staff. (1C) - Increase data sharing while protecting data that should not be shared. (1C-joint)
CROSS-PROGRAM RESOURCES— Partnerships	Continue to expand and deepen partnerships with associated tribes and tribal partner organizations.	Create new opportunities for information sharing, collaborating, and cross-training between park staff and tribal members.	- For all park resource management goals and activities across all resources, increase collaboration between NPS and tribal resource management programs, including working together in areas of common interest, such as surveys, monitoring, research and management. (1I-joint) - Meet with tribal partners, annually or more often, to share priorities, updates, planned research, and monitoring projects, among other items of interest or concern. (1I-joint) - Increase collaboration with tribal partners (e.g., on resource projects, funding opportunities, research collaboration and review, joint positions). (1I-joint) - Develop a communication protocol, especially for early notification of threats. (1I-joint) - Work with tribal partners to provide annual training to park staff about the park's unique relationship to tribes, including tribal rights to harvest, conduct ceremonies, and access. (1I-joint)
CROSS-PROGRAM RESOURCES— Parkwide Remote Sensing Data	Obtain remote sensing data for specific park resource stewardship projects.	Obtain remote sensing data for specific park resource stewardship projects.	- Work with partners in the use of LiDAR and sonar information (topographic, bathymetric) in support of a variety of cultural resource and natural resource projects. Collaborate with park, regional, and the Great Lakes I&M Network natural resource specialists to fund and complete a shoreline modeling project using LiDAR and other methods. (1D)
CROSS-PROGRAM RESOURCES— Citizen Science Programs	Augment park staff capacity and help achieve natural resource stewardship goals through citizen science program engagement at local, regional, and national levels.	Support park knowledge and monitoring goals for amphibians, reptiles, birds, aquatic systems, rare plants, and invasive plants through participation in citizen science programs.	- Develop a unified parkwide strategy for the park to engage in citizen science programs. (1P) - Work with the Wisconsin Department of Natural Resources to obtain citizen science information relevant to the park. (1C) - Create a watch program to engage park visitors in identifying exotic plant species that impact birds. (2C)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
CROSS-PROGRAM RESOURCES—Interpretation, Education, and Outreach	Conduct public education and outreach that convey information about the park's natural resources and major stewardship issues to enhance public knowledge, safety, and support for park resource management objectives.	Improve general public knowledge of park resources as a standalone objective as well as to enhance public appreciation of and support for park resource stewardship objectives and programs.	- Continue geology interpretation at Julian Bay, including material on climate change and the changing landscape. (1C) - Continue visitor information and public outreach about wetlands science (reference Cooper et al. 2020). (1C) - Work with partners to boost the capacity for conducting information and outreach projects/initiatives for all resource types. (1C) - Continue personal and nonpersonal opportunities for visitors to understand wetlands issues. (1C) - Communicate the wave monitoring program to the public. (1C) - Communicate emerging threats related to water quality issues to the public. (1C) - Continue presentations to enhance the public's understanding and appreciation of park resources (e.g., at the annual bird and nature festival and Audubon). (1C) - Continue to participate in the Partners in Flight initiative with the park's sister park in Costa Rica. (1C) - Include information in interpretation materials about the bats' decline and their habitat in historic structures. (1C) - Continue efforts by park staff and plover monitors to inform visitors about threats to plovers and to cultivate enthusiasm for plovers. (1C) - Model rare bat stewardship outreach efforts at other parks or bat conservation organizations (Bat Conservation International [www.batcon.org]; Wisconsin bat monitoring program [www.wiatri.net]), such as bat houses. (1C) - Encourage visitors to get involved in the protection of pollinators (e.g., through the Wisconsin Department of Natural Resources/Wisconsin Odonata Surveys; the Wisconsin Bumble Bee Brigade; or through the Wisconsin Pollinator Protection Plan education resources. (1C) - Highlight the importance of native plants to pollinators. (1C) - Leverage existing organizations to inform the public about the importance of pollinators in natural systems and in their lives. (1C)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
CROSS-PROGRAM RESOURCES—Interpretation, Education, and Outreach (CONTINUED)			- Model educational approaches/tools such as pollinator gardens, migratory pollinator trackers-monarch programs, and milkweed planting/protection projects. (1C) - Partner with Wisconsin organizations funding state native pollinator education efforts (www.wisconservation.org). (2C) - Investigate the importance/role of scenery in park interpretive themes. (currently in park purpose, significance, inherent to fundamental resources and values, park description). (2C) - Model or participate in existing stewardship programs/approaches offered by other parks or local organizations, which increase visitor and community understanding of stewardship of park natural and cultural resource systems. (2C)
CROSS-PROGRAM RESOURCES—Interpretation, Education, and Outreach	Conduct public education and outreach that convey information about the park's natural resources and major stewardship issues to enhance public knowledge, safety, and support for park resource management objectives.	Leverage social media platforms and other modern technologies as unique means to generate interest and excitement about park resources, educate a broader segment of the public, engage with national dialogues, and create interactive opportunities with remote audiences.	- Leverage social media in support of outreach and education goals for pollinators. (1C) - Encourage visitors to post their favorite scenic views on social media with park/NPS tags/handles. (2C) - Expand available online information related to the park's acoustic environment. (2C) - Include important scenic views from the visual resource inventory in the photo gallery on the park's website (e.g., 360-degree views). (1C) - Investigate the possibility of using park webcam(s) to enhance the virtual experience of park scenery. (1C) - Capture high-resolution, high-quality audio of select park resources/acoustic sources (e.g., surf echoes in sea caves). (2C) - Continue working with FAINL night sky photographers to highlight on social media the cultural value of the nocturnal environment. (1C) - Provide an air quality section on the park website with content and links to park air quality condition, trends, and implications. (2C) - Continue sharing wildlife cam efforts with the public (e.g., link to Snapshot Wisconsin, pictures from the park camera project). (1C) - Enhance social media posting with "cultural" interpretations of park "natural" resources. (1C)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
CROSS-PROGRAM RESOURCES—Interpretation, Education, and Outreach	Conduct public education and outreach that convey information about the park's natural resources and major stewardship issues to enhance public knowledge, safety, and support for park resource management objectives.	Engage with schools and teachers to connect park resource management and interpretive missions with existing formal education programs and to create new interactive learning opportunities for students.	- Continue invasive species education and outreach in schools with local nursery partnerships, exhibits, and in programming with Great Lakes Restoration Initiative funding. (1C) - Use PBS Climate Wisconsin education resources (www.climatewisconsin.org) (e.g., sugaring, phenology, ice fishing, adaptation, ice cover) and PBS Learning Media for teachers. (2C) - Determine if a cultural curriculum/media associated with birds of importance (e.g., eagle, heron, thunderbirds) is available to be shared with teachers via the park website. Monitor neotropical migrants. (2C) - Use existing teaching materials about wildlife created by teachers and tribal nations, which meet state teaching standards and have been field tested in schools and refer teachers to these resources via our website. (2C) - Continue geology education and outreach program in Bayfield School (virtual and in-person). (1C)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
CROSS-PROGRAM RESOURCES—Interpretation, Education, and Outreach	Conduct public education and outreach that convey information about the park's natural resources and major stewardship issues to enhance public knowledge, safety, and support for park resource management objectives.	In collaboration with tribal partners, create or expand interpretive materials that educate the public about the continuing cultural importance of resources throughout and beyond the park and of the fluid boundaries between what might be popularly understood as "cultural" versus "natural" resources.	- Develop a cultural native plant garden at Little Sand Bay with Red Cliff botanists and cultural advisors guiding student design and implementation, including language translations. (3C) - Develop public educational materials about the continuing cultural importance and use of certain vegetation resources. (2C) - Inspire stewardship and respect of wolf populations through visitor education about the cultural value of wolves in particular, as well as other species of cultural importance. This education will include close working relationships with tribal wolf "managers," Tribal Historic Preservation Office, and GPRO/Isle Royale National Park to identify culturally inclusive education and outreach efforts to further deepen the understanding of, for example, wolves (Ma'iingan) and how concerns about delisting/hunting interface with cultural stewardship. (1C) - Develop educational materials and programming that provide opportunities for park visitors to compare and contrast differences between designated "Wilderness," and the legal constructs within this definition, and "wilderness," allowing them to embrace the knowledge and wisdom of those living on this landscape and the way this forms our connection to wilderness areas. Include Native Ecological Knowledge to inspire and provoke to behavioral changes. (2C)

PRIORITY RESOURCE AND COMPONENTS	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY
CROSS-PROGRAM RESOURCES—Interpretation, Education, and Outreach	Conduct public education and outreach that convey information about the park's natural resources and major stewardship issues to enhance public knowledge, safety, and support for park resource management objectives.	Develop and disseminate education and outreach materials to educate visitors about park resources to enhance their own safety and prevent inadvertent damage or harm to park resources.	- Determine the most effective method for providing fish consumption advisory information to anglers as it applies to park water bodies for mercury and PCB contamination. Consider formalizing social media usage towards this end. (1C) - Communicate the importance of wetland services to nearby landowners and land managers to help minimize impacts from upland uses (e.g., slowing floodwaters and storm surges, filtering excess sediments, nutrients, pollutants, providing habitat for fish and wildlife). (3C) - Provide visitors with information needed to stay safe from potential geological hazards (e.g., risk of undercut cliffs) and to minimize impacts on resources sensitive to damage (e.g., sandscapes). (1C) - Evaluate the current Bark Ranger program and assess the desirability of expanding this program to other areas of the park, including plover nesting areas, to promote wildlife safety and pet safety. (1C) - Encourage visitors to protect the soundscapes by celebrating and becoming comfortable with natural sounds while taking a break from devices such as mobile radios and speaker systems. (2C) - Continue implementing a suite of management and interpretive/education strategies to protect habitat and reduce bear-visitor conflict. (1I) - Continue to adapt management and educational strategies as new science emerges and improves knowledge of bear habitat, bear behavior, and human behavior. Search for and learn from strategies being implemented elsewhere that prove effective, such as the Bear Aware campaign. (1I)
CROSS-PROGRAM RESOURCES—Interpretation, Education, and Outreach	Conduct public education and outreach that convey information about the park's natural resources and major stewardship issues to enhance public knowledge, safety, and support for park resource management objectives.	Identify and leverage opportunities for interdivisional cross-training and cooperation between resource managers and interpreters to enhance the success of both divisions' missions.	- Continue to collaborate between the natural resources, cultural resources, and interpretation divisions to incorporate the latest science/management data (e.g., park resource management division provides one-page resource briefs that summarize and explain the latest data and information to interpretation staff for use in developing public programming). (1C) - Include interpretation staff in natural resource projects (e.g., the piping plovers project). (1C)

APPENDIX B: APOSTLE ISLANDS NATIONAL LAKESHORE—TRIBAL PARTNERS CONSULTATION OUTCOMES (JOINT ACTIVITIES)

PARK RESOURCE	JOINT STEWARDSHIP GOALS AND ACTIVITIES
COMMON TO ALL RESOURCES	- Increase collaboration between NPS and tribal resource management programs, including working together in areas of common interest, including surveys, monitoring, research and management.
CEDED TERRITORY	**Goals** - Recognize and fully support the federal Trust Responsibility for ceded tribal territory through park policies and programs, and expand relationships with tribal partners to include collaborative stewardship of park resources. - Maintain agreements for treaty rights, including hunting and gathering; usual rights of occupancy (including a range of traditional ceremonies and other usage); and other rights. **Activities** - Continue maintaining the existing agreement with Great Lakes Indian Fish and Wildlife Commission member tribes and the National Park Service related to treaty-related rights (e.g., meet annually; review and update addendums, as needed; meet on specific issues and concerns, as needed). - Increase collaboration between NPS and tribal resource management programs, including working together on surveys, monitoring, and research of common interest (e.g., piping plover management; wildlife research and management). - Investigate and implement ways to normalize the alignment and integration of Traditional Experiential Knowledge/Native Experiential Knowledge (TEK/NEK) and science into park resource management best practices. - Conduct informal consultations with tribal leaders to share information about park resource management practices for purposes of gaining feedback. - Support (e.g., seek funding for) projects that facilitate direct cooperation between park staff and tribal staff.
NPS INHOLDING WITHIN RED CLIFF RESERVATION	**Goals** - Improve knowledge of resources in the inholding and execute agreements to facilitate collaborative stewardship and decision-making with Red Cliff and better access to the inholding by tribal members. - Develop management priorities and funding strategies collaboratively between park and tribal staffs to ensure shared decision-making, shared funding, and shared prioritization for resource stewardship. **Activities** - Continue and expand collaboration with the Red Cliff Band (e.g., protection, restoration, surveys, monitoring, research, information needs). - Formalize an annual coordination/information sharing meeting. - Develop, if mutually beneficial, an NPS/Red Cliff agreement related to management of the NPS inholding within the Red Cliff Reservation to address issues such as harvestable species, rights of use and occupancy, collaboration, access, and usage. - Increase data sharing while protecting data that should not be shared.

PARK RESOURCE	JOINT STEWARDSHIP GOALS AND ACTIVITIES
PARTNERSHIPS	**Activities** - Meet with tribal partners at least annually to share priorities, updates, planned research and monitoring projects, and other items of interest or concern. - Increase collaboration with tribal partners (e.g., on resource projects, funding opportunities, research collaboration and review, joint positions). - Develop a communication protocol, especially for early notification of threats. - Work with tribal partners to provide annual training to Apostle Islands staff about the park's unique relationship to tribes, including tribal rights to harvest, conduct ceremonies, and access.
CLIMATE CONCERNS	**Goals** - Work with tribal partners to understand and implement strategies related to mitigating impacts of climate change (e.g., Tribal Adaptation Menu, Bad River Climate Change Monitoring). **Activities** - Continue to coordinate conversation through annual meetings. Coordinate with the new Wisconsin science center. TAM.
ARCHEOLOGY AND RESOURCE OF CULTURAL INTEREST AND USE	**Goals** - Manage resources of cultural interest and use in partnership with tribes. - Support tribal efforts to maintain and restore their cultural connections to park lands. - Implement public outreach programs to foster a better understanding of tribal perspectives and treaty rights and to reduce inadvertent public interference with resources and practices. **Activities** - Perform through formal and informal consultations with tribal partners: - Identify barriers to accessing park resources and appropriate management responses and actions. - Identify at risk resources of cultural interest, including TEK/NEK. - Prioritize resources for focused management activity, including protection and visitor education. - Based on consultation and feedback from tribal partners, scope and complete collaborative ethnographic resource inventory and/or traditional use studies. - Expand elder access to areas identified as being important for bridging loss of knowledge.
AIR QUALITY	**Goals** - Work to improve the understanding of air quality condition and trend and air pollution impacts. - Seek to perpetuate the best possible air quality for the protection of resources affected by air pollution. - Be an environmental leader by reducing park air pollutant emissions, improving park sustainability, and environmental management. **Activities** - Increase collaboration with tribal partners and other partners to improve the understanding of air quality and trends related to monitoring and protection of air quality. - Develop a park air quality summary, including the compilation of existing data, condition, threats, sensitive resources, and research. - Continue to monitor air quality indicators (e.g., lichen, dragonflies).

PARK RESOURCE	JOINT STEWARDSHIP GOALS AND ACTIVITIES
GEOLOGY AND COASTAL FEATURES AND PROCESSES	**Goals** - Support natural geologic processes, while preparing for climate-related changes. - Increase collaboration and information sharing with tribal partners (e.g., Red Cliff mainland shoreline) on projects of mutual interest. **Activities** - Increase collaboration with tribal partners related to monitoring and research of joint interests. - Inventory key coastal geologic features and implement shoreline change monitoring. - Monitor erosion implications in areas with rare plant communities and archeological resources to determine if mitigations are needed. - Conduct engineering analysis before new dock construction to evaluate potential erosion/coastal process impacts. - Develop mitigation measures, where feasible and appropriate, to address coastal erosion impacts. - Conduct modeling on key coastal geologic features to predict future coastal changes in light of climate change.
WETLANDS	**Goals** - Steward and manage wetland ecosystems through partnerships that focus on recognizing their ecological and cultural importance, improving knowledge of hydrologic processes and wetland dynamics to preserve native species diversity and composition while recognizing the potential for consequential changes to this ecosystem. - Mitigate effects of invasive species (aquatic and terrestrial). **Activities** - Increase collaboration with tribal partners related to monitoring and research of joint interest. - Conduct a long-term comprehensive wetland survey, including long-term vegetation transects (5–7-year rotation). - Work collaboratively with partners to conduct exotic species surveys in coastal wetlands; share information on new detections; implement early detection and early control; and focus on high-priority species.

PARK RESOURCE	JOINT STEWARDSHIP GOALS AND ACTIVITIES
WATER RESOURCES (LAKE SUPERIOR AND INLAND STREAMS)	**Goals** - Collaborate on existing interorganizational efforts to steward and manage Lake Superior, with a focus on nearshore aquatic ecosystems and streams within Apostle Islands that work towards maintaining or improving water quality, fisheries, food webs, and native species diversity and composition. - Maintain ecological integrity of nearshore and stream ecosystems by working with partners and the public to protect water quality and mitigate impacts from stressors. - Improve the understanding of nearshore aquatic ecosystems, water quality, and water levels. **Activities** - Work with tribal and other partners to address threats that may impact water resources of the park. - Work with partners to monitor nearshore water quality conditions and temperature changes. - Work with partners to identify, respond, and provide public notification on algal blooms and other water quality issues (e.g., E. coli). - Work with Red Cliff tribal staff to collaboratively manage the aquatic systems on the inholding within the reservation, and survey/monitor island and mainland streams/drainages. - Identify likely native mussel refugia, invasive mussel habitats, and fish-spawning habitats. - Work with the Great Lakes Inventory and Monitoring Network and other partners to survey/monitor island streams/drainages for general condition, including geomorphological changes, and water quality, and to implement a wadeable streams program. - Maintain the ecological integrity of nearshore and stream ecosystems by working with partners and the public. - Continue to collaborate with partners to support real-time wave monitoring.
AQUATIC	**Goals** - Maintain the ecological integrity of nearshore and stream ecosystems by mitigating the impacts from exotic species. **Activities** - Work with tribal and other partners to develop strategies to prevent the introduction and spread of exotic species; establish an early notification protocol. - Monitor high-risk sites for invasive mussel establishment/expansion, and implement control efforts at high-risk sites, where feasible.

PARK RESOURCE	JOINT STEWARDSHIP GOALS AND ACTIVITIES
NATIVE PLANT COMMUNITIES/ RARE PLANTS	**Goals** - Steward and manage native plant communities to preserve native species abundance, diversity, composition and function and focus management attention on species that are rare, significant, or of cultural interest and use. - Obtain rare plants species information needs (e.g., data on breeding system, genetic structure, physiological requirements, nonnative and exotic species threats). **Activities** - Increase collaboration with tribal partners on planning, monitoring, and research projects of joint interest. - Continue long-term forest vegetation monitoring through collaboration with the NPS-Great Lakes Inventory and Monitoring Network. - Continue annual and long-term monitoring of rare plants and develop mitigation measures, where feasible, for rare species that are declining due to climate changes. - Continue to implement prescribed burning on the Stockton tombolo to maintain the pine forest, savanna, and barrens communities. - Increase the understanding of the impacts of blowdown events on plant communities. - Collaborate with tribal and other partners to monitor phenology. - Consider seed banking for species vulnerable to climate change and consider translocation options.
PLANTS OF SPECIAL CULTURAL INTEREST	**Goals** - Increase the understanding of past and present uses of plant resources in the park, including historic gathering (e.g., blueberries and other foods, medicines). **Activities** - Collaborate with tribal partners to monitor species of special concern and use (e.g., birch, ash). - Consult with tribal partners to obtain knowledge of past and current uses of plants within the park, while maintaining protection of sensitive information, to inform vegetation management. - Obtain information on the prevalence of plant species that are not considered "rare" but that need to be accessible and of an appropriate condition or quality for traditional use. - Identify and determine the potential for restoration of species that have been lost due to human activities. - Conduct field mapping and geographic information system development showing past and current distributions of vegetative communities. - Inventory plants of special cultural interest and use (e.g., berries, sugar maple, birch, cedar, ash, medicinal and ceremonial plants). - Continue collaboration with tribal partners to implement prescribed burning on the Stockton tombolo.

PARK RESOURCE	JOINT STEWARDSHIP GOALS AND ACTIVITIES
TERRESTRIAL	**Goals** - Minimize impacts to ecosystem function and biodiversity from invasive plant and animal species and diseases through efforts to eliminate or minimize introduction and spread, as well as targeted control. - Maintain partnerships to monitor and control invasive species at a regionwide level. - Mitigate impacts of invasive plants and animals on native species at multiple scales. - Increase the understanding of new invasive species threats due to climate change impacts. **Activities** - Develop and implement an early notification protocol to increase collaboration with tribal and other partners. - Implement early detection/rapid response strategies for various invasive species. - Incorporate the requirement for exotic species inspections and mitigation measures for projects that have the risk of spreading exotic invasive species (e.g., constructions, ground disturbance).
WILDLIFE—Insects and Pollinators	**Goals** - Obtain trophic dynamics and knowledge of insect and pollinator populations within the park to understand and best inform future management strategies. - Manage park lands to allow for a diverse community of native vegetation that provide quality habitat for pollinators and other species, where feasible. **Activities** - Conduct pollinator surveys (e.g., bees and lepidoptera), with a focus on proposed fire units and park sandscapes. - Adjust landscape management as appropriate to benefit pollinators, coordinating closely with cultural resource staff if cultural landscapes are involved. - Explore the potential for working with the US Forest Service and other partners to protect pollinators during prescribed burning.
WILDLIFE—Herptiles	**Goals** - Steward and manage amphibian and reptile habitat to preserve native species abundance, diversity, and composition. - Assess and analyze information on population trends and long-term changes to habitat and identify potential mitigation actions (focus on keystone and indicator species). - Research long-term trends and threats to amphibian species, with an emphasis on those that are key indicators of climate change (e.g., red-backed salamander) and those that may be vulnerable to commercial harvest. **Activities** - Increase collaboration with tribal partners related to monitoring and research projects of joint interest. - Conduct periodic monitoring of non-calling amphibians and reptiles. - Continue monitoring calling amphibians through acoustic monitors. - Implement adaptive management actions, as needed.

PARK RESOURCE	JOINT STEWARDSHIP GOALS AND ACTIVITIES
WILDLIFE—Birds	**Goals** - Steward and manage bird habitat and maintain native species abundance, diversity, and composition, with a focus on keystone wildlife species and species of concern that are rare, significant, or of cultural importance. - Research long-term trends of breeding, migratory, and colonial bird populations, with an emphasis on those that are key indicators of climate change. **Activities** - Increase collaboration with tribal partners related to monitoring and research projects of joint interest. - Continue long-term monitoring of breeding birds and colonial birds. - Conduct periodic monitoring of migratory birds. - Identify and monitor climate-sensitive bird species. - Implement adaptive management actions, as needed.
WILDLIFE—Game and Furbearers	**Goals** - Steward and manage native mammals and their habitat to maintain native species abundance, diversity, and composition, with a focus on keystone wildlife species and species of concern that are rare, significant, or of special cultural interest. - Manage harvestable species in collaboration with state and tribal partners. **Activities** - Meet regularly and consult with tribal partners about the status and management of harvestable species. - Consult with tribal partners regarding potential alternative management strategies when science-based strategies regarding harvestable species might conflict with cultural and spiritual well-being. - Monitor black bear, white-tailed deer, and furbearer population dynamics in collaboration with tribal and other partners. - Expand the use of apps (e.g., iNaturalist) in support of wildlife-monitoring goals.
WILDLIFE—Culturally Important, Nongame, Threatened and Endangered Species	**Goals** - Acknowledge and respect the cultural and spiritual values of Ojibwe nations related to the harvest and cultural uses of wildlife. - Collaborate with tribal partners to develop and implement wildlife management strategies, including the continuation and expansion of cooperative research and monitoring. - Reach recovery goals for rare wildlife species through the joint efforts of park staff and partners. **Activities** - Collaborate with tribal partners and the Wisconsin Department of Natural Resources related to wolf protection and management, including formally establishing zero-quota zones for areas that provide habitat for wolves that are considered "tribal wolves." (Note: Wolves that use the park are likely "reservation" wolves and may be considered and extension of reservations.) - Work with the Wisconsin marten recovery team and tribal partners related to marten protection and restoration efforts, including needed monitoring and research. - Continue working with partners to provide protection for rare bat species, including information on status and trends and protection of high-priority bat habitat. - Continue to collaborate with the Bad River Tribe, the Wisconsin Department of Natural Resources, the US Fish and Wildlife Service, and other partners to protect and manage piping plovers, including needed monitoring and research (e.g., food web, predictive modeling of habitat suitability).

PARK RESOURCE	JOINT STEWARDSHIP GOALS AND ACTIVITIES
WILDLIFE—Human/ Wildlife Conflict	**Goals** - Minimize human/wildlife conflict. **Activities** - Continue implementing a suite of management and interpretive/education strategies to protect habitat and reduce bear-visitor conflicts. - Work with tribal and state partners to help resolve situations of human/wildlife conflict. - Consider incorporating traditional tribal practices of thanks/apologies/offerings in situations of human/wildlife conflict. - Search for and learn from strategies being implemented elsewhere that prove effective, such as the Be Bear Aware campaign.

APPENDIX C: CULTURAL TERMS

Note: This section is written from the tribal perspective and tribal voice.

Welcome to the Resource Stewardship Strategy for Apostle Islands National Lakeshore. We acknowledge that we do not know everything, that we are always learning, and always listening so that we can continue to learn. Because we firmly believe that both traditional science and the voice of Traditional Experiential Knowledge (TEK) are co-equals in our quest for knowledge with which to better steward these lands, we begin this document with a Preface that provides insight into words, concepts and thoughts that inform us and encourage both individuals and teams to contemplate, better understand, discuss, and relate to TEK. For some, this way of stewarding may be a new concept. Please reach out with questions regarding the Preface as we encourage open dialogue, listening, and learning.

The following concepts in this preface were created as a thoughtful dialogue regarding words, questions, or ideas that are best considered prior to and during this planning process. There are many concepts that need consideration when understanding the relationship between the Ojibwe people and this place. There are also concepts that need consideration when attempting to understand the historic relationship between the US government and tribal nations. These are important for understanding why trust and respect must be a part of the future and why they will always require on-going effort- past actions speak louder than words when so many treaties were not honored by the US government and because past efforts at assimilation, termination, and cultural genocide left a deep trauma which still exists today. "The realization that there was a need to fight and continue to fight for sovereignty further grew in the termination era." -Myra Foster

These concepts and terms were compiled and reviewed by a group of people with high cultural competence and culturally sensitive professional approaches. Special thanks to: Anna Deschamps, (GPRO), Myra Foster, Interpretive Program Manager (APIS), Damon Panek, Ojibwe Educator (APIS), Scott Bentley, Superintendent (RIRA), Lynne Dominy, Superintendent (APIS), and Dorothy Firecloud, NPS Native American Liaison (WASO). Thanks also to all of the people who created the Tribal Adaptation Menu and shared the concepts and terms with us. TAM GLIFWC words and definitions were taken, with permission, from the Tribal Adaptation Menu Great Lakes Indian Fish and Wildlife Commission.

Importance of Human/Non-Human Relationships to the Anishinaabe
(Tribal Adaptation Menu pages 8-9)

"Relationships are the interwoven bonds that form the framework of place within which we exist. Western societies value, and therefore emphasize, the importance of human interactions. These exchanges are often categorized into bonds of family, friendship, business, casual, intimate, and intellectual, to name but a few. All these ties create a roadmap that we utilize to guide our everyday actions. Indigenous cultures around the globe and throughout time have also applied these relational values to recognizing and developing connections with their natural environment.

The Anishinaabe consider beings in the natural environment to be elders and teachers who can teach us valuable lessons. This has ensured an equitable, long-term, sustainable, and generational existence for many of these human and nonhuman communities. These relationships have developed in a multiplicity of cultures that have passed down a knowledge of place through thousands of years of experience to subsequent generations. They provide the framework of relationships and the roadmap to a truly sustainable way of life, with respect and understanding for all aspects of creation.

English and scientific terminology used in currently accepted land management practices tends to assume human dominance over non-human beings. This approach deviates from an equitable coexistence with our environment, which is typically a foundational understanding in many indigenous cultures. The terms used throughout this document are an attempt to recognize agency and sovereignty of our non-human relations. The ability of indigenous communities to survive was developed with their understanding of self within place. From this understanding, humans learned values of respect, humility, honesty, bravery, love, wisdom and truth. These values are applicable in most interactions of the Anishinaabeg people and can be closely considered when understanding an Anishinaabe perspective on climate change and adaptation. Since its inception this world has been constantly changing. Seasons change, years change and eventually, climates change. From an Ojibwe perspective, one can derive an understanding of these changes through the values that are declared in stories, practices and teachings."

The Ojibwe have a seven values framework which emphasizes the importance of wisdom, love, respect, bravery, honesty, humility/compassion and truth. Respecting these values is key to defining resource stewardship. (Bad River cultural web site Culture – Bad River Tribe (http://www.badriver-nsn.gov/culture/))

- **Bravery/Aakode'ewin:** To face the foe with integrity. In the Anishinaabe language, this word literally means "state of having a fearless heart." To do what is right even when the consequences are unpleasant.
- **Honesty/Gwayakwaadiziwin:** Honesty in facing a situation is to be brave. Always be honest in word and action. Be honest first with yourself, and you will more easily be able to be honest with others.
- **Humility/Dabaadendiziwin:** To know yourself as a sacred part of Creation. In the Anishinaabe language, this word can also mean "compassion." You are equal to others, but you are not better.
- **Love/ Zaagi'idiwin—To know peace is to know Love. Love must be unconditional. When people are challenged emotionally and financially they become fearful of their situation. Anishinaabeg is reminded to love the people; the children; and the environment.**
- **Respect/Minaadendamowin:** To honor all creation is to have Respect. All of creation should be treated with respect. You must give respect if you wish to be respected.
- **Truth/Debwewin:** To know all of these things. Speak the truth. Do not deceive yourself or others.
- **Wisdom /Nibwaakaawin:** To cherish knowledge is to know Wisdom. Wisdom is given by the Creator to be used for the good of the people.

"There are still important ways to stop cultural genocide from continuing- assuring tribal languages are spoken, heard, and read in tribal homelands; reconnecting youth and elders together on sacred sites and traditional cultural landscapes; and respecting tribal values and beliefs..."-Lynne Dominy

WORDS matter and should be used carefully as they often have different meanings in different cultures and in different government agencies, including the National Park Service. Some words broaden our understanding of the word "Ojibwe" and the language spoken by the people. Anglo culture and laws have created terms which are associated with tribal relationships. This is especially true with the Native American Graves Protection and Repatriation Act (Public Law 101-601). It is also important to understand that spoken words are understood in context and often by location/place. Written words thus have an incomplete meaning.

Languages are complex and tied to cultural values, personal relationships, and deep knowledge passed through many generations as a binding force for learning, sharing, and understanding about all living and non-living things around us. Traditional languages must be stewarded and taught for relationships with the world to continue to be understood and sustained.

- **Anishinaabe:** A group of culturally related Indigenous peoples in Canada and the United States that include the Odawa, Ojibwe (including Mississaugas), Potawatomi, Oji-Cree, and Algonquin peoples. (TAM GLIFWC). "Respect starts when you understand that all people have a name for themselves and do not need others to rename them." -Lynne Dominy
- **Anishinaabewakiing:** Ojibwe word for original land/place. (TAM GLIFWC)
- **Anthropogenic:** Relating to or resulting from the influence of human beings on nature. (TAM GLIFWC)
- **Apostle Islands/Wenabozho ominisan:** The name for the 22 Apostle islands in Ojibwe is Wenabozho ominisan, which translates to a possessive relationship between the cultural hero Wenabozho and his ownership of the islands as the one who made them.
- **Associated group:** Indigenous people with a connection to a place or resource. This includes all native tribes and native indigenous communities, regardless of recognition status, which does not impact these groups' sovereignty, interests in ancestral territory and resources, or the validity of traditional knowledge and cultural practices.
- **Bad River Band of Lake Superior Chippewa/Mashkiiziibii:** the Ojibwe name for the people who live within or are members of the Bad River Band of Lake Superior Chippewa. Bad River is the largest Chippewa reservation in Wisconsin at 124,459 acres. The reservation encompasses 36 miles of Anishinaabeg-Gichigami (Lake Superior) shoreline and over 488 miles of rivers and streams. The park is within the ceded territory of the Ojibwe nations where they continue to maintain their reserved rights for hunting, gathering and fishing. (Bad River website)
- **Band:** sub-group of a tribe. The two neighboring bands to this park are the Red Cliff and Bad River Bands of Lake Superior Chippewa.
- **Being:** an organism, creature and/or spirit. Beings include those which are both animate (i.e., fish) and inanimate from the western perspective (i.e., rocks) and implies an equal importance to all. (TAM GLIFWC)
- **Blueberries/miinagaawanzh:** these native berries are gathered in the park and their presence is enhanced by the use of prescribed fire/ishkode, especially on Stockton Island.
- **Ceremony:** Ceremonies have been taking place in this area for a very long time and are protected by law. Ceremonies can be simple gestures of thanks or elaborate celebrations. The NPS has the responsibility to provide affiliated tribal nations with ceremonial access to the park in ways that acknowledge tribal sovereignty and values (see sovereignty; wisdom, love, respect, bravery, honesty, humility, truth). "An offering could just be a moment to recognize how lucky we are to have all these gifts around us and that when you look at how dependent we really are, we should be more grateful." Damon Panek
- **Chippewa:** An Algonquin speaking group of Native Americans that inhabit the Great Lakes region in the United States and Canada. The official name given to the Anishinaabe by the US Government recognizing different bands of Ojibwe people, such as the Red Cliff Band of Lake Superior Chippewa, the Bad River Band of Lake Superior Chippewa, etc. See also Anishinaabe & Ojibwe.

- **Clan:** The Ojibwe have clans called odoodeman. They are a patrilineal society meaning their clan or "dodem" membership is passed down through the father. A person's clan membership originally denoted what function in society the family and individual would fulfill. The primary clans surviving here are the Crane, Loon, Eagle, Bear, Marten, Lynx, Bullhead, Sucker and Turtle-all of which have special cultural significance. The original religious society is known as Midewiwin or Grand Medicine Lodge.

- **Community:** Ojibwe culture speaks with a community voice not an individual voice thus consultation requires a broad community conversation which often includes elders, traditional leaders, and elected officials. Everyone has a valued place in the Ojibwe community; single people, childless adults, families, grandparents, elders, children; everyone.

- **Conservation:** Keeping or protecting something, especially an environmentally or culturally important place or thing, from harm or destruction. Conservation seeks the proper use of nature, while preservation seeks protection of nature from use. In the NPS, conservation is generally associated with the protection of natural resources, while preservation is often associated with the protection of cultural resources such as buildings, objects, and landscapes.

- **Consultation:** Per the implementing regulations of Section 106 of the National Historic Preservation Act (NHPA), consultation means the process of seeking, discussing, and considering the views of other participants, and, where feasible, seeking agreement with them regarding matters arising in the section 106 process (36 C.F.R. § 800.16). Pertaining to Indian tribes, consultation means the process of government-to-government dialogue between the Federal Government and Indian tribes regarding proposed federal actions in a manner intended to secure meaningful and timely tribal input. It is a deliberative process that aims to create effective collaboration and informed federal decision-making. Consultation is built upon government-to-government exchange of information and promotes enhanced communication that emphasizes trust, respect, and shared responsibility. The U.S. Government conducts consultation with Indian or Alaska Native tribes, bands, nations, pueblos, villages, or communities that the Secretary of the Interior acknowledges to exist as an Indian tribe pursuant to the Federally Recognized Indian Tribe List Act of 1994, 25 U.S.C. 479a. Coordination and collaboration are essential for effective consultation, but they do not satisfy the requirement of legally mandated government-to-government consultation.

- **Culture/Enaadizing:** is used to describe a people groups or tribal habits, beliefs, and traditions. It is often used interchangeably with "tradition." (TAM GLIFWC)

    - **Cultural appropriation:** taking intellectual property, traditional knowledge, cultural expressions or artifacts from someone else's culture without permission. (Susan Scafidi)

    - **Cultural credibility:** a trait possessed by someone trusted with cultural knowledge gained directly through tribal relationships with tribal elders and leaders.

- **Cultural landscape:** A geographic area (including both cultural and natural resources and the wildlife or domestic animals therein), associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values (Birnbaum and Peters 1996).

- **Cultural resources:** The broad array of stories, knowledge, people, places, structures, and objects, together with their associated environment, that contribute to the maintenance of cultural identity and/or reveal the historic and contemporary human interactions with an ecosystem. "Cultural and natural resources are intertwined when your identity is linked to the world around you." -Damon Panek

- **Culturally sensitive information:** Information that is culturally privileged or otherwise controlled or regulated, often by gender, age, or cultural norms. Sharing this knowledge with non-tribal members may be contrary to tribal practices. Even though culturally sensitive information may sometimes be publicly available, respect for the nature of this information must be demonstrated when consulting with tribes.

- **Elders:** Tribal elders are the keepers of knowledge and the teachers of values and living history.

- **Enabling Legislation:** legislation passed in the US Congress establishing a unit of the NPS and defining its purpose. Legislation is unique to each site and identifies conditions of establishment.

- **Federally recognized Indian Tribe:** Indian tribe, band, nation, or other organized group or community that the Secretary of the Interior acknowledges to exist as an Indian tribe pursuant to the Federally Recognized Indian Tribe List Act of 1994, 25 U.S.C. 479a, which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians (36 C.F.R. § 800.16). Historically, most of today's federally recognized tribes received federal recognition status through treaties, acts of Congress, presidential executive orders or other federal administrative actions, or federal court decisions. The Federal Government has a unique relationship with Indian tribes derived from the Constitution of the United States, treaties, Supreme Court decisions, and federal statutes. Consultation with a federally recognized Indian tribe must recognize the government-to-government relationship between the Federal Government and Indian tribes and should be conducted in a sensitive manner respectful of tribal sovereignty (36 C.F.R. § 800.2 and Executive Order 13175).

- **Fire/ishkode:** An earth element and an ancient Ojibwe spirit, here long before humans. Sacred fire is often a part of ceremonies and has many spiritual meanings.

- **Gathering (of plants):** Picking or collecting natural resources for ceremonial or consumptive use by citizens of Federally Recognized Tribal Nations. The gathering of plants is a protected treaty right that the park recognizes. Great Lakes Indian Fish and Wildlife Commission (GLIFWC) works with tribes throughout Ceded Territory on limits for certain plant gathering (https://data.glifwc.org/regulations/gathering.php).

- **Great Lakes Indian Fish and Wildlife Commission (GLIFWC):** GLIFWC represents eleven Ojibwe tribes in Minnesota, Wisconsin, and Michigan who have reserved hunting, fishing and gathering rights in the 1836, 1837, 1842, and 1854 Treaties with the United States government. GLIFWC provides natural resource management expertise, conservation enforcement, legal and policy analysis, and public information services in support of the exercise of treaty rights during well-regulated, off-reservation seasons throughout the treaty ceded territories.

- **Harvesting:** to harvest something means that you pick or gather it. Harvesting is a protected treaty right and refers to the gathering of a crop for sustenance or killing of an animal for consumption (https://www.glifwc.org/publications/pdf/jointtreatyrightspub.pdf). "Treaty-reserved rights to harvest" natural resources are a property right protected under the Fifth Amendment to the U.S. Constitution. The federal government, as a treaty signatory, is required to uphold treaty rights, including the protection and restoration of natural resources on which those rights are based."

- **Indigenous:** Original inhabitants of a region, prior to colonization by another culture. Also used interchangeably with "native" or "native peoples" (TAM GLIFWC).

- **Invasive/Non-native species/bakaan ingoji ga-ondaadag:** Non-local beings. The Ojibwe term translates to "that which comes from somewhere else and now resides here" (TAM GLIFWC).

- **Lake Superior/Anishinaabeg-Gichigami:** the largest and northernmost of the great lakes.

- **Land Management:** The process of managing the use and development (in both urban and rural settings) of land resources. The US government has established many different land management agencies for public lands including the National Park Service-which focuses on land conservation and quality visitor experiences. "Ojibwe people do not navigate their environment in terms of managing because it really isn't up to us to do that. Rather, we can influence a certain condition but we aren't in-charge... Our goal should be to work collaboratively with the natural environment." -Damon Panek

- **Memorandum of Agreement (MOA):** A written agreement that describes in detail the specific responsibilities and actions to be taken by each of the parties so that their goals may be accomplished. Per the implementing regulations of NHPA Section 106, MOA means the document that records the terms and conditions agreed upon to resolve the adverse effects of an undertaking upon historic properties (36 C.F.R. § 800.16). In general, an MOA is legally enforceable. As used by the U.S. Army Corps of Engineers, for example, an MOA is a "conditional agreement" between two or more parties where the transfer of funds for services is anticipated.

- **Medicine/nookwezigan:** in this context, could be anything natural. Ojibwe sacred herbs are nookwezigan. (TAM GLIFWC) "Some medicines are also spiritual in nature. "-Damon Panek

- **Migration:** The Anishinaabe migrated to the shores of Gichi Gami (Lake Superior) because of a prophecy that was gifted to our people from the manidoog (spirits) through the dream world. This prophecy told the Anishinaabe to follow the miigis shell toward the setting sun, and that there would be seven stopping points. The final of which would be the place where our people would live forever; the place where the food (wild rice) grows on water. The migration prophecy brought them to where they are now. (Red Cliff Language Plan 2020)

- **Native:** Describe the original inhabitants of a region, prior to colonization by another culture. Sometimes used interchangeably with "indigenous" (TAM GLIFWC).

- **Natural Resources:** Resources that exist without any actions of humankind. On Earth, it includes sunlight, atmosphere, water, land, all minerals along with all vegetation, and animal life. These resources may have human valued characteristics such as commercial and industrial use, aesthetic value, scientific interest and cultural significance/use.

- **Native Experiential Knowledge/NEK:** A more inclusive way to recognize the experiential knowledge that comes with living in an area for a long time and passing that knowledge on to others. "You don't have to be Native to pay attention and teach others about your connection to a place." -Damon Panek (*Also see TEK*).

- **Ojibwe:** An Anishinaabe group of Indigenous peoples that originated from the northern United States and Canada. Also, the Indigenous language of these people (TAM GLIFWC). The native language is known as Ojibwe Anishinaabemowin. The meaning of the word Ojibwe is unclear but some would translate it as "he who writes," referring to the fact that the people kept some of their records written on birchbark scrolls in a pictographic writing system they had developed. See also Anishinaabe & Chippewa. "Tribal languages are a cultural resource which must be protected and sustained. They are an essential element for maintaining tribal cultures and on-going relationships with their homelands."-Lynne Dominy

- **Organic Act:** The Act of Congress which states that "the National Park Service thus established shall promote and regulate the use of the Federal areas known as national parks, monuments and reservations . . . by such means and measures as conform to the fundamental purpose of the said parks, monuments and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

- **Programmatic agreement:** A document that records the terms and conditions agreed upon to resolve the potential adverse effects of a federal agency program, complex undertaking or other situations in accordance with 36 C.F.R. § 800.14(b) (36 C.F.R. § 800.16).

- **Peer review:** evaluation of a person's work or performance by a group of people in the same occupation, profession, or industry. https://www.dictionary.com/browse/peer-review?s=t. "Native Experiential Knowledge (NEK) utilized similar form of peer review that are found in the scientific process. Ojibwe cultural life ways are based in peer review." -Damon Panek

- **Preservation:** Conservation seeks the proper use of nature, while preservation seeks protection of nature from use. In the NPS, conservation is generally associated with the protection of natural resources, while preservation is associated with the protection of cultural resources such as buildings, objects, and landscapes. "The words conserve and protect go against our beliefs about gathering for use. What we don't use we lose." -Melanie Montano, GLIFWC

- **Reciprocity:** The practice of exchanging things with others for mutual benefit, especially privileges granted by one country or organization to another. (TAM GLIFWC)

- **Red Cliff Band of Lake Superior Chippewa Reservation/ Miskwaabikaang:** The reservation hugs the northeastern shoreline of the Bayfield Peninsula, nestled between Cornucopia and Bayfield overlooking the Apostle Islands in northern Wisconsin. As of January 2021, there are 7,548 living Red Cliff Tribal Members. The park is within the ceded territory of the Ojibwe nations where they continue to maintain their reserved rights for hunting, gathering and fishing.

- **Research:** the systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions. It is important to combine scientific and TEK/NEK knowledge together when doing comprehensive research.

- **Resource:** A feature, material, or supply that can be drawn upon to enhance or contribute to life. This applies to purposes of sustenance and/or quality of life. Most often this encompasses tangible items of importance held by indigenous communities and could include but not be limited to: the flora and fauna of an area, as well as hunting, fishing, and gathering locations, archaeological sites, rock features, villages, and burial locations. However, intangible items are also important resources for indigenous communities and may include sacred spaces or places such as creation or prayer areas. Natural phenomena such as wind, water currents, lightning, and thunder are potential attributes associated with resources.

- **Reserved Rights:** *"…holds that any rights that are not specifically addressed in a treaty are reserved for the tribe. In other words, treaties outline the specific rights that the tribes gave up, not those that they retained. The courts have consistently interpreted treaties in this fashion, beginning with United States v Winans, 198 U.S. 371, 25S.Ct. 662, 49 L. Ed. 1089 (1905), in which the U.S. Supreme Court ruled that a treaty is "not a grant of rights to the Indians, but a grant of rights from them." Any right not explicitly extinguished by a treaty or a federal statute is considered to be "reserved" to the tribe. Even when a tribe is officially "terminated" by Congress, it retains any and all rights that are not specifically mentioned in the termination statute."*

- **Sacred:** When plants, animals, birds, or other beings have such a high degree of cultural significance that their value transcends across cultures and beyond consumptive uses. Examples include species like ma'iingan (wolf) who are seen as brothers not as a harvestable species. Other examples include plants like asemaa (tobacco) which is a gift or offering when requesting permission from another being and nookwezigan (sacred herbs).

- **Sacred sites:** Indian sacred sites are defined in Executive Order 13007 as "specific, discrete, narrowly delineated locations on Federal land that are identified by an Indian tribe, or . . . authoritative representative of an Indian religion, as sacred by virtue of their established religious significance to, or ceremonial use by, an Indian religion . . ." This definition is at odds with the Indian traditional view that the sacred is embedded in all natural phenomena, and that sacred sites are often not confined or precisely delineated. The executive order definition of sacred site clearly focuses on the places that are more important than others for worshipping the sacred or conducting religious ceremonies, and it is those special places that federal agencies are directed to consider under the executive order. Broader cultural landscapes and values in addition to the more specifically defined locations should be addressed as human environment elements through the National Environmental Policy Act analysis.

- **Scientific/science:** The intellectual and practical activity encompassing the systematic study of the structure and behavior of the physical and natural world through observation and experiment. (https://www.lexico.com/en/definition/science)

- **Scientific Ecological Knowledge (SEK):** An alternative to the phrase 'western science;' describes an objective and quantitative system of knowledge which relies on certain laws that have been established through the application of the scientific method. SEK often views humans as separate from the natural world (TAM GLIFWC).

- **Self-determination:** In 1975, the United States Congress enacted the Indian Self-Determination and Education Assistance Act, Public Law 93-638. The Act allowed for Indian tribes to have greater autonomy and to have the opportunity to assume the responsibility for programs and services administered to them on behalf of the Secretary of the Interior through contractual agreements. The Act assured that Indian tribes had paramount involvement in the direction of services provided by the Federal government in an attempt to target the delivery of such services to the needs and desires of the local communities (BIA).

- **Spatial area:** An area of interest defined by a tribe or other indigenous group. It is deliberately all-encompassing and intended to include the diverse and complex understandings of the world held by tribes that pertain to airspace, land surface and below surface dimensions and can be defined by but not limited to: oral traditions, ratified or non-ratified treaties, executive orders, statutes (federal or state), cultural use or based on historical documents.

- **Stewardship:** Stewardship is an ethic that embodies the responsible care of resources. The word "steward" for the National Park Service (NPS) means a manager, administrator, or guardian who cares for the public parks, resources, values. NPS employees are given this role and trust by Congress and the American public to care for the resources on NPS lands and provide leadership for resource management throughout the nation.

- **Traditional:** Long established tribal knowledge, habits, beliefs, lands, religion, ceremonies, techniques, trades, festivities and lifeways handed down through the generations. It is often used interchangeably with "cultural" (TAM GLIFWC).

- **Traditional Cultural Property (TCP):** A property on the National Register of Historic Places (buildings, structures, sites, historic districts, objects, landscapes) may possess traditional cultural significance, derived from the role the property plays in a community's historically rooted beliefs, customs, and practices. That property would be eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community. Because a TCP is a National Register property type, it must have a defined boundary. This can apply to non-indigenous traditional groups (Parker and King 1990).

- **Traditional [Ecological] Knowledge (TK or TEK):** A cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission. It concerns the relationship of living beings (including humans) with one another and with their environment. See NEK.

- **Treaties:** A formal agreement or contract between two or more sovereign nations that acknowledges the creation of agreed upon binding rights, entitlements, boundaries, alliances and/or obligations. Article VI of the United States Constitution states "…all treaties made, or which shall be made, under the authority of the United States, shall be the supreme law of the land; and the judges in every state shall be bound thereby, anything in the Constitution or laws of any State to the contrary notwithstanding."

- **Treaty Area:** A geographic region a treaty applies. Often, treaty areas relate to Federally Recognized Tribal Nation areas in which the Nation's hunting, fishing, and gathering rights were retained by tribes when they ceded their lands to the United States government, but it can also refer to other entitlements in a specific geographic region. (TAM GLIFWC)

- **Treaty Rights:** Treaty rights are legal entitlements established or reserved through a treaty recognized by the United States government and Tribal Nation(s) and upheld by the Supreme Court. (TAM GLIFWC)

- **Treaty Tribe:** A Native American tribe that formally negotiated a treaty with the United States government between 1778 and 1871, which was subsequently ratified by the United States Senate. The Anishinaabe of Lake Superior engaged in many treaties with the United States Government. The most referenced of these treaties were made in the years 1836, 1837, 1842, and 1854. These 4 treaties ceded millions of acres of land to the United States Government. A treaty is a constitutionally recognized contract between sovereign nations. These legally binding contracts are protected under the U.S. Constitution, which states that they are the "supreme law of the land." Under these treaties, tribes ceded millions of acres of land while retaining certain rights such as fishing, hunting, and gathering, as well as rights to determine use of reserved land and its resources. As federally recognized tribes, treaty tribes retain a sovereign status and maintain a government-to-government relationship with the United States. The treaties obligate the Federal Government to protect tribal treaty rights, lands, assets, and resources—commonly referred to as a trust obligation.

- **Tribal Nation or Tribe:** In the United States, a Tribe or Tribal Nation refers to a sovereign self-governing group of united people that existing before the development of states. Generally, each Tribe has a unique history, culture, language or dialect or language and inhabited a particular geographic region. The northern Midwest region includes Ojibwe (also known as Chippewa), Menominee, Ho-chunk, Potawatomi, Ottawa, and Dakota tribes, among others (TAM GLIFWC).

- **Tribal Sovereignty:** Tribal sovereignty refers to the fact that each tribe has the inherent right to govern itself. The ways that individual tribes exercise their sovereignty vary widely, but, in general, tribal authority is used in the following ways: to form tribal governments; to determine tribal membership; to regulate individual property; to levy and collect taxes; to maintain law and order, to exclude nonmembers form tribal territory, to regulate domestic relations; and to regulate commerce and trade. (https://legal-dictionary.thefreedictionary.com/Reserved+Rights+Doctrine)

- **Tribal Cultural Landscape (TCL):** Any place in which a relationship, past or present, exists between a spatial area, resource, and an associated group of indigenous people whose cultural practices, beliefs, or identity connects them to that place. A tribal cultural landscape is determined by and known to a culturally related group of indigenous people with relationship to that place. (A Guidance Document for Characterizing Tribal Cultural Landscapes, BOEM-2015-047).

- **Tribal Historic Preservation Officer:** In accordance with Section 101(d)(2) of the National Historic Preservation Act, Tribal Historic Preservation Officers (THPOs) formally assume the responsibilities of the State Historic Preservation Officer (SHPO) for purposes of Section 106 compliance on their tribal lands (all lands within the exterior boundaries of any Indian reservation and all dependent Indian communities). These duties include identifying and maintaining inventories of culturally significant properties, nominating properties to national and tribal registers of historic places, conducting Section 106 reviews of federal agency projects on tribal lands, and conducting educational programs on the importance of preserving historic properties. Federal agencies consult with THPOs in lieu of the SHPO for undertakings occurring on, or affecting historic properties on, tribal lands. The decision to participate or not participate in the national historic preservation program rests with the tribe.

- **Use:** Many native cultures believe that they have a reciprocal relationship with the world around them. When they take something they offer something else in return. “From the Anishinaabe view what we don’t use we will lose.” -Melanie Montano, GLIFWC

- **Undertaking:** A project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a federal agency; those carried out with federal financial assistance; and those requiring a federal permit, license or approval (36 C.F.R. § 800.16).

- **Whole system:** connection of each individual to the entire system including the soil, water, air- the interactions between all life.

- **Wilderness:** Wilderness implies an area of land remains in its natural state, unsettled and uncultivated. “Wilderness preservation is the philosophy that recognizes an inherent worth of all living beings, regardless of their instrumental utility to human needs.” -Aldo Leopold

- **Wild/primeval:** The idea that something is wild refers to an area of land or animal that is untamed or undomesticated. Primeval refers to something that is ancient, original, prehistoric or in its original pristine state. “The idea that North America was a wilderness devoid of settlements and uncultivated when Europeans arrived is rooted in manifest destiny and the justification for the American government taking of lands to colonize tribal lands. We know that Native people had sophisticated settlements with far reaching economies, agriculture and lifeways to support their villages and nations. To suggest that things were wild perpetuates the lie that native people were not sophisticated members of well-established self-governing nations that have occupied North America since time immemorial. We just need to be careful with how we word things.” -Damon Panek

RESOURCES

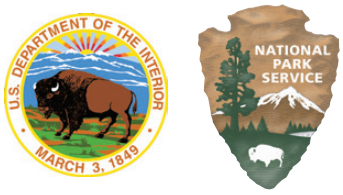
- **The Ojibwe People's Dictionary:** https://ojibwe.lib.umn.edu/
- **Federal glossary:** https://sanctuaries.noaa.gov/tribal-landscapes/appendix1.html
- **A Guide to Cultural Awareness of Minnesota:** https://www.dhs.state.mn.us/main/groups/agencywide/documents/defaultcolumns/dhs16_158118.pdf
- **Guidance Document for Characterizing Tribal Cultural Landscapes:** https://www.boem.gov/sites/default/files/environmental-stewardship/Environmental-Studies/Pacific-Region/Studies/BOEM-2015-047.pdf
- **A Tribal Perspective:** Steps Toward Cultural Sensitivity: https://www.zerotothree.org/resources/2077-a-tribal-perspective-steps-toward-cultural-sensitivity

CONTACT INFORMATION

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As the nation's principal conservation agency, the Department of the Interior has 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 historic 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 US administration.

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RESOURCE STEWARDSHIP STRATEGIES

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