



# *Sleeping Bear Dunes National Lakeshore*



**Final  
General Management Plan  
Wilderness Study  
Environmental Impact Statement**

*October, 2008*







IN REPLY REFER TO:

# United States Department of the Interior

## NATIONAL PARK SERVICE

Sleeping Bear Dunes National Lakeshore  
9922 Front St. (Hwy M-71)  
Empire, Michigan 49630-9797

D18 (SLBE)

October, 2008

Dear Friends and Neighbors of Sleeping Bear Dunes National Lakeshore:

We are very pleased to present to you the *Final General Management Plan/Wilderness Study/Environmental Impact Statement* for Sleeping Bear Dunes National Lakeshore (National Lakeshore). The completion of this document depended on the participation of all of you and reflects your valued input.

The planning process for this *Final General Management Plan/Wilderness Study/Environmental Impact Statement* began in 2006. Throughout the process National Lakeshore staff conducted an extensive public involvement and outreach program. As we go to press with the final document, National Park Service (NPS) staff have met with more than 2,500 people in more than 90 informational meetings held throughout the planning process.

We want to express our gratitude to the many of you who provided comments on the *Draft General Management Plan/Wilderness Study/Environmental Impact Statement*. The draft plan was made available for public review between April 7 and June 15, 2008. Public hearings were held in Honor, Traverse City, and Glen Arbor, Michigan, on June 3, 4, and 5, 2008, respectively, with a total of 196 people attending. A total of 292 comments were received via letters, electronic mail messages, Web responses, and comments transcribed from the public hearings.

The *Final General Management Plan/Wilderness Study/Environmental Impact Statement* was crafted from the valuable input we received on the draft plan, and we have revised the preferred alternative based upon your input. Perhaps the most significant changes are that the Cottonwood Trail into the dunes from the Pierce Stocking Scenic Drive has been removed from proposed wilderness, and electric motors will be allowed on Otter, Tucker, and Bass (Leelanau County) lakes. To see all the significant changes to the preferred alternative, and for information on the wide range of comments received and our responses to those comments, please refer to the "Comments on, Changes to, and Responses to Comments on the Draft Plan" section in chapter 6 of this plan.

Copies of the plan will be available at:

- Libraries: Benzie Shores District Library, Darcy Library of Beulah, Glen Lake Community Library, Leelanau Township Library, Leland Township Library, Library of Michigan, Suttons Bay Bingham District Library, and Traverse City District Library

- On the Internet (follow instructions and link from the park website at [www.nps.gov/slbe](http://www.nps.gov/slbe))
- Sleeping Bear Dunes National Lakeshore Visitor Center

Following distribution of the final plan and a 30-day no-action period, a “Record of Decision” will be signed by the National Lakeshore superintendent and the NPS regional director documenting the selection of the alternative to be implemented.

I would like to take this opportunity to express my appreciation for your continued interest in this very special place. Working together, we have developed a final plan that maintains a variety of recreational opportunities while continuing to preserve and protect the natural and cultural resources of Sleeping Bear Dunes National Lakeshore. We could not have done this without you.

Sincerely,

A handwritten signature in black ink, appearing to read "Dusty Shultz". The signature is fluid and cursive, with the first name "Dusty" and last name "Shultz" clearly distinguishable.

Dusty Shultz  
Superintendent

**Final**  
**General Management Plan / Wilderness Study / Environmental Impact Statement**  
**Sleeping Bear Dunes National Lakeshore**  
Benzie and Leelanau Counties, Michigan

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Sleeping Bear Dunes National Lakeshore was established by the U.S. Congress in 1970 by Public Law 91-479. Part of the national park system, the National Lakeshore, which consists of a mainland portion plus North Manitou and South Manitou islands (71,291 acres total), is in the northwestern portion of Michigan's Lower Peninsula. The mainland portion straddles Benzie and Leelanau counties. The Manitou Islands, entirely in Leelanau County, are located about 7 miles to the northwest in Lake Michigan.

The National Lakeshore's last *General Management Plan* was completed in 1979. Since 1970, most of the 71,291 acres in the National Lakeshore's boundary have come into federal management. Private development adjacent to and near the National Lakeshore is continuing to increase. The National Lakeshore faces new resource and other management challenges as a result of these changes. In 1982 a boundary revision was authorized, in a legislative amendment, to include the Bow Lakes and Miller Hill areas, and more recently, lands along the Crystal River were added to the National Lakeshore. This current *General Management Plan* will provide management direction for these new lands. Recent studies have enhanced the National Park Service's understanding of the resources in the National Lakeshore. Desired conditions and general (conceptual) direction for management of these resources need to be defined.

The *Wilderness Study* considerations in this plan provide a public forum for evaluating lands within the National Lakeshore for possible recommendation to Congress for inclusion in the national wilderness preservation system. The *Wilderness Study* is included because of public interest and because inclusion saves time and money. Wilderness, which can be designated only by Congress, provides for permanent protection of lands in their natural condition, providing outstanding opportunities for primitive and unconfined recreation.

The document examines five alternatives for managing the National Lakeshore for the next 20 or more years. It also analyzes the impacts of implementing each of the alternatives. The **no-action alternative** reflects current conditions and activities at the Lakeshore. It is provided as a base-line against which to compare the other alternatives and includes 30,903 acres managed to maintain their existing wilderness character. In the **preferred alternative**, the Lakeshore is valued primarily for preservation of its natural resources, and for the opportunities it provides for visitor enjoyment of the natural, cultural, and recreational resources in a scenic outdoor setting. Lands proposed for wilderness designation include 32,100 acres and no developed county roads. In **alternative A**, the Lakeshore is valued primarily for conservation of its natural resources. Lands proposed for wilderness designation include 33,600 acres and no developed county roads. In **alternative B**, the Lakeshore is valued primarily for its recreational opportunities in scenic outdoor settings. Lands proposed for wilderness designation include 14,400 acres and no county roads. In **alternative C**, the Lakeshore is managed so that most visitor use is concentrated in selected areas, with more natural, primitive conditions promoted in the rest of the Lakeshore. Lands proposed for wilderness designation include 23,200 acres and no developed county roads. The five alternatives are summarized in table 2 (in the pocket at the end of the document). The key impacts of implementing these alternatives are summarized in table 4 and detailed in chapter 5.

This document has been distributed to other agencies and interested organizations and individuals for their review. Following distribution of the final plan and a 30-day no-action period, a "Record of Decision" will be signed by the National Lakeshore superintendent and the NPS regional director documenting the NPS selection of an alternative for implementation.





## SUMMARY

### BRIEF DESCRIPTION OF THE NATIONAL LAKESHORE

Sleeping Bear Dunes National Lakeshore (hereafter referred to as National Lakeshore, Lakeshore, or park) was established by the U.S. Congress in 1970. Part of the national park system, the National Lakeshore consists of a mainland portion located in Michigan's lower peninsula plus North Manitou and South Manitou islands (71,291 acres total).

### PURPOSE FOR THE GENERAL MANAGEMENT PLAN / WILDERNESS STUDY / ENVIRONMENTAL IMPACT STATEMENT

General management plans are required for all units of the national park system and are intended to establish the future management direction of a park unit. General management plans look 20 or more years into the future and consider the park system unit holistically, in its full ecological and cultural context and as part of a surrounding region. This *General Management Plan* will provide comprehensive guidance for perpetuating natural systems, preserving cultural resources, and providing opportunities for quality visitor experiences at Sleeping Bear Dunes National Lakeshore. The purpose of this plan is to decide how the National Park Service (NPS) can best fulfill the National Lakeshore's purpose, maintain its significance, and protect its resources unimpaired for the enjoyment of present and future generations. The plan does not provide specific and detailed answers to every issue facing the park, but rather is a framework to assist NPS managers in making decisions today and in the future. The National Lakeshore's last *General Management Plan*, completed in 1979, is outdated. New areas have been added to the Lakeshore at Bow Lakes, Miller Hill, and the Crystal River, and

many individual parcels within the original boundary have been acquired. New information about the significance of natural and cultural resources in the Lakeshore has been recognized. Private development adjacent to and near the National Lakeshore has increased, and this trend has accelerated in recent years. The National Lakeshore faces new management challenges as a result of all these changes. This new *General Management Plan* will update the management framework for the National Lakeshore, address changing issues and conditions, incorporate new resource information, and provide management direction for these new park lands.

The *Wilderness Study* element of this new *General Management Plan* evaluates lands within Sleeping Bear Dunes National Lakeshore for possible recommendation to Congress for inclusion in the national wilderness preservation system. The *Wilderness Study* is needed because of public interest in developing a proposal that improves upon the 1981 "Wilderness Recommendation." Including the *Wilderness Study* in the *General Management Plan* saves time and money because the two processes have similar environmental compliance and public involvement needs. Wilderness, which can be designated only by Congress, provides for permanent protection of lands in their natural condition that provide outstanding opportunities for solitude or primitive and unconfined recreation.

Wilderness studies typically result in a recommendation to Congress to designate all, some, or none of the lands possessing wilderness character as part of the national wilderness preservation system. Based on the *Wilderness Study* included in this document, the National Park Service anticipates preparing a proposal for such a recommendation to forward to the U.S. Department of the Interior at the conclusion of this planning effort. However, by law,

## SUMMARY

areas proposed as wilderness in the 1981 recommendation for the National Lakeshore will be managed as wilderness until Congress acts on a new wilderness recommendation.

## MANAGEMENT ZONES

Management zones prescribe how different areas of the National Lakeshore would be managed. Four management zones have been developed for the National Lakeshore — the high use zone, the experience history zone, the recreation zone, and the experience nature zone. The high use zone provides for visitor orientation, education, and other structured activities (such as ranger-led tours). High numbers of visitors enjoy and learn about the National Lakeshore. The experience history zone is managed primarily to preserve historic structures and landscapes. Moderate to high numbers of visitors enjoy and learn about significant historic activities, buildings, and landscapes. The recreation zone provides a wide range of recreational opportunities for moderate numbers of visitors. The active Lake Michigan beach area is within this zone, as is the 0.25 mile of Lake Michigan waters within the National Lakeshore boundary. The experience nature zone is the wildest, most natural management zone. Low numbers of visitors enjoy primitive recreation on foot or in nonmotorized watercraft. This is the only management zone in which wilderness may occur.

The alternatives presented in this document each propose a different configuration of the management zones within the National Lakeshore based on the overall concept for each action alternative. (The no-action alternative, which describes existing conditions, has no management zoning.) In every management zone, the Lakeshore intends to preserve and protect natural and cultural resources to the greatest extent possible given available funds.

## THE ALTERNATIVES

Five alternatives, including the preferred alternative, for future management of Sleeping Bear Dunes National Lakeshore are presented in this document. The alternatives were developed through a lengthy public involvement process, described in detail in the “Public Involvement, Including Scoping” section in chapter 6. Each alternative is consistent with maintaining the National Lakeshore’s purpose, significance, and fundamental resources and values; the alternatives present different choices for how to manage resources, visitor use, and facilities within the Lakeshore. The alternatives are the no-action (“business as usual”) alternative, the preferred alternative, alternative A, alternative B, and alternative C. Each alternative includes a wilderness proposal. Note that the acreage figures for the various wilderness proposals are estimates based on small-scale maps. Maps of the alternatives are provided in the back pocket on the inside back cover.

### The No-Action Alternative

The no-action alternative primarily reflects current conditions and activities at the National Lakeshore. This alternative is provided as a baseline against which to compare the “action” alternatives. As directed by Congress in 1982, the National Park Service would continue to manage lands proposed for wilderness in the 1981 “Wilderness Recommendation” (30,903 acres or 43% of the National Lakeshore) to maintain their existing wilderness character. Natural resource management programs would continue to emphasize protection of natural resources and processes. Efforts to preserve as many historic structures and landscapes as possible would continue.

Visitor orientation services, interpretive activities, visitor access and facilities, and recreational opportunities would remain much as they are now.



The National Park Service would continue to acquire lands within the Benzie Corridor on a willing-seller basis (subject to available funding) for future development of a scenic road, which would include bike lanes/trail. (However, the road and bike lanes/trail would not be expected to be built within the life of this plan.)

The key impacts associated with implementing this alternative would be in the areas of visitor opportunities and use and wilderness character. Visitors seem satisfied overall with most current opportunities in the Lakeshore. Maintaining the current access, scenic resources, range of visitor opportunities, experiences, and recreation-oriented facilities would have a long-term, minor to moderate beneficial impact on visitor opportunities and use. Some visitors would prefer some additional improvements in recreation-oriented facilities, a few additional visitor opportunities, or a reduction of crowding on the Platte River, and the lack of these would result in a long-term, minor adverse impact on these visitors. As the result of ongoing management of nearly 31,000 acres to maintain its existing wilderness character, as directed by Congress, the National Lakeshore would continue to include extensive, largely natural undeveloped areas where outstanding opportunities for solitude or primitive, unconfined recreation would continue to be available. Impacts of the no-action alternative would continue to be mostly beneficial, moderate, and long term — but there would also be some continuing localized, minor adverse impacts on wilderness character. Impacts on historic resources, natural resources, regional socioeconomics, and NPS operations would not differ substantially among the alternatives.

### **Preferred Alternative**

Under the preferred alternative, the Lakeshore would be valued primarily for preservation of its natural resources, and for the opportunities it provides for visitor

enjoyment of natural, cultural, and recreational resources in a scenic outdoor setting. About 32,100 acres (45% of the National Lakeshore) in the north, central, south, and island areas of the Lakeshore would be proposed as wilderness. No developed county roads are within areas proposed for wilderness.

Based on the emphasis placed on natural resource conditions and experiences in this alternative, the experience nature zone would extend across much of the Lakeshore. Some selected areas would be zoned high use or recreation to allow for possible future recreational opportunities.

Based on the emphasis placed on opportunities for enjoyment of cultural resources in this alternative, the experience history zone would encompass most of the National Lakeshore's historic resources. Historic structures and landscapes would be preserved at a minimum and managed as specified for the management zone in which they lie.

Visitor orientation services, interpretive activities, visitor access and facilities, and recreational opportunities would remain much as they are now except that a few trails and backcountry campgrounds would be added and new designated campgrounds would be provided on North Manitou Island; Valley View campground would be removed; parking at the end of Esch Road (and possibly at Platte River Point) would be improved; the possibility of improved boat access near Platte River Point could be studied; motorized boats would not be allowed on North Bar Lake; electric motors would be allowed on Bass Lake (Leelanau County), Tucker Lake, and Otter Lake; there would be improved access at some inland lakes; the Glen Lake picnic area would be upgraded; occasional ferry service for day trips to North Manitou Island would be allowed; concession auto tours to near the Giant Cedars area would be considered; and the Crystal River access area would be upgraded or relocated.

## SUMMARY

The National Park Service would continue to acquire lands within the Benzie Corridor on a willing-seller basis (subject to available funding) for future development of a scenic road and/or a bike/hike trail (determined and evaluated via a future study). The road/trail would not be expected to be built within the life of this plan.

The key impacts associated with implementing this alternative would be in the areas of visitor opportunities and use and wilderness character. Increased access and visitor opportunities related to additional recreation-oriented facilities would have a long-term, moderate beneficial impact on visitor opportunities and use. Implementation of user capacity management strategies would have a long-term, minor beneficial impact on visitor opportunities, but potentially long-term minor adverse effects on use. The removal of Valley View campground and disallowing gas-powered motorboats on two inland lakes would have long-term, minor, adverse impacts on visitor opportunities and use. The increased visitor opportunities and facilities would have a long-term, minor, adverse impact on natural sound and the night sky. Establishment of 32,100 acres of designated wilderness in all three portions of the mainland and on both islands would permanently protect wilderness values (naturalness and opportunities for solitude or primitive, unconfined recreation). Impacts of the preferred alternative on wilderness character would be mostly beneficial, moderate, and long term (permanent), but there would also be some localized, minor adverse impacts. Impacts on historic resources, natural resources, regional socio-economics, and NPS operations would not differ substantially among the alternatives.

### Alternative A

Under alternative A, the Lakeshore would be valued primarily for conservation of its natural resources. About 33,600 acres (47% of the

National Lakeshore) in the north, central, south, and island areas of the National Lakeshore would be proposed as wilderness. No developed county roads are within areas proposed for wilderness. Based on the emphasis on natural resources conditions and experiences in this alternative, the experience nature zone would extend across most of the Lakeshore. Historic structures and landscapes would be managed as specified for the management zone in which they lie.

Visitor orientation services, interpretive activities, visitor access and facilities, and recreational opportunities would remain much as they are now. However, interpretive opportunities relating to natural resource themes would be emphasized. On South Manitou Island, concession-operated farm tours would stop at the west end of Chicago Road and continue on foot from there, a few trails and campgrounds would be added and Valley View campground would be removed, NPS-owned Tiesma Road would be closed, motor boats would no longer be allowed on Bass Lake (Leelanau County), and the Glen Lake picnic area would be removed.

The National Park Service would cease acquisition of lands within the Benzie Corridor. No scenic roadway or trail would be developed. The National Park Service would recommend that the Lakeshore's enabling legislation be amended to remove the Benzie Corridor from the boundary. This would require congressional action.

The key impacts associated with implementing this alternative would be in the areas of visitor opportunities and use and wilderness character. Increased access and visitor opportunities related to modest additional recreation-oriented facilities would have a long-term, minor to moderate beneficial impact on visitor opportunities and use. Implementation of user capacity management strategies would have a long-term, minor beneficial impact on the visitor experience, but potentially long-term minor adverse

effects on visitor use. The loss of some vehicle access, visitor opportunities, and recreation-oriented facilities (e.g., Tiesma Road and Glen Lake picnic area) would have long-term, moderate adverse impacts on visitor opportunities and use. The removal of the Benzie Corridor from the Lakeshore boundary would have long-term, minor to moderate adverse impacts on visitor access and opportunities, scenic resources, natural soundscapes, and the night sky. Establishment of 33,600 acres of designated wilderness (the most of any alternative) in all three portions of the mainland and on both islands would permanently protect naturalness and opportunities for solitude or primitive, unconfined recreation. Impacts of alternative A on wilderness character would be mostly beneficial, moderate, and long term (permanent), but there would also be some localized minor adverse impacts on wilderness character. Impacts on historic resources, natural resources, regional socioeconomics, and NPS operations would not differ substantially among the alternatives.

### **Alternative B**

Under alternative B the National Lakeshore would be valued primarily for its recreational opportunities in scenic outdoor settings. About 14,400 acres (20% of the National Lakeshore), all on North Manitou Island, would be proposed as wilderness. No county roads are within areas proposed for wilderness. Based on the large extent of the recreation zone in this alternative, natural resources might be modified to provide for a variety of recreational activities. Historic structures and landscapes would be managed as specified for the management zone in which they lie.

Visitor orientation services, interpretive activities, visitor access and facilities, and recreational opportunities would remain much as they are now except that a few trails and campgrounds would be added and some new campgrounds would be designated (to replace dispersed camping on North Manitou

Island), parking would be improved at Peterson Road and the end of Esch Road, facilities would be expanded and improved boat access could be studied at Platte River Point, motorized boats would be allowed on Shell and Tucker lakes, access would be improved at a few inland lakes, a few picnic areas would be upgraded, occasional ferry service for day trips to North Manitou Island would be allowed, concession auto tours to near the Giant Cedars area would be considered, and the Crystal River access area would be upgraded or relocated.

The National Park Service would continue to acquire lands within the Benzie Corridor on a willing-seller basis (subject to available funding) for future development of a scenic road. The scenic road would include bike lanes (or in some stretches a separate bike trail, as appropriate). For cost and impact comparison purposes, the scenic road was assumed to be built in year 25 of the plan.

The key impacts associated with implementing this alternative would be in the areas of visitor opportunities and use and wilderness character. Increased access and visitor opportunities related to additional recreation-oriented facilities would have a long-term, minor to moderate beneficial impact on visitor opportunities and use. Implementation of user capacity management strategies would have a long-term, minor beneficial impact on visitor experiences but potentially long-term minor adverse effects on visitor use. The removal of dispersed camping on North Manitou Island would have long-term minor adverse impacts on visitor opportunities and use. The increased visitor opportunities and facilities would have a long-term minor adverse impact on scenic resources, natural sound, and the night sky. Establishment of 14,400 acres of designated wilderness on North Manitou Island would permanently protect wilderness values therein. However, there would be no wilderness protection on the mainland or South Manitou Island, so naturalness and opportunities for solitude and primitive



## SUMMARY

recreation would be substantially reduced there. Alternative B would have long-term (some permanent), minor beneficial and minor to major adverse impacts on wilderness character. Impacts on historic resources, natural resources, regional socioeconomics, and NPS operations would not differ substantially among the alternatives.

### Alternative C

Under alternative C the Lakeshore would be managed so that most visitor use is concentrated in selected areas, with more natural, primitive conditions promoted in the rest of the Lakeshore. About 23,200 acres (32% of the National Lakeshore) in the central, south, and island areas of the Lakeshore would be proposed as wilderness. No developed county roads are within areas proposed for wilderness. Within the high use and experience history zones there would be less emphasis on managing the Lakeshore for natural conditions. Outside those concentrated use areas, the Lakeshore would be managed for more natural conditions. Historic structures and landscapes would be managed as specified for the management zone in which they lie.

Visitor orientation services, interpretive activities, visitor access and facilities, and recreational opportunities would remain much as they are now. However, more structured interpretive opportunities would be offered in concentrated use areas and more self-guided opportunities would be offered elsewhere. A few trails would be added; the D. H. Day campground would be upgraded and/or expanded; there would be new designated campgrounds on North Manitou Island; concession auto tours to near the Giant Cedars would be considered; facilities at the ends of County Road 669, Esch Road, and Platte River Point would be expanded; access to a few inland lakes would be improved; the Glen Lake picnic area would be upgraded or expanded; and the Dune Climb facilities would be upgraded.

The National Park Service would continue to acquire lands within the Benzie Corridor on a willing-seller basis (subject to available funding) for future development of a scenic nonmotorized hike/bike trail. For cost and impact comparison purposes, the scenic trail was assumed to be built in year 25 of the plan.

The key impacts associated with implementing this alternative would be in the areas of visitor opportunities and use and wilderness character. Increased access and visitor opportunities related to additional recreation-oriented facilities would have a long-term, minor to moderate beneficial impact on visitor opportunities and use. Implementation of user capacity management strategies would have a long-term, minor, beneficial impact on the visitor experience, but potentially long-term minor, adverse effects on visitor use. The increased visitor opportunities and facilities in the high-use zones would have a long-term, minor, adverse impact on scenic resources, natural sounds, and the night sky. Establishment of 23,200 acres of designated wilderness in the central and south portions of the mainland and on both islands would permanently protect wilderness values (naturalness and opportunities for solitude or primitive unconfined recreation). However, wilderness values in several areas (north portion of the mainland, Otter Creek area, and southeast portion of South Manitou Island) would no longer have wilderness protection. Impacts of alternative C on wilderness character would be long term (some permanent), minor, and adverse and beneficial. Impacts on historic resources, natural resources, regional socioeconomics, and NPS operations would not differ substantially among the alternatives.

## THE NEXT STEPS

This *Final General Management Plan / Wilderness Study / Environmental Impact Statement* includes letters from governmental agencies, substantive comments on the draft

document, and NPS responses to those comments. Following distribution of the final plan and a 30-day no-action period, a “Record of Decision” will be signed by the National Lakeshore superintendent and the NPS regional director documenting the NPS selection of an alternative for implementation.

Although this *Final General Management Plan / Wilderness Study / Environmental Impact Statement* provides the analysis and justification for future National Lakeshore funding proposals, this plan does not guarantee future NPS funding. Many actions would be necessary to achieve the desired conditions for natural resources, cultural resources, recreational opportunities, and facilities as envisioned in this plan. The National Park Service will seek funding to

achieve these desired conditions; although the National Lakeshore hopes to secure this funding and will prepare itself accordingly, the Lakeshore may not receive enough funding to achieve all desired conditions. National Lakeshore managers will need to continue to pursue other options, including expanding the service of volunteers, drawing upon existing or new partnerships, and seeking alternative funding sources, including the philanthropic community. Even with assistance from supplemental sources, Lakeshore managers may be faced with difficult choices when setting priorities. The *General Management Plan / Wilderness Study / Environmental Impact Statement* provides the framework within which to make these choices.





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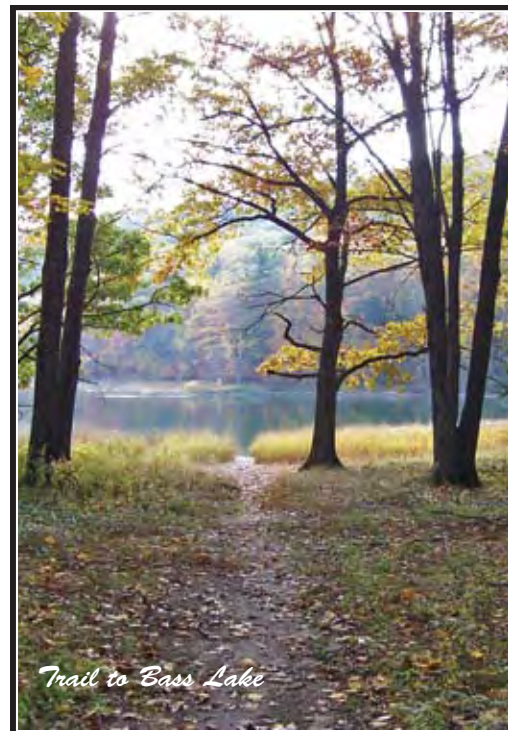
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# Introduction



## A GUIDE TO THIS DOCUMENT

This *Final General Management Plan / Wilderness Study / Environmental Impact Statement* is organized into six chapters plus appendixes. Each section is described briefly below.

**Chapter 1: Introduction** describes the context for the entire document. It explains why the plan is being prepared and what issues it will address. It provides guidance (e.g., park purpose, significance, fundamental resources and values, special mandates, and servicewide laws and policies) for the alternatives that are being considered. This chapter also describes how this plan relates to other plans and projects.

**Chapter 2: Alternatives, Including the Preferred Alternative**, discusses management zones, user capacity, and the five management alternatives (the focus of this plan). Mitigating measures for minimizing or eliminating impacts of some proposed actions are then described. A section on the environmentally preferred alternative follows. A summary table of the alternatives (table 2) is included in the back pocket. Summary tables of the range of treatments for historic properties (table 3, page 74) and the environmental consequences of implementing the alternatives (table 4, page 76) are also included in this chapter.

**Chapter 3: Wilderness Study and Proposal**, provides background information about wilderness, describes the options analyzed in this *Wilderness Study* (including the preferred option), summarizes public comment on wilderness, and describes the implications of managing lands that are proposed for wilderness.

**Chapter 4: Affected Environment** describes areas and resources that would be affected by actions in the various alternatives—historic resources, natural resources, visitor opportunities and use, wilderness character, regional socioeconomics, and NPS operations. It also includes a discussion of impact topics that were dismissed from detailed analysis.

**Chapter 5: Environmental Consequences** analyzes the impacts of implementing the alternatives. Methods used to assess impacts are outlined at the beginning of the chapter.

**Chapter 6: Consultation and Coordination** describes the history of public and agency coordination during the planning effort; it also lists agencies and organizations who received copies of the document.

The **Appendixes** present supporting information for the document, along with bibliographic references and a list of the planning team and other consultants.

## OVERVIEW OF THE NATIONAL LAKESHORE

Sleeping Bear Dunes National Lakeshore (hereafter referred to as National Lakeshore, Lakeshore, or park) was established by the U.S. Congress in 1970 with the passage of Public Law (PL) 91-479 (see appendix A). Part of the national park system, the National Lakeshore, which consists of a mainland portion plus North Manitou and South Manitou islands (71,291 acres total), is in the northwestern portion of Michigan's Lower Peninsula (see Region map). The mainland portion straddles the dividing line between Benzie and Leelanau counties. The Manitou Islands, in Leelanau County, are located to the northwest in Lake Michigan, about 7 miles from the nearest mainland shore. The nearest city is Traverse City, Michigan (population 15,000), which is 30 miles east of the Lakeshore. Smaller communities such as Empire, unincorporated Glen Arbor, and the town of Frankfort are nearer to the National Lakeshore.

Named after a complex of coastal sand dunes, the National Lakeshore features white sand beaches, steep bluffs reaching as high as 450 feet above Lake Michigan, thick maple and beech forests, and clear inland lakes. The National Lakeshore's most notable features — the ancient sand dunes — are products of wind, ice, and water action over thousands of years. During the Ice Age, continental glaciers spread southward from Canada, repeatedly burying the Upper Midwest under sheets of ice. These massive glaciers enlarged river valleys, carved out the Great Lake Basins, and left behind conditions promoting the formation of sand dunes. Over the years, prevailing winds blowing across Lake Michigan built beach dunes on low-lying shores and "perched" dunes on high glacial plateaus. Sculpted by the wind, the active

dunes shift and advance over time, sometimes burying trees and creating "ghost forests" of stark, bleached trunks. The high, perched dunes afford spectacular views across Lake Michigan and of other glacially formed landscapes. The contrast between the open, sunny environment of the dunes and the adjacent lush beech-maple forests is striking.

Long before the area became a National Lakeshore, American Indians, lumbermen, merchant sailors, and farmers visited or settled here. Archeological evidence dates back to prehistoric Indians about 3,000 years ago. The Ottawa and Ojibwe migrated to the area in the 17th century to hunt, fish, and collect maple sap. French explorers, fur traders, and missionaries arrived in the mid-1600s. Not long thereafter, other groups settled in the area, and shipping on the Great Lakes increased, along with the region's population and commerce. Vast forests were cleared in the 1880s to supply lumber for construction and fuel for ships that sailed the Great Lakes. In the 1920s, lumbering subsided as the supply of hardwood dwindled. Subsistence homesteads evolved, followed by cash-crop farms and orchards. Visitors to the area found that its pleasant climate and stunning scenery made for a great place to spend leisure time.

Today, a lighthouse and U.S. Life-Saving Service stations, coastal villages, and picturesque farmsteads reflect the National Lakeshore's rich maritime, agricultural, and recreational history. The region surrounding the National Lakeshore is a popular vacation and summer home destination. In recent times the area has undergone considerable growth as homes and support services are built for expanding full-time and summer populations.



## BACKGROUND

Park planning is a decision-making process, and general management planning is the broadest level of decision-making for parks. General management plans (GMPs) are required for all units of the national park system and are intended to establish the future management direction of a park unit. General management planning is the first phase of tiered planning and decision-making for national park system units. It focuses on why the park unit was established (purpose), why it is special (significance, fundamental resources and values), and what resource conditions and visitor experiences should be achieved and maintained (desired future conditions). General management plans look years into the future and consider the park holistically, in its full ecological and cultural context and as part of a surrounding region.

Although a general management plan provides the analysis and justification for future funding, the plan in no way guarantees that money will be forthcoming. Requirements for additional data or legal compliance and competing national park system priorities can delay implementation of actions. Full implementation of a plan may extend many years into the future.

This *General Management Plan / Wilderness Study / Environmental Impact Statement* (GMP/WS/EIS) was developed by an interdisciplinary team in consultation with National Park Service (NPS) offices; tribal, federal, state, and local agencies; other interested parties; and substantial input and participation from the general public.

### PURPOSE AND NEED FOR THE GENERAL MANAGEMENT PLAN

This *General Management Plan* provides comprehensive guidance for perpetuating natural systems, preserving cultural resources,

and providing opportunities for quality visitor experiences at Sleeping Bear Dunes National Lakeshore. Its purpose is to decide how the National Park Service can best fulfill the National Lakeshore's purpose, maintain its significance, and protect its resources unimpaired for the enjoyment of present and future generations.

This *General Management Plan* describes the general path that the National Park Service would follow in managing the National Lakeshore over the next 20 years or more. The plan does not provide specific and detailed answers to every issue facing the park, but rather is a framework to assist NPS managers in making decisions today and in the future. The plan will

- identify and support the National Lakeshore's purpose, significance, and fundamental resources and values
- provide general guidance for how to manage resources and provide for visitor use
- outline a general approach for facilities management, access strategies, and development patterns
- clearly define desired resource conditions and visitor experience opportunities
- ensure that the foundation for decision-making has been developed in consultation with the public and adopted by NPS leadership after sufficient analysis of the benefits, impacts, and economic costs of alternative courses of action

This *General Management Plan* is needed to update the management framework for the National Lakeshore, address changing issues and conditions, and incorporate new resource information. The National Lakeshore's last *General Management Plan* was completed in 1979. The 1979 plan is outdated and does not follow current NPS guidelines for planning elements such as foundation statements,



## Region

### Sleeping Bear Dunes National Lakeshore General Management Plan/Wilderness Study

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management zones, etc. The Lakeshore started a new *General Management Plan* in 1999. In October 2002 the Department of the Interior instructed the National Park Service to cease work on the plan. At that time, public opposition arose to possible changes in motorized access to key visitor use areas, particularly beaches, that had been identified in the planning alternatives because of the existing wilderness proposal.

In the years following the National Lakeshore's establishment in 1970, most of the 71,291 acres within the National Lakeshore's boundary have come into federal management through the purchase of over 1,500 tracts of private property and land donations from the state of Michigan. Many of these tracts have come into NPS management since the 1979 *General Management Plan* was completed. Acquisition of private lands within the original boundaries of the Lakeshore continues on a willing-seller basis, not only within the Benzie Corridor but throughout the Lakeshore as well. Private development adjacent to and near the National Lakeshore has increased, and this trend has accelerated in recent years. The National Lakeshore faces new management challenges as a result of all these changes.

A 1982 amendment to the National Lakeshore's enabling legislation authorized a boundary revision to include the Bow Lakes and Miller Hill areas. More recently, lands along the Crystal River were added to the National Lakeshore. Acquisition of private lands within these areas continues on a willing-seller basis. This current *General Management Plan* will provide management direction for these new park lands.

Recent investigations have enhanced the National Park Service's understanding of maritime, agricultural, and recreation-related historic resources in the National Lakeshore. Desired conditions and general (conceptual) direction for management of these resources need to be defined.

## PURPOSE AND NEED FOR THE WILDERNESS STUDY

This *Wilderness Study* evaluates lands within Sleeping Bear Dunes National Lakeshore for possible recommendation to Congress for inclusion in the national wilderness preservation system. The *Wilderness Study* is needed because of public interest in developing a proposal that improves upon the 1981 "Wilderness Recommendation." Including the *Wilderness Study* in the *General Management Plan* saves time and money because the two processes have similar environmental compliance and public involvement needs. Wilderness, which can be designated only by Congress, provides for permanent protection of lands in their natural condition that provide outstanding opportunities for solitude or primitive and unconfined recreation.

The 1970 legislation that established Sleeping Bear Dunes National Lakeshore (PL 91-479) required the secretary of the interior to recommend the suitability or unsuitability of lands within the National Lakeshore for preservation as wilderness. The first wilderness study for the National Lakeshore resulted in a 1975 "Wilderness Recommendation." The 1979 *General Management Plan* endorsed most (but not all) findings from the 1975 recommendation. In 1981 a new "Wilderness Recommendation" was prepared to carry forward the wilderness proposal endorsed by the 1979 plan. Although the 1981 recommendation never formally reached Congress, amendments in 1982 (PL 97-361) to the National Lakeshore's enabling legislation stated that the lands identified in the recommendation "shall, until Congress determines otherwise, be administered by the Secretary so as to maintain their presently existing wilderness character . . . ."

The congressional direction that requires the National Park Service to manage lands in the 1981 recommendation to "maintain their presently existing wilderness character" is unusual and has created some dilemmas

regarding management direction. Moreover, despite public outreach efforts by the National Park Service to clarify the wilderness situation at the National Lakeshore, the wilderness issue remains confusing to many members of the public. Taking into

consideration feedback from numerous presentations made in 2004-2005 to members of the public, including park neighbors and various interest groups, the National Park Service concluded that a new wilderness study was warranted.

### Uses and Management in Wilderness

A variety of recreational uses, management actions, and certain facilities are permitted in wilderness areas under the Wilderness Act of 1964 and NPS policies. Among the uses, management actions, and facilities *permitted* in wilderness are the following:

- ⇒ nonmotorized recreational uses (e.g., hiking, picnicking, camping, canoeing)
- ⇒ hunting and fishing
- ⇒ guided interpretive walks and onsite presentations
- ⇒ use of wheelchairs, service animals, and reasonable accommodations for the disabled (e.g., barrier-free trails, accessible campsites)
- ⇒ trails, campsites, toilets, and signs necessary for visitor safety or to protect wilderness resources
- ⇒ emergency actions and equipment necessary to ensure life safety
- ⇒ fire management activities (including fire suppression)
- ⇒ preservation of historic properties eligible for the National Register of Historic Places
- ⇒ uses and facilities for landowners with valid property rights in a wilderness area
- ⇒ scientific activities, research, and monitoring
- ⇒ natural resource management actions such as restoration of extirpated species, controlling invasive exotic species, endangered species management, and protection of air and water quality
- ⇒ certain administrative facilities if necessary to carry out wilderness management objectives (e.g., storage or support structures, ranger station)
- ⇒ Native American religious activities and other actions recognized under treaty-reserved rights

The Wilderness Act also specifically *prohibits* certain uses and developments. Under section 4(d) of the act, the following uses are not permitted in a wilderness:

- ⇒ permanent improvements or human habitation
- ⇒ structures (historic structures are excluded)
- ⇒ permanent and temporary roads
- ⇒ use of motor vehicles and motorized equipment (except for emergency purposes)
- ⇒ landing of aircraft (except for emergency purposes)
- ⇒ other forms of mechanical transport (e.g., bicycles)
- ⇒ commercial enterprises (except for those that are necessary for realizing the recreational or other wilderness purposes of the area, such as guiding and outfitting)

With the exception of permanent roads, the act does recognize that the above uses *may be permitted* if necessary to meet the minimum requirements for the administration of the area as wilderness or for emergency purposes.

In addition to the above prohibitions, NPS policies also *prohibit* some developments such as the following:

- ⇒ new utility lines
- ⇒ permanent equipment caches
- ⇒ site markings or improvements for nonemergency aircraft use
- ⇒ borrow pits (except for small quantity use of borrow material for trails)
- ⇒ new shelters for public use
- ⇒ picnic tables

Wilderness studies typically result in a recommendation to Congress to designate all, some, or none of the lands possessing wilderness character as part of the national wilderness preservation system. Based on the *Wilderness Study* included in this document, the National Park Service anticipates preparing a proposal for such a recommendation to forward to the U.S. Department of the Interior at the conclusion of this planning effort. However, because of the 1982 law, areas proposed as wilderness in the 1981 recommendation will be managed as wilderness until Congress acts on a new wilderness recommendation.

## PLANNING ISSUES AND CONCERNS

### Wilderness

The 1981 “Wilderness Recommendation” that was prepared for Sleeping Bear Dunes National Lakeshore proposed 30,903 acres of wilderness. Of that total acreage, 7,128 acres were “recommended wilderness” and 23,775 acres were “potential wilderness.” (Recommended wilderness refers to lands that immediately qualify for wilderness designation. Potential wilderness refers to lands that have been identified for future designation as wilderness if temporary, nonconforming uses or incompatible conditions are removed or eliminated.) The 1982 amendment to the park’s enabling legislation (PL 97-361) requires that the areas proposed for wilderness in the 1981 recommendation be managed to maintain their wilderness character “until Congress determines otherwise.” NPS management policies also require such management, which has been occurring at Sleeping Bear Dunes for more than 25 years. Public interest in and debate about the 1981 recommendation was renewed in the early 2000s, and that interest continues today. The National Park Service has decided to reconsider the issue of wilderness at Sleeping Bear Dunes National Lakeshore. Thus, the National Park Service needs to determine,

through this new *Wilderness Study*, which areas of the National Lakeshore should be included in a new wilderness proposal. **Because of the 1982 law, areas proposed as wilderness in the 1981 recommendation will be managed as wilderness until Congress acts on a new wilderness recommendation.**

### Access and Management of Roads within the Park

The National Lakeshore is traversed by many different types of roads, including county roads, NPS administrative and public roads, private roads, and state highways. Some roads provide access to Lake Michigan beaches or other park features, while others provide access to private property. There are some roads that do not access any particular feature or property, having formerly served private properties that are no longer present. Some roads are in areas proposed as wilderness in the 1981 “Wilderness Recommendation.” A few roads are NPS-owned and managed, but most road rights-of-way in the park are held by Benzie or Leelanau counties. The *General Management Plan / Wilderness Study / Environmental Impact Statement* will evaluate how roads support or impact National Lakeshore resources and visitor experiences. This information will: (a) provide management direction for NPS-owned roads, and (b) provide information for the counties to consider in their road management programs. The counties control road rights-of-way in the National Lakeshore, so any decision to close county roads rests with them.

### Protecting Fundamental Resources and Values

The 1979 *General Management Plan* no longer provides an adequate planning foundation for park management. The National Park Service must identify fundamental resources and values (see following “Foundation for

Planning and Management” section) that deserve primary consideration in planning and management for the National Lakeshore and outline strategies to protect those values. Similarly, the National Park Service must identify what visitor opportunities or experiences fit with the purposes and maintain the significance of the National Lakeshore and must develop strategies for supporting or enhancing those opportunities. This might include additional or expanded visitor facilities. To accomplish this, the National Park Service must decide how to manage specific areas of the park (through management zoning) to protect and provide for these different natural, cultural, recreational, and visitor experience values.

### **Benzie Corridor and Crystal Ridge**

The 1970 legislation that established the National Lakeshore authorized the establishment of a scenic southern entrance road to the park. To that end, the park boundary includes a corridor (the Benzie Corridor) on a ridge (Crystal Ridge) between Crystal Lake and Platte Lake. The National Park Service has acquired nearly 100 acres (about 10%) of the lands within the Benzie Corridor since the park was established. Land has become increasingly expensive in this area, however, and development continues to take place, raising questions as to whether acquiring enough land for a scenic southern entrance is still feasible. The National Park Service needs to decide whether the Benzie Corridor remains essential to the National Lakeshore’s purpose (e.g., for providing a

scenic road or trail), or whether the corridor should be recommended for removal from the park boundary. However, until such time that Congress acts to alter current mandates, the National Park Service will continue to acquire property for a scenic road on a willing-seller basis or via donations.

### **Crowding and Overuse**

Some visitor facilities and areas of the National Lakeshore are crowded and congested during the summer. Areas that the public has expressed particular concern about include the Dune Climb, the Platte River and the area around its mouth, and beach access parking areas. Crowding and congestion affects visitor experiences, strains park infrastructure, and may result in harm to natural and cultural resources. A general management plan must deal with issues of crowding and provide general direction for addressing user capacity at locations throughout the National Lakeshore.

### **Management of Newly Acquired Park Lands**

About 1,720 acres of new lands have been added to the National Lakeshore since 1979, when the last *General Management Plan* for the park was prepared. The National Park Service must decide how to manage these new areas (e.g., Bow Lakes, Miller Hill, and Crystal River areas) for resource protection and visitor enjoyment.



## FOUNDATION FOR PLANNING AND MANAGEMENT

### PURPOSE

Purpose statements convey the reason(s) for which the national park unit was set aside as part of the national park system. Grounded in an analysis of park legislation (appendix A) and legislative history, purpose statements also provide primary criteria against which the appropriateness of plan recommendations, operational decisions, and actions are tested. A park's purpose statement focuses the agency's management role at a particular park unit but does not supersede the NPS Organic Act (see "Servicewide Laws and Policies" section in this chapter).

The purpose of Sleeping Bear Dunes National Lakeshore is as follows:

- To preserve outstanding natural features, including forests, beaches, dune formations, and ancient glacial phenomena in their natural setting and protect them from developments and uses that would destroy the scenic beauty and natural character of the area, for the benefit, inspiration, education, recreation, and enjoyment of the public.
- The National Lakeshore contains compactly grouped features of continental glaciation, including post-glacial shoreline adjustment, ridge/swale complex, wind-formed dunes, perched dunes, and examples of associated plant succession. These features are of global importance due to their relatively unimpacted state, the variety of features present, and their proximity to one another.
- The National Lakeshore preserves outstanding scenic and publicly accessible resources. Its massive glacial headlands, expansive Lake Michigan beaches, diverse habitats, superb water resources, and rich human history offer an exceptional range of recreational, educational, and inspirational opportunities.
- The collection of historic landscapes — maritime, agricultural, and recreational — in the National Lakeshore is of a size and quality unsurpassed on the Great Lakes and rare elsewhere on the United States' coastline.
- The National Lakeshore's native plant and animal communities, especially the northern hardwoods, coastal forests, dune communities, and interdunal wetlands, are of a scale and quality that is rare on the Great Lakes shoreline. These relatively intact communities afford an opportunity for continuation of the ecological processes that have shaped them.

### SIGNIFICANCE

Significance statements capture the essence of the national park unit's importance to the nation's natural and cultural heritage. They describe the unit's distinctiveness and describe why an area is important within regional, national, and global contexts. This helps managers focus their efforts and limited funding on protection and enjoyment of attributes that are directly related to the purpose of the park unit. The significance statements for the National Lakeshore are as follows:

### FUNDAMENTAL RESOURCES AND VALUES

Fundamental resources and values are systems, processes, features, visitor experiences, stories, and scenes that deserve primary consideration in planning and management because they are critical to

maintaining the park's purpose and significance. Fundamental resources and values are subject to periodic review and updates based on new information or changing conditions. The planning team, with assistance from other resource experts and the public, has identified the following fundamental resources and values for Sleeping Bear Dunes National Lakeshore. The fundamental resources and values listed below are only a portion of the Lakeshore's total resources and values; all resources and values were considered in this planning effort.

#### **Geologic Processes**

- ridge and swale topography resulting from old shorelines (e.g., along the Crystal River and the Boekeloo area)
- perched dunes (e.g., Sleeping Bear Plateau/dune complex)
- Bow Lakes (kettle lakes — glacial origin)

#### **Visitor Opportunities and Scenery**

- Dune Climb
- Pierce Stocking Scenic Drive
- scenic views of historic farmsteads, inland lakes, Lake Michigan shoreline (Empire Bluffs, Sleeping Bear Plateau, Pyramid Point), to/from the shoreline of Manitou Islands, and emergence from dense canopy to open dunes
- Lake Michigan beaches
- experiences of North Manitou and South Manitou islands
- opportunities for quiet, solitude, and naturalness
- Platte River and Crystal River experiences
- learning about the natural and cultural heritage of the area (glacial phenomena, diverse habitats, human history)
- the opportunity for visitors to understand the complex and rapidly disappearing natural history of the ecosystems that evolved along the Great Lakes shoreline

#### **Cultural Resources and History**

- three U.S. Life-Saving Service stations/South Manitou Island Light Station
- Port Oneida Rural Historic District
- Glen Haven area

#### **Ecological Communities**

- excellent examples of plant succession transition from shoreline edge to climax hardwood forest (e.g., Esch Road and Good Harbor areas)
- extensive intact tracts of northern hardwood forest
- Sleeping Bear Plateau dune community complex
- interdunal wetlands (e.g., Boekeloo marsh, Crystal River area)
- freshwater resources

### **PRIMARY INTERPRETIVE THEMES**

Primary interpretive themes are the most important ideas and concepts communicated to the public about the park. They are the core of all interpretive programs and media provided to park visitors. The following primary interpretive themes are the most important ideas or concepts to be communicated to the public about the National Lakeshore:

- The tall dunes and dramatic sweep of Lake Michigan shoreline at Sleeping Bear Dunes National Lakeshore, along with other more subtle glacial features, provide an outstanding illustration of glaciation and help people to discover and understand the continually evolving surface of the Earth and how it influences the environment in which we live today.
- The spectacular, yet accessible terrain and sublime beauty of the landscapes at Sleeping Bear Dunes National Lakeshore beckon to all who seek opportunities for exploration, discovery, recreation, and solitude that fulfill the human need for

inspiration and renewal through connection to the land.

- The diversity of landscapes and structures at Sleeping Bear Dunes National Lakeshore, including the towering sand dunes with a “cap” of trees called by the region’s Anishinabek people “Misha Mokwa” (Sleeping Bear) illustrates the rich American Indian, maritime, agricultural, and recreational history of the area and provides an opportunity to understand and appreciate the traditions, struggles, resourcefulness, and heroism of the people who have lived here using the abundant natural resources for food, shelter, clothing, and commerce.
- The diverse post-glacial landscapes protected by Sleeping Bear Dunes National Lakeshore support relatively intact, but fragile, native plant and animal communities that continue to be shaped by natural ecological processes, affording people the opportunity to understand, cherish, and help save the rapidly vanishing natural heritage of the Great Lakes shoreline.

## **SPECIAL MANDATES**

Special mandates are legislative or judicial requirements that are specific to a particular unit of the national park system. They are typically mandated by Congress or by the courts. Special mandates for Sleeping Bear Dunes National Lakeshore are listed below.

### **Proposed Wilderness**

The 1981 “Wilderness Recommendation” for the National Lakeshore proposed 7,128 acres for wilderness designation. An additional 23,775 acres were identified in this recommendation as potential wilderness, meaning that they would qualify for wilderness designation if and when they became federal

lands and nonconforming uses were terminated. This recommendation never went through the necessary reviews and approvals, however, and no wilderness has been formally designated within the National Lakeshore. The total 30,903 acres were, and still are, proposed wilderness. In 1982 Congress directed the U. S. Department of the Interior to administer the lands proposed for wilderness in the 1981 recommendation so as to maintain their existing wilderness character and potential for inclusion in the National Wilderness Preservation System” (PL 97-361), pending future action by Congress.

### **Road Rights-of-Way**

The park’s enabling legislation, PL 91-479, dated October 21, 1970, Section 8 (b) states “Any property or interests therein, owned by the State of Michigan or any political subdivisions thereof, may be acquired only by donation.” This applies to all road rights-of-way, including those managed by the Leelanau County and Benzie County road commissions.

### **Scenic Road Corridors**

The National Park Service is authorized to construct and administer, as part of the National Lakeshore, a scenic road within a specified zone (Crystal Ridge) in Benzie County. It is also authorized to acquire, by donation or purchase, limited lands for this purpose (1970 park enabling legislation).

### **Hunting, Fishing, and Trapping**

Hunting and fishing are permitted in the National Lakeshore (1970 park enabling legislation). Trapping is not allowed in the park (1991 decision by the U.S. Court of Appeals).

## National Historic Landmark — North Manitou Island Life-Saving Service Complex

The National Lakeshore includes one national historic landmark, the North Manitou Island U. S. Life-Saving Service Complex, which is the highest designation afforded to a cultural resource. National historic landmarks are governed by Section 110(f) of the National Historic Preservation Act.

## 1836 Treaty

Sleeping Bear Dunes National Lakeshore is in the area ceded by the *Treaty with the Ottawa, etc. March 28, 1836*, between the United States and regional Ottawa and Chippewa peoples. Five federally recognized tribes are in this area. A Consent Decree on the *U.S. v. Michigan 1836 Inland Treaty Rights* case was signed in November 2007. The Consent decree recognizes a treaty-retained right for tribal members to engage in certain hunting, fishing, and gathering activities in the ceded territory (including the National Lakeshore). The five Michigan Indian tribes involved in the agreement are the Bay Mills Indian Community, the Sault Ste. Marie Tribe of Chippewa Indians, the Little Traverse Bay Bands of Odawa Indians, the Grand Traverse Band of Ottawa and Chippewa Indians, and the Little River Band of Ottawa Indians. This plan in no way restricts these rights. How those rights may be exercised with the National Lakeshore will be determined through consultation among the affected tribes and the National Park Service.

## SERVICEWIDE LAWS AND POLICIES

Many park management directives are specified in laws and policies guiding the National Park Service and are therefore not subject to alternative approaches. For example, there are laws and policies about managing environmental quality (such as the

Clean Air Act, the Endangered Species Act, and Executive Order 11990 “Protection of Wetlands”); laws governing the preservation of cultural resources (such as the National Historic Preservation Act and the Native American Graves Protection and Repatriation Act); and laws about providing public services (such as the Americans with Disabilities Act) — to name only a few. In other words, a general management plan is not needed to decide that it is appropriate to protect endangered species, control exotic species, protect historic and archeological sites, conserve artifacts, or provide for access for disabled persons. Laws and policies have already decided those and many other things for us. Although attaining some conditions set forth in these laws and policies may have been temporarily deferred in the park because of funding or staffing limitations, the National Park Service will continue to strive to implement these requirements with or without a new general management plan. The *General Management Plan* is critical in providing guidance on how we comply with laws and policies.

There are other laws and executive orders that are applicable solely or primarily to units of the national park system. These include the 1916 Organic Act that created the National Park Service; the General Authorities Act of 1970; the act of March 27, 1978, relating to the management of the national park system; and the National Parks Omnibus Management Act (1998).

The NPS Organic Act (16 *United States Code*, Section 1) provides the fundamental management direction for all units of the national park system:

[P]romote and regulate the use of the Federal areas known as national parks, monuments, and reservations . . . by such means and measure as conform to the fundamental purpose of said parks, monuments and reservations, which purpose is to conserve the scenery and

the natural and historic objects and the wildlife 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.

The National Park System General Authorities Act (16 *United States Code* [USC] Section 1a-1 et seq.) affirms that while all national park system units remain “distinct in character,” they are “united through their interrelated purposes and resources into one national park system as cumulative expressions of a single national heritage.” The act makes it clear that the NPS Organic Act and other protective mandates apply equally to all units of the

system. Further, amendments state that NPS management of park units should not “derogat[e] . . . the purposes and values for which these various areas have been established.”

The National Park Service also has established policies for all units under its stewardship. These are identified and explained in a guidance manual entitled *NPS Management Policies 2006*. The “action” alternatives considered in this document (the preferred alternative, plus alternatives A, B, and C), as well as the no-action alternative (current management), incorporate and comply with the provisions of these mandates and policies.

## DESIRED CONDITIONS AND STRATEGIES

This section focuses on desired conditions and strategies to guide management of Sleeping Bear Dunes National Lakeshore in all alternatives, including the no-action alternative. They guide actions taken by NPS staff on such topics as natural and cultural resource management, park facilities, and visitor use management. Each topic discussed below has two parts: (a) desired conditions for that topic (in italics), and (b) broad strategies that may be used to achieve those desired conditions.

Desired conditions articulate the ideal conditions the National Park Service is striving to attain. The term desired conditions is used interchangeably with goals. Desired conditions provide guidance for fulfilling the park's purpose and for protecting the park's fundamental resources and values on a Lakeshore-wide basis.

The strategies describe actions that could be used by the National Park Service (and/or its partners) to achieve the desired conditions. Most of these strategies are already being implemented. Those not already being implemented are consistent with NPS policy, are not believed to be controversial, and require no analysis and documentation under the National Environmental Policy Act of 1969 (or analysis and documentation would be completed separately from this *General Management Plan / Wilderness Study / Environmental Impact Statement*). This is not an exhaustive list of strategies. As new ideas, technologies, and opportunities arise, they will be considered if they further support the desired condition.

The Lakeshore-wide desired conditions and strategies in this section, combined with the management actions that are specific to the management alternative ultimately selected for implementation (see chapter 2), will form the complete general management plan for the National Lakeshore.

## ECOSYSTEM MANAGEMENT

*National Lakeshore staff demonstrates leadership in resource stewardship and conservation of ecosystem values. The dunes, forests, and aquatic systems are managed from an ecosystem perspective, considering both internal and external factors affecting visitor use, environmental quality, and resource stewardship. Management decisions about ecosystems are based on scholarly and scientific information. Resources and visitation are managed in consideration of the ecological and social conditions of the National Lakeshore and surrounding area. NPS managers adapt management strategies to changing ecological and social conditions and are partners in regional land planning and management.*

### Strategies

- Continue to participate in and encourage ongoing partnerships with local, state, and federal agencies, and nongovernmental organizations in programs that have importance within and beyond park boundaries. Partnerships important to the long-term viability of critical natural resources include the following:
  - Monitoring water quality of local water bodies and Lake Michigan.
  - Managing wildlife across human-created boundaries (such as jurisdictions, property lines, and fences).
  - Managing nonnative invasive species.
  - Managing wildland fire.
- Central to ecosystem management is long-term monitoring of changes in the condition of cultural and natural resources and related human influences. Improvement or degradation of resources and visitor experience cannot be determined with any certainty without a monitoring program. To protect, restore, and enhance park resources and to sustain visitor use and enjoyment

within and around the National Lakeshore, NPS staff would do the following:

- Initiate or continue long-term monitoring of resources and visitor use, including use of the visitor experience and resource protection framework or other user capacity process, as appropriate. (See “User Capacity (Carrying Capacity)” discussion in chapter 2.)
- Promote research to increase understanding of National Lakeshore resources, natural processes, and human interactions with the environment, with emphasis on fundamental resources and values.
- Practice science-based decision-making and adaptive management, incorporating the results of resource monitoring and research into NPS operations.
- Identify lands/waters outside the National Lakeshore where ecological processes and human use affect park resources or are closely related to park resource management considerations; initiate joint research, monitoring, management actions, agreements, or partnerships to promote resource conservation.
- Provide education and outreach programs to highlight conservation and management issues facing the park and related lands and encourage partners who are able to assist with ecosystem stewardship.
- Continue the disturbed site restoration program.
- Strive to control invasive nonnative species in coordination with adjacent landowners, inholders (those owning lands within the park boundary), other agencies, and NPS staff specialists; consider control of native species that threaten ecosystem health.

## NATURAL RESOURCES (GENERAL) AND DIVERSITY

*The resources and processes of the National Lakeshore retain a significant degree of ecological integrity. Natural wind, sand, and water processes function as unimpeded as possible. Management decisions about natural resources are based on scholarly and scientific information and on the National Lakeshore’s identified fundamental resources and values. Park resources and values are protected through collaborative efforts with neighbors and partners. Visitors and employees recognize and understand the value of the park’s natural resources. Human impacts on resources are monitored, and harmful effects are minimized, mitigated, or eliminated.*

*Biologically diverse native communities are protected and restored when possible. Particularly sensitive communities are closely monitored and protected. Endemic species and habitats are fully protected; nonnative species are controlled, and native species are reintroduced when conditions allow. Genetic integrity of native species is protected. Threatened and endangered species are protected to the greatest extent possible and are generally stable or improving. Natural fire regimes are investigated and supported where possible.*

### Strategies

- Continue to inventory biotic and abiotic resources in the National Lakeshore and assess their status and trends.
- Continue long-term systematic monitoring of resources and processes to detect natural and human-caused trends, document changes in species or communities, evaluate the effectiveness of management plans and restoration projects, and mitigate impacts where possible.
- Continue research that furthers understanding of the geology, sand, wind, and water processes that underlie the dune system.
- Implement and keep current a cooperative wildland fire management plan that

includes interagency participation to maintain conditions within the natural range as much as possible.

- Work in consultation with American Indian tribes to identify, evaluate, and determine appropriate treatment for natural resources used by American Indians throughout the National Lakeshore.
- Inventory human-made structures and modifications, and remove those that do not contribute to the purposes or management of the park or are judged to be unsafe provided they have been determined not to have cultural significance.
- Provide information to adjacent homeowners and private landowners on natural processes, wildlife, critical habitats, and threats to resources.
- Conserve and restore habitats for threatened and endangered species and species of special concern (e.g., piping plover, Pitcher's thistle, and Michigan monkey flower).
- In conjunction with other NPS offices, continue to expand the park's data management systems for analyzing, modeling, predicting, and testing trends in resource conditions.
- Continue to regularly update the park's resource stewardship strategy.
- Apply mitigation techniques to minimize impacts of construction and other activities on park resources.
- Continue to educate staff, visitors, and the public about the significance of natural resources and major threats to these resources.

## AIR QUALITY

*Sleeping Bear Dunes National Lakeshore is a Class II area under the Clean Air Act (this designation allows for limited amounts of new air emissions). The air quality of the National Lakeshore is enhanced or maintained.*

### Strategies

- Continue to monitor and record air pollution levels and analyze changes over time.
- Monitor and reduce emissions, when possible, from activities within the National Lakeshore boundaries.
- Continue to participate in regional air quality planning and research and implementation of air quality standards.

## WATER QUALITY AND QUANTITY

*Sleeping Bear Dunes National Lakeshore's water quality and quantity reflect natural conditions and support operational, and recreational uses. Outstanding water quality is protected and preserved.*

### Strategies

- Continue to monitor water quality and quantity within a local and regional context, and expand monitoring as needed to more fully understand the status and trends of ground and surface water.
- Participate in local, state, and national water quality remediation and watershed planning programs.
- Update strategies for water resources management as needed to reflect changing resources and management issues.
- Continue to inventory wetlands so that important wetland communities can be identified and protected.
- Continue to identify and address threats to wetlands, such as purple loosestrife and other exotic species.
- Continue to assess human-related threats to water quality and quantity.
- Continue to monitor E. coli at designated recreational beaches.

## WILDLIFE MANAGEMENT

*Natural wildlife populations and systems are understood and perpetuated. Natural fluctuations in populations are permitted to occur to*



*the greatest extent possible. Natural influences are mimicked if necessary. National Lakeshore staff work with neighbors and partners to achieve mutually beneficial goals related to wildlife.*

### **Strategies**

- Continue cooperative management of threatened or endangered species within the National Lakeshore to stabilize or improve the status of these species.
- Strive to identify species that have occupied the National Lakeshore in the past, and evaluate the feasibility and advisability of reintroducing extirpated species.
- Continue to cooperate with the Michigan Department of Natural Resources (MDNR) Fisheries and Wildlife management staff to better understand populations and determine appropriate management actions for game and nongame species.
- Work with MDNR Fisheries and Wildlife management staff to address conflicts between hunters and other recreational users of the Lakeshore.

## **CULTURAL RESOURCES (GENERAL)**

*Cultural resources are identified, evaluated, managed, and protected within their broader context. Management decisions about cultural resources are based on scholarly research and scientific information, fundamental resources and values, and consultation with the Michigan state historic preservation officer and with American Indians, as appropriate. The historic integrity of properties listed in (or eligible for listing in) the National Register of Historic Places is protected. Visitors and employees recognize and understand the value of the park's cultural resources. Human and natural impacts on cultural resources are monitored, and adverse effects are minimized or eliminated.*

### **Strategies**

- Continue to collect information to fill gaps in the knowledge and understanding of the National Lakeshore's cultural resources, to assess status and trends, and to effectively protect and manage cultural resources.
- In accordance with the National Historic Preservation Act of 1966, as amended, continue to locate, identify, and evaluate cultural resources to determine if they are eligible for listing in the National Register of Historic Places (national register).
- Prepare and update national register nominations as appropriate.
- Update and keep current the National Lakeshore's cultural landscape inventory and List of Classified Structures (the NPS inventory of evaluated historic and prehistoric structures that have historical, architectural, and/or engineering significance)
- Work in consultation with the Michigan state historic preservation officer, American Indian tribes as appropriate, and other interested parties to identify, evaluate, and determine appropriate treatment for historic structures, sites, and cultural landscapes throughout the park.
- Conduct scholarly research and use the best available scientific information and technology for making decisions about management of the park's cultural resources.
- Build a partnership program that considers appropriate adaptive use to assist in maintaining historic buildings and cultural landscapes throughout the park.
- Continue to initiate and regularly update plans and prioritize actions needed to protect cultural resources.
- Continue to research, document, catalogue, exhibit, and store the Lakeshore's museum collection according to NPS standards.

- Continue to educate staff, visitors, and the public about cultural and historic issues relating to the park.
- Treat all cultural resources as eligible for the national register pending formal determination.
- Monitor and regulate use impacts to minimize both immediate and long-term damage to structures.
- Involve historical architects and other professionals in work that could affect historic structures.

## HISTORIC STRUCTURES

*The character of historic structures is preserved in good condition to retain a high degree of integrity. Whenever possible, adaptive use of historic structures for park needs is considered before building new infrastructure.*

### Strategies

- Prepare historic structure inventories and reports, and amend them as needed. Implement actions identified in historic structure reports and add a record of treatment to the reports.
- Prepare and update national register nominations as appropriate.
- Monitor, inspect, and manage identified and evaluated historic structures to enable long-term preservation of historic features, qualities, and materials.
- Use historic structures as they were historically used, or adaptively use them in ways that are compatible with park purpose and that maximize retention of historic materials, features, spaces, and spatial relationships.
- Consider historic buildings for appropriate adaptive use by other public and private entities to assist in preservation of the structures.
- Create design guidelines and/or historic structure reports for specific areas in the Lakeshore to preserve architectural and character-defining features. Include provisions for design review to ensure the compatibility of new planning, design, and construction.
- Aggressively pursue basic preservation maintenance activities to maintain historic materials in good condition.

## CULTURAL LANDSCAPES

*Sleeping Bear Dunes National Lakeshore's cultural landscapes are preserved in good condition to retain a high degree of integrity. (Cultural landscapes reflect human adaptation and use of natural resources and are often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built.)*

### Strategies

- Prepare cultural landscape inventories and reports, and amend existing reports as needed.
- Monitor, inspect, and manage identified and evaluated cultural landscapes to enable long-term preservation of historic features, qualities, and materials.
- Implement actions identified in cultural landscape reports, and add a record of treatment to the reports.
- Create design guidelines and/or cultural landscape reports for specific developed areas in the Lakeshore to preserve landscape-defining features. Include provisions in the guidelines for design review to ensure the compatibility of new planning, design, and construction.
- Have cultural landscape specialists (e.g., historical landscape architects) prepare plans and specifications for preservation, rehabilitation, and restoration, in consultation with the park's Natural Resources Division staff.

## ARCHEOLOGICAL RESOURCES

*Archeological resources in the National Lakeshore are identified and preserved. (Archeological resources are the remains of past human*

*activity and records documenting the scientific analysis of these remains. Archeological features are typically buried, but may extend above ground. Although archeological resources are commonly associated with prehistoric peoples, they may be products of more contemporary society.)*

### **Strategies**

- Conduct sufficient research to identify and evaluate park archeological resources and assess condition and potential threats.
- Continue long-term monitoring of archeological sites to measure deterioration from natural and human sources and to evaluate the effectiveness of management actions to protect resources and mitigate impacts.
- Preserve and protect archeological resources by eliminating and avoiding natural and human impacts, stabilizing sites and structures, monitoring conditions, and enforcing protective laws and regulations.
- Make decisions that promote the preservation of archeological resources in place.
- Carry out required consultation and legal compliance, and consider concerns raised.
- Include information about archeological resources, as appropriate, in interpretive and educational programs for the public.

## **ETHNOGRAPHIC RESOURCES**

*Ethnographic resources, the cultural and natural features of a park that are of traditional significance to traditionally associated peoples, are identified and protected to the fullest extent possible. These resources may be objects, beliefs, or places, and may have attributes that are of great importance to the group but not necessarily associated with the reason the park was established or appropriate as a topic of park interpretation.*

### **Strategies**

- Identify and document, through studies and consultations, ethnographic resources, traditionally associated people and other affected groups, and such groups' cultural affiliations to park resources.
- Recognize the sensitivity of ethnographic resources and associated data and provide confidentiality to the extent possible under the law.
- Have researchers formally collaborate with traditional cultural experts to develop a park strategy for dealing with ethnographic resources.
- Monitor effects of use on ethnographic resources and effects of park plans on authorized uses and traditional users.

## **VISITOR USE AND EXPERIENCE**

*Visitors from diverse backgrounds can experience a range of opportunities consistent with the purpose, significance, and fundamental resources and values of the National Lakeshore. Most visitors understand and appreciate the purpose and significance of the National Lakeshore and value their stewardship role in preserving natural and cultural features. They actively contribute to the park's preservation through appropriate use and behavior. Park programs and services are accessible to all, and conflicts between different user groups are minimized.*

*Visitor use levels and activities are consistent with preserving park purpose, significance, and fundamental resources and values, and with providing opportunities for recreation, education, and inspiration. Management decisions are based on scholarly and scientific information. When such information is lacking, managers make decisions based on the best available information, adapting as new information becomes available. Regional recreational opportunities continue to be coordinated among agencies for public benefit and ease of use.*

### **Strategies**

- Work towards providing programs and facilities that are effective in reaching and serving diverse communities.
- Collect data over time to monitor visitor experiences as part of an overall effort to protect desired resource conditions and visitor experiences.
- Address threats to resources and the visitor experience by means other than limiting or restricting use (e.g., through education programs). If necessary, however, implement more restrictive methods.
- Base restrictions on visitor use on a determination by the park superintendent that such measures are consistent with the park's enabling legislation and NPS policies, are necessary to prevent degradation of the purposes and values for which the park was established, will minimize visitor use conflicts, or will provide opportunities for quality visitor experiences.

## **VISITOR INFORMATION, INTERPRETATION, AND EDUCATION**

*Interpretive and educational services/programs at the National Lakeshore facilitate intellectual and emotional connections between visitors and park resources, foster understanding of park resources and resource stewardship, and build a local and national constituency. Outreach programs through schools, organizations, and partnerships build connections to the park. Curriculum and place-based education inspire student understanding and resource stewardship. Visitors receive adequate information to orient themselves to the park and possible opportunities for a safe and enjoyable visit.*

### **Strategies**

- Develop and implement a comprehensive interpretive plan, with emphasis on providing information, orientation, and interpretive services in the most effective manner possible. Use both personal (involving authorized

staff) and nonpersonal (not involving staff) services (including state-of-the-art technologies) as appropriate.

- Stay informed of changing visitor demographics and preferences to effectively tailor programs for visitors. Develop interpretive media supportive of park purpose, significance, interpretive themes, and fundamental resources and values.
- Continue to promote improved pre-trip planning information and orientation for park visitors through the park's website and other media. Work with local communities and other entities to provide services outside park boundaries, where appropriate.
- Cooperate with partners, other governmental agencies, educational institutions, and other organizations to enrich interpretive and educational opportunities locally, regionally, and nationally.
- Create and implement an education strategy plan, which outlines goals and actions for providing curriculum and place-based education programs.
- Continue to regularly update plans and prioritize actions needed to serve visitors and provide effective interpretation.
- Continue to educate staff, visitors, and the public about park interpretation/education programs.

## **VIEWSHEDS**

*The visual quality of the natural vistas and cultural landscapes provide park visitors with an immediate and lasting sensory experience that strongly conveys the character of the National Lakeshore. Key scenic vistas are identified and protected. Park managers work with neighbors, local communities, and land managers to preserve scenic values.*

### **Strategies**

- Identify and document key vistas and viewpoints in the park.

- Work with neighboring landowners, communities, conservancy groups, and management agencies to develop preservation goals for identified viewsheds, identify potential threats, and establish a sense of communal stewardship for important visual resources.
  - Work with neighboring communities and partners to preserve the scenic character of park entrance areas and corridors and complement the park's key viewpoints and vistas.
- Enforce existing noise regulations.
  - Require bus tour companies to comply with regulations that reduce noise levels (e.g., turning off engines when buses are parked).
  - Limit use of generators.
  - Maintain quiet hours in campgrounds.
- Continue to work with the Federal Aviation Administration, commercial businesses, and general aviation entities to minimize noise and visual impacts of aircraft on the park. Continue to discourage pilots of conventional aircraft and ultralights from flying low along the National Lakeshore. If demand for commercial air tours develops, develop a commercial air tour management plan to address tours and their effects on the park.
  - Minimize noise generated by NPS use of noise-producing machinery such as motorized equipment. Consider noise potential when procuring and using park equipment.

## NIGHT SKY

*The naturally dark night sky is preserved. Artificial light sources in and outside the park do not hinder opportunities to see the moon, stars, planets, and other celestial features. Park staff and partners continue to work with local communities to encourage protection of the night sky. To the greatest extent possible, NPS staff work within a regional context to protect the quality of the night sky and the experience thereof.*

### Strategies

- Establish baseline data for the dark night sky through NPS programs.
- Determine if light sources in the National Lakeshore exceed appropriate levels. Study and implement ways to reduce or minimize artificial and unnecessary light.

## NATURAL SOUNDS

*Natural soundscapes are preserved, and sounds of modern society are minimized. Visitors to the National Lakeshore have opportunities in most parts of the park to hear natural sounds.*

### Strategies

- Strive to collect baseline data on park soundscapes to understand characteristics and trends in natural soundscapes.
- Continue to control existing and potential land-based noise sources:

## FACILITIES AND SERVICES

*Sleeping Bear Dunes National Lakeshore facilities and related development are the minimum necessary to serve visitor needs and protect park resources. Visitor and administrative facilities are as compatible as possible with natural processes and surrounding landscapes, aesthetically pleasing, and functional. Historic structures and properties are adaptively used when practicable and appropriate. Commercial services in the park are limited to those that are necessary and compatible with the park purpose. If possible, commercial support services are based outside the park rather than inside. Staff housing is sufficient to ensure an adequate level of protection for park resources, visitors, employees, and government property, and to provide necessary services. Adequate response (equipment and people) for visitor, resource, and facility protection; search-and-rescue; fire management; and safety is available. Decisions regarding park operations, facilities manage-*

*ment, and development at the National Lakeshore — from initial concept through design and construction—reflect principles of resource conservation and sustainability.*

### **Strategies**

- Build, locate, and/or modify facilities according to the Guiding Principles of Sustainable Design (NPS 1993) or similar guidelines. Establish architectural guidelines to ensure sustainability and compatibility with the natural and cultural environment. Properly maintain and upgrade existing facilities using sustainability principles, where possible, to serve the park mission.
- Consider the availability of existing or planned facilities in nearby communities and on adjacent lands, as well as the possibility of joint facilities with other agencies, when deciding whether to pursue new developments in the park. This will ensure that any additional facilities in the park are necessary, appropriate, and cost-effective.
- Integrate NPS asset management practices into decision-making and planning. Build, modify, and/or maintain facilities according to projected funding levels and defined park priorities. Consider removal of facilities that do not meet minimum NPS criteria and/or are not cost-effective to maintain.
- Continue to strive to provide affordable housing within the park for emergency response staff, seasonal and entry-level employees, volunteers, and to support other park needs (housing for researchers, etc.).
- Provide commercial visitor services (for example services provided through concessioners) that are necessary and appropriate for visitor use and enjoyment through the use of concession contracts and commercial use authorizations. Ensure that concession operations are consistent with the protection of park resources and values and demonstrate sound environmental management and stewardship.

## **ACCESSIBILITY TO THE NATIONAL LAKESHORE**

*New and renovated facilities are designed and constructed to be universally accessible in accordance with the Americans with Disabilities Act of 1990 and the Architectural Barriers Act Accessibility Standards (2006). Visitors with limited mobility have opportunities to experience the dunes, surrounding sands and waters, historic structures and cultural landscapes and to enjoy representative portions of the backcountry.*

### **Strategies**

- Identify and modify existing facilities to meet accessibility standards as funding permits, or as facilities are replaced or rehabilitated. Design new facilities to meet accessibility standards.
- Consider providing public information about ease of access for various facilities and trails.
- Periodically consult with disabled persons or their representatives to increase awareness of the needs of the disabled and to determine how to make the park more accessible.
- Continue to provide boardwalks and human-powered over-sand wheelchairs for visitors with special accessibility needs.
- Develop park interpretive programs per accessibility standards and needs.

## **RELATIONS WITH PRIVATE AND PUBLIC ORGANIZATIONS, ADJACENT LANDOWNERS, AND GOVERNMENTAL AGENCIES**

*The National Lakeshore is managed holistically, as part of a greater ecological, social, economic, and cultural system. Positive relations are maintained with inholders (those owning property within the park boundary), adjacent landowners, surrounding communities, and private and public groups that affect, and are affected by, the National Lakeshore. The National Lakeshore is managed proactively to*

*ensure that NPS values are effectively communicated and understood.*

#### **Strategies**

- Continue to establish and foster partnerships with public and private organizations such as Friends of Sleeping Bear Dunes, Preserve Historic Sleeping Bear, and Manitou Islands Memorial Society to achieve the purposes and mission of Sleeping Bear Dunes National Lakeshore.
- Foster a spirit of cooperation with neighbors, and encourage compatible uses of adjacent lands. Keep landowners, land managers, tribes, local governments, nongovernmental organizations, and the public informed about park management activities and issues. Consult periodically with landowners and communities that are affected by or potentially affected by park visitors and management actions.
- Work closely with local, state, and federal agencies and tribal governments whose programs affect or are affected by activities in the National Lakeshore.
- Continue to support and encourage volunteers who contribute to National Lakeshore programs.

### **RELATIONS WITH AMERICAN INDIAN TRIBES**

*The National Park Service recognizes that the Sleeping Bear dunes have long occupied a prominent position for American Indians in the Great Lakes Region and that the National Lakeshore is included in the Ceded Territory of the Treaty of 1836. Park staff work to ensure that traditional American Indian ties to the National Lakeshore are recognized; park staff also strive to maintain positive, productive, government-to-government relationships with tribes culturally affiliated with the park. The rights, viewpoints, and needs of tribes are respected, and issues that arise are promptly addressed. American Indian values are*

*considered in the management and operation of the park.*

#### **Strategies**

- To ensure productive, collaborative working relationships, consult regularly and maintain government-to-government relations with federally recognized tribes that have traditional ties to resources in the National Lakeshore.
- Continue to identify and deepen the understanding of the significance of the National Lakeshore's resources and landscapes to American Indian people through collaborative research.
- Protect and preserve sites and resources that are significant to federally recognized tribes.
- Create opportunities for and invite the participation of tribes in protecting natural and cultural resources of interest within the National Lakeshore.
- Support the continuation of traditional American Indian activities in the park to the extent allowed by law and policy.
- Work with tribes to conduct ethnographic studies that identify culturally significant resources.
- Seek input from tribes during development of interpretive programs that relate to American Indians.
- Consult with American Indians under the Native American Graves Protection and Repatriation Act for actions that affect or have the potential to affect burial remains or items of sacred or ceremonial significance.

### **WILDERNESS**

*Potential and proposed wilderness areas retain their wilderness characteristics and values. Visitors find opportunities for primitive recreation and solitude. Wilderness areas are affected primarily by the forces of nature, and signs of people remain substantially unnoticeable.*

### **Strategies**

- Administer areas described in the 1981 “Wilderness Recommendation” to maintain their existing wilderness character “until Congress determines otherwise,” as directed by Congress in 1982.
- Within five years after wilderness designation, if any, complete a wilderness management plan, to guide preservation, management, and use of wilderness areas. Ensure that management decisions affecting wilderness are consistent with the “minimum requirements” concept. In the meantime, and in keeping with established NPS policies and Director’s Order # 41 “Wilderness Preservation and Management,” continue to manage proposed wilderness areas as wilderness.

## **LAND PROTECTION**

*The National Park Service works actively with private landholders and reservation of use and occupancy holders to ensure that National Lakeshore resources and values are protected and preserved. Park staff work with government agencies and nongovernmental organizations to support efforts to protect adjacent lands that are important to preserving the resources within the Lakeshore.*

### **Strategies**

- Continue to recognize private property and water rights within the National Lakeshore. Continue to communicate with private property owners to understand and address each others’ values and concerns.
- Use various techniques to protect National Lakeshore values, including general agreements, acquisition of conservation and access easements, land exchanges, donations, and fee-simple acquisition. Inholdings may be acquired from willing sellers or right-of-first-refusal properties, assuming conditions

for transfer are acceptable and compatible with the purposes of the National Lakeshore.

- Carefully site any new telecommunication structures so as to not jeopardize the park’s purpose, significance, and fundamental resources and values (including viewsheds); also consider the park’s management zones. Permit new rights-of-way only with specific statutory authority and approval by NPS managers, and only if there is no practicable alternative to such use of NPS lands.
- Continue to support the efforts of others to protect adjacent lands that are important to preserving Lakeshore resources through appropriate planning, zoning, and other protection methods.

## **RESEARCH**

*The National Park Service works with partners to learn about natural and cultural resources and associated values. Research priorities for the National Lakeshore are aligned with its purpose, significance, and fundamental resources and values.*

### **Strategies**

- Encourage and support basic and applied research through various partnerships and agreements to enhance understanding of resources and processes or to answer specific management questions.
- Mitigate impacts of research conducted on natural and cultural resources, as needed to preserve those resources for future generations to enjoy and study.
- Develop and implement criteria to determine whether requested research supports Lakeshore purpose and significance, or other park goals.
- Develop/update list of research issues that are important to the National Lakeshore.



## BOUNDARY ADJUSTMENTS

As part of general management planning, the National Park Service is required to identify and evaluate boundary adjustments that may be necessary or desirable to carry out the purposes of the park unit. Boundary adjustments may be recommended to

- 1) protect significant resources and values, or to enhance opportunities for public enjoyment related to park purposes,
- 2) address operational and management issues, such as the need for access or the need for boundaries to correspond to logical boundary delineations such as topographic or other natural features or roads, or
- 3) otherwise protect park resources that are critical to fulfilling park purposes.

Additionally, all recommendations for boundary changes must meet the following two criteria:

- 4) The added lands will be feasible to administer considering their size, configuration, and ownership; costs; the views of and impacts on local communities and surrounding jurisdictions; and other factors such as the presence of hazardous substances or exotic species.
- 5) Other alternatives for management and resource protection are not adequate.

During scoping for this *General Management Plan*, some members of the public suggested specific areas to consider including within the boundaries of Sleeping Bear Dunes National Lakeshore. For these boundary adjustments to be recommended, at least one of criteria 1–3 above must be met, and both criteria 4 and 5 must be met. NPS staff did a preliminary evaluation of properties that appeared to have the potential to meet the criteria above. However, none of the properties or areas evaluated fulfill these requirements (see appendix B for more information), so they are not included as additions to the boundary in any of the alternatives in this plan.

However, one alternative does propose the deletion of the Benzie Corridor, which would be a boundary adjustment requiring congressional legislation. The establishment of a scenic southern entrance road to the park was included in the National Lakeshore's establishing legislation, and the park boundary includes the Benzie Corridor for that reason. Land has become increasingly expensive in this area, however, and private development continues to take place in the corridor, raising questions as to whether acquiring enough land for a scenic southern entrance is still feasible. The planning team felt that there were valid reasons for considering the removal of the Benzie Corridor and thus included the removal of the corridor in alternative A.

## RELATIONSHIP OF THE GENERAL MANAGEMENT PLAN TO OTHER PLANNING EFFORTS

Sleeping Bear Dunes National Lakeshore does not exist separately from its surroundings. Several plans for areas within or near the National Lakeshore could influence or be influenced by actions presented in this *General Management Plan / Wilderness Study / Environmental Impact Statement* and must be considered. These relevant plans and studies are listed below.

### NPS MANAGEMENT PLANS AND STUDIES

#### Scenic Road Feasibility Study

The “Scenic Road Feasibility Study, Sleeping Bear Dunes National Lakeshore” (NPS 1982) assessed the feasibility of developing a scenic road within the Benzie Corridor. The study consists of two parts. The first part describes the road (alignment, engineering specifications, estimated cost, and scenic aspects) and supporting facilities such as picnic sites, associated trails, and parking areas. The second part evaluates engineering feasibility, projected need for the road, and environmental and socioeconomic impacts that would be associated with constructing the road.

The no-action alternative and alternative B in this *General Management Plan / Wilderness Study / Environmental Impact Statement* include the Benzie Corridor scenic road concept as envisioned in the 1982 feasibility study. For the no-action alternative (continuation of current conditions and activities), the NPS planning team assumed that the scenic road *would not be* built within the life of this *General Management Plan*, so road construction is not assessed for this alternative. For alternative B, the planning team assumed that the road *would be* constructed within the life of this plan, so road construction is assessed for this alternative. The preferred alternative

in this plan retains the option for either the scenic road concept as envisioned in 1982 or for a hike/bike path — to be decided at a future date. Because the decision would be based on a separate environmental document using up-to-date information at an unknown time in the future, the preferred alternative assumes that construction of either option would not occur within the life of this plan. Alternatives A and C in this plan explore scenarios for the Benzie Corridor other than that envisioned in the 1982 feasibility study (see “Chapter 2: Alternatives, Including the Preferred Alternative” for more information).

#### Platte River Management Plan

The “Platte River Management Plan” (NPS 1992b) provided management guidance for the Platte River corridor, including the developed area near the river mouth. Elements of the “Platte River Management Plan” have been implemented. Actions in the *General Management Plan* alternatives are consistent with the “Platte River Management Plan.”

#### Fire Management Plan

The “Fire Management Plan” (NPS 2005a) for Sleeping Bear Dunes National Lakeshore was prepared to address U. S. Department of the Interior and NPS policies related to wildland fire management. The plan: (1) presents goals for preparedness and suppression, hazard fuels management, vegetation management, and public use/awareness; (2) identifies fire management units; and (3) identifies actions for fire suppression, wildland fire use, prescribed fire use, and non-fire treatments to reduce hazard fuels. Implementation of the *Fire Management Plan* will help the National Lakeshore achieve the desired conditions

related to natural resource management and cultural resource preservation presented in this plan.

### **Strategic Plan**

The “Strategic Plan” (NPS 2005b) for Sleeping Bear Dunes National Lakeshore is a five-year plan that contains a mission statement born out of the NPS Organic Act and the specific legislation that established the National Lakeshore. It includes mission goals for the Lakeshore that closely parallel NPS mission goals. It also includes objectives, measurable targets to be achieved over a five-year time frame. Achievement of these targets demonstrates progress toward meeting the Lakeshore’s mission goals. The desired conditions identified in this *General Management Plan* provide information necessary to update the *Strategic Plan*.

### **Port Oneida Rural Historic District Environmental Assessment**

The Port Oneida Rural Historic District (Port Oneida) is representative of late 19th and early 20th century farm landscapes of the upper Midwest and includes 19 farms and more than 3,400 acres of land. The need for the proposed project is driven by the deterioration of cultural resources, with approximately 35 of the 110 historic structures in poor to fair condition and requiring immediate work. Visitation is increasing at Port Oneida and the area currently lacks visitor support services. There are no basic facilities such as public restrooms, a visitor contact station, picnic shelters, or adequate parking areas. The *Port Oneida Rural Historic District Environmental Assessment* assessed four action alternatives that would provide for a visitor contact station and employee housing (in rehabilitated historic structures), improved circulation, rehabilitation and stabilization of historic structures, and stabilization of cultural landscapes. The action alternatives would

provide physical improvements to Port Oneida by creating visitor amenities, rehabilitating or stabilizing historic structures, and restoring or stabilizing historic landscape features. As of late 2007, funding for the Port Oneida improvements had not been obtained. Actions in the *General Management Plan* alternatives are consistent with the “Port Oneida Environmental Assessment.”

## **COUNTY AND REGIONAL PLANS**

### **Leelanau General Plan**

The “Leelanau General Plan” (Leelanau County 2005) for Leelanau County, Michigan, was first adopted in 1995, and updates were approved by the Leelanau County Planning Commission in 2000 and 2005. The “Leelanau General Plan” is intended to serve as the foundation for planning within Leelanau County. The principal goal of the “Leelanau General Plan” is to

establish a strategy for guiding growth that protects and, where possible, enhances the unique character of life on the peninsula. To that end, the General Plan focuses on balancing environmental protection, resource management, and economic development so as to provide a foundation for a suitable economy that permits long term prosperity for all present and future Leelanau County residents. The balance so achieved should not sacrifice environmental quality when reasonable and prudent development alternatives exist. This plan recognizes that a healthy economy depends on a healthy environment. Achievement of this goal means protecting the integrity of the land base for use by present generations without unnecessarily compromising the options of future generations.

Management alternatives for the National Lakeshore assessed in this document are consistent with the principal goal of the “Leelanau General Plan.”

### **Benzie County 2020 Comprehensive Plan**

The purpose of the “Benzie County 2020 Comprehensive Plan” (Benzie County 2000) is to provide policy and guide decision-making for land and infrastructure development decisions within Benzie County. The plan identifies key planning issues; describes the community’s character; outlines a community vision for the year 2020; identifies goals, policies, and actions for achieving the 2020 vision; describes and maps existing and future land uses; establishes public facility standards; identifies transportation improvements; and recommends specific implementation measures. The plan identifies the Benzie Corridor as a “sensitive environment” (sensitive environments include “wetlands, steep slopes, floodplains, dunes, and others”). The plan indicates that the preferred future land use for the Benzie Corridor is primarily “rural residential” (average residential density is less than one dwelling unit per 10 acres) with some “farm preservation” (overall development density is less than one dwelling unit per 40 acres and the purpose is to preserve large, contiguous areas for farming) in the eastern portion of the corridor. The alternatives in this *General Management Plan / Wilderness Study / Environmental Impact Statement* propose various options for the Benzie Corridor. Management alternatives for the National Lakeshore assessed in this document are consistent with the principal goal of the “Benzie County 2020 Comprehensive Plan.”

### **Benzie County Open Space and Natural Resources Protection Plan**

The “Benzie County Open Space and Natural Resources Protection Plan” (Benzie County

2002) identifies county lands that are high priority for protection and explains why they are a high priority. The plan suggests that some of the most important open space and natural resource lands should be purchased if the owners are willing to sell all or part of their development rights. The plan also provides tools for property owners to use in transferring development rights to local government or conservation organizations in ways that benefit the property owners and are practical for the community. The plan identifies the Benzie Corridor as a high priority scenic corridor protection area based on concerns about preserving views of the natural ridgeline from surrounding areas. The alternatives in this *General Management Plan / Wilderness Study / Environmental Impact Statement* propose various options for the Benzie Corridor. All the management alternatives assessed in this document except alternative A would be consistent with the principal goal of the “Benzie County Open Space and Natural Resources Protection Plan.” Alternative A recommends removing the Benzie Corridor from the National Lakeshore boundary, which would likely mean less protection of scenic and natural qualities.

## **COOPERATIVE PLANS**

### **Leelanau Scenic Heritage Route Trailway**

Sleeping Bear Dunes National Lakeshore is working with the Leelanau Scenic Heritage Route Committee on planning for a 27-mile nonmotorized trailway. The route would generally follow M-22 and M-109 through the National Lakeshore from the Lakeshore's northern boundary at County Road 651 to the Leelanau–Benzie County line at Manning Road south of Empire, Michigan. The trailway would connect visitor sites and facilities, including campgrounds, historic sites, beaches, trailheads, and other points of interest within the National Lakeshore. It would also provide a nonmotorized trail connection between the villages of Empire

and Glen Arbor. The railway would be on public land (either Michigan Department of Transportation right-of-way or National Lakeshore property). Where possible, the railway would also be separated from the roadway to provide safe, alternative recreation and transportation opportunities for Lakeshore visitors and residents.

Grant funds and donations have been used to contract with an architectural, design, and engineering firm to conduct a pre-engineering study and environmental assessment to determine the trail route and alignment, design concept, probable cost and range of uses for a multipurpose railway. The project falls under the umbrella of the Leelanau Scenic Heritage Route, designated in 2001 under the Michigan Department of Transportation State Heritage Route Program and coordinated by the Northwest Michigan

Council of Governments. The Leelanau Scenic Heritage Route committee appointed a Railway Work Group, which includes the Northwest Michigan Council of Governments, the National Park Service, Friends of Sleeping Bear Dunes, Michigan Department of Transportation, Traverse Area Recreation and Transportation (TART) Trails, local governments, and citizens. After completion and review of the environmental assessment and pre-engineering study, in cooperation with the Michigan Department of Transportation and the National Park Service, the Leelanau Scenic Heritage Route committee hopes to apply for Federal Transportation Enhancement funds to design and construct the railway. The Leelanau Scenic Heritage Route Railway is included in each action alternative. The goals of the railway support the desired conditions for visitor use and experience at the Lakeshore.

## ONGOING NPS PROJECTS AND PROJECTS PLANNED FOR THE NEAR FUTURE

Projects that are ongoing or that are funded and likely to be initiated (or even completed) before this GMP/WS effort is complete are listed below. These projects *are not* part of actions proposed in this *General Management Plan / Wilderness Study / Environmental Impact Statement* and will be (or have been) covered under separate environmental compliance documents. These projects *are* considered in the cumulative effects sections of this document.

### BEACH ACCESS IMPROVEMENTS — ENDS OF LEELANAU COUNTY ROADS 651 AND 669

In cooperation with the Leelanau County Road Commission, improvements will be made to beach access at the ends of Leelanau County Roads 651 and 669. The National Park Service will provide paved designated off-road parking areas (about 25 spaces each) to improve vehicular circulation and pedestrian safety and reduce damage to roadside resources that results from parking along the road shoulders. Each site will be provided with potable water service, picnic tables, visitor information panels, accessible parking spaces, and other accessible facilities.

### GLEN HAVEN VILLAGE IMPROVEMENTS

This project will combine preservation and interpretation of the historic Glen Haven village with outdoor recreational use at one of the National Lakeshore's busiest beaches. The National Park Service will preserve and stabilize historic structures and will provide interpretive information, audiovisual site history, boat exhibits, asbestos removal, housing, underground utility service, parking, sidewalks, and boardwalks and facilities for

picnicking, visitor education, and recreation. Historic structures will be rehabilitated for visitor use facilities and interpretation and/or adaptive use by partners. This project will provide operational efficiencies and reduce visitor impacts on the adjacent dunes that provide critical habitat for the endangered piping plover.

### LAKE MICHIGAN OVERLOOKS IMPROVEMENTS—PIERCE STOCKING SCENIC DRIVE

Lake Michigan Overlooks 9 and 10 on the Pierce Stocking Scenic Drive will be improved to address natural resource, scenic, safety, and maintenance concerns. The perched dune bluff at this location, which is one of the Lakeshore's fundamental resources, is about 450 feet above Lake Michigan. The path from the parking area to the overlooks takes visitors directly across the top of the bluff face, and despite signs discouraging visitors from descending in the sand toward Lake Michigan, many do so. Safety is a concern because some visitors are injured during the descent from missteps or falls or during the ascent from heart and heat-related illnesses. The heavy and concentrated foot traffic in this location has caused considerable erosion of the dune face. Finally, maintaining the current configuration of the path and overlooks is difficult and not cost-effective because of the need to frequently remove the blowing and shifting sand.

### RESTORE THE FORMER WATER WHEEL AND CASEY'S CANOE LIVERIES — PLATTE RIVER

The Platte River banks at the former Water Wheel and Casey's canoe liveries are being restored. Collapsing retaining walls at the sites

posed a visitor safety hazard and impaired the river channel's natural function and appearance. An environmental assessment was completed in August 2007. The retaining walls and backfill have been removed, and restoration activities are underway.

### **RESTORATION OF DISTURBED AREAS WITHIN THE NATIONAL LAKESHORE**

The National Park Service will continue to restore nonhistoric areas disturbed by past land uses to more natural conditions. Where cultural resources are probable, national register evaluation would occur before a decision as to final disposition is made. Such actions would, as always, be undertaken in consultation with the state historic preservation office. Structures on these properties may have deteriorated, presenting serious health and safety concerns. Many of these areas have nonnative vegetation, disturbed soils, and disturbed topographic and hydrologic patterns. Some of the areas are in state-designated critical dunes. There is concern that threatened or endangered native plants such as Pitcher's thistle and three-birds orchid will be overtaken by nonnative invasive species such as leafy spurge, garlic mustard, and Scotch pine. To restore these areas, the National Park Service will remove any nonhistoric structures, remove or otherwise

mitigate any hazardous materials, and reestablish more natural landforms. Non-native vegetation will be removed, and native vegetation will be reestablished using seeds, transplants, and cuttings from other areas of the National Lakeshore. The ultimate goal is restoration of natural habitats and processes.

### **SOUTH MANITOU LIGHTHOUSE COMPLEX — EXTERIOR RESTORATION AND INTERIOR REHABILITATION**

The National Park Service will restore the exterior of the keeper's quarters and connecting passageways. The structures' interiors will be rehabilitated to allow for public access and displays. Work will include painting walls and trim, refinishing floors, and repairing some plaster walls. (See page 40 for cultural resources treatment definitions.)

### **DUNE CLIMB PARKING AREA — PAVING AND OTHER MINOR IMPROVEMENTS**

The National Park Service will pave the Dune Climb parking area and make other minor improvements to alleviate vehicular circulation and drainage problems and improve access for the disabled.

## The Alternatives, Including the Preferred Alternative







## INTRODUCTION

This chapter presents five alternatives, including the preferred alternative, for future management of Sleeping Bear Dunes National Lakeshore. The alternatives were developed through a lengthy and diligent public involvement process, described in detail in the “Public Involvement, Including Scoping” section in chapter 6. The five alternatives, each of which is consistent with the National Lakeshore’s purpose, significance, and fundamental resources and values, are the no-action (“business as usual”) alternative, the preferred alternative, alternative A, alternative B, and alternative C. The no-action alternative

is included as a baseline for comparing the environmental consequences of implementing each “action” alternative. This chapter also includes sections on implementation of the general management plan, management zones, user capacity, mitigative measures common to all action alternatives, and the environmentally preferred alternative. It also includes a table that compares the alternatives, a table that shows the possible range of treatment for historic properties under the alternatives, and a table that summarizes the expected impacts of implementing the alternatives.

## IMPLEMENTATION OF THE GENERAL MANAGEMENT PLAN

### IMPLEMENTATION FUNDING

Although this *General Management Plan* provides the analysis and justification for future National Lakeshore funding proposals, this plan does not guarantee future NPS funding. Many actions would be necessary to achieve the desired conditions for natural resources, cultural resources, recreational opportunities, and facilities as envisioned in this plan. The National Park Service will request funding to achieve these desired conditions; although the National Lakeshore hopes to secure this funding and will prepare itself accordingly, the Lakeshore may not receive enough funding to achieve all desired conditions. Because NPS funding may be insufficient to accomplish the goals set by the plan, National Lakeshore managers will need to continue to pursue other options, including expanding the service of volunteers, drawing upon existing or new partnerships, and seeking alternative funding sources, including the philanthropic community. Many people care deeply about their national parks (and Sleeping Bear Dunes National Lakeshore in particular), and these people are likely to continue to offer assistance in meeting NPS goals that matter most to them. Many potential partner groups exist whose missions are compatible with that of the Lakeshore, and these groups are likely to offer to work with the Lakeshore for mutual benefit.

Even with assistance from supplemental sources, Lakeshore managers may be faced with difficult choices when setting priorities. The *General Management Plan* provides the framework within which to make these choices.

### KEY IMPLEMENTATION PLANS TO FOLLOW THIS GENERAL MANAGEMENT PLAN / WILDERNESS STUDY / ENVIRONMENTAL IMPACT STATEMENT

#### Wilderness Management

If Congress acts to designate wilderness within the National Lakeshore, a wilderness management plan would be developed. The wilderness management plan would guide NPS managers in the preservation, management, and use of areas designated as wilderness. The wilderness management plan would be developed with public input and would comply with the National Environmental Policy Act (1969) and other applicable laws and policies.

#### Asset Management

The National Park Service is developing a national program for managing structures and facilities (assets) in park system units. This program is likely to call for development of an asset management plan for each park unit. Such plans are designed to provide park managers with a means of prioritizing, scheduling, and funding maintenance and repair work. They also include techniques to manage gaps between needed and anticipated funding, such as “mothballing” or even disposing of lower priority assets. The Lakeshore’s asset management plan would follow the guidelines of the national program, including guidance for compliance with the National Environmental Policy Act, Sections 106 and 110 of the National Historic Preservation Act, and other applicable laws and policies.

**Ethnographic Resources Study/Assessment**

The National Lakeshore will conduct ethnographic studies to formally identify

groups of people with traditional associations to park lands and waters. This is a key step toward ensuring that ethnographic resources are protected.

## MANAGEMENT ZONES

Management zones prescribe how different areas of the National Lakeshore would be managed. Each management zone specifies complementary natural resource conditions, cultural resource conditions, opportunities for visitor experiences, and appropriate facilities, and combines these into a possible management strategy that could be applied to locations within the National Lakeshore. As such, management zones give an indication of the management priorities for various areas. Four management zones have been developed for the National Lakeshore — the high use zone, the experience history zone, the recreation zone, and the experience nature zone. The action alternatives presented later in this chapter each propose a different configuration of the management zones within the National Lakeshore based on the

concept for each alternative. In every management zone, the Lakeshore intends to preserve and protect natural and cultural resources to the greatest extent possible given available funds. An overview of the management zones is provided on the following page, with more detail in table 1 that follows. The table describes the conditions, opportunities, and services that would apply to each management zone. The management zones are listed in order from most intensive management (high use zone) to least intensive management (experience nature zone).

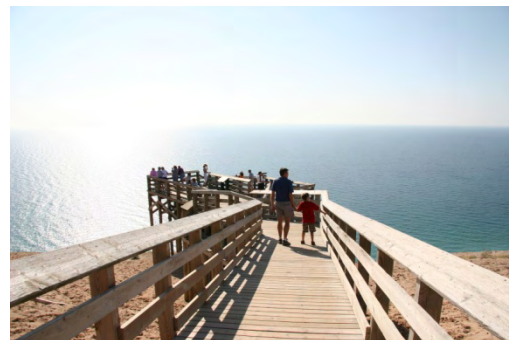
The cultural resource treatments mentioned in the management zones table (table 1) are defined as follows:

- **Preservation** is the act or process of applying the measures necessary to sustain the existing form, integrity, and materials of a historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses on ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction.
- **Rehabilitation** is the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, or architectural values.
- **Restoration** is the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by removing features from other periods in its history and reconstructing missing features from the restoration period.

### **High Use Zone**

This management zone provides for visitor orientation, education, and other structured activities (such as ranger-led tours). High numbers of visitors enjoy and learn about the National Lakeshore. This zone also supports the Lakeshore's main administrative and operational facilities. Wilderness does not occur in this zone.

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### **Experience History Zone**

This management zone is managed primarily to preserve historic structures and landscapes. Moderate to high numbers of visitors enjoy and learn about significant historic activities, buildings, and landscapes. Wilderness does not occur in this zone.

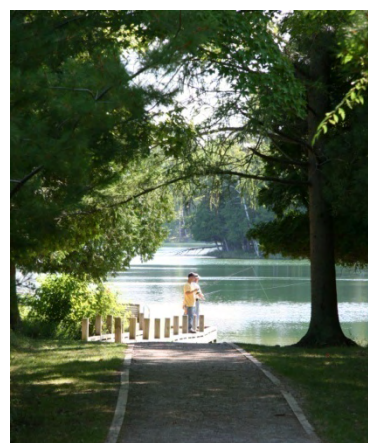
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### **Recreation Zone**

This management zone provides a wide range of recreational opportunities for moderate numbers of visitors. The active Lake Michigan beach area is within this zone, as is the 0.25 mile of Lake Michigan waters within the National Lakeshore boundary. Wilderness does not occur in this zone.

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### **Experience Nature Zone**

This is the wildest, most natural management zone. Low numbers of visitors enjoy primitive recreation on foot or in nonmotorized watercraft. Wilderness may or may not occur in this zone.



**TABLE 1: MANAGEMENT ZONES**

	High Use Zone	Experience History Zone
<b>Overview</b>	This management zone provides for visitor orientation, education, and other structured activities (such as ranger-led tours). High numbers of visitors enjoy and learn about the National Lakeshore. This zone also supports the Lakeshore's main administrative and operational facilities. Wilderness does not occur in this zone.	This management zone is managed primarily to preserve historic structures and landscapes. Moderate to high numbers of visitors enjoy and learn about significant historic activities, buildings, and landscapes. Wilderness does not occur in this zone.
<b>Resource Conditions</b>	This zone is characterized by high levels of recreational use in a modified natural environment. This developed zone may be located in previously disturbed areas or areas with relatively resilient natural resources that can be modified to support development with acceptable impacts. Natural resources may be modified to accommodate NPS operational facilities or high levels of visitor use. Cultural resource treatments in this zone may range from <b>preservation to rehabilitation</b> based on fundamental resources, national register significance, documentation, condition, interpretive value, and suitability for NPS operations. Cultural resources may be modified to accommodate NPS operational facilities or high levels of visitor use.	This zone is characterized by cultural resources set within a natural environment. Protecting and preserving cultural resources is a very high priority. In keeping with the focus on cultural resources, natural resources may be modified to preserve, rehabilitate, or restore cultural resources. Cultural resource treatments in this zone may range from <b>preservation to restoration</b> based on fundamental park resources, national register significance, documentation, condition, interpretive value, and suitability for NPS operations. Cultural resources may be modified to provide safe visitor access or to preserve them through adaptive use.
<b>Visitor Opportunities</b>	The easily accessed areas in this zone focus on a connection with and appreciation of special Lakeshore resources. Visitors are offered a variety of opportunities for orientation, interpretation, and education. Conveying Lakeshore themes to visitors is a priority. Common visitor activities may include viewing scenic vistas, taking short walks, picnicking, camping in developed campgrounds accessible by motor vehicles, swimming, boating, and attending interpretive programs. This zone is popular and well suited for family recreation. Self-sufficiency and knowledge of outdoor skills are not necessary. Time commitment varies, depending on information or services desired. High visitation levels are accommodated. Encounters with other visitors and Lakeshore staff are likely, especially around developed facilities.	The primary experience is visiting historic areas and learning about cultural history. Visitors are offered a variety of opportunities to understand and enjoy cultural resources. Common visitor activities may include sightseeing, guided walks, historic tours, educational programs, hiking, hunting, cross-country skiing, snowshoeing, and enjoyment of the cultural setting. Self-sufficiency and knowledge of outdoor skills are not necessary. The time commitment is typically one to two hours, but longer on the islands due to travel time from the mainland. Moderate to high visitation levels are accommodated. Encounters with other visitors and Lakeshore staff are likely, especially at points of interest. Encounters may be fewer in larger districts and open areas.
<b>Facilities and Commercial Services</b>	New and existing park roads and trails may be accommodated. State highway and county road rights-of-way may be in this zone. Developments may be used for visitor or administrative purposes. Appropriate kinds of facilities may include visitor centers, visitor contact stations, museums, roads, parking areas, trailheads and trails, developed campgrounds, surfaced walkways, picnic areas, restrooms, and Lake Michigan and inland lake boat ramps or docks. Appropriate kinds of operational facilities include administrative offices, employee housing, and maintenance areas. Appropriate commercial services may include convenience concessions, shuttle services, boat rentals, and guided services, such as vehicle and bicycle tours.	New and existing park roads and trails may be accommodated. State highway and county road rights-of-way may be in this zone. Developments include groupings of historic structures and related landscape elements such as orchards, fields, and cemeteries. Other developments are unobtrusive and fit with the cultural landscape. Appropriate kinds of facilities may include visitor contact stations, roads, museums, parking areas, surfaced walkways, restrooms, trailheads and trails, and picnic areas. Appropriate kinds of operational facilities include administrative offices, employee housing, and maintenance areas. Appropriate commercial services may include limited convenience concessions, shuttle services, and guided services such as vehicle and bicycle tours.

TABLE 1: MANAGEMENT ZONES (CONT.)

	Recreation Zone	Experience Nature Zone
<b>Overview</b>	This management zone provides a wide range of recreational opportunities for moderate numbers of visitors. The active Lake Michigan beach area is within this zone, as is the 0.25 mile of Lake Michigan waters within the National Lakeshore boundary. Wilderness does not occur in this zone.	This is the wildest, most natural management zone. Low numbers of visitors enjoy primitive recreation on foot or in nonmotorized watercraft. Wilderness may or may not occur in this zone.
<b>Resource Conditions</b>	This zone's character is natural overall; alterations are designed to blend with the natural landscape. Protecting and preserving natural resources is a high priority. Natural resources may be modified to provide for a variety of compatible recreational activities. Cultural resource treatments in this zone may range from <b>preservation to rehabilitation</b> based on fundamental park resources, national register significance, documentation, condition, interpretive value, and suitability for NPS operations. Cultural resources may be modified to provide for a variety of compatible recreational activities.	This zone's character is natural overall; alterations are minimal and designed to blend with the natural landscape. Protecting and preserving natural resources is a very high priority. Natural resources may be modified to provide safe visitor access or reduce the overall level of resource impacts. Cultural resources within the zone would be <b>preserved</b> , but may be modified to preserve or restore natural resources.
<b>Visitor Opportunities</b>	Generally, the experience is rustic and there is a sense of being in a natural landscape. Visitors enjoy a wide range of recreational activities. Common visitor activities may include scenic driving, hiking, backpacking, motorized and nonmotorized boating, bicycling on roads and designated trails, hunting, fishing, horseback riding on designated trails, cross-country skiing, snowshoeing, camping, beach-going, and swimming. Self-sufficiency and knowledge of outdoor skills are typically not necessary (except for backpacking and camping on the islands). The time commitment ranges from about 30 minutes to more than a day (for camping). On the islands, this zone requires a longer time commitment. Moderate visitation levels are accommodated. Encounters with other visitors and Lakeshore staff are likely at trailheads, points of interest, and river access sites. The number of encounters may be moderate along major trails and rivers. Solitude can usually be found if sought.	There is a sense of being in a primitive, natural landscape. Visitors enjoy natural surroundings on foot or in nonmotorized watercraft. Common visitor activities may include hiking, nonmotorized boating, backpacking, hunting, fishing, horseback riding on designated trails, cross-country skiing, snowshoeing, beach-going and swimming, and backcountry camping. Typically, the amount of time, outdoor skill, and self-reliance needed is greater than for other zones. This is especially true on the islands. Lower visitation levels are accommodated. Encounters with other visitors and Lakeshore staff are generally few, although there may be pulses of visitor activity near trailheads and other entry points. Opportunities for solitude are plentiful.
<b>Facilities and Commercial Services</b>	New and existing park roads and trails may be accommodated. County road rights-of-way may be in this zone. Developments are unobtrusive and fit in with the natural environment. Appropriate kinds of facilities may include roads, trailheads and trails, primitive or rustic campgrounds, parking areas, primitive toilets, picnic areas, inland water boat docks and launches, and information kiosks. Appropriate kinds of operational facilities include employee housing. Appropriate commercial services may include boat rentals and guided services such as hunting, fishing, hiking, bicycling, and horseback riding.	There are no active roads in this zone. However, county road rights-of-way that have not been developed, or that are being used as trail corridors may be in this zone. Developments are limited to those necessary for protecting resources or for safety purposes. Appropriate kinds of facilities may include trails, backcountry campsites or campgrounds, primitive toilets, and special trail surfaces in localized areas (e.g., sand ladders to protect sensitive dunes, or raised planking to protect wet areas). There are no operational facilities in this zone. Appropriate commercial services may include nonmotorized boat rentals and guided services such as hunting, fishing, horseback riding, and hiking.



## USER CAPACITY (CARRYING CAPACITY)

### OVERVIEW

General management plans for national park system units, including national lakeshores, must address user capacity management. The National Park Service defines user capacity as the type and level of use that can be accommodated while sustaining the quality of a park unit's resources and visitor opportunities consistent with the purposes of the park unit.

User capacity management involves establishing desired conditions, monitoring, evaluating, and taking actions (managing visitor use) to ensure that park unit values are protected. The premise is that with any use on public lands comes some level of impact that must be accepted; therefore it is the responsibility of the National Park Service to decide what level of impact is acceptable and what management actions are needed to keep impacts within acceptable limits. Instead of just tracking and controlling user numbers, NPS staff manage the levels, types, and patterns of visitor use and other public uses as needed to preserve the condition of the resources and quality of the visitor experience. The monitoring component of this process helps NPS staff evaluate the effectiveness of management actions and provides a basis for informed management of public use.

The user capacity management process can be summarized by the following major steps:

1. Establish desired conditions for resources and visitor experiences (through management zoning).
2. Identify indicators (things to monitor to determine whether desired conditions are being met, e.g., soil loss, vegetation damage).
3. Identify standards (limits of acceptable change) for the indicators.
4. Monitor indicators to determine if there are disturbing trends or if standards are being exceeded.
5. Take management action to maintain or restore desired conditions.

With limited staffs and budgets, NPS managers must focus on areas where there are definite concerns and/or clear evidence of problems. This means monitoring should generally take place where conditions are approaching or violate standards, conditions are changing rapidly, specific and important values are threatened by visitation, and/or the effects of management actions taken to address impacts are uncertain.

This *General Management Plan* addresses user capacity in the following ways:

- It outlines management zones that provide the foundation for user capacity management. The management zones prescribe desired resource conditions, visitor experience opportunities, and types of facilities to support the resource conditions and visitor experiences for different areas;
- It describes the Lakeshore's most pressing use-related resource and visitor experience concerns. This helps NPS managers focus limited resources on specific potential indicators and determine what kinds of baseline information to collect.
- It identifies potential indicators that could be monitored as needed in the future to determine if desired conditions are not being met due to unacceptable impacts from public use. As National Lakeshore managers collect more detailed information on use-related concerns, specific indicators will be selected for monitoring and corresponding standards (limits of acceptable change) will be identified.

- It outlines representative examples of management actions that might be used to avoid or minimize unacceptable impacts from public use.
- It identifies specific geographic areas for special monitoring attention.
- It calls for a wilderness management plan to be completed soon after wilderness designation (if any).

The last steps in the user capacity process, which will continue indefinitely, involve monitoring the National Lakeshore's indicators and taking management actions as needed to minimize impacts. As a means for providing flexibility in the face of changing conditions, National Lakeshore managers will use an adaptive management approach when appropriate. (Adaptive management is a management system based on clearly identified outcomes, monitoring to determine if management actions are meeting outcomes, and if not, making changes that will best ensure that outcomes are met or that outcomes are reevaluated.) If new use-related resource or visitor experience concerns arise in the future, additional indicators and standards will be identified as needed to address these concerns.

## **OVERVIEW OF CURRENT AND POTENTIAL USE-RELATED IMPACTS**

This section discusses existing and potential use-related impacts that may occur in the National Lakeshore, challenging the National Park Service's ability to manage for the desired conditions outlined in this *General Management Plan*.

Existing facilities in the Lakeshore generally support enjoyable visitor opportunities and protect resources, and based on projected trends will continue to function fairly well. Beach access parking areas, the Dune Climb parking area, and campgrounds sometimes fill to capacity during the summer. As a result, visitors may be frustrated in trying to reach certain areas of the Lakeshore and may park

in or use nondesignated areas. In addition to the associated impact on the visitor experience, using nondesignated areas may cause impacts such as vegetation loss, erosion, and introduction of invasive species, particularly in vulnerable areas.

In the summer, high volumes of use along the Platte River cause crowded conditions at times. Some people who commented during the GMP process expressed concern about this issue and its related impacts (e.g., bank erosion). If use increases or patterns of use change, crowding on the Platte River may worsen and/or become more frequent. In addition to crowding, use on the Platte River is resulting in excessive impacts to the riverbanks and associated floodplains, such as proliferation of informal trails, erosion, vegetation damage and loss, litter, and improper disposal of human waste. Impacts to water quality (e.g., increased sedimentation, nitrates, and *E. coli*) on the rivers and inland lakes from visitor use are also a concern. In the future, use levels may also increase on the Crystal River and cause similar conditions during the busy summer season.

Visitor crowding does not currently seem to be a problem on trails. However, visitor encounter rates must remain low on trails in some areas to ensure that visitors' expectations for solitude and natural conditions are met.

Use levels on the islands are relatively low and are highly influenced by the capacity and timing of the island ferry. At this time, there do not seem to be any major crowding or use conflicts affecting visitor opportunities on the islands. Some resource-related impacts (e.g., proliferation of campsites, damage to vegetation, and improper human waste disposal) are associated with dispersed backcountry camping on North Manitou Island.

## POTENTIAL USER CAPACITY INDICATORS AND RELATED MANAGEMENT ACTIONS

The following section outlines some potential indicators that may be monitored to better understand the magnitude and trends of the most pressing use-related concerns described in the previous section. The management zones **for which each indicator is likely to be most relevant** is identified, along with potential management actions to address resource and/or visitor experience concerns. Some management actions may not be appropriate in some management zones. Final selection of indicators and standards for monitoring purposes and implementation of management actions that affect use will comply with the National Environmental Policy Act (1969), Section 106 of the National Historic Preservation Act, and other laws and NPS management policies as appropriate.

Potential user capacity indicators may include the following:

- Water quality (high use zone, recreation zone, experience nature zone)  
Management actions that may be considered to avoid or minimize impacts to water quality include encouraging low-impact practices (e.g., Leave No Trace); directing use to designated areas or facilities; providing more waste disposal facilities; redistributing use to lesser used areas or off-peak times; cleaning equipment before entering waterways; and reducing/eliminating certain uses, activities, or equipment.
- Impacts to riverbanks, such as erosion, vegetation damage or loss, creation of informal trails (high use zone, recreation zone, experience nature zone)  
Management actions that may be considered to avoid or minimize riverbank impacts include encouraging low impact practices;

directing use to designated areas or facilities; providing more waste disposal facilities; increasing the number of signs to direct visitors to appropriate facilities; redistributing use to lesser used areas or off-peak times, rehabilitating some sites; and reducing use levels.

- Amount of litter (high use zone, recreation zone, experience nature zone, experience history zone)  
Management actions that may be considered to avoid or minimize litter include encouraging personal responsibility for waste disposal, providing more waste disposal facilities, and directing use to designated areas or facilities.
- Improper human waste disposal (high use zone, recreation zone, experience nature zone)  
Management actions that may be considered to prevent or minimize improper human waste disposal include encouraging proper waste disposal, providing more toilet facilities, directing use to appropriate facilities, and reducing use levels.
- Impacts to dunes (e.g., erosion, vegetation damage and loss, informal trails, invasive species) (recreation zone, experience nature zone, experience history zone)  
Management actions that may be considered to prevent or minimize impacts to dunes include encouraging low-impact practices through information, directing use to designated areas or facilities, increasing the number of signs to direct visitors to appropriate access points, using erosion control techniques to stabilize problem areas, designating alternate access points, and reducing use levels.
- Impacts from backcountry camping, such as proliferation of user created campsites, increase in campsite size, tree

damage, and improper human waste disposal (experience nature zone)

Management actions that may be considered to prevent or minimize impacts from backcountry camping include encouraging low-impact practices (e.g., Leave No Trace), directing use to designated campsites, providing information directing visitors to appropriate areas or facilities, providing information on how to select an appropriate campsite, better defining appropriate use areas, providing facilities to contain impacts (e.g., fire grates and privies), managing access to certain areas with natural barriers, redistributing use to lesser used areas or off-peak times, rehabilitating some sites, and reducing use levels.

- Failure of nesting piping plovers to raise young (recreation zone). Piping plovers are federally endangered shorebirds that prefer certain areas along Lake Michigan beaches for nesting.

Management actions that may be continued or considered to prevent or minimize impacts to piping plovers include providing information about the species and its habits, temporary fencing and closing nesting territories to discourage inadvertent trampling of nests or disturbance of the species, designating alternate access points, and establishing and enforcing dog closure areas.

- Overcrowding at beach parking areas (high use zone, recreation zone)  
Management actions that may be considered to prevent or minimize these impacts include providing advanced planning information that encourages visitation to lesser used areas or at off-peak times, providing real-time information about parking availability, adding more parking or redesigning parking areas for greater efficiency, and closing areas when full

and actively redistributing use to other sites.

- Crowding from high use levels on rivers (high use zone, recreation zone, experience nature zone)  
Management actions that may be considered to prevent or minimize crowding on rivers include providing information on visitor etiquette, redistributing visitation to lesser used areas or off-peak times, and limiting the number of watercraft on the river.
- Vandalism and unintentional damage to historic structures (experience history zone, recreation zone)

Management actions that may be considered to prevent or minimize impacts to historic structures include providing more information on the sensitivity and value of the Lake-shore's cultural resources, hardening or protecting heavily used areas with special materials, increased ranger patrols in target areas, using remote video-monitoring, and directing use away from (or closure of) particularly vulnerable sites.

## **AREAS FOR SPECIAL MONITORING ATTENTION**

Areas that have been identified for special monitoring attention include the following:

- Platte River, Crystal River, and associated riverbank areas
- dune areas near the Dune Climb and North Bar Lake
- Lake Michigan Overlook (Overlooks 9 and 10) on the Pierce Stocking Scenic Drive
- Piping plover nesting areas, especially those near visitor use areas
- Platte Point developed area
- White Pine backcountry campground
- popular camping areas on North Manitou Island

## ALTERNATIVES

Regardless of this planning effort, the National Park Service would continue to follow special mandates and servicewide laws and policies as noted in chapter 1. Similarly, Lakeshore-wide desired conditions (and potential strategies to achieve those conditions) for topics ranging from ecosystem management to Lakeshore accessibility are presented in chapter 1 and would apply regardless of which GMP alternative is ultimately selected for implementation. As this *General Management Plan / Wilderness Study / Environmental Impact Statement* was being developed, the National Lakeshore was proceeding with a number of projects that are

planned or already underway; these projects, discussed in chapter 1 in the “Ongoing NPS Projects and Projects Planned for the Near Future” section and in chapter 5 (cumulative impacts), would also occur regardless of this planning effort.

The alternatives described on the following pages, each of which is consistent with maintaining the National Lakeshore’s purpose, significance, and fundamental resources and values, present different choices for how to manage resources, visitor use, and facilities within the Lakeshore.

## NO-ACTION ALTERNATIVE

### OVERALL VISION

The no-action alternative primarily reflects current conditions and activities at the Lakeshore. This alternative is provided as a baseline against which to compare the other “action” alternatives.

### WILDERNESS

The existing wilderness proposal of 30,903 acres (43% of the National Lakeshore) would remain in place (see No-action Alternative map in back pocket). As directed by Congress in 1982, the National Park Service would continue to manage lands proposed for wilderness in the 1981 “Wilderness Recommendation” to maintain their existing wilderness character. These proposed wilderness areas are in the north, south, and island areas of the National Lakeshore. Some county roads are within areas proposed for wilderness.

Areas proposed for wilderness include the following:

- North area of the mainland — most of the area north of M-22, including a portion of Port Oneida
- Central area of the mainland — none
- South area of the mainland — much of the area north and west of M-22
- North Manitou Island — most of the island (the historic village is excluded; part of Cottage Row is included)
- South Manitou Island — most of the island (the lighthouse complex, historic village, and farm loop tour route are excluded)

### NATURAL RESOURCES

Natural resource management programs would continue to emphasize protection of natural resources and processes. Natural resource management programs that would occur regardless of the general management plan are outlined in the “Desired Conditions and Strategies” section in chapter 1. Examples of ongoing programs include controlling invasive species, restoring disturbed sites, protecting open dune areas, and protecting threatened and endangered species.

### CULTURAL RESOURCES

Efforts to preserve as many historic structures and landscapes as possible would continue; management would consider the Lakeshore’s fundamental resources and values, national register significance, documentation, condition, interpretive value, and suitability for NPS operations. More information on individual areas is provided on the following pages.

- Glen Haven (same in all alternatives) — The Glen Haven Historic District and cultural landscape would be preserved, rehabilitated, or restored. The Sleeping Bear Point Life-Saving Station would be preserved, rehabilitated, or restored.
- Port Oneida (same in all alternatives) — Historic structures and landscapes would be preserved, rehabilitated, or restored.
- North Manitou Island — The historic life-saving station structures would be preserved, rehabilitated, or restored. Preservation and/or adaptive use of the rehabilitated historic former Manitou Island Association structures for administrative and operational purposes would continue. Historic structures on Cottage Row and elsewhere on the island would be preserved.

- South Manitou Island — The historic life-saving station, lighthouse complex, schoolhouse, and village historic structures would be preserved, rehabilitated, or restored. Structures and landscapes elsewhere on the island would be preserved.
- Other Mainland Historic Structures and Landscapes — Treatments for historic structures and landscapes range from preserved to rehabilitated.

### VISITOR ORIENTATION, INTERPRETATION, AND EDUCATION

Visitor orientation services would continue at the NPS visitor center in Empire, at Glen Haven, and at the visitor contact station on South Manitou Island. Interpretive activities would continue throughout the Lakeshore, with special emphasis at the Dune Climb, the major campgrounds, Port Oneida, Glen Haven, and Sleeping Bear Point Maritime Museum. A variety of interpretive and educational programs (e.g., guided hikes, summer and school programs) would continue. On South Manitou Island, concession-operated farm loop tours would continue.

### VISITOR FACILITIES, OPPORTUNITIES, AND ACTIVITIES

Opportunities to enjoy recreational activities would exist in a variety of settings.

- Roads — Roads would remain essentially the same as now.
- Trails — Trails would remain essentially the same as now.
- Campgrounds — Campgrounds and camping would remain essentially the same as now.
- Lake Michigan Beach Access — Beach access points that are accessible to motor vehicles (Lake Michigan Road [Leelanau County], Glen Haven, North Bar Lake, Esch Beach, Peterson Road, Tiesma

Road, and Lake Michigan Road [Platte River mouth] would remain essentially the same. (By late summer 2008, beach access improvements at the County Road 651 and 669 road ends are expected to be complete. See the “Ongoing NPS Projects and Projects Planned for the Near Future” section in chapter 1 for more information.)

- Lake Michigan Boat Access — Boat access to Lake Michigan would remain at the end of Lake Michigan Road, near the mouth of the Platte River.
- Inland Lake Use and Access — Motorized boats would continue to be allowed on School, Bass (Leelanau County), North Bar, and Loon lakes.
- Picnic Areas — Existing picnic areas would remain.
- Ferry Service — Ferry service for day and overnight stays on South Manitou Island and overnight stays on North Manitou Island would continue.
- Boat Access for River Use — Motorized and nonmotorized watercraft use along the Platte and Crystal rivers would continue.
- Dune Climb — The Dune Climb would remain essentially the same. (By late summer 2008, the parking area is expected to be paved and wheelchair accessibility and drainage issues are expected to be addressed. See the “Ongoing NPS Projects and Projects Planned for the Near Future” section in chapter 1 for more information).
- Bicycle Use — Bicycle use would continue to be allowed on roads used by motor vehicles but not on hiking trails.
- Hang Gliding — Hang gliding would continue to be allowed at designated sites within the Lakeshore.

### Benzie Corridor

The National Park Service would continue to acquire lands within the Benzie Corridor on a willing-seller basis (subject to available

funding) for future development of a scenic road. The scenic road would include bike lanes (or in some stretches a separate bike trail, as appropriate). However, the road and bike lanes/trail would not be expected to be built within the life of this plan.

Land acquisition costs are not included in the cost estimates below. Merely stating that the National Lakeshore would continue to purchase lands within the Benzie Corridor would not immediately make funds available for acquisition. It might be several years before funds are actually available to implement the plan.

### **Bow Lakes**

Nature observation and backcountry hiking on informal, undesignated trails would continue. The National Park Service would acquire properties within this area of the Lakeshore on a willing-seller basis as they become available (subject to available funding).

## **BOUNDARY ADJUSTMENTS**

There would be no boundary adjustments under this alternative.

## **STAFFING AND COSTS**

The staffing level under the no-action alternative would continue to be the equivalent of 66 full-time staff members.

Volunteers and partnerships would continue to be key contributors to NPS operations.

The cost estimates provided here are given for comparison to other alternatives only; they are not to be used for budgeting purposes. Although the numbers appear to be absolutes, they represent a midpoint in a possible range of costs. The costs developed are estimates inclusive of all one-time capital costs (see “Ongoing NPS Projects and Projects Planned for the Near Future” in chapter 1) and non-facility costs such as major resource plans and projects are estimated at \$6.6 million. Ongoing plans and projects include improvements to selected beach access parking areas and overlooks, Glen Haven improvements, restoration/ rehabilitation of the South Manitou Island Lighthouse complex, and restoration of areas disturbed by past land uses. Deferred maintenance costs of the no-action alternative are estimated at \$15.4 million. The total cost of this alternative (one-time capital costs plus deferred maintenance costs) is estimated at \$22 million. Annual operating costs under this alternative would be \$3.9 million. Presentation of these costs in this plan does not guarantee future NPS funding. Project funding will not come all at once; it will likely take many years to secure and may be provided by partners, donations or other nonfederal sources. Although the National Lakeshore hopes to secure this funding and will prepare itself accordingly, the Lakeshore may not receive enough funding to achieve all desired conditions within the timeframe of the *General Management Plan* (the next 20 or more years). More information on costs is provided in appendix C.



## PREFERRED ALTERNATIVE

### OVERALL VISION

The Lakeshore is valued primarily for preservation of its natural resources, and for the opportunities it provides for visitor enjoyment of natural, cultural, and recreational resources in a scenic outdoor setting. The preferred alternative was determined through a planning process that included public involvement. See “Appendix D: Development of the Preferred Alternative” for rationale and other information about the preferred alternative.

### WILDERNESS

About 32,100 acres (45% of the National Lakeshore) in the north, central, south, and island areas of the Lakeshore would be proposed as wilderness (see Preferred Alternative map in back pocket). No developed county roads are within areas proposed for wilderness. None of the Lake Michigan active beach zone is in areas proposed for wilderness. Please note that the acreage figures for the various wilderness proposals are estimates based on small-scale maps; the acreage for the approved wilderness proposal will be refined prior to legislation, using detailed, large-scale maps.

Areas of proposed wilderness are as follows:

- North area of the mainland — an area north of M-22 and east of Port Oneida; none in Port Oneida
- Central area of the mainland — Sleeping Bear Plateau
- South area of the mainland — much of the area north and west of M-22
- North Manitou Island — most of the island (the historic village and Cottage Row would be excluded)
- South Manitou Island — most of the island (the lighthouse complex, historic

village, schoolhouse, farm loop tour and surrounding cultural landscape, and the route to the Giant Cedars would be excluded)

### NATURAL RESOURCES

Based on the emphasis placed on natural resource conditions and experiences in this alternative, the experience nature zone would extend across much of the Lakeshore. Some selected areas would be zoned high use or recreation to allow for possible future recreational opportunities. Natural resource management programs that would occur regardless of the general management plan are outlined in the “Desired Conditions and Strategies” section in chapter 1. Examples include controlling invasive species, restoring disturbed sites, protecting open dune areas, and protecting threatened and endangered species.

### CULTURAL RESOURCES

Based on the emphasis placed on opportunities for enjoyment of cultural resources in this alternative, the experience history zone would encompass most of the National Lakeshore’s historic resources. Historic structures and landscapes would be preserved at a minimum and managed as specified for the management zone in which they lie (see alternative map and zone descriptions).

- Glen Haven (same in all alternatives) — The Glen Haven Historic District and Sleeping Bear Point Life-Saving Station would be preserved, rehabilitated, or restored. Some buildings would be rehabilitated for visitor and/or staff use. The Sleeping Bear Inn and garage would be placed in the NPS historic leasing program to allow rehabilitation for

adaptive use. All other structures would be stabilized and maintained in their current condition.

- Port Oneida (same in all alternatives) — Historic structures and landscapes would be preserved, rehabilitated, or restored. Structures on at least one farmstead would be restored for interpretive purposes. Some buildings in the district would be rehabilitated for visitor and/or staff use, including a visitor contact station and staff housing. At least one farmstead would be placed in the NPS historic leasing program to allow rehabilitation and adaptive use. All other structures and landscapes would be stabilized and maintained in their current condition.
- North Manitou Island — The historic life-saving station and Cottage Row structures would be preserved, rehabilitated, or restored. Preservation and/or adaptive use of the rehabilitated historic former Manitou Island Association structures for administrative and operational purposes would continue. Historic structures and landscapes elsewhere on the island would be preserved.
- South Manitou Island — The historic life-saving station, lighthouse complex, village historic structures, schoolhouse, and farm loop tour historic structures would be preserved, rehabilitated, or restored. Structures and landscapes elsewhere on the island would be preserved.
- Other Mainland Historic Structures and Landscapes — Historic structures and landscapes would be managed as specified for the management zone in which they lie (see alternative map and zone descriptions).

## **VISITOR ORIENTATION, INTERPRETATION, AND EDUCATION**

Visitor orientation services would continue at the NPS visitor center in Empire, at Glen Haven, and at the visitor contact station on South Manitou Island. Interpretation activities would continue throughout the Lakeshore, with special emphasis at the Dune Climb, the major campgrounds, Port Oneida, Glen Haven, and Sleeping Bear Point Maritime Museum. A variety of interpretive and educational programs (e.g., guided hikes, summer and school programs, etc.) would continue. On South Manitou Island, concession-operated farm loop tours would continue. Concession auto tours to near the Giant Cedars would be allowed, provided there is demand and the service is economically feasible. (Concession autos would go as far as the end of the county road; the tours would continue on foot to the cedars from there).

## **VISITOR FACILITIES, OPPORTUNITIES, AND ACTIVITIES**

Opportunities for experiencing solitude and natural quiet would abound in many areas of the Lakeshore. Opportunities for recreational activities such as hiking, backpacking, fishing and hunting, paddling, cross-country skiing, and backcountry camping would be facilitated or expanded as described below:

- Roads — Roads would remain essentially the same as now. All developed county roads would be zoned compatible with motor vehicle and bicycle use.
- Trails — Trails would remain the same, except for a few additions: (1) a hike/bike trail located primarily along M-22 and M-109 could be developed at the initiative of partners; a separate study would be needed to make certain that such a trail would have no significant impact. Several candidate areas for the hike/bike trail that are zoned recreation

(such as Wilco hill, north of the Dune Climb, and near M-109 at Alligator Hill) would revert to experience nature if they are not needed for the M-22/M-109 hike/bike trail; (2) a “bay-to-bay” trail for hikers and Lake Michigan paddlers would parallel the mainland shoreline within the Lakeshore; on land, this trail would make use of active beach areas or existing disturbed areas and corridors to the extent possible; and (3) a loop hiking trail and trailhead parking area would be provided at Bow Lakes.

- Campgrounds — Campgrounds and camping would remain essentially the same, except that (1) four or five small, primitive campgrounds would be constructed an easy day’s hike or paddle apart along the Lake Michigan shoreline, for paddlers and hikers (see “trails” above); (2) Valley View backcountry campground would be abandoned and the area returned to more natural conditions; a replacement campground for hikers and paddlers would be provided closer to the Lake Michigan shoreline (location to be determined); and (3) on North Manitou Island, in addition to dispersed camping, additional designated campgrounds would be provided (locations to be determined).
- Lake Michigan Beach Access — The following beach access points that are accessible to motor vehicles would remain essentially the same: Lake Michigan Road (Leelanau County), Glen Haven, North Bar Lake, Peterson Road, and Tiesma Road. Parking at the end of Esch Road would be improved. The beach access area at the end of Lake Michigan Road near the mouth of the Platte River would be zoned high use to allow for parking improvements; a separate study would examine the appropriateness of these developments in more detail.
- Lake Michigan Boat Access — A high use zone would be located around and east of the mouth of the Platte River. The high

use zone would allow for boat ramps or docks for access to Lake Michigan, although no new boat ramps or docks are proposed by the National Park Service. A separate study would be needed to determine whether any such facility would be appropriate in this area. If this study indicated that a new boat ramp or dock was not appropriate near the mouth of the Platte River, the high use zone beyond the Lake Michigan Road area would revert to the experience nature zone and Tiesma Road would revert to the recreation zone.

- Inland Lake Use and Access — Motorized boats would be allowed on School and Loon lakes. Motorized boats would no longer be allowed on North Bar Lake. Electric motors would be allowed in the experience nature zone on Bass Lake (Leelanau County), Tucker Lake, and Otter Lake. Access for boats would be improved at a few inland lakes (locations to be determined).
- Picnic Areas — Existing picnic areas would remain. The Glen Lake picnic area would be improved to facilitate beach and picnic use.
- Ferry Service — Ferry service for day and overnight stays on South Manitou Island and overnight stays on North Manitou Island would continue. Day trips to North Manitou Island would be allowed once or twice a week (not daily), provided there is demand and the service is economically feasible.
- Boat Access for River Use — Motorized and nonmotorized watercraft use along the Platte and Crystal rivers would continue. The Crystal River access area would be upgraded or relocated, and a small parking area would be provided.
- Dune Climb — The Dune Climb would remain essentially the same (see the no-action alternative).
- Bicycle Use — Bicycle use would continue to be allowed on roads used by motor vehicles, but not on hiking trails. An exception would be that as part of the

M-22/M-109 hike/bike trail, bicycle use would be evaluated for portions of the Bay View Trail immediately adjacent to the M-22 corridor. Bicycle use would be evaluated for expansion in zones that permit it (recreation, high use, and experience history) — e.g., the Burnham Woods area south of the Glen Lakes.

- Hang Gliding — Hang gliding would continue to be allowed at designated sites within the Lakeshore.

### **Benzie Corridor**

The National Park Service would continue to acquire lands within the Benzie Corridor on a willing-seller basis (subject to available funding) for future development of a scenic road and/or a bike/hike trail (determined and evaluated via a future study). The road/trail would not be expected to be built within the life of this plan.

Land acquisition costs are not included in the cost estimates below. Merely stating that the National Lakeshore would continue to purchase lands within the Benzie Corridor would not immediately make funds available for acquisition. It might be several years before funds are actually available to implement the plan.

### **Bow Lakes**

Nature observation and backcountry hiking would be facilitated by development of a small parking area and a loop trail. The National Park Service would acquire properties within this area of the Lakeshore on a willing-seller basis as they become available (subject to available funding).

## **BOUNDARY ADJUSTMENTS**

There would be no boundary adjustments under this alternative.

## **STAFFING AND COSTS**

The staffing level needed to implement the preferred alternative would be the equivalent of 79 full-time staff members. Volunteers and partnerships would continue to be key contributors to NPS operations.

The cost estimates provided here are given for comparison to other alternatives only; they are not to be used for budgeting purposes. Although the numbers appear to be absolutes, they represent a midpoint in a possible range of costs. The costs developed are estimates inclusive of all one-time capital costs of the preferred alternative, including projects that are planned for the near future. One-time capital costs of the preferred alternative, including projects that are planned for the near future or are underway, new construction, and non-facility costs such as major resource plans and projects, are estimated at \$17.5 million. In addition to items mentioned for the no-action alternative, this includes costs of new trails and campgrounds, picnic area improvements, improved access for nonmotorized boats at inland lakes and rivers, and historic preservation/ rehabilitation/ restoration (various areas). Deferred maintenance costs of the preferred alternative are estimated at \$15.4 million. The total cost of this alternative (one-time capital costs plus deferred maintenance costs) is estimated at \$32.9 million. Annual operating costs under this alternative would be \$4.4 million. Presentation of these costs in this plan does not guarantee future NPS funding. Project funding will not come all at once; it will likely take many years to secure and may be provided by partners, donations or other nonfederal sources. Although the National Lakeshore hopes to secure this funding and will prepare itself accordingly, the Lakeshore may not receive enough funding to achieve all desired conditions within the timeframe of the *General Management Plan* (the next 20 or more years). More information on costs is provided in appendix C.

## ALTERNATIVE A

### OVERALL VISION

Under alternative A, the Lakeshore would be valued primarily for conservation of its natural resources.

### WILDERNESS

About 33,600 acres (47% of the National Lakeshore) in the north, central, south, and island areas of the National Lakeshore would be proposed as wilderness (see Alternative A map in back pocket). No developed county roads are within areas proposed for wilderness. None of the Lake Michigan active beach zone is in areas proposed for wilderness. Please note that the acreage figures for the various wilderness proposals are estimates based on small-scale maps.

Areas of proposed wilderness are as follows:

- North area of the mainland — an area north of M-22 and east of Port Oneida; none in Port Oneida
- Central area of the mainland — Sleeping Bear Plateau
- South area of the mainland — much of the area north and west of M-22
- North Manitou Island — most of the island (the historic village and Cottage Row would be excluded)
- South Manitou Island — most of the island (the lighthouse complex, historic village, and county roads on the farm tour and Giant Cedars routes would be excluded)

### NATURAL RESOURCES

Based on the emphasis on natural resources conditions and experiences in this alternative, the experience nature zone would extend across most of the Lakeshore. Natural

resource management programs that would occur regardless of the general management plan are outlined in the “Desired Conditions and Strategies” section in chapter 1. Examples include controlling invasive species, restoring disturbed sites, protecting open dune areas, and protecting threatened and endangered species.

### CULTURAL RESOURCES

Historic structures and landscapes would be managed as specified for the management zone in which they lie (see alternative map and zone descriptions). More information on individual areas is provided below:

- Glen Haven (same in all alternatives) — The Glen Haven Historic District and Sleeping Bear Point Life-Saving Station would be preserved, rehabilitated, or restored. Some buildings would be rehabilitated for visitor and/or staff use. The Sleeping Bear Inn and garage would be placed in the NPS historic leasing program to allow rehabilitation for adaptive use. All other structures would be stabilized and maintained in their current condition.
- Port Oneida (same in all alternatives) — Historic structures and landscapes would be preserved, rehabilitated, or restored. Structures on at least one farmstead would be restored for interpretive purposes. Some buildings in the district would be rehabilitated for visitor and/or staff use, including a visitor contact station and staff housing. At least one farmstead would be placed in the NPS historic leasing program to allow rehabilitation and adaptive use. All other structures and landscapes would be stabilized and maintained in their current condition.

- North Manitou Island — The historic life-saving station structures would be preserved, rehabilitated, or restored. Preservation and/or adaptive use of the rehabilitated historic former Manitou Island Association structures for administrative and operational purposes would continue. Historic structures and landscapes on Cottage Row and elsewhere on the island would be preserved.
- South Manitou Island — The historic life-saving station, lighthouse complex, and village historic structures would be preserved, rehabilitated, or restored. Historic structures and landscapes elsewhere on the island would be preserved.
- Other Mainland Historic Structures and Landscapes — Historic structures and landscapes would be managed as specified for the management zone in which they lie (see alternative map and zone descriptions).

## VISITOR ORIENTATION, INTERPRETATION, AND EDUCATION

Visitor orientation services would continue at the NPS visitor center in Empire, at Glen Haven, and at the visitor contact station on South Manitou Island. Interpretive activities would continue throughout the Lakeshore, with special emphasis at the Dune Climb, the major campgrounds, Port Oneida, Glen Haven, and Sleeping Bear Point Maritime Museum. Interpretive opportunities relating to natural resource interpretive themes would be emphasized. On South Manitou Island, concession-operated farm tours would stop at the west end of Chicago Road rather than continue around the farm loop. Tours would continue to the farms on foot rather than by vehicle.

## VISITOR FACILITIES, OPPORTUNITIES, AND ACTIVITIES

Opportunities for experiencing solitude and natural quiet would abound, and opportunities for recreational activities such as hiking, backpacking, fishing and hunting, paddling, cross-country skiing, and backcountry camping would be facilitated or expanded as described below:

- Roads — Roads would remain essentially the same as now, except that two NPS-owned roads in the experience nature zone would be closed and returned to more natural conditions — Tiesma Road on the mainland and the NPS portion of the current farm loop route off Chicago Road on South Manitou Island. All developed county roads would be zoned compatible with motor vehicle and bicycle use.
- Trails — Trails would remain the same, except for a few additions: (1) a hike/bike trail located primarily along M-22 and M-109 could be developed at the initiative of partners; a separate study would be needed to make certain that such a hike/bike trail would have no significant impact; (2) a “bay-to-bay” trail for hikers and Lake Michigan paddlers would parallel the mainland shoreline within the Lakeshore; on land, this trail would make use of active beach areas or existing disturbed areas and corridors; and (3) a short loop hiking trail (with trailhead parking area) would be provided at Bow Lakes.
- Campgrounds — Campgrounds and camping would remain essentially the same, except that (1) four or five small, primitive campgrounds would be constructed an easy day’s hike or paddle apart along the Lake Michigan shoreline, for paddlers and hikers (see “trails” above), and (2) Valley View backcountry campground would be abandoned and the area returned to more natural conditions; a replacement campground

for hikers and paddlers would be provided closer to the Lake Michigan shoreline (location to be determined).

- Lake Michigan Beach Access — The following beach access points that are accessible to motor vehicles would remain essentially the same: Lake Michigan Road (Leelanau County), Glen Haven, North Bar Lake, Esch Beach, Peterson Road, and Lake Michigan Road (Platte River mouth). Tiesma Road (NPS owned) would be closed.
- Lake Michigan Boat Access — Boat access to Lake Michigan would remain at the end of Lake Michigan Road, near the mouth of the Platte River (same as in the no-action alternative).
- Inland Lake Use and Access — Motorized boats would be allowed on School, Loon, and North Bar lakes. Motorized boats would no longer be allowed on Bass Lake (Leelanau County).
- Picnic Areas — Existing picnic areas would remain, except for Little Glen Lake picnic area, which would be restored to a natural state in keeping with the experience nature zone.
- Ferry Service — Ferry service for day and overnight stays on South Manitou Island and overnight stays on North Manitou Island would continue (same as in the no-action alternative).
- Boat Access for River Use — Motorized and nonmotorized watercraft use along the Platte and Crystal rivers would continue (same as in the no-action alternative).
- Dune Climb — The Dune Climb would remain essentially the same.
- Bicycle Use — Bicycle use would continue to be allowed on roads used by motor vehicles, but not on hiking trails. An exception would be that as part of the M-22/M-109 hike/bike trail, bicycle use would be evaluated for portions of the Bay View Trail immediately adjacent to the M-22 corridor. Bicycle use would be evaluated for expansion in zones that

permit it (recreation, high use, and experience history).

- Hang Gliding — Hang gliding would continue to be allowed at designated sites within the Lakeshore, although not at Empire Bluff.

## **Benzie Corridor**

The National Park Service would cease acquisition of lands within the Benzie Corridor. No scenic roadway or trail would be developed. The National Park Service would recommend that the Lakeshore's enabling legislation be amended to remove the Benzie Corridor from the boundary.

Land acquisition costs are not included in the cost estimates below. Merely stating that the National Lakeshore would cease to purchase lands within the Benzie Corridor would not immediately stop any ongoing acquisitions, but would be dependent upon the passage of legislation removing the Benzie Corridor from the boundary. It might be several years before the plan could be implemented.

## **Bow Lakes**

Nature observation and backcountry hiking would be facilitated by development of a small parking area and a short loop trail. The National Park Service would acquire properties within this area of the Lakeshore on a willing-seller basis as they become available (subject to available funding).

## **BOUNDARY ADJUSTMENTS**

Under this alternative the Benzie Corridor would be removed from the National Lakeshore boundary. This would require congressional action.

## STAFFING AND COSTS

The staffing level needed to implement alternative A would be the equivalent of 77 full-time staff members. Volunteers and partnerships would continue to be key contributors to NPS operations.

The cost estimates provided here are given for comparison to other alternatives only; they are not to be used for budgeting purposes. Although the numbers appear to be absolutes, they represent a midpoint in a possible range of costs. The costs developed are estimates inclusive of all one-time capital costs of the preferred alternative, including projects that are planned for the near future. One-time capital costs of alternative A, including projects that are planned for the near future or are underway, new construction, and non-facility costs such as major resource plans and projects, are estimated at \$14.4 million. In addition to items mentioned for the no-action

alternative, this includes costs of new trails and campgrounds and historic preservation/ rehabilitation/ restoration (various areas). Deferred maintenance costs of alternative A are estimated at \$15.4 million. The total cost of this alternative (one-time capital costs plus deferred maintenance costs) is estimated at \$29.8 million. Annual operating costs under this alternative would be \$4.2 million. Presentation of these costs in this plan does not guarantee future NPS funding. Project funding will not come all at once; it will likely take many years to secure and may be provided by partners, donations, or other nonfederal sources. Although the National Lakeshore hopes to secure this funding and will prepare itself accordingly, the Lakeshore may not receive enough funding to achieve all desired conditions within the timeframe of the *General Management Plan* (the next 20 or more years). More information on costs is provided in appendix C.



## ALTERNATIVE B

### OVERALL VISION

Under alternative B the National Lakeshore would be valued primarily for its recreational opportunities in scenic outdoor settings.

### WILDERNESS

About 14,400 acres (20% of the National Lakeshore), all on North Manitou Island, would be proposed as wilderness (see Alternative B map in back pocket). No county roads are within areas proposed for wilderness. None of the Lake Michigan active beach zone is in areas proposed for wilderness. Please note that the acreage figures for the various wilderness proposals are estimates based on small-scale maps.

Areas of proposed wilderness are as follows:

- North area of the mainland — none
- Central area of the mainland — none
- South area of the mainland — none
- North Manitou Island — most of the island (the historic village and Cottage Row would be excluded)
- South Manitou Island — none

### NATURAL RESOURCES

Based on the large extent of the recreation zone in this alternative, natural resources might be modified to provide for a variety of recreational activities. Natural resource management programs that would occur regardless of the general management plan are outlined in the “Desired Conditions and Strategies” section in chapter 1. Examples include controlling invasive species, restoring disturbed sites, protecting open dune areas, and protecting threatened and endangered species.

### CULTURAL RESOURCES

Historic structures and landscapes would be managed as specified for the management zone in which they lie (see alternative map and zone descriptions). More information on individual areas is provided below.

- Glen Haven (same in all alternatives) — The Glen Haven Historic District and Sleeping Bear Point Life-Saving Station would be preserved, rehabilitated, or restored. Some buildings would be rehabilitated for visitor and/or staff use. The Sleeping Bear Inn and garage would be placed in the NPS historic leasing program to allow rehabilitation for adaptive use. All other structures would be stabilized and maintained in their current condition.
- Port Oneida (same in all alternatives) — Historic structures and landscapes would be preserved, rehabilitated, or restored. Structures on at least one farmstead would be restored for interpretive purposes. Some buildings in the district would be rehabilitated for visitor and/or staff use, including a visitor contact station and staff housing. At least one farmstead would be placed in the NPS historic leasing program to allow rehabilitation and adaptive use. All other structures and landscapes would be stabilized and maintained in their current condition.
- North Manitou Island (same as the preferred alternative) — The historic life-saving station and Cottage Row structures would be preserved, rehabilitated, or restored. Preservation and/or adaptive use of the rehabilitated historic former Manitou Island Association structures for administrative and operational purposes would continue. Historic structures and landscapes elsewhere on the island would be preserved.

- South Manitou Island — The historic life-saving station, lighthouse complex, and village historic structures would be preserved, rehabilitated, or restored. Historic structures and landscapes elsewhere on the island would be preserved or rehabilitated.
- Other Mainland Historic Structures and Landscapes — Historic structures and landscapes would be managed as specified for the management zone in which they lie (see alternative map and zone descriptions).

## VISITOR ORIENTATION, INTERPRETATION, AND EDUCATION

Visitor orientation services would continue at the NPS visitor center in Empire, at Glen Haven, and at the visitor contact station on South Manitou Island. Interpretive activities would continue throughout the Lakeshore, with special emphasis at the Dune Climb, the major campgrounds, Port Oneida, Glen Haven, and Sleeping Bear Point Maritime Museum. On South Manitou Island, concession-operated farm loop tours would continue. Concession auto tours to near the Giant Cedars would be allowed, provided there is demand and the service is economically feasible. (Concession autos would go as far as the end of the county road; the tours would continue on foot to the Cedars from there.)

## VISITOR FACILITIES, OPPORTUNITIES, AND ACTIVITIES

Opportunities for recreational activities such as hiking, backpacking, fishing and hunting, paddling, cross-country skiing, and backcountry camping would be expanded as described below:

- Roads — Roads would remain essentially the same as now, except that a new scenic road would eventually be built within the

Benzie Corridor. All county road rights-of-way would be zoned compatible with motor vehicle and bicycle use.

- Trails — Trails would be expanded in several areas of the National Lakeshore: (1) a hike/bike trail located primarily along M-22 and M-109 could be developed at the initiative of partners; a separate study would be needed to make certain that such a trail would have no significant impact; (2) a “bay-to-bay” trail for hikers and Lake Michigan paddlers would parallel the mainland shoreline within the Lakeshore; on land, this trail would make use of active beach areas or existing disturbed areas and corridors; (3) a modest, multi-loop hiking trail system (with trailhead parking area) would be provided at Bow Lakes; (4) existing trails would be evaluated to see if a few could be groomed for skiing in winter; and (5) bike lanes (or in some stretches a separate bike trail, as appropriate), would accompany the Benzie Corridor scenic road.
- Campgrounds — Campgrounds and camping would remain essentially the same, except that (1) four or five small, primitive campgrounds would be constructed an easy day’s hike or paddle apart along the Lake Michigan shoreline, for paddlers and hikers (see “trails” above); (2) the D. H. Day group campground would be relocated to the main D.H. Day campground; and (3) on North Manitou Island, dispersed camping would no longer occur; instead, designated campgrounds would be provided (locations to be determined).
- Lake Michigan Beach Access — The following beach access points that are accessible to motor vehicles would remain essentially the same — Lake Michigan Road (Leelanau County), Glen Haven, North Bar Lake, and Tiesma Road. Parking at the ends of Peterson Road and Esch Road would be improved. The area around the mouth of the Platte River would be zoned high use and

managed as a more developed beach access area (e.g., expanded parking area, picnicking, and comfort station).

- Lake Michigan Boat Access — A high use zone is located around and east of the mouth of the Platte River. The high use zone allows for boat ramps or docks for access to Lake Michigan, although no new boat ramps or docks are proposed by the National Park Service. A separate study would be needed to determine whether any such facilities would be appropriate for this area.
- Inland Lake Use and Access — Motorized boats would be allowed on School, Bass (Leelanau County), Loon, North Bar, Shell, and Tucker lakes. Access (parking areas, ramps or docks) would be improved at a few inland lakes (locations to be determined).
- Picnic Areas — Existing picnic areas would remain. A few of these areas would be upgraded.
- Ferry Service — Ferry service for day and overnight stays on South Manitou Island and overnight stays on North Manitou Island would continue. Day trips to North Manitou Island would be added, but these would occur once or twice a week, not daily.
- Boat Access for River Use — Motorized and nonmotorized watercraft use along the Platte and Crystal rivers would continue. The Crystal River access area would be upgraded or relocated, and a small parking area would be provided.
- Dune Climb — The Dune Climb would remain essentially the same.
- Bicycle Use — Bicycle use would continue to be allowed on roads used by motor vehicles, but not on hiking trails. An exception would be that as part of the M-22/M-109 hike/bike trail, bicycle use would be evaluated for portions of the Bay View Trail immediately adjacent to the M-22 corridor. Bicycle use would be evaluated for expansion in zones that permit it (recreation, high use, and experience history). Bicycle rentals on

South Manitou Island would be considered.

- Hang Gliding — Hang gliding would continue to be allowed at designated sites within the Lakeshore (same as in the no-action alternative).

### **Benzie Corridor**

The National Park Service would continue to acquire lands within the Benzie Corridor on a willing-seller basis (subject to available funding) for future development of a scenic road. The scenic road would include bike lanes (or in some stretches a separate bike trail, as appropriate). For cost and impact comparison purposes, the scenic road was assumed to be built in year 25 of the plan.

Land acquisition costs are not included in the cost estimates below. Merely stating that the National Lakeshore would continue to purchase lands within the Benzie Corridor would not immediately make funds available for acquisition. It might be several years before funds are actually available to implement the plan.

### **Bow Lakes**

Nature observation and backcountry hiking would be facilitated by development of a modest, multi-loop trail system, which would link up with the nearby public school if possible, to facilitate use by students. The National Park Service would acquire properties within this area of the Lakeshore on a willing-seller basis as they become available (subject to available funding).

## **BOUNDARY ADJUSTMENTS**

There would be no boundary adjustments under this alternative.

## STAFFING AND COSTS

The staffing level needed to implement alternative B would be the equivalent of 79 full-time staff members. Volunteers and partnerships would continue to be key contributors to NPS operations.

The cost estimates provided here are given for comparison to other alternatives only; they are not to be used for budgeting purposes. Although the numbers appear to be absolutes, they represent a midpoint in a possible range of costs. The costs developed are estimates inclusive of all one-time capital costs of the preferred alternative, including projects that are planned for the near future. One-time capital costs of alternative B, including projects that are planned for the near future or are underway, new construction, and non-facility costs such as major resource plans and projects, are estimated at \$42.8 million. In addition to items mentioned for the no-action alternative, this includes costs of the Benzie Corridor scenic road, new trails and

campgrounds, picnic area improvements, improved access for nonmotorized boats at inland lakes and rivers, beach access improvements, and historic preservation/rehabilitation/restoration (various areas). Deferred maintenance costs of alternative B are estimated at \$15.4 million. The total cost of this alternative (one-time capital costs plus deferred maintenance costs) is estimated at \$58.2 million. Annual operating costs under this alternative would be \$4.4 million. Presentation of these costs in this plan does not guarantee future NPS funding. Project funding will not come all at once; it will likely take many years to secure and may be provided by partners, donations or other nonfederal sources. Although the National Lakeshore hopes to secure this funding and will prepare itself accordingly, the Lakeshore may not receive enough funding to achieve all desired conditions within the timeframe of the *General Management Plan* (the next 20 or more years). More information on costs is provided in appendix C.

## ALTERNATIVE C

### OVERALL VISION

Under alternative C the Lakeshore would be managed so that most visitor use is concentrated in selected areas, with more natural, primitive conditions promoted in the rest of the Lakeshore.

### WILDERNESS

About 23,200 acres (32% of the National Lakeshore) in the central, south, and island areas of the Lakeshore would be proposed as wilderness (see Alternative C map in back pocket). No developed county roads are within areas proposed for wilderness. None of the Lake Michigan active beach zone is in areas proposed for wilderness. Please note that the acreage figures for the various wilderness proposals are estimates based on small-scale maps.

Areas of proposed wilderness are as follows:

- North area of the mainland — none
- Central area of the mainland — Sleeping Bear Plateau
- South area of the mainland — much of the area north of M-22
- North Manitou Island — most of the island (the historic village and Cottage Row would be excluded)
- South Manitou Island — the northwestern two-thirds of the island (the lighthouse complex, historic village, farm loop tour route, Florence Lake, and Giant Cedars would be excluded)

### NATURAL RESOURCES

Within the high use and experience history zones there would be less emphasis on managing the Lakeshore for natural conditions. Outside those concentrated use

areas, the Lakeshore would be managed for more natural conditions. Natural resource management programs that would occur regardless of the general management plan are outlined in the “Desired Conditions and Strategies” section in chapter 1. Examples include controlling invasive species, restoring disturbed sites, protecting open dune areas, and protecting threatened and endangered species.

### CULTURAL RESOURCES

Historic structures and landscapes would be managed as specified for the management zone in which they lie (see alternative map and zone descriptions). More information on individual areas is provided below.

- Glen Haven (same in all alternatives) — The Glen Haven Historic District and Sleeping Bear Point Life-Saving Station would be preserved, rehabilitated, or restored. Some buildings would be rehabilitated for visitor and/or staff use. The Sleeping Bear Inn and garage would be placed in the NPS historic leasing program to allow rehabilitation for adaptive use. All other structures would be stabilized and maintained in their current condition.
- Port Oneida (same in all alternatives) — Historic structures and landscapes would be preserved, rehabilitated, or restored. Structures on at least one farmstead would be restored for interpretive purposes. Some buildings in the district would be rehabilitated for visitor and/or staff use, including a visitor contact station and staff housing. At least one farmstead would be placed in the NPS historic leasing program to allow rehabilitation and adaptive use. All other structures and landscapes would be stabilized and maintained in their current condition.

- North Manitou Island (same as the preferred alternative) — The historic life-saving station and Cottage Row structures would be preserved, rehabilitated, or restored. Preservation and/or adaptive use of the rehabilitated historic former Manitou Island Association structures for administrative and operational purposes would continue. Historic structures and landscapes elsewhere on the island would be preserved.
- South Manitou Island (same as the preferred alternative) — The historic life-saving station, lighthouse complex, village historic structures, the schoolhouse, and farm loop tour historic structures would be preserved, rehabilitated, or restored. Historic structures and landscapes elsewhere on the island would be preserved.
- Other Mainland Historic Structures and Landscapes — Historic structures and landscapes would be managed as specified for the management zone in which they lie (see alternative map and zone descriptions).

## VISITOR ORIENTATION, INTERPRETATION, AND EDUCATION

Visitor orientation services would continue at the NPS visitor center in Empire, at Glen Haven, and at the visitor contact station on South Manitou Island. Interpretive activities would continue throughout the Lakeshore, with special emphasis at the Dune Climb, the major campgrounds, Port Oneida, Glen Haven, and Sleeping Bear Point Maritime Museum. Educational and interpretive programs for visitors would be more structured (e.g., more guided programs) in the concentrated use areas. Outside the concentrated use areas, most interpretive opportunities would be self-guided. On South Manitou Island, concession-operated farm loop tours would continue. Concession auto tours to near the Giant Cedars would be

allowed, provided there is demand and the service is economically feasible. (Concession autos would go as far as the end of the county road; the tours would continue on foot to the Cedars from there.)

## VISITOR FACILITIES, OPPORTUNITIES, AND ACTIVITIES

Concentrated use areas would be managed for more developed facilities and guided recreational opportunities. Opportunities for recreational activities such as hiking, backpacking, fishing and hunting, paddling, cross-country skiing, and backcountry camping would be expanded as discussed below:

- Roads — Roads would remain essentially the same as now. All developed county roads would be zoned compatible with motor vehicle and bicycle use.
- Trails — Additional trails would be considered within the high use zone near Little Glen Lake to increase both recreational options and connectivity between Lakeshore attractions. Other trail opportunities would be added: (1) a hike/bike trail located primarily along M-22 and M-109 could be developed at the initiative of partners; a separate study would be needed to make certain that such a trail would have no significant impact; (2) a “bay-to-bay” trail for hikers and Lake Michigan paddlers would parallel the mainland shoreline within the Lakeshore; on land, this trail would make use of active beach areas or existing disturbed areas and corridors; (3) a short loop hiking trail (with trailhead parking area) would be provided at Bow Lakes; and (4) a hike/bike trail would eventually be developed within the Benzie Corridor.
- Campgrounds — Campgrounds and camping would remain essentially the same, except that: (1) the D. H. Day group campground would be relocated to the main D. H. Day campground; (2) the D. H. Day campground would be zoned

high use, allowing for improved facilities and/or campground expansion; and (3) on North Manitou Island, in addition to dispersed camping, additional designated campgrounds would be provided (locations to be determined).

- Lake Michigan Beach Access — The following beach access points that are accessible to motor vehicles would remain essentially the same: Lake Michigan Road (Leelanau County), Glen Haven, North Bar Lake, Peterson Road, and Tiesma Road. The areas around the ends of County Road 669, Esch Road, and the Platte River mouth would be zoned high use and managed as more developed beach access areas (e.g., expanded parking and picnicking and comfort station).
- Lake Michigan Boat Access — High use zones would be located near the end of County Road 669, around the Platte River mouth, and near the end of Esch Road. The high use zone allows for boat ramps or docks for access to Lake Michigan, although no new boat ramps or docks are proposed by the National Park Service. Separate studies would be needed to determine whether any such facilities would be appropriate in these areas.
- Inland Lake Use and Access — Motorized boats would be allowed on School, Bass (Leelanau County), North Bar, and Loon Lakes. Access (parking areas, ramps, or docks) would be improved at a few inland lakes (locations to be determined).
- Picnic Areas — Existing picnic areas would remain, and the Glen Lake picnic area would be formalized and upgraded (including a comfort station) to facilitate beach and picnic use.
- Ferry Service — Ferry service for day and overnight stays on South Manitou Island and overnight stays on North Manitou Island would continue (same as in the no action alternative).

- Boat Access for River Use — Motorized and nonmotorized watercraft use along the Platte and Crystal rivers would continue (same as in the no action alternative).
- Dune Climb — Facilities at the Dune Climb would be upgraded (e.g., picnic tables and pedestrian paths would be better defined) to support continued heavy use.
- Bicycle Use — Bicycle use would continue to be allowed on roads used by motor vehicles, but not on hiking trails. An exception would be that as part of the M-22/M-109 hike/bike trail, bicycle use would be evaluated for portions of the Bay View Trail immediately adjacent to the M-22 corridor. Bicycle use would be evaluated for expansion in zones that permit it (recreation, high use, and experience history).
- Hang Gliding — Hang gliding would continue to be allowed at designated sites within the Lakeshore (same as in the no action alternative).

### **Benzie Corridor**

The National Park Service would continue to acquire lands within the Benzie Corridor on a willing-seller basis (subject to available funding) for future development of a scenic nonmotorized hike/bike trail. For cost and impact comparison purposes, the scenic trail was assumed to be built in year 25 of the plan.

Land acquisition costs are not included in the cost estimates below. Merely stating that the National Lakeshore would continue to purchase lands within the Benzie Corridor would not immediately make funds available for acquisition. It might be several years before funds are actually available to implement the plan.

## Bow Lakes

Nature observation and backcountry hiking would be facilitated by development of a small parking area and a short loop trail. The National Park Service would acquire properties within this area of the Lakeshore on a willing-seller basis as they become available (subject to available funding).

## BOUNDARY ADJUSTMENTS

There would be no boundary adjustments under this alternative.

## STAFFING AND COSTS

The staffing level under alternative C would be the equivalent of 85 full-time staff members. Volunteers and partnerships would continue to be key contributors to NPS operations.

The cost estimates provided here are given for comparison to other alternatives only; they are not to be used for budgeting purposes. Although the numbers appear to be absolutes, they represent a midpoint in a possible range of costs. The costs developed are estimates inclusive of all one-time capital costs of the preferred alternative, including projects that are planned for the near future. One-time

capital costs of alternative C, including projects that are planned for the near future or are underway, new construction, and non-facility costs such as major resource plans and projects, are estimated at \$30.5 million. In addition to items mentioned for the no-action alternative, this includes costs of new trails, new or upgraded campgrounds, picnic area improvements, improved access for non-motorized boats at inland lakes, beach access and Dune Climb improvements, and historic preservation/ rehabilitation/ restoration (various areas). Deferred maintenance costs of alternative C are estimated at \$15.4 million. The total cost of this alternative (one-time capital costs plus deferred maintenance costs) is estimated at \$45.9 million. Annual operating costs under this alternative would be \$4.5 million. Annual operating costs under this alternative would be \$4.5 million. Presentation of these costs in this plan does not guarantee future NPS funding. Project funding will not come all at once; it will likely take many years to secure and may be provided by partners, donations or other nonfederal sources. Although the National Lakeshore hopes to secure this funding and will prepare itself accordingly, the Lakeshore may not receive enough funding to achieve all desired conditions within the timeframe of the *General Management Plan* (the next 20 or more years). More information on costs is provided in appendix C.



## MITIGATIVE MEASURES FOR THE ACTION ALTERNATIVES

In the legislation that created the National Park Service, Congress charged the agency with managing lands under its stewardship “in such manner and by such means as will leave them unimpaired for the enjoyment of future generations” (National Park Service Organic Act). As a result, the National Park Service routinely considers and implements mitigative measures whenever activities that could adversely affect the resources or systems are anticipated. Mitigation means to take action to avoid, reduce, or compensate for the effects of environmental damage.

A common set of mitigative measures would be applied to the action alternatives in this *General Management Plan*. The National Park Service would avoid, minimize, and mitigate adverse impacts whenever practicable.

### GENERAL

New facilities (e.g., campsites, trails, bicycle trails) would be sited to minimize impacts on resources, including avoiding steep slopes and sensitive areas and placing new facilities as close to existing disturbances as feasible. Before any construction activity, construction zones would be identified with temporary fencing to confine disruptions to the minimum area required. All protection measures would be clearly stated in the construction specifications, and workers would be instructed to avoid areas beyond the fencing.

Construction activities would implement standard soil erosion and stormwater runoff prevention methods such as use of silt fencing to avoid erosion and runoff in flowing water environments or during rain events.

Outdoor lighting for new or rehabilitated facilities would be the minimum amount required to provide for personal safety. Lights

would also be shielded and/or directed downward to minimize impact on the night sky.

Standard noise abatement measures would be implemented, as appropriate, during park operations and construction activities. Examples include: scheduling activities so that impacts are minimized, use of the best available noise control techniques, use of hydraulically or electrically powered tools, and situating noise-producing machinery as far as possible from sensitive uses or resources.

### CULTURAL RESOURCES

#### Archeological Resources

The Archeological Resources Protection Act of 1979 requires that all federal land managers develop plans for surveying lands under their control to determine the nature and extent of archeological resources on those lands. Funding for a comprehensive survey has been requested and site-specific surveys continue to be conducted in the interim. The following procedures would be taken to ensure that archeological resources are not lost or damaged due to National Lakeshore activities:

As appropriate, archeological surveys and/or monitoring would precede any construction. Known archeological resources would be avoided to the greatest extent possible. If archeological resources listed in or eligible for listing in the national register could not be avoided, an appropriate mitigation strategy would be developed in consultation with the state historic preservation officer and, if necessary, associated American Indian tribes. If during construction previously undiscovered archeological resources were uncovered, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and an

appropriate mitigation strategy developed in consultation with the state historic preservation officer and, if necessary, associated American Indian tribes.

### **Human Remains**

In the event that human remains, funerary objects, sacred objects, or objects of cultural patrimony were discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001) and other applicable laws would be followed.

### **Ethnographic Resources**

Sleeping Bear Dunes National Lakeshore staff would consult with associated American Indian tribes to develop and accomplish programs in a way that respects the beliefs, traditions, and other cultural values of the American Indian tribes who have ancestral ties to National Lakeshore lands. NPS staff will maintain government-to-government relations with associated tribes to ensure a collaborative working relationship, and will consult regularly with them before taking actions that would affect natural and cultural resources that are of interest and concern to them. Access to, and ceremonial use of, American Indian sacred sites by American Indian religious practitioners would be accommodated in a manner that is consistent with National Lakeshore purposes and applicable law, regulations, and policy.

### **Historic Structures and Landscapes**

All structures and landscapes in the National Lakeshore have been or are being inventoried and evaluated using the criteria of the National Register of Historic Places. Not all of these structures and landscapes have been fully documented and submitted to the keeper of the national register. Until that action has

occurred, however, all properties listed on or appearing to meet national register criteria will be treated as though they are listed. No action affecting any of these resources may proceed without appropriate consultation with the state historic preservation officer and documentation of the action under Section 106 of the National Historic Preservation Act of 1966, as amended, as promulgated under the Advisory Council on Historic Preservation's "Regulations for the Protection of Historic and Cultural Properties" (36 CFR 800).

## **NATURAL RESOURCES**

### **General**

For alternatives that include a concessions farm tour to near the Giant Cedars, tour vehicles could travel as far as the end of the county-owned road. From there, visitors would continue on foot for a short distance to the trees. Mitigating measures (e.g., education, supervision by tour leaders, fences, and/or boardwalks) would be used as needed to prevent visitor-use-related impacts to the cedar trees, which are believed to be vulnerable to trampling due to shallow root systems.

Activities with the potential to disturb natural resources would be monitored for use-related impacts. Management options could range from (a) placing structures to limit impacts (e.g., sand ladders and boardwalks) or redirect visitors (i.e., fences), (b) education, and (c) guided activities, and (d) limiting access through a permit system.

### **Wetlands**

Trails and other developments would avoid wetlands and "Waters of the United States" (all waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce) to the extent feasible. Where crossing or impingement upon wetlands is unavoidable, design and

construction would minimize impacts on the wetlands. All potential impacts on wetlands would require state and federal permits.

### **Geology and Soils**

Structures such as sand ladders, boardwalks, and sidewalks would be used to reduce impacts to the substrate, and silt fences would be used to control erosion and runoff. Steep slopes and inundated areas would be avoided.

### **Vegetation and Wildlife**

Trails/paths would be placed as close to existing disturbances as possible. The construction footprint would be minimized for both temporary and permanent impacts. Construction would take place outside peak breeding and nesting seasons.

### **Threatened and Endangered Species**

Surveys would be conducted, as appropriate, for threatened and endangered species and species of concern before ground-disturbing activities are undertaken.

Impacts on three federally threatened or endangered species are analyzed in detail in this document— the piping plover (and piping plover critical habitat), the Michigan monkey flower, and the Pitcher’s thistle. (See chapter 5 for details.)

Conservation measures would be undertaken to reduce potential impacts on federally listed species or candidate species as needed. Conservation measures would be implemented in consultation with the U.S.

Fish and Wildlife Service and would be required if

- activities expected to have impacts on piping plovers or their designated critical habitat beyond those addressed in this document were initiated
- additional Michigan monkey flower occurrences were identified within the Lakeshore
- activities anticipated to have impacts on Michigan monkey flower populations were initiated
- activities anticipated to have impacts on Pitcher’s thistle populations beyond those addressed in this document were initiated

Should any of the above events occur, renewed discussion and consultation with the U.S. Fish and Wildlife Service would focus on development of specific conservation measures to reduce potential impacts on these species and/or designated critical habitat. Such conservation measures would be based on the recommendations provided by the U.S. Fish and Wildlife Service.

Conservation measures would likely include, but would not be limited to, the following:

- Protecting piping plovers by fencing or another system designed to prevent impacts from human activity and discourage predators.
- Restricting dogs from piping plover breeding areas during the breeding season.
- Providing education about species and habitats.
- Designating alternate access points.

## THE ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The environmentally preferable alternative is the alternative that promotes the national environmental policy expressed in the National Environmental Policy Act (Sec. 101(b)). This includes alternatives that

- (1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- (2) ensure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;
- (3) attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
- (4) preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
- (5) achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and
- (6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources" (NPS DO-12 Handbook, Section 2.7D).

The alternatives do not differ much with respect to criteria 2 and 6; therefore the evaluation focuses on criteria 1, 3, 4, and 5.

The no-action alternative represents "business as usual" and was included to provide a baseline against which to compare the effects of the other (action) alternatives. The no-action alternative realizes criterion 1 in that most of the Lakeshore would be managed as rather natural, and large areas would be managed to maintain their existing wilderness character. The no-action alternative would

not fully realize criteria 3, 4, and 5 to the same extent as alternatives B, C, and the preferred alternative because it has fewer recreational opportunities.

The preferred alternative proposes managing much of the National Lakeshore as the experience nature zone, provides limited new recreational opportunities, proposes substantial amounts of designated wilderness, and protects the National Lakeshore's fundamental resources and values; as such it realizes criteria 1, 3, 4, and 5.

Alternative A realizes criterion 1 by managing most of the Lakeshore as the experience nature zone and by proposing substantial amounts of designated wilderness. Because it proposes a narrower range of recreational opportunities (and fewer such opportunities) than alternatives B, C, and the preferred alternative, alternative A does not realize criteria 3, 4, and 5 to the same extent as these alternatives.

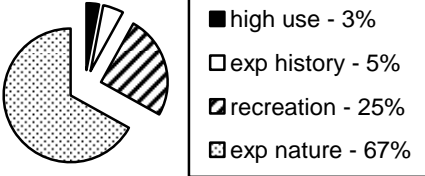
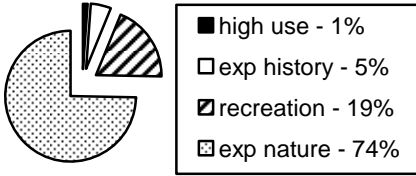
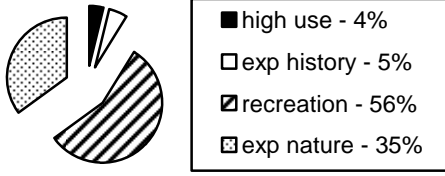
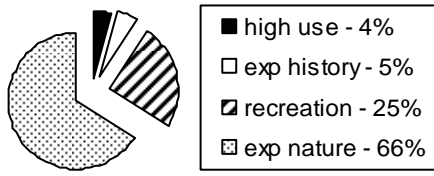
Alternative B realizes many aspects of criteria 3, 4, and 5 by providing a relatively wide range of and more new recreational opportunities. Alternative B realizes criterion 1 to a lesser degree than the other alternatives due to the more limited extent of the experience nature zone and its modest wilderness proposal.

Alternative C realizes criterion 1 to a lesser extent than the preferred alternative and alternative A, and to a greater extent than alternative B, based on the relative proportions of management zones and its moderate wilderness proposal. However, similar to alternative B and the preferred alternative, alternative C realizes many aspects of criteria 3, 4, and 5 by providing a relatively wide range of and more new recreational opportunities.

After considering the environmental consequences of the five management alternatives, including consequences to the human environment, the National Park Service has concluded that the preferred alternative is also the environmentally

preferable alternative. By a slight margin over alternative C, this alternative best realizes the full range of national environmental policy goals as stated in section 101 of the National Environmental Policy Act.

Table 2: Alternatives Comparison

No-Action Alternative	Preferred Alternative	Alternative A	Alternative B	Alternative C
Overall Vision				
Reflects current conditions and activities	Lakeshore valued primarily for preservation of its natural resources and for opportunities for visitor enjoyment of natural, cultural, and recreational resources in a scenic outdoor setting.	Lakeshore valued primarily for conservation of its natural resources.	Lakeshore valued primarily for its recreational opportunities in scenic outdoor settings.	Lakeshore managed so most visitor use is in select, concentrated areas with more natural, primitive conditions promoted elsewhere.
Provides a baseline for comparing the other alternatives				
Management Zones				
No-action alternative is not zoned.				
Wilderness				
30,903 acres (43%) (from the 1981 “Wilderness Recommendation)”	32,200 acres (46%)	33,600 acres (47%)	14,400 acres (20%)	23,200 acres (32%)
Includes areas on North Manitou and South Manitou islands, north and south portions of mainland, some county road rights-of-way	Addition of Sleeping Bear plateau; exclusion of developed county road rights-of-way, exclusion of Port Oneida and Cottage Row on North Manitou Island; other minor revisions.	Addition of Sleeping Bear plateau; exclusion of developed county road rights-of-way, exclusion of Port Oneida and Cottage Row on North Manitou Island; other minor revisions.	North Manitou Island areas only; exclusion of Cottage Row.	Addition of Sleeping Bear plateau; exclusion of developed county road rights-of-way, exclusion of Port Oneida and Cottage Row on North Manitou Island, exclusion of areas on South Manitou Island and some areas in north and south portions of mainland.
Natural Resources				
Natural resource management programs continue to emphasize protection of natural resources and processes.				
Not zoned and therefore cannot be directly compared to the other alternatives.	Second largest amount of experience nature zone, which emphasizes natural resource conditions.	Largest amount of experience nature zone, which emphasizes natural resource conditions.	Least amount of experience nature zone, which emphasizes natural resource conditions.	Slightly less of experience nature zone, which emphasizes natural resource conditions, than the preferred alternative.
Not zoned and therefore cannot be directly compared to the other alternatives.	About one-third of Lakeshore in zones where natural resources may be modified to preserve cultural resources or provide recreational opportunities	About one-quarter of Lakeshore in zones where natural resources may be modified to preserve cultural resources or provide recreational opportunities	About two-thirds of Lakeshore in zones where natural resources may be modified to preserve cultural resources or provide recreational opportunities	About one-third of Lakeshore in zones where natural resources may be modified to preserve cultural resources or provide recreational opportunities
Cultural Resources				
Preserve as many historic structures and landscapes as possible.				
Not zoned and therefore cannot be directly compared to the other alternatives.	Historic structures and landscapes managed as specified by management zone (some treatments are accomplished, some are proposed).			
Note: Percentages below, referring to numbers of historic structures, are based on a total of 262 structures (detailed in table 20); some treatments are accomplished, some are proposed.				
70% preserved, rehabilitated, or restored	79% preserved, rehabilitated, or restored	69% preserved, rehabilitated, or restored	74% preserved, rehabilitated, or restored	79% preserved, rehabilitated, or restored
21% preserved or rehabilitated	13% preserved or rehabilitated	3% preserved or rehabilitated	16% preserved or rehabilitated	15% preserved or rehabilitated
9% preserved	8% preserved	28% preserved	10% preserved	6% preserved
Visitor Orientation				
Information, interpretation, and educational opportunities at Empire visitor center, Glen Haven, and South Manitou Island visitor contact station				
Interpretive activities at major visitor use areas				
A variety of interpretive and educational programs would continue.	Same as no-action.	Same as no-action, except that interpretive opportunities would emphasize natural resource themes.	Same as no-action.	More structured interpretive opportunities offered in concentrated use areas and more self-guided opportunities offered elsewhere.
On South Manitou island, concession-operated farm tours would continue.	Same as no-action.	Vehicle portion of farm tours on South Manitou Island ends at west end of Chicago Road (NPS portion of loop road restored to natural conditions). Tours would continue on foot from road end.	Same as no-action.	Same as no-action.
No concession auto tours to the Giant Cedars.	Concession auto tours to near Giant Cedars considered.	Same as no-action.	Concession auto tours to near Giant Cedars considered.	Concession auto tours to near Giant Cedars considered.

No-Action Alternative	Preferred Alternative	Alternative A	Alternative B	Alternative C
Visitor Facilities, Opportunities, and Activities				
Road access remains essentially the same.	Road access remains essentially the same; all developed county roads zoned compatible with motor vehicle and bicycle use.	Road access remains essentially the same, except NPS-owned Tiesma Road and a portion of the farm loop on South Manitou Island are closed and restored to natural conditions; all developed county roads zoned compatible with motor vehicle and bicycle use.	Road access remains essentially the same, except scenic road would eventually be built in Benzie Corridor; all county road rights-of-way zoned compatible with motor vehicle and bicycle use.	Same as preferred alternative.
Trails remain essentially the same.	Same as no-action, except add M-22/M-109 hike/bike trail, bay-to-bay hike/paddle trail, and Bow Lakes trail.	Same as preferred alternative.	Same as no-action, except add M-22/M-109 hike/bike trail, bay-to-bay hike/paddle trail, Bow Lakes trails, possible groomed ski trails, and bike lane/trail along Benzie Corridor scenic road.	Same as no-action, except add M-22/M-109 hike/bike trail, bay-to-bay hike/paddle trail, possible trails near Little Glen Lake in the high use zone, Bow Lakes trail, and Benzie Corridor nonmotorized hike/bike trail.
Campgrounds remain essentially the same.	Same as no-action, except add backcountry campgrounds associated with bay-to-bay trail; remove Valley View campground; and provide new designated campgrounds on North Manitou Island.	Same as no-action, except add backcountry campgrounds associated with bay-to-bay trail and remove Valley View campground.	Same as no-action, except add backcountry campgrounds associated with bay-to-bay trail; relocate D. H. Day group campground, and provide new designated campgrounds to replace dispersed camping on North Manitou Island.	Same as no-action, except relocate D. H. Day group campground; add amenities and/or capacity at D. H. Day campground and new designated campgrounds on North Manitou Island.
Lake Michigan beach access remains essentially the same.	Same as no-action, except improve parking at end of Esch Road and possibly at Platte River Point.	Same as no-action, except close Tiesma Road (NPS owned).	Same as no-action, except improve parking at Peterson Road and end of Esch Road, and expanded facilities at Platte River Point.	Same as no-action, except expand facilities at ends of County Road 669, Esch Road, and Platte River Point.
Lake Michigan boat access remains essentially the same.	Same as no-action, except allow for study of improved boat access near Platte River Point.	Same as no-action.	Same as no-action, except allow for study of improved boat access near Platte River Point.	Same as no-action, except allow for study of improved boat access at the ends of County Road 669, Esch Road, and near Platte River Point.
Inland lake use and access remains essentially the same (motorized boats allowed on School, Bass-Leelanau County, North Bar, and Loon lakes).	Same as no-action, except no longer allow motorized boats on Bass Lake (Leelanau County) and North Bar Lake; improve access for nonmotorized boats at some inland lakes.	Same as no-action, except no longer allow motorized boats on Bass Lake (Leelanau County).	Same as no-action, except allow motorized boats at Shell and Tucker lakes; improve access at a few inland lakes.	Same as no-action, except improve access at a few inland lakes.
Picnic areas remain essentially the same.	Same as no-action, except upgrade Glen Lake picnic area facilities.	Same as no-action, except remove Glen Lake picnic area and restore site to natural conditions.	Same as no-action, except upgrade a few picnic areas.	Same as no-action, except upgrade/expand Glen Lake picnic area facilities.
Ferry service for day and overnight stays on South Manitou Island and overnight stays on North Manitou Island would continue.	Same as no-action, plus allow occasional ferry service for day trips to North Manitou Island.	Same as no-action.	Same as no-action, plus allow occasional ferry service for day trips to North Manitou Island.	Same as no-action.
Platte and Crystal river access areas remain essentially the same.	Same as no-action, except upgrade or relocate Crystal River access area.	Same as no-action.	Same as no-action, except upgrade or relocate Crystal River access area.	Same as no-action.
Dune Climb would remain essentially the same.	Same as no-action.	Same as no-action.	Same as no-action.	Upgrade Dune Climb facilities.
Bicycle use allowed on roads used by motor vehicles.	Same as no-action, plus conduct evaluations for expanded bicycle use in zones that permit it.	Same as no-action, plus conduct evaluations for expanded bicycle use in zones that permit it.	Same as no-action, plus conduct evaluations for expanded bicycle use in zones that permit it; consider bicycle rentals on South Manitou Island.	Same as no-action, plus conduct evaluations for expanded bicycle use in zones that permit it.
Hang gliding would continue at designated sites.	Same as no-action.	Hang gliding use at Empire Bluffs suspended.	Same as no-action.	Same as no-action.
Some areas crowded or degraded by overuse.	User capacity management strategies implemented to reduce crowding and protect resources, as needed.			
Benzie Corridor				
Continue to purchase lands on a willing-seller basis for future development of scenic road and bike lane/trail; current conditions (nothing built); no construction costs are included in cost estimates; no impacts are assessed.	Continue to purchase lands on a willing-seller basis for future development of scenic road and/or a hike/bike trail (nothing built within life of plan); no construction costs are included in cost estimates; no impacts are assessed.	Recommend removal of Benzie Corridor from Lakeshore boundary (nothing built); no construction costs are included in cost estimates; general impacts of removing the corridor from Lakeshore boundary are assessed.	Continue to purchase lands on a willing-seller basis for development of scenic road and bike lane/trail (built within life of plan); construction costs are included in cost estimates; general impacts are assessed in this document.	Continue to purchase lands on a willing-seller basis for development of nonmotorized hike/bike trail (built within life of plan); construction costs are included in cost estimates; general impacts are assessed in this document.
Bow Lakes				
Continue nature observation and backcountry hiking on informal, undesignated trails .	Construct a loop trail and small parking area.	Same as preferred alternative.	Construct a multi-loop trail and small parking area.	Same as preferred alternative.
The National Park Service would acquire properties within this area of the Lakeshore, on a willing-seller basis, as they become available (subject to available funding).				
Estimated “Full-time Equivalent” Staff*				
66	79	77	79	85
Estimated Cost in Millions*				
\$22.0	\$32.9	\$29.8	\$58.2	\$45.9

\* For more information see “Appendix C: Cost Summary of GMP Alternatives”

**TABLE 3: RANGE OF TREATMENT FOR HISTORIC PROPERTIES UNDER THE ALTERNATIVES**

	experience history zone (allows for preservation, rehabilitation, or restoration)
	recreation zone (allows for preservation or rehabilitation)
	experience nature zone (allows for preservation)

The shading in the table below reflects the management zone and the possible treatment range (see table box above) where the property is located. (There are no historic properties in the high use zone.) See definitions for preservation, rehabilitation, and restoration on page 40.

	No Action			Preferred Alternative			Alternative A			Alternative B			Alternative C		
Treatment	Preservation	Rehabilitation	Restoration	Preservation	Rehabilitation	Restoration	Preservation	Rehabilitation	Restoration	Preservation	Rehabilitation	Restoration	Preservation	Rehabilitation	Restoration
<b>FUNDAMENTAL HISTORIC RESOURCES</b>															
Sleeping Bear Point Life-Saving Station (4) <sup>a</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
North Manitou Life-Saving Station (8) <sup>a</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
South Manitou Island Lighthouse Complex and Life-Saving Station Historical District (13) <sup>a</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Glen Haven Village Historic District (15) <sup>a</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Port Oneida Rural Historic District (121) <sup>a</sup> (18 farms)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<b>SUBTOTAL (161)</b>															
<b>OTHER HISTORIC RESOURCES</b>															
North Manitou Island Village (Manitou Island Association) (10) <sup>a</sup>	•	•		•	•	•	•	•	•	•	•	•	•	•	•
North Manitou Island Village (Cottage Row) (13) <sup>a</sup>	•			•	•	•	•			•	•	•	•	•	•
North Manitou Island Westside Barn (1) <sup>a</sup>	•			•			•			•			•		
Bournique Cabin (4) <sup>a</sup>	•			•			•			•			•		
South Manitou Island Loop (Schoolhouse, August Beck farm, G.C. Hutzler farm (13) <sup>a</sup>	•		○	•	•	•	•			•	•	•	•	•	•



Table 3: Range of Treatment for Historic Properties under the Alternatives

	No Action			Preferred Alternative			Alternative A			Alternative B			Alternative C		
Treatment	Preservation	Rehabilitation	Restoration	Preservation	Rehabilitation	Restoration	Preservation	Rehabilitation	Restoration	Preservation	Rehabilitation	Restoration	Preservation	Rehabilitation	Restoration
South Manitou Island non-farm loop (G. J. Hutzler farm, T. Beck farm) (5) <sup>a</sup>	•			•			•			•	•		•		
Remainder of South Manitou Island Village (9) <sup>a</sup>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Bufka Farm (8) <sup>a</sup>	•	•		•	•		•			•			•	•	
Kropp Farm (5) <sup>a</sup>	•	•		•	•		•			•			•	•	
Eitzen Farm (7) <sup>a</sup>	•	•		•	•		•			•			•	•	
Shalda Log Cabin (1) <sup>a</sup>	•	•		•	•		•			•	•		•		
Tweddle School (1) <sup>a</sup>	•	•		•	•		•			•	•		•	•	
Pelky Barn (1) <sup>a</sup>	•	•		•	•		•			•	•		•	•	
Treat Farm (9) <sup>a</sup>	•	•		•			•			•	•		•	•	
Esch Farm (1) <sup>a</sup>	•	•		•	•		•	•		•	•		•	•	
Lyle Schmidt Farm (3) <sup>a</sup>	•	•		•			•			•	•		•		
Tweddle Farm (6) <sup>a</sup>	•	•		•	•		•	•		•	•		•	•	
Boekeloo Log Cabin (2) <sup>a</sup>	•	•		•	•		•			•	•		•		
Ken-Tuck-U Inn (3) <sup>a</sup>	•	•		•	•		•			•			•	•	
<b>SUBTOTAL (102)</b>															
<b>TOTAL (263)</b>															
Figures refer to numbers of structures.				206 (78%)			180 (68%)			193 (73%)			206 (78%)		
				35 (13%)			7 (03%)			42 (16%)			41 (16%)		
				22 (08%)			76 (29%)			28 (11%)			16 (06%)		

a Number of buildings at each property. All landscapes are preserved. Numbers do not include other landscape features such as fence rows, cemeteries, sidewalks, etc.

o Restoration of Schoolhouse only, preservation of all others.

**TABLE 4: SUMMARY OF THE IMPACTS OF THE ALTERNATIVES**

There would be *no impairment* of National Lakeshore resources or values from actions proposed in the alternatives.

IMPACT TOPIC		NO-ACTION ALTERNATIVE	PREFERRED ALTERNATIVE	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
<b>Impacts on Historic Resources</b>						
		The no-action alternative would have a determination of no adverse effect under the Advisory Council on Historic Preservation "Regulations for the Protection of Historic and Cultural Properties" (36 CFR 800).	The preferred alternative would have a determination of no adverse effect under the Advisory Council on Historic Preservation "Regulations for the Protection of Historic and Cultural Properties" (36 CFR 800).	Alternative A would have a determination of no adverse effect under the Advisory Council on Historic Preservation "Regulations for the Protection of Historic and Cultural Properties" (36 CFR 800).	Alternative B would have a determination of no adverse effect under the Advisory Council on Historic Preservation "Regulations for the Protection of Historic and Cultural Properties" (36 CFR 800).	Alternative C would have a determination of no adverse effect under the Advisory Council on Historic Preservation "Regulations for the Protection of Historic and Cultural Properties" (36 CFR 800).
<b>Impacts on Natural Resources</b>						
<b>Soils and Geologic Resources</b>		The no-action alternative would have short- and long-term, minor to moderate adverse impacts and short- and long-term moderate beneficial impacts on soils and geologic resources.	The preferred alternative would have short- and long-term, minor to moderate adverse and beneficial impacts on soils and geologic resources.	Alternative A would have short- and long-term, negligible to moderate adverse impacts, and long-term, minor beneficial impacts on soils and geologic resources.	Alternative B would have short- and long-term, negligible to moderate adverse and beneficial impacts on soils and geologic resources.	Alternative C would have short- and long-term, negligible to moderate adverse and beneficial impacts.
<b>Vegetation and Wildlife</b>		The no-action alternative would have long-term, moderately beneficial impacts, and short- and long-term negligible to moderate adverse impacts on the vegetation and wildlife of the Lakeshore.	The preferred alternative would have short- and long-term negligible to minor adverse impacts, and short- and long-term minor to moderate beneficial impacts.	Alternative A would have short- and long-term negligible to moderate adverse impacts, and short- and long-term negligible to moderate beneficial impacts.	Alternative B would have short- and long-term negligible to moderate adverse impacts, and short- and long-term negligible to moderate beneficial impacts.	Alternative C would have short- and long-term negligible to moderate adverse impacts, and short- and long-term, minor to moderate beneficial impacts.

Table 4: Summary of the Impacts of the Alternatives

IMPACT TOPIC	NO-ACTION ALTERNATIVE	PREFERRED ALTERNATIVE	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
<b>Federal Threatened and Endangered Species</b>	The no-action alternative may affect but would not be likely to adversely affect addressed federally listed species and designated critical habitat.	Any adverse impacts of the preferred alternative on the addressed federally listed species and designated critical habitat would be no more than insignificant or discountable over both the short and long terms. Implementation of the preferred alternative may affect but would not likely adversely affect the addressed listed species and critical habitat.	Any adverse impacts of alternative A on the addressed federally listed species and designated critical habitat would be no more than insignificant or discountable over both the short and long terms. Implementation of alternative A may affect but would not likely adversely affect the addressed listed species and critical habitat.	Any adverse impacts of alternative B on the addressed federally listed species and designated critical habitat would be no more than insignificant or discountable over both the short and long terms. Implementation of alternative B may affect but would not likely adversely affect the addressed listed species and critical habitat.	Any adverse impacts of alternative C on the addressed federally listed species and designated critical habitat within the Lakeshore would be no more than insignificant or discountable over both the short and long terms. Implementation of alternative C may affect but would not likely adversely affect the addressed listed species and critical habitat.
<b>Michigan State-Listed Species</b>	The no-action alternative would have short- and long-term, minor to moderate, adverse impacts on Michigan state-listed species.	The preferred alternative would have short- and long-term, minor to moderate adverse and beneficial impacts on state-listed species.	Alternative A would have short- and long-term negligible to moderate adverse impacts and short- and long-term minor to moderate beneficial impacts on Michigan state-listed species.	Alternative B would have short- and long-term, negligible to moderate, adverse impacts and short- and long-term negligible to moderate beneficial impacts on state-listed species.	Alternative C would have short- and long-term, minor to moderate, adverse impacts, and short- and long-term minor to moderate beneficial impacts on state-listed species.
<b>Wetlands and Water Quality</b>	The no-action alternative would have short- and long-term, minor to moderate, adverse impacts on wetlands and water quality.	The preferred alternative would have short- and long-term, negligible to moderate adverse, and short- and long-term negligible to moderate beneficial impacts on wetlands and water quality.	Alternative A would contribute short- and long-term negligible to moderate adverse, and negligible to moderate beneficial impacts on wetlands and water quality.	Alternative B would have short- and long-term, negligible to moderate, adverse and short- and long-term, negligible to moderate, beneficial impacts on wetlands and water quality.	Alternative C would have short-term, negligible to moderate, adverse; short-term, negligible to minor, beneficial; and long-term negligible to moderate beneficial impacts on wetlands and water quality.

IMPACT TOPIC		NO-ACTION ALTERNATIVE	PREFERRED ALTERNATIVE	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Impacts on Visitor Opportunities and Use		<p>Visitors seem satisfied overall with most current opportunities in the Lakeshore. Maintaining the current access, scenic resources, range of visitor opportunities, experiences, and recreation-oriented facilities have a long-term, minor to moderate beneficial impact on visitor opportunities and use. Some visitors would prefer some additional improvements in recreation-oriented facilities, a few additional visitor opportunities, or a reduction of crowding on the Platte River, and the lack of these would result in a long-term, minor adverse impact on these visitors.</p>	<p>Increased access and visitor opportunities related to additional recreation-oriented facilities would have a long-term, moderate beneficial impact on visitor opportunities and use. Implementation of user capacity management strategies would have a long-term, minor beneficial impact on the visitor experience, but potentially long-term minor adverse effects on use. The removal of Valley View campground and disallowing gas-powered motorboats on two inland lakes would have long-term, minor, adverse impacts. The increased visitor opportunities and facilities would have a long-term, minor, adverse impact on natural sound and the night sky. Construction activities would have short-term, minor, adverse impacts.</p>	<p>Increased access and visitor opportunities related to modest additional recreation-oriented facilities would have a long-term, minor to moderate beneficial impact on visitor opportunities and use. Implementation of user capacity management strategies would have a long-term, minor beneficial impact on the visitor experience, but potentially long-term minor adverse effects on visitor use. The loss of some vehicle access, visitor opportunities, and recreation-oriented development (e.g., Tiesma Road, Glen Lake picnic area, and part of the farm tour) would have a long-term, moderate adverse impact. The removal of the Benzie Corridor from the Lakeshore boundary would have long-term, minor to moderate adverse impacts on visitor access and opportunities, scenic resources, natural soundscapes, and the night sky. Construction activities would have short-term, minor adverse impacts.</p>	<p>Increased access and visitor opportunities related to additional recreation-oriented facilities would have a long-term, minor to moderate beneficial impact on visitor opportunities and use. Implementation of user capacity management strategies would have a long-term, minor beneficial impact on visitor experiences but potentially long-term minor adverse effects on visitor use. The removal of dispersed camping on North Manitou Island would have a long-term minor adverse impact. The increased visitor opportunities and facilities would have a long-term minor adverse impact on scenic resources, natural sound, and the night sky. Construction activities would have short-term minor adverse impact.</p>	<p>Increased access and visitor opportunities related to additional recreation-oriented facilities would have a long-term, minor to moderate beneficial impact on visitor opportunities and use. Implementation of user capacity management strategies would have a long-term, minor, beneficial impact on the visitor experience, but potentially long-term minor, adverse effects on visitor use. The increased visitor opportunities and facilities in the high-use zones would have a long-term, minor, adverse impact on scenic resources, natural sounds and the night sky. Construction activities would have short-term, minor, adverse impacts.</p>

Table 4: Summary of the Impacts of the Alternatives

IMPACT TOPIC		NO-ACTION ALTERNATIVE	PREFERRED ALTERNATIVE	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
<b>Impacts on Wilderness Character</b>		As the result of ongoing management of nearly 31,000 acres to maintain its existing wilderness character, as directed by Congress, the National Lakeshore would continue to include extensive, largely natural undeveloped areas where outstanding opportunities for solitude or primitive, unconfined recreation would continue to be available. Impacts of the no-action alternative would continue to be mostly beneficial, moderate, and long term — but there would also be some continuing localized, minor adverse impacts on wilderness character.	Establishment of 32,100 acres of designated wilderness in all three portions of the mainland and on both islands would protect wilderness values (naturalness and opportunities for solitude or primitive, unconfined recreation). Impacts of the preferred alternative on wilderness character would be mostly beneficial, moderate, and long term (permanent), but there would also be some continuing localized, minor adverse impacts.	Establishment of 33,600 acres of designated wilderness (the most of any alternative) in all three portions of the mainland and on both islands would permanently protect naturalness and opportunities for solitude or primitive, unconfined recreation. Impacts of alternative A on wilderness character would be mostly beneficial, moderate, and long term (permanent), but there would also be some localized minor adverse impacts on wilderness character.	Establishment of 14,400 acres of designated wilderness on North Manitou Island would permanently protect wilderness values therein. However, about 16,503 acres on the mainland and South Manitou Island would no longer have wilderness protection, so naturalness and opportunities for solitude and primitive recreation would be substantially reduced there. Alternative B would have long-term (some permanent), minor beneficial and minor to major adverse impacts on wilderness character.	Establishment of 23,200 acres of designated wilderness in the central and south portions of the mainland and on both islands would permanently protect wilderness values (naturalness and opportunities for solitude or primitive unconfined recreation). However, wilderness values in several areas (north portion of the mainland, Otter Creek area, and southeast portion of South Manitou Island) would no longer have wilderness protection. Impacts of alternative C on wilderness character would be long term (some permanent), minor, and adverse and beneficial.

IMPACT TOPIC		NO-ACTION ALTERNATIVE	PREFERRED ALTERNATIVE	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
Impacts on Regional Socioeconomics						
	The economic and social effects of the no-action alternative would include negligible to minor short-term and long-term economic benefits and negligible, indeterminate, or adverse effects on population growth and demands on community services and facilities. Long-term consequences on attitudes and lifestyle are indeterminate, but in general would be more likely to be adverse than beneficial.	The economic effects of the preferred alternative would include negligible to minor short-term and moderate long-term economic benefits, the latter due to increased visitation. Short- and long-term consequences on lifestyles and attitudes would be minor benefits, because many interested parties could support the management direction established in the preferred alternative. Long-term social consequences would include a negligible to minor contribution to long-term population growth and demands on community infrastructure and services.	The economic and social effects of alternative A would include negligible to minor short-term and moderate long-term economic benefits compared to the no-action alternative. Short- and long-term effects on lifestyles and attitudes would be indeterminate. Long-term social consequences would include a negligible to minor contribution to long-term population growth and demands on community infrastructure and services.	The economic and social effects of alternative B would include negligible to minor short-term and moderate long-term economic benefits compared to the no-action alternative. Short- and long-term effects on lifestyles and attitudes are indeterminate. Long-term social consequences would include a negligible to minor contribution to long-term population growth and demands on community infrastructure and services.	The economic effects of alternative C would include negligible to minor short-term and minor to moderate long-term economic benefits, the latter due to increased visitation. Short- and long-term consequences on lifestyles and attitudes are indeterminate; many interested parties would support this alternative, but some would be disappointed in one or more of its aspects. Long-term social consequences include a negligible to minor contribution to long-term population growth and demands on community infrastructure and services.	
Impacts on NPS Operations						
	Ongoing impacts (long-term minor to moderate beneficial and adverse) would continue, but the no-action alternative would have no <i>new</i> impacts on NPS operations.	The preferred alternative would have long-term, minor beneficial and adverse impacts on NPS operations.	Alternative A would have long-term, minor beneficial and adverse impacts on NPS operations.	Alternative B would have long-term minor beneficial and moderate adverse impacts on NPS operations.	Alternative C would have long-term minor beneficial and moderate adverse impacts on NPS operations.	



3

## Wilderness Study and Proposal







## INTRODUCTION

The purpose of wilderness designation is to preserve and protect wilderness characteristics and values in perpetuity, including opportunities for solitude or primitive and unconfined recreation. With passage of the 1964 Wilderness Act (16 USC 1131 et seq.), Congress declared that it is national policy to secure for present and future generations the benefits of enduring wilderness resources. Wilderness can be officially designated only through congressional action.

### WILDERNESS DEFINITION

The Wilderness Act of 1964 (PL 88-577) is the guiding piece of legislation for all wilderness areas. The act defines wilderness as follows:

- “lands designated for preservation and protection in their natural condition” Section 2(a)
- “an area where the earth and its community of life are untrammelled by man” Section 2(c)
- “an area of undeveloped Federal land retaining its primeval character and influence, without permanent

improvement or human habitation”  
Section 2(c)

- “generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable” Section 2(c)
- “has outstanding opportunities for solitude or a primitive and unconfined type of recreation” Section 2(c)
- “shall be devoted to the public purposes of recreation, scenic, scientific, educational, conservation and historic use” Section 4(b)

### BRIEF DESCRIPTION OF THE STUDY AREA

The wilderness study area consists of the 71,291 acres within the legislated boundary of Sleeping Bear Dunes National Lakeshore. Major land cover types of the area include hardwood forest, coniferous forest, sand dunes, dune bluffs, beaches, Lake Michigan waters, inland lakes, and wetlands. Most of the area is federally owned and managed, but there are also some privately owned parcels, reservations of use and occupancy, and rights-of-way for utilities and state and county roads within the study area.

## WILDERNESS STUDY AND PROPOSAL

### WILDERNESS ELIGIBILITY

The first step in a wilderness study is typically to identify wilderness *eligible* lands, or lands that possess wilderness character. The 1970 legislation that established Sleeping Bear Dunes National Lakeshore (Public Law 91-479) required the secretary of the interior to recommend the suitability or unsuitability of lands within the Lakeshore for preservation as wilderness. As a result, six areas totaling more than 36,000 acres were identified as wilderness eligible in the 1975 “Final Wilderness Recommendation”: (1) most of North Manitou Island, (2) most of South Manitou Island, (3) an area around Pyramid Point/Good Harbor Bay (northern portion of the Lakeshore), (4) an area around the Sleeping Bear Plateau (central portion of the Lakeshore), (5) an area around Otter Creek (southern portion of the Lakeshore), and (6) an area west of the Platte River (southern portion of the Lakeshore). The 1975 recommendation proposed 35,060 acres — all as potential wilderness, recognizing that the limited land acquisition authority in the Lakeshore’s enabling legislation would likely result in nonconforming uses (such as residences) remaining in many areas. Not all of the eligible areas were proposed as potential wilderness at that time; the northern portion of the Sleeping Bear Plateau area was withheld because “interpretation is proposed in this area.”

Subsequently, after most of the land acquisition had taken place and the 1979 *General Management Plan* was completed, a new wilderness proposal was prepared. The 1981 “Wilderness Recommendation” also proposed most, but not all, of the wilderness-eligible areas for wilderness designation, and the recommendation included the general areas described above, with the exception of the area around the Sleeping Bear Plateau. The 1981 “Wilderness Recommendation”

proposed 30,903 acres of wilderness; 7,128 for full designation and 23,775 as potential wilderness (areas in which there remained temporary nonconforming uses, such as reservations of use and occupancy).

Congress then passed a law in 1982 (PL 97-361) requiring Sleeping Bear Dunes National Lakeshore to manage areas proposed in the 1981 “Wilderness Recommendation” to maintain their existing wilderness character “until Congress determines otherwise.”

**Because of this law, all lands included in the 1981 recommendation have been, and will continue to be, managed as wilderness unless and until Congress acts upon a recommendation.**

In 2006 the NPS planning team evaluated the wilderness eligibility of lands added to the Lakeshore boundary since the initial eligibility was determined in 1975. The Bow Lakes (975 acres), Miller Hill (640 acres), and Crystal River (104 acres) additions were determined to be *ineligible* for wilderness. This determination was based primarily on substantial percentages of nonfederal ownership (Bow Lakes and Miller Hill), existing developments, the relatively small size of the areas (especially considering that none is contiguous to other National Lakeshore areas that were earlier determined to be eligible for wilderness), and the corresponding lack of outstanding opportunities for solitude or a primitive and unconfined type of recreation.

### OPTIONS ANALYZED IN THIS WILDERNESS STUDY

This *Wilderness Study* is a fresh look at the question of whether, and if so, where, wilderness should be designated within Sleeping Bear Dunes National Lakeshore, given the best available current information about wilderness character, public review and

comment, and practical considerations. This *Wilderness Study* is being carried out primarily because of public interest regarding issues associated with the 1981 “Wilderness Recommendation” that arose during a 2002 effort to produce a new *General Management Plan* for the Lakeshore. Following the halting of that planning effort, Lakeshore managers decided that the best way to address public concerns, and the indeterminate status of wilderness posed by the 1982 law, would be to conduct a new *Wilderness Study*. Because there are many misperceptions about wilderness, it is important to understand what wilderness designation for portions of Sleeping Bear Dunes National Lakeshore would mean. Information about *what is* and *what is not* allowed in wilderness is provided in chapter 1 (see “Uses and Management in Wilderness” in the section titled “Purpose and Need for the Wilderness Study”).

Using the overall vision for each action alternative and public comment, the planning team developed a range of possibilities for proposed wilderness that would meet the Lakeshore mission of preserving resources and providing visitors appropriate opportunities to enjoy them. These alternative configurations and amounts of proposed wilderness are included in the action alternatives in this *General Management Plan*. Where practicable, proposed wilderness boundaries have been defined by roads, rivers, ridgelines, or other physical features to facilitate future management.

Five wilderness options or proposals are evaluated in this *General Management Plan / Wilderness Study / Environmental Impact Statement*. Each wilderness option is included as part of one of the general management plan alternatives; see “Chapter 2: Alternatives, Including the Preferred Alternative.” The *Environmental Impact Statement* included in this document analyzes the consequences of these five wilderness options.

**It should be noted that the most substantial difference between the wilderness proposal in the no-action alternative (the 1981 “Wilderness Recommendation”) and the proposals in each of the four action alternatives is that no developed county roads are included in proposed wilderness in the action alternatives.** These roads were excluded from proposed wilderness in order to continue to provide vehicle access to various areas of the Lakeshore, and in consultation with the Benzie and Leelanau County Road Commissions who own the road rights-of-way. Excluding the road corridors from proposed wilderness fragmented some of the eligible lands to the point that the planning team felt that they would no longer possess sufficient wilderness character, so the lands adjacent to M-22 between the Platte River and Fowler Road in the southern section of the park were excluded from the wilderness proposals in the action alternatives, including alternative A that proposes the largest acreage of wilderness.

**TABLE 5: WILDERNESS OPTIONS EVALUATED IN THIS WILDERNESS STUDY**

Alternative	Wilderness Proposal (acres)	Notes
<b>No-action Alternative</b>	30,903 (43% of the National Lakeshore)	1981 “Wilderness Recommendation;” portions of both islands and the mainland
<b>Preferred Alternative</b>	32,100 (45% of the National Lakeshore)	Portions of both islands and the mainland
<b>Alternative A</b>	33,600 (47% of the National Lakeshore)	Portions of both islands and the mainland
<b>Alternative B</b>	14,400 (20% of the National Lakeshore)	Portions of North Manitou Island only
<b>Alternative C</b>	23,200 (32% of the National Lakeshore)	Portions of both islands and the mainland

The overall vision of alternative A is that the National Lakeshore is valued primarily for the conservation of its natural resources. Correspondingly, this alternative proposes the largest acreage of wilderness including most (about 33,600 acres) of the more than 36,000 acres of wilderness-eligible areas. In comparison to the no-action alternative, the wilderness proposal in this alternative adds the Sleeping Bear Plateau and removes some of the fragmented areas described above. No developed county roads are within areas proposed for wilderness. None of the Lake Michigan active beach zone is in areas proposed for wilderness.

The overall vision of alternative B is that the National Lakeshore is valued primarily for its recreational opportunities in scenic outdoor settings. Because alternative B could potentially allow recreational facilities and moderate numbers of visitors in most areas of the Lakeshore, it proposes wilderness only on North Manitou Island, about 14,400 acres. There is no wilderness proposed in alternative B on South Manitou Island or the mainland. No county roads are within areas proposed for wilderness. None of the Lake Michigan active beach zone is in areas proposed for wilderness.

The overall vision of alternative C is that the National Lakeshore would be managed so that most visitor use is concentrated in selected areas, with more natural, primitive conditions promoted in the rest of the Lakeshore. Consequently, alternative C was chosen to represent a wilderness proposal containing a partial amount of the eligible wilderness, about 23,200 acres, including almost all of North Manitou Island, slightly more than half of South Manitou Island, the Sleeping Bear Plateau north of the Pierce Stocking Scenic Drive, and the area west and south of the Platte River. No developed county roads are within areas proposed for wilderness. None of the Lake Michigan active beach zone is in areas proposed for wilderness.

The wilderness proposal for the preferred alternative is discussed in the “Wilderness Proposal” section on the next page.

Please note that the acreage figures for the various wilderness proposals are estimates based on small-scale maps; the acreage for the approved wilderness proposal will be refined prior to legislation, using detailed, large-scale maps.

## **PUBLIC COMMENT ON WILDERNESS**

Early in the planning process for this *General Management Plan / Wilderness Study / Environmental Impact Statement* it became apparent that many members of the public had misperceptions about wilderness. In particular, many people opposed wilderness designation thinking that it would close much of the park to the public, while at the same time many also expressed their support for continuing current management of the National Lakeshore, not realizing that more than 30,000 acres were already being managed as wilderness. Lakeshore managers held public meetings and media interviews and had many other communications with the public in an effort to provide correct information regarding wilderness.

In October 2006 the National Park Service distributed *Newsletter #3*, which presented four alternative management concepts that were developed with public input and represented different ways to manage the National Lakeshore. Each of the management concepts included a distinctive (a) overall vision, (b) description of the relative proportions of the various management zones, and (c) the amount of wilderness that would be proposed for designation.

Public support for the four management concepts was fairly evenly distributed, with the “resource enjoyment” and no-action concepts receiving somewhat greater support. Many respondents to *Newsletter #3* expressed

either support or opposition to wilderness designation within the National Lakeshore. Most who supported wilderness did so because they value natural conditions, primitive recreation, and opportunities for solitude, particularly as areas surrounding the Lakeshore become more developed. Some who opposed wilderness pointed out that few areas within the National Lakeshore are truly pristine. Others opposed wilderness due to a perception that it would restrict access or because they believe it is contrary to the purpose of the Lakeshore.

In March 2007, the National Park Service distributed *Newsletter #4*, which presented four preliminary alternatives developed from the concepts described in *Newsletter #3*. Each preliminary alternative included a more detailed wilderness proposal. Alternative A, with the most extensive wilderness proposal, received support from 42% of the respondents. The no-action alternative received support from 15%; alternative B, with the least wilderness, received support from 18%; and alternative C, with a moderate amount of wilderness, received support from 19% of the respondents. Most people who supported alternative A said the more substantial wilderness proposal in this alternative was a main reason they supported it. Fewer of the supporters for the other alternatives cited wilderness amounts as the reason for their preference.

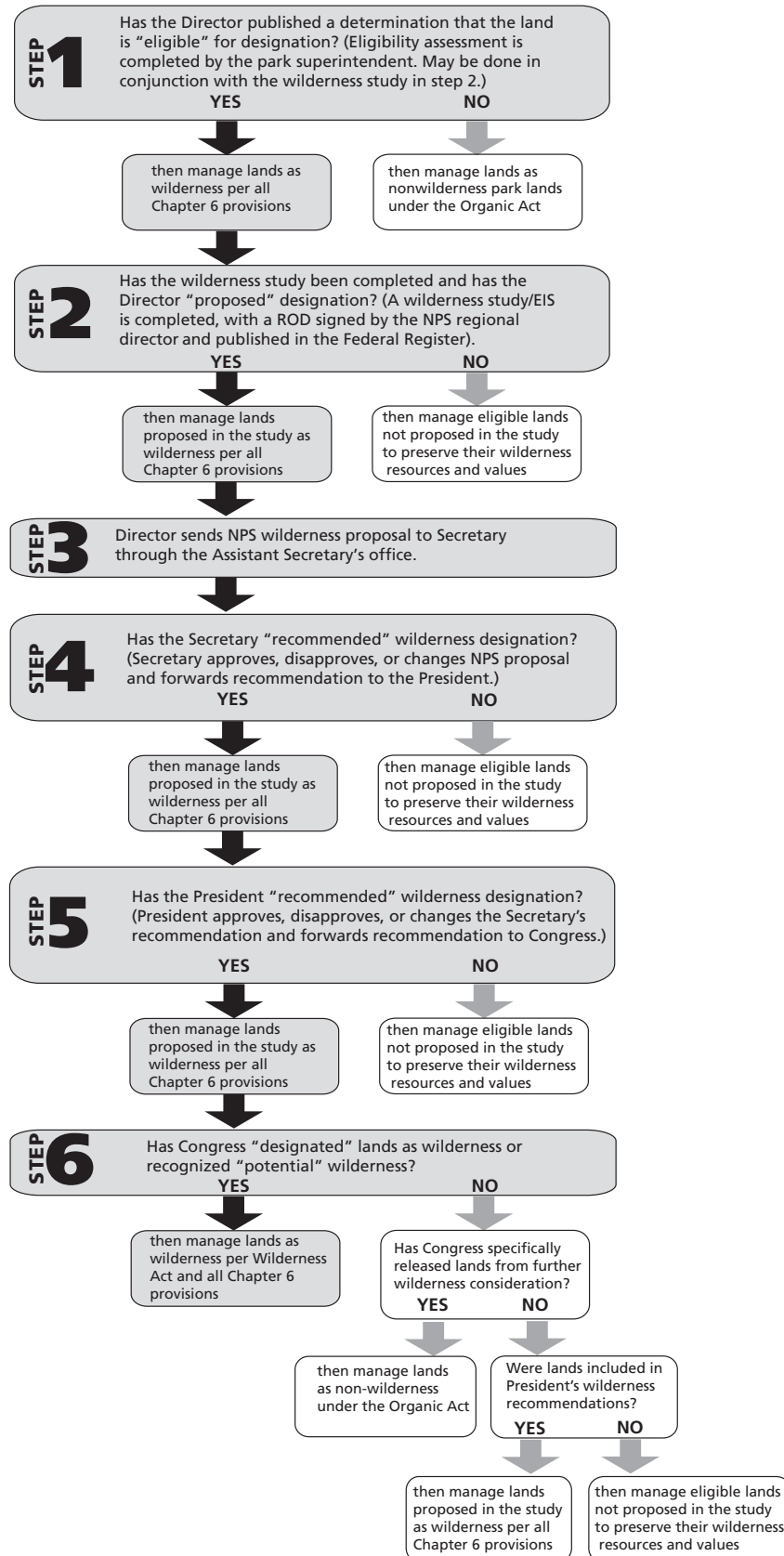
## WILDERNESS PROPOSAL

The overall vision of the preferred alternative is that the Lakeshore is valued primarily for the preservation of its natural resources and for the opportunities it provides for visitor enjoyment of natural, cultural, and recreational resources in a scenic outdoor setting. In keeping with this vision, as well as with public comment, the NPS preferred alternative proposes wilderness for most of the eligible lands but excludes the developed county roads. Six areas totaling 32,100 acres

are proposed as wilderness: (1) nearly all of North Manitou Island, (2) most of South Manitou Island, (3) an area around Good Harbor Bay (northern portion of the Lakeshore), (4) the Sleeping Bear Plateau (central portion of the Lakeshore), (5) an area around Otter Creek (southern portion of the Lakeshore), and (6) an area west of the Platte River (southern portion of the Lakeshore). After studying the various options and considering public comment, the National Park Service has tentatively concluded that wilderness designation of these areas helps to fulfill its mission at Sleeping Bear Dunes National Lakeshore by ensuring protection of the values of naturalness and solitude for the purposes of recreation, scenic, scientific, educational, conservation, and historic use. In addition, wilderness designation of most of the eligible lands best fulfills the wishes expressed in public comment, as most respondents wanted the Lakeshore to remain largely the way it is now — which is to have these areas managed as wilderness but with existing roads remaining open and excluded from wilderness.

Ultimately, wilderness studies typically result in a recommendation to Congress to designate all, some, or none of the lands possessing wilderness character as part of the national wilderness preservation system. Based on the *Wilderness Study* in this document, the National Park Service anticipates forwarding a wilderness proposal to the U.S. Department of the Interior at the conclusion of the current planning effort. The secretary of the interior is then responsible for reviewing this proposal and either approving or revising it before forwarding it on to the president as recommended wilderness. The president then formally transmits this recommendation to both houses of Congress for action. The process for establishing wilderness is described in more detail in a “Wilderness Review and Management Process” flowchart that can be found in *NPS Management Policies 2006* (Section 6.2) (see following page).

## WILDERNESS REVIEW AND MANAGEMENT PROCESS



## IMPLICATIONS OF MANAGING LANDS PROPOSED FOR WILDERNESS

Congress passed a law in 1982 (PL 97-361) requiring Sleeping Bear Dunes National Lakeshore to manage areas proposed in the 1981 “Wilderness Recommendation” to maintain their wilderness character “until Congress determines otherwise.” Because of this law, **all lands included in the 1981 recommendation have been, and will continue to be, managed as wilderness unless and until Congress acts upon a recommendation. This is true even if this *Wilderness Study* produces a new recommendation that proposes to withdraw portions of those lands from wilderness.**

In addition to the lands in the 1981 recommendation, any additional lands that are proposed for wilderness designation in the “Record of Decision” for this planning process are to be managed as wilderness until such time as Congress specifically decides whether or not to include them in a formal wilderness designation (NPS *Management Policies* 2006). That is, management activities on lands proposed for wilderness cannot diminish the wilderness eligibility of those lands.

### PLANNING AND MANAGEMENT

Once wilderness, if any, is designated, a wilderness management plan is typically developed to guide preservation, management, and use of NPS wilderness areas. Such a plan is developed with public involvement and contains specific, measurable objectives for preservation of wilderness values as specified in the Wilderness Act and NPS management policies. Wilderness management plans, which are often combined with backcountry management plans, articulate management actions such as regulations, monitoring, and permit systems such as those currently in

place for backcountry camping on the mainland and islands.

Management decisions affecting wilderness will be consistent with the “minimum requirements” concept. This concept is a documented process used to determine whether administrative activities affecting wilderness resources or visitor experiences are necessary in wilderness, and if so, how to minimize impacts from such activities. Parks are to complete a minimum requirements analysis for administrative actions and equipment uses that have potential to affect wilderness character.

Where practical alternatives do not exist, maintenance or other activities may occasionally be accomplished through the use of motorized equipment. The use of motorized equipment should be based on the minimum requirement concept. Motorized equipment need not be allowed for activities that can reasonably be accomplished using nonmotorized means.

### PRIVATE RIGHTS

Wilderness designation does not extinguish valid existing private rights such as land or right-of-way ownership or valid mineral interests. Valid private rights in wilderness are administered in keeping with the specific terms and conditions of each right.

### RECREATIONAL USE

Recreational uses of NPS wilderness are to be of a type and nature that enable the areas to retain their undeveloped primeval character and influence, protect and preserve natural conditions, leave the imprint of man’s work substantially unnoticeable, provide

outstanding opportunities for solitude or primitive and unconfined types of recreation, and preserve wilderness in an unimpaired condition. Hunting and fishing are appropriate uses of wilderness at Sleeping Bear Dunes National Lakeshore. Public use of motorized equipment or any form of mechanical transport is prohibited, except as provided for in specific legislation. Operating a motor vehicle or possessing a bicycle in wilderness is prohibited. The use of a wheelchair, as defined by the Americans with Disabilities Act of 1990, is allowed in wilderness. Service animals accompanying persons with disabilities are also allowed in wilderness.

### **EMERGENCY SERVICES**

In emergency situations involving the health and safety of persons, the use of aircraft, motorboats, and other motorized or mechanical equipment is allowed. Wildfires will be controlled as necessary to prevent loss of life, damage to property, the spread of wildfire to lands outside wilderness, or unacceptable loss of wilderness values. The use of tool caches, aircraft, motorboats, and motorized firefighting equipment may be permitted for such control. Prescribed fire and hazard fuel reduction programs may be implemented according to approved plans. The minimum requirement concept will be followed for all fire activities in wilderness.

### **RESOURCE MANAGEMENT AND RESEARCH**

Wilderness designation does not prevent the National Park Service from protecting and maintaining historic and other cultural resources located within wilderness areas. Using the minimum requirement concept, these resources will be protected and maintained according to the pertinent laws and policies governing cultural resources. Natural resource management activities may be carried out in a similar fashion, and will generally be undertaken only to address the impacts of past and current use or influences originating outside of wilderness boundaries. Natural processes will be allowed, insofar as possible, to shape and control wilderness ecosystems.

Scientific activities are appropriate in wilderness. Even scientific activities (including inventory, monitoring, and research) that involve a potential impact to wilderness resources or values (including access, ground disturbance, use of equipment, and animal welfare) are allowed when the benefits of what can be learned outweigh the impacts on wilderness resources or values. However, all such activities must be evaluated using the minimum requirement concept.

See also “Uses and Management in Wilderness” in the section titled “Purpose and Need for the Wilderness Study” in chapter 1 of this document.





*Sand Ladder at North Bar Lake*

4

## Affected Environment



*Piping Plover*



*Sleeping Bear Inn, Glen Haven*



## INTRODUCTION

This chapter describes the existing environment of Sleeping Bear Dunes National Lakeshore. The focus is on elements (natural and cultural resources, visitor opportunities, socioeconomic characteristics, etc.) that would be affected by the actions proposed in the alternatives, should they be implemented. These topics were selected on the basis of federal law, regulations, executive orders, NPS expertise, and concerns expressed by

other agencies or members of the public during project scoping.

The first section in this chapter discusses impact topics that are analyzed in detail in this *General Management Plan / Wilderness Study / Environmental Impact Statement*. The next section discusses impact topics that are not analyzed in detail and explains the rationale for these decisions.

Impact Topics Considered in this Plan	Impact Topics Eliminated from Detailed Analysis in this Plan
<i>Alternatives in this plan have potential to affect these resources or topics.</i>	<i>These resources or topics are important, but alternatives in this plan would have only positive impacts on them, and/or any adverse impacts would be negligible to minor.</i>
Cultural Resources	Cultural Resources
<i>Historic Resources</i>	<i>Museum Collections</i>
Natural Resources	<i>Ethnographic Resources</i>
<i>Soils and Geologic Resources</i>	<i>Archeological Resources</i>
<i>Vegetation</i>	Indian Trust Resources
<i>Wildlife</i>	Natural Resources
<i>Federal Threatened and Endangered Species</i>	<i>Air Quality</i>
<i>Michigan State-listed Species*</i>	<i>Michigan State-listed Species (northern goshawk, grasshopper sparrow, least bittern, calypso or fairy-slipper, beauty sedge, and broad-leaved sedge)*</i>
<i>Wetlands</i>	<i>Floodplains</i>
<i>Water Quality</i>	<i>Coastal Zone Management</i>
Visitor Opportunities and Use	<i>Water Quantity</i>
<i>Visitor Opportunities</i>	<i>Prime or Unique Farmland</i>
<i>Visitor Use</i>	Energy Requirements and Conservation Potential
Wilderness Character	Environmental Justice
Regional Socioeconomics	Wild and Scenic Rivers
NPS Operations	

\* The northern goshawk, grasshopper sparrow, least bittern, calypso or fairy-slipper, beauty sedge, and broad-leaved sedge, all state-listed species, were dismissed from further analysis. The reasons for dismissing these species can be found in the discussion of topics eliminated from detailed analysis.

## IMPACT TOPICS CONSIDERED AND ANALYZED IN DETAIL

### HISTORIC RESOURCES

Cultural resources as a group include historic structures, cultural landscapes, archeological resources, ethnographic resources, and museum collections. The latter three categories have not been analyzed in detail because they would not be affected under any alternative; these categories are described in the “Impact Topics Dismissed” section later in this chapter.

#### Historic Property Definitions

Within the topic of historic resources there are several historic property types defined under 36 CFR 800. They are defined as “any historic district, site, building, structure, or object included in or eligible for inclusion in, the National Register of Historic Places.” The following definitions are used by the National Park Service:

- **Building:** created principally to shelter any form of human activity such as a barn, house, church, or hotel
- **Site:** the location of a significant event; a prehistoric or historic occupation or activity; or a building or structure, whether standing or ruined or vanished, where the location itself possesses historic, cultural, or archeological value, regardless of the value of the existing structure
- **Structure:** a functional construction usually made for purposes other than creating human shelter, such as tunnels, bridges, oil wells, or dams
- **Object:** primarily artistic in nature or is relatively small in scale and simply constructed — Although an object may be moveable by nature or design, it is associated with a specific setting or

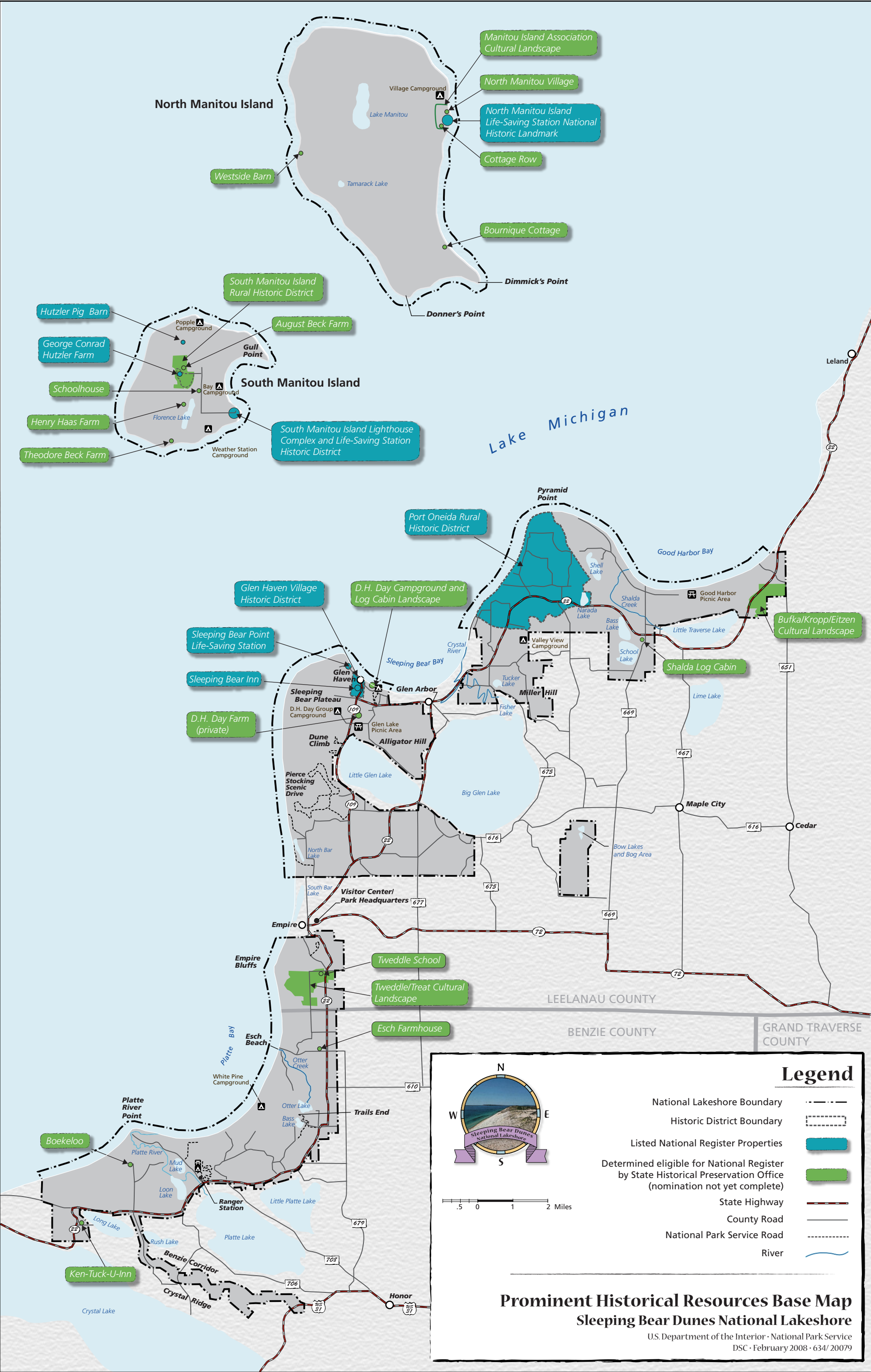
environment, including sculptures, boundary markers, or statues.

- **District:** possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development, such as a college campus, central business district, fort, or sprawling ranch
- **Landscape:** geographic area associated with events, persons, design styles, or ways of life that are significant in American history, landscape architecture, archeology, engineering, or culture

Each of the property types above is represented at Sleeping Bear Dunes National Lakeshore. However, not all of these property types will be affected by actions described in this plan. Therefore, within the historic resources topic, the property types to be discussed include cultural landscapes, sites, buildings, structures, and districts.

All historic properties in Sleeping Bear Dunes National Lakeshore have been or will be surveyed and evaluated for eligibility for the National Register of Historic Places by the National Park Service. Currently eight structures or groupings of structures or cultural landscapes have been listed on the national register (see Prominent Historical Resources Base map).

Within Leelanau County the listed historic properties are as follows: the Glen Haven Village Historic District, the George Conrad Hutzler Farm, the George J. and Margaretha Hutzler pig barn, the North Manitou Island Life-Saving Station (also a designated national historic landmark), the Port Oneida Rural Historic District, the Sleeping Bear Inn, the Sleeping Bear Point Life-Saving Station, and the South Manitou Island Lighthouse Complex and Life-Saving Station Historical







District. In Benzie County, no historic properties listed on the national register exist within the boundaries of the National Lakeshore.

Numerous other properties have been determined eligible for listing on the National Register of Historic Places by the National

Park Service and the Michigan state historic preservation officer. Many of these properties, however, have not yet had their significant features or time periods described on a nomination form for submission to the keeper of the national register for official listing.

#### **A Note about the National Register of Historic Places and the National Historic Preservation Act**

The National Register of Historic Places (national register) is a comprehensive list of districts, sites, buildings, structures, and objects of national, regional, state, and local significance in American history, architecture, archeology, engineering, and culture. The national register is maintained by the National Park Service under authority of the National Historic Preservation Act of 1966 as amended. Any property that appears eligible must be studied and documented and formally submitted to the state historic preservation officer for concurrence and to the keeper of the national register. The final decision on listing is made by the keeper of the national register.

During the time the proposed nomination is reviewed by the state historic preservation officer, property owners and local officials are notified of the intent to nominate and public comment is solicited. Once the property is listed on or determined eligible for the national register, all actions that could have an effect on the property, good or bad, must undergo the Section 106 process. Section 106 of the National Historic Preservation Act of 1966, as amended, requires that all actions affecting cultural resources listed on or eligible for inclusion on the national register be reviewed both by the state historic preservation officer and the Advisory Council on Historic Preservation before the undertaking. Should all parties concur, the action may proceed. Any disagreement requires additional consultation. Should no agreement be forthcoming following additional consultation, a formal decision to proceed may be made by the agency.

Once a property is listed on or determined eligible for the national register, the National Park Service is obligated to preserve and protect that property until a formal, conscious decision to do otherwise is made in consultation with the state historic preservation officer and the Advisory Council on Historic Preservation. Under Section 106 of the National Historic Preservation Act of 1966, as amended, the National Park Service has an obligation to request adequate funding for preservation maintenance of these properties — intentional neglect of a property under Section 106 is an “adverse effect” subject to consultation.

To preserve the historic properties in the National Lakeshore, the National Park Service intends to use a variety of means, such as NPS funding, grants, volunteers, and leasing of structures. Should these means prove inadequate to preserve all of the historic properties, the National Lakeshore would work with the state historic preservation officer when making decisions about preservation priorities.

By passage of the National Historic Preservation Act (NHPA), Congress established a comprehensive program to preserve the historical and cultural foundations of the nation as a living part of community life. Section 110 of the act identifies broad historic preservation responsibilities for federal agencies, such as the National Park Service, to ensure that historic preservation is fully integrated into all of their ongoing programs. Important benchmarks for federal agency preservation programs include the following:

- historic properties under the jurisdiction or control of the agency are to be managed and maintained in a way that considers the preservation of their historic, archeological, architectural, and cultural values;

- historic properties not under agency jurisdiction or control but potentially affected by agency actions are to be fully considered in agency planning; and
- agency preservation-related activities are to be carried out in consultation with other federal, state, and local agencies, Indian tribes, and the private sector.

Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effects of their undertakings on historic properties either listed in or eligible to be listed in the national register. The historic preservation review process required by Section 106 is outlined in regulations (36 CFR Part 800, *Protecting Historic Properties*) issued by Advisory Council on Historic Preservation (ACHP), an independent federal agency established by the act in 1966 to promote the preservation, enhancement, and productive use of our nation's historic resources. The goal of the Section 106 review process is to seek ways to avoid, minimize, or mitigate any adverse effects on historic properties.

Federal agencies are responsible for initiating Section 106 review, most of which takes place between the agency and state and tribal officials. Appointed by the governor, the state historic preservation officer administers the national historic preservation program at the state level, coordinates the state's historic preservation program, and consults with federal agencies during Section 106 review. Federal agencies also consult with officials of federally recognized Indian tribes when tribal lands or historic properties of significance to such tribes are involved, as well as representatives of state and local governments, agencies, and organizations, the general public, and, as necessary, the Advisory Council.

Section 106 review encourages, but does not mandate, preservation of national register listed or eligible historic properties. The purpose of Section 106 review is not to stop proposed projects, but rather to ensure that federal agencies fully consider historic preservation values and the views of other agencies, tribes, organizations, and the public during project planning and decision-making. Sometimes there is no feasible and prudent way for a needed project to proceed without adversely affecting historic properties, and there may be overriding natural resource concerns or economic and social benefits that make it necessary for such a project to proceed as planned. Section 106 review does, however, ensure that preservation values are factored into federal agency planning and decision-making, and that federal agencies assume responsibility for the consequences of their actions on historic properties and are publicly accountable for their decisions.

### **Properties Listed in the National Register of Historic Places**

The Glen Haven Village Historic District consists of 17 structures. It was first entered into the national register June 24, 1983, and the entry was subsequently modified on April, 19, 1990. The district is listed at a state level of significance as an excellent example of a frontier company-operated steamboat stop. Glen Haven Village is associated with David Henry Day whose entrepreneurial skills allowed the development of a lumber industry to supply cordwood for Great Lakes steamers and lumber for shipment to Chicago, dairy farming and livestock raising, fruit horticulture, and resort development. Its period of significance currently spans the years from 1857 to 1939, although a recently completed

cultural landscape report for Glen Haven recommends changing the period to 1864 to 1931, a period bracketed by the construction of the first structure, the Sleeping Bear Inn, and the last year that the steamboats stopped at Glen Haven.

The Sleeping Bear Inn was constructed circa 1864. It was individually listed on the national register on September 6, 1979, as a fine example of a frontier hotel with significance in the areas of commerce, entertainment recreation, and exploration and settlement. The inn served as home for area workers, an intermediate stop for settlers homesteading the area, and later as a resort hotel. The inn's period of significance is currently shown as 1857 to 1928. The Sleeping Bear Inn was later



also included in the Glen Haven Village Historic District nomination.

The Sleeping Bear Point Life-Saving Station is made up of five structures originally constructed between 1901 and 1931. The life-saving station was moved in 1931 to its current location and continued in operation until 1942. The station was added to the national register on April 26, 1979; its period of significance is 1901 to 1931. Since the nomination was entered, several additional landscape features have been identified as significant components of the complex and have been determined eligible for the national register. A modified nomination to include these features has yet to be prepared.

The Port Oneida Rural Historic District comprises 146 sites, structures, and buildings in a rural agricultural landscape reflecting the general settlement patterns of Northern European immigrants in the Upper Great Lakes region. The district was added to the national register in 1997 with a state level of significance. The district's period of significance is from 1880-1945. Since the nomination was entered, several additional landscape and archeological features have been identified as significant components of the district and are believed to contribute to the significance of the district. A modified nomination to include these features has yet to be prepared.

The North Manitou Island Life-Saving Station National Historic Landmark was entered on the national register on August 5, 1998. The station was operational from 1854 to 1938, first as a volunteer facility, then as part of the U.S. Life-Saving Service (1874-1915), and finally as a part of the U.S. Coast Guard. The station served as a key element in the network of rescue stations that provided humanitarian aid to shipwreck victims. Of the nearly 200 such stations, the North Manitou Island Life-Saving Station is the only remaining station

that represents the entire U.S. Life-Saving Service history from the volunteer era through the U.S. Coast Guard era. The 12 station structures retain a high level of integrity of design, material, and workmanship. The station's period of significance spans the years from 1854 to 1932.

The South Manitou Island Lighthouse Complex and Life-Saving Station Historical District was a strategic location on the Manitou Passage, providing the only harbor large enough for many ships transiting from Chicago to the Straits of Mackinac. The district consists of a lighthouse complex constructed 1858-1875, a life-saving station constructed 1901 to 1902, and two wood-frame houses constructed in 1902 and 1930. The period of significance is ca. 1858 to 1958. The historic district was entered on the state register on September 21, 1976, and the national register on October 28, 1983. Since the nomination was entered, several additional landscape features have been identified as significant components of the district, and have been determined eligible for the national register. A modified nomination to include these structures has yet to be prepared.

The George Johann and Margaretha Hutzler pig barn, built between 1856 and 1880 on South Manitou Island, was entered on the National Register of Historic Places January 3, 1978, with a designation of local significance. The structure is significant for its association with early settlement and agriculture on the island.

The George Conrad and Mary Ann Hutzler farm was listed on the national register May 3, 1992, with a designation of state significance for its association with scientific agriculture, particularly the development of Rosen rye and Michelite beans for Michigan Agricultural College in the 1920s. The period of significance is 1860 to 1930.

**TABLE 6: EXISTING LISTED PROPERTIES**

Property Name	Property Type	Structures Within	Significance Level	Period of Significance
Glen Haven Village Historic District	historic district	14 buildings, 2 structures, 1 site	state *	1857–1931
Sleeping Bear Inn	structure	1 building	state *	1857–1928
Sleeping Bear Point Life-Saving Station	buildings	4 buildings, 1 structure, 1 object	state *	1901–1958
Port Oneida	rural historic district	121 buildings, 20 structures, 5 sites	state *	1870–1945
North Manitou Island Life-Saving Station	national historic landmark	8 buildings, 4 structures, 1 object	national	1854–1932
South Manitou Island Lighthouse Complex and Life-Saving Station Historical District	historic district	13 buildings, 5 structures	state*	1858–1958
George Conrad and Mary Ann Hutzler Farm	district (160 acre tract)	9 buildings	state*	1860–1930
George Johann and Margaretha Hutzler Pig Barn	structure	1 building	local	

\* Property was later determined by the National Lakeshore and concurred by the state historic preservation officer as meeting a national level of significance as part of a larger historic district. A description and recommended significance level has not yet been submitted to the keeper of the national register for nomination of these districts (see below).

### **Properties Determined Eligible for Inclusion on the National Register and Possible New National Register Districts**

As cultural resources within the National Lakeshore continue to be studied, new themes have been proposed for national register listing that look at the resources differently. Although all historic properties have already been identified through initial survey and preliminary consultations, the proposed themes may result in some resources being included in more than one national register district.

**Manitou Passage Maritime Landscape National Historic District.** This district would be comprised of a concentration of maritime historic sites, geographic features, and native habitats with few modern intrusions. This district would exemplify the historic landscape features related to the Great Lakes transportation system more completely than any site on the Great Lakes. The Glen Haven Village Historic District, portions of the villages on North Manitou and South Manitou islands, and the three life-saving stations would be among the prominent contributing elements to this district. In 1999, the Michigan state historic preservation

officer concurred that such a district would be eligible for the register at the national level of significance. The Manitou Passage Maritime Landscape National Historic District has not yet been formally described or proposed to the keeper of the national register.

**South Manitou Island Rural Historic District.** This district would be significant for its association with the island's agriculture and pattern of settlement, and would span a period of about 1838-1940. The district would include contributing elements such as the August Beck, George Johann Hutzler, and George Conrad Hutzler farms; the South Manitou Island schoolhouse; and other properties. In 1999 the Michigan state historic preservation officer concurred that such a district would be eligible for the register at the state level of significance. The district has been described, but a nomination has not yet been prepared or submitted to the keeper of the national register for listing.

Several additional structures and building complexes within the National Lakeshore have been determined by the National Park Service, and the state historic preservation officer has concurred, as eligible for inclusion on the National Register of Historic Places as individual listings: at a state level of significance, the North Manitou Sawmill Complex; and at a local level of significance, the Bufka Farmstead (see also Bufka/Kropp/Eitzen Rural Historic Landscape below), the Shalda log cabin, the Esch house, the Swenson/Westside barn on North Manitou Island, and the Henry Haas and Theodore Beck houses on South Manitou Island. None have yet been documented on a nomination form for submittal to the keeper of the national register for listing.

Several other landscapes also have been determined eligible for inclusion on the national register by the National Park Service and the state historic preservation office, but have not yet been documented on a nomination form for submittal to the keeper of the

national register for listing. These include the following: at a state level of significance, the Boekeloo Wilderness Landscape, the D.H. Day Campground and Log Cabin Landscape; and at a local level of significance, the Tweddle/Treat Rural Historic Landscape (four farmsteads and a rural schoolhouse), the Ken-Tuck-U-Inn Historic Landscape, the Manitou Island Association Historic Landscape, and the Bufka/Kropp/Eitzen Rural Historic Landscape. See also table 3 on page 74.

## NATURAL RESOURCES

### Soils and Geologic Resources

Landforms of the National Lakeshore were shaped by the continental glaciation of the Wisconsin stage as well as earlier glacial periods of the Pleistocene Era. Additionally, fluctuating water levels of the ancient lakes that preceded Lake Michigan, along with wave and wind action, created the National Lakeshore's truncated headlands and fashioned the Lake-shore's perched dunes and embayment lakes.

The glacial ice of some 50,000 years ago followed ancient drainage patterns and excavated the basins that now form the lakes along the coastal area of this region. During the final advances of the Wisconsin stage of Pleistocene glaciation, the ice deposited large terminal and lateral moraines that form contemporary dunes and high points of the local geography. Ice Age glaciers, combined with enormous quantities of melt water and huge stranded blocks of ice, created entire valleys and left kettles or ice block lakes and depressions. (NPS 2005a.)

As the glaciers retreated, massive volumes of water either filled the Lake Michigan basin or were drained from it — depending upon the extent of glaciation and the development of drainage channels that allowed the waters of ancient Lake Michigan (Lake Algonquin, Lake Nipissing, Lake Algoma, and Lake Chippewa)

to deepen or drain away. New beaches were cut into the shorelines when the lake levels were high. As levels of Lake Michigan waters lowered, a succession of beaches was formed. These remnant beaches, examples of which can be seen at the Platte Basin, the Good Harbor Bay region, and the bay portion of South Manitou Island, reflect the shape of the ancient shorelines some distance from today's shoreline. The beaches that are the farthest from the current lake shoreline are the oldest. (NPS 2005a.)

Later, headlands such as the Empire Bluffs, Sleeping Bear Bluffs, Pyramid Point, and the western bluffs of North Manitou and South Manitou islands directed ice into the lowlands, sculpting many new lakes. These headlands are now truncated and continually eroding. In 1995 more than 35 million cubic feet (about a million cubic meters) of sand from the beach and bluff at Sleeping Bear Point disappeared into Lake Michigan in a huge landslide (USGS 1998).

These headlands also provided the materials that wind and wave action transformed into the sandbars that cut off the embayment lakes (such as Platte Lakes, North and South Bar Lakes, Glen Lake, Shell Lake, and Little Traverse Lake) from the parent ancient lakes. The exposed sand and gravel in these truncated morainal headlands were separated by the winds. The sand was blown to the top of high glacial moraines and created even higher dunes on top of the glacial moraines. These are referred to as "perched dunes" because they developed on top of the glacial moraines. Sleeping Bear Dunes, Empire Bluffs, Pyramid Point, and the island dunes are examples of these perched dunes. Lower dunes between the headlands and moraines are found in the Platte Plains and Good Harbor areas (NPS 2005a). These perched and lower dunes, both the currently exposed dunes close to the shoreline and the ancient dune and swale complexes landward of the current shoreline,

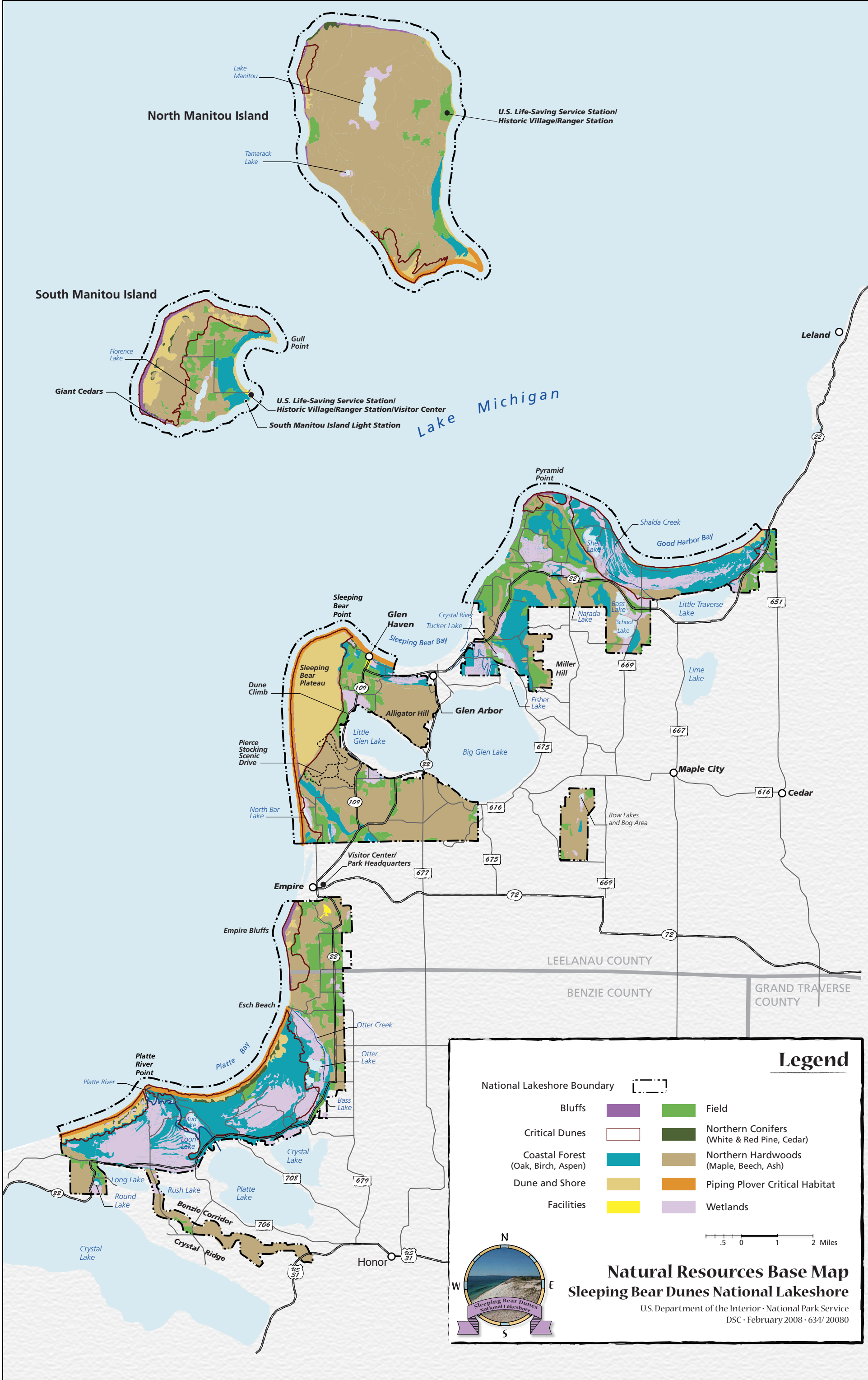
comprise designated critical dune habitat (see Natural Resources Base map).

The National Lakeshore's soils are predominantly sandy or sand mixed with gravel and are well drained. These soils are often found on steep slopes. In most areas soils are covered with thin topsoil that was depleted in many instances by unsustainable farming practices after the land was logged in the early 1900s. Duff layers covering the soils are extremely variable, ranging from no duff layer to a foot or more. (NPS 2005a.)

## Vegetation

Pleistocene-era glaciers, glacial melt water, and subsequent wind and water erosion all shaped the landforms — including beaches, moraines, dunes, kettles, and embayment lakes — upon or around which plant communities are established (NPS 2005a). (See Natural Resources Base map.)

Lake Michigan moderates temperature fluctuations, influencing the climate, and therefore the vegetation, of the National Lakeshore. Winters are milder and summers are cooler along the shore of Lake Michigan than in more inland areas. The moderating effect of Lake Michigan, combined with regional air circulation patterns, provide a growing period of approximately 150 days near the shore — 50 days longer than areas several miles inland. Another lake effect on the National Lakeshore's climate is increased cloudiness in late fall and early winter. The cold, winter air mixing with warmer, moist air from the lake frequently produces greater amounts of snow, rain, and fog near the lake. This relatively temperate and humid climate of the near-shore environment strongly influences the plant communities within the Lakeshore. (NPS 2005a.)





Former land uses and resource exploitation or extraction have also impacted the Lakeshore's landforms and vegetative cover. The Lakeshore's protected landscapes and vegetation communities provide sanctuary to several threatened and endangered species as well as representative regional species of flora and fauna. At least 900 species of vascular plants, representing more than 100 taxonomic families, occur at the National Lakeshore (NPS 2005a). Major plant communities occurring in the Lakeshore are described below within broader vegetation categories, which are generally presented from the shoreline landward.

**Shoreline Vegetation.** Beaches and sand dunes present harsh growing conditions characterized by strong winds, shifting sand, seasonally high surface temperatures, and dry conditions. Approximately 4,800 acres (1,920 hectares) of beaches and sand dunes occur in the Lakeshore (NPS 2005a). Vegetation starts just behind the "storm beach" of Lake Michigan. No vascular plants grow on the "storm beach" proper because of high waves, ice, and moving sand. The first dunes behind this beach support some pioneer plants, including beach or Marram grass (*Ammophila breviligulata*), Pitcher's thistle (*Cirsium pitcheri*), sand cherry (*Prunus pumila*), and beach pea (*Lathyrus japonicus*). Further landward in more stabilized areas of the dunes, grass, forb, and shrub species such as little bluestem (*Schizachyrium scoparium*), hoary puccoon (*Lithospermum canescens*), and creeping juniper (*Juniperus horizontalis*) become established (NPS 2005a, MNFI 2006a).

**Forest Resources.** Landward of the grass- and shrub-dominated dunes area is typically a dynamic zone where the dunes and neighboring woodland or forest move back and forth as conditions change. In some sites containing actively moving dunes, the dunes zone encroaches directly onto the mature hardwood forest. More often, however, the dunes zone integrates with an open pine forest including red pine (*Pinus resinosa*), white pine (*Pinus*

*strobus*), jack pine (*Pinus banksiana*), creeping juniper, and common juniper (*Juniperus communis*). Alternatively, the dunes zone may grade into an oak-aspen woodland that is comprised of bigtooth aspen (*Populus grandidentata*), quaking aspen (*Populus tremuloides*), red oak (*Quercus rubra*), white oak (*Quercus alba*), birch species such as yellow birch (*Betula alleghaniensis*) or paper birch (*B. papyrifera*), and ground vegetation composed of bracken fern (*Pteridium aquilinum*), prince's pine (*Chimaphila* sp.), trailing arbutus (*Epigaea repens*), wintergreen (*Pyrola* sp.), blueberry (*Vaccinium* sp.), and partridgeberry (*Mitchella repens*). When lake levels go down and beach and dune area is increased on the lakeward side of the zone, wind speed and sand abrasion at the forest or woodland edge decreases, permitting forest development. Oak-aspen woods cover about 3,300 acres (1,320 hectares) of the National Lakeshore, and "coastal forest," of which oak-pine and birch-maple-aspen are two subtypes, covers an additional 11,000 acres (4,400 hectares). (NPS 2005a, MNFI 2006a.)

Further inland, beyond the dynamic zone, is found more mature forest. The climax forest of this region is primarily a beech-maple hardwood forest, known as the northern hardwood forest community. The trees are predominantly American beech (*Fagus grandifolia*) and sugar maple (*Acer saccharum*), but also include black cherry (*Prunus serotina*), white ash (*Fraxinus americana*), red oak, yellow birch, and green ash (*Fraxinus pennsylvanica*). Dwarf or bunchberry dogwood (*Cornus canadensis*), Canada mayflower (*Maianthemum canadense*), sweet cicely (*Osmorhiza claytonii*), columbine (*Aquilegia canadensis*), trillium (*Trillium* sp.), and wild leeks (*Allium burdickii*) are represented in the understory and on the forest floor. Approximately 24,000 acres (9,600 hectares), or 42% of the National Lakeshore's land surface area, are covered with northern hardwood forest.

Approximately 578 acres (234 hectares) of the Lakeshore are in plantations of conifers, including the native Jack, white, and red pine and black spruce (*Picea mariana*), and nonnatives such as Douglas fir (*Pseudotsuga menziesii*), Scotch pine (*Pinus sylvestris*), Austrian pine (*Pinus nigra*), blue spruce (*Picea pungens*), and Norway spruce (*Picea abies*) (NPS 2005a, MNFI 2006a, USDA 2007).

Most of the forests in the National Lakeshore are considered second growth, having first been logged in the late 19th century. The total removal of forested areas is still evident in the open fields that remain from past agricultural ventures or pine plantations as noted above. Several forested tracts were managed by individual landowners as woodlots until the property was acquired by the National Lakeshore.

The southwestern corner of South Manitou Island supports a small area (less than 10 acres or 4 hectares) known by some as the “Valley of the Giants” or “Giant Cedars” because of a grove of giant northern white cedars (*Thuja occidentalis*) (Thompson 1962). This virgin stand of giant cedars escaped logging and now has the largest northern white cedar in the United States, at 110 feet (33 meters) tall with a girth of 206 inches (523 cm). Many of these cedars are more than 500 years old. This Giant Cedars area of South Manitou Island is also important in that four plant species, two of which are listed as threatened by the Michigan Natural Features Inventory, have been documented in the general vicinity. Other species in this area are mountain maple (*Acer spicatum*), striped maple (*Acer pennsylvanicum*), red trillium (*Trillium erectum*), and nodding trillium (*Trillium flexipes*), which is also known as Gleason’s trillium (NatureServe 2007). The vegetation community described for the Giant Cedars area is classified as boreal forest by the Michigan Natural Features Inventory (MNFI 2006a).

**Agricultural Landscapes.** The Lakeshore includes open areas consisting of former farm

fields and road edges. Native plants occasionally found in these areas include black-eyed Susan (*Rudbeckia hirta*); goldenrod (*Solidago* sp.); pussytoes (*Antennaria* sp.); pearly everlasting (*Anaphalis margaritacea*); yarrow (*Achillea millefolium*); common milkweed (*Asclepias syriaca*); staghorn sumac (*Rhus typhina*); and several grasses. Fields cover almost 7,900 acres (3,160 hectares) of the National Lakeshore, or about 14% of its land surface area. (NPS 2005a.) Some of these agricultural landscapes are maintained as cultural landscapes and provide important habitat for grassland wildlife species, particularly birds (see next section on wildlife).

**Invasive Species.** The National Lakeshore has embarked on a cooperative program with the U.S. Geological Survey Biological Resource Division to survey and assess exotic species in the Lakeshore. At least 150 exotic or nonnative plants or noxious weeds have been identified at Sleeping Bear Dunes (NPS 2005a). Some of the more invasive exotic plants in the Lakeshore are garlic mustard (*Alliaria petiolata*), leafy spurge (*Euphorbia esula*), purple loosestrife (*Lythrum salicaria*), and baby’s breath (*Gypsophila paniculata*). The Lakeshore placed a high priority on controlling these four plants and five others — black locust, common reed, myrtle, Scotch pine, and the tree of heaven or ailanthus in 1999 (NPS 1999b). Subsequent surveys revealed spotted knapweed, baby’s breath, bull thistle, blue lyme grass, bladder campion, hoary alyssum, and Lombardy poplar were establishing extensive populations in the open dune habitat that supports a number of sensitive species including the endangered piping plover and the threatened Pitcher’s thistle among others. A survey was conducted in 2005 to determine the extent of infestation by baby’s breath, and in 2006 the NPS staff developed an invasive species control plan and environmental assessment (NPS 2006a). Zebra mussels (*Dreissena polymorpha*), quagga mussels (*D. bugensis*), round goby (*Neogobius melanostomus*), and Cladophora (a



native green algae) are troublesome aquatic invaders in the National Lakeshore.

## Wildlife

Michigan wildlife species are well represented at Sleeping Bear Dunes National Lakeshore, reflecting the variety of habitats found within the Lakeshore. Wildlife documented in the Lakeshore include 74 species of fish, 18 species of amphibians, 17 species of reptiles, 46 species of mammals, and 247 species of birds. The following discussion provides a brief description of common inhabitants in the various habitats found within the Lakeshore and is not intended as an exhaustive list of species present.

Beaver (*Castor canadensis*), otter (*Lontra canadensis*), mink (*Neovison vison*), and muskrat (*Ondatra zibethicus*) occur in the Lakeshore's wetlands/aquatic areas. Several species of ducks and geese nest at the National Lakeshore. Snapping turtles (*Chelydra serpentina*), painted turtles (*Chrysemys pictis*), leopard frogs (*Rana pipiens*), and spring peepers (*Pseudacris crucifer*) are some of the reptiles and amphibians found in and near aquatic and wetland habitats.

Common forest wildlife includes the white-tailed deer (*Odocoileus virginianus*), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), fox squirrel (*Sciurus niger*), flying squirrel (*Glaucomys sabrinus*), eastern chipmunk (*Tamias striatus*), and the deer mouse (*Peromyscus maniculatus*). Typical forest-dwelling birds include the ruffed grouse (*Bonasa umbellus*), pileated woodpecker (*Dryocopus pileatus*), downy and hairy woodpeckers (*Picoides pubescens* and *P. villosus*, respectively), red-breasted and white-breasted nuthatches (*Sitta canadensis* and *S. carolinensis*, respectively), black-capped chickadees (*Poecile atricapillus*), brown creepers (*Certhia americana*), barred owls (*Strix varia*), and great horned owls (*Bubo virginianus*). Wild turkeys (*Meleagris gallopavo*)

are also present, but this is probably due to the state feeding programs, because the National Lakeshore is north of their native range. Garter snakes (*Thamnophis* spp.) and salamanders (*Ambystoma* spp.) occur in the forest as well.

In the meadows, fields, and dunes of the National Lakeshore, representative birds include bobolinks, bluebirds (*Sialia sialis*), killdeer (*Charadrius vociferous*), meadowlarks (*Sturnella* spp.), horned larks (*Eremophila alpestris*), and northern harriers. Common mammals are deer, fox, and meadow voles (*Microtus pennsylvanicus*). The Lakeshore's open fields provide valuable habitat for grassland nesting birds in the summer and for other wildlife throughout the year. Throughout much of North America, populations of open land (grassland-shrubland-early successional forests) birds have been declining dramatically, primarily in response to the loss of available habitat. Corace et al. (2003) found the bird community associated with the Lakeshore's cultural open areas to include six open land species that are of conservation concern as designated by the U.S. Fish and Wildlife Service Region Three (Midwest) (USFWS 2002a) and shown in table 7). This habitat is maintained with an open field management mowing plan. In the absence of cultivation and grazing, grassland bird species in national decline such as grasshopper sparrows, bobolinks, and upland sandpipers flourish in these fields.

The National Lakeshore's approximately 160 species of nesting birds is one of the larger numbers among national park system units. This is because of the wide variety of undisturbed habitat and the lack of agriculture, grazing, and major development. The Lakeshore is an important area for the protection of nesting sites for vulnerable bird species and for stopover sites and resting for migratory birds. Migrant shorebirds like the semipalmated plover (*Charadrius semipalmatus*), ruddy turnstone (*Arenaria interpres*), sanderling (*Calidris alba*), and others can be found on National Lakeshore beaches.

**TABLE 7: BIRD SPECIES ASSOCIATED WITH CULTURAL OPEN LANDS IN SLEEPING BEAR DUNES NATIONAL LAKESHORE THAT ARE DESIGNATED BY THE U.S. FISH AND WILDLIFE SERVICE AS SPECIES OF CONSERVATION CONCERN**

Common Name	Scientific Name
black-billed cuckoo	<i>Coccyzus erythrophthalmus</i>
bobolink	<i>Dolichonyx oryzivorus</i>
Connecticut warbler	<i>Oporomis agilis</i>
Henslow's sparrow	<i>Ammodramus henslowii</i>
Le Conte's sparrow	<i>Ammodramus leconteii</i>
upland sandpiper	<i>Bartramia longicauda</i>

Other bird species that use cultural open areas in the Lakeshore included the field sparrow (*Spizella pusilla*), grasshopper sparrow (*Ammodramus savannarum*), sedge wren (*Cistothorus platensis*), eastern meadowlark (*Sturnella magna*), western meadowlark (*Sturnella neglecta*), northern harrier (*Circus cyaneus*), and whip-poor-will (*Caprimulgus vociferous*) (Corace et al. 2003).

The Manitou Islands are an interesting case study in "island biogeography." As would be expected, they support fewer species of wildlife than nearby mainland areas. The seven miles (11 km) of Lake Michigan between the islands and the mainland is a substantial barrier to animal migration and has been a major factor in the ecology and species composition of the islands.

South Manitou Island has dense ground vegetation rich in woodland wildflowers and Canada yew (*Taxus canadensis*). The vegetation developed in the absence of deer browsing. In 1994 however, deer tracks were observed for the first time on South Manitou Island. Their presence threatened the natural vegetation composition of this island and they were removed in 2001. New deer tracks were reported on South Manitou Island in 2003. These migrants probably came from North Manitou Island. The deer mouse is the only mouse species, compared to seven species of mice and voles on the mainland. Eastern chipmunks and fox squirrels are found on South Manitou Island, but none of the other

tree squirrels or flying squirrels occurs on the island.

The masked shrew (*Sorex cinereus*) has been documented on South Manitou Island, but not the short-tailed shrew (*Blarina brevicauda*), which is found on the mainland. Reptile and amphibian species are also limited. Leopard frogs, spring peepers, American toads (*Bufo americanus*), painted turtles, and garter snakes may all be observed on South Manitou Island.

South Manitou Island's bird life is rather diverse, with many woodland residents and migrating birds. The ruffed grouse, however, is not found on this island. There was a large ring-billed gull (*Larus delawarensis*) colony on South Manitou as well as a herring gull (*Larus argentatus*) colony. The combined rookery failed in 1990 and 1991, probably due to predation by red fox. The ring-billed colony has since returned, and there were an estimated 13,000 nests in 1998. It is unusual for gulls to nest where there is a substantial threat of predation, and it is thought that the gull colonies developed during short periods when the numbers of fox were severely reduced or eliminated by island settlers. The fox population has declined in recent years, and the snowshoe hare (*Lepus americanus*) population has increased.

The wildlife found on North Manitou Island is similar to South Manitou Island except that white-tailed deer, raccoons, and wild turkey were all introduced in the 1920s while the island was a private hunting preserve. The deer

herd exceeded the natural carrying capacity of the island because of an artificial feeding program. As a result, North Manitou's vegetation displayed classic symptoms of over-browsing. Natural browse was almost entirely eliminated, and sharp browse lines are evident at the level deer can reach. For a number of years, deer starved on the island because the artificial feeding program favored bucks and large does, leaving many of the young deer to die. In contrast, South Manitou Island has luxuriant understory and ground cover vegetation.

In response to this deer overpopulation and subsequent habitat degradation, the National Lakeshore initiated an intense public hunting program on North Manitou Island in 1985 to reduce deer numbers and restore natural native vegetation. The annual public deer hunt continues under regulation by the state and the National Park Service.

In the Lakeshore as a whole, trapping is prohibited. As a result, sightings of fox, coyote (*Canis latrans*), otter, and bobcat (*Lynx rufus*) have increased. In recent years, cougar (*Puma concolor*) sightings have been reported with increasing regularity. The National Park Service conducted a study from November 2004 through April 2005 to investigate whether cougars are present in the National Lakeshore. Using multiple survey methods, no physical evidence of cougars was found in the National Lakeshore (NPS 2006b).

Sleeping Bear Dunes National Lakeshore's aquatic habitats contain a number of fish species, including rainbow trout (nonnative) (*Oncorhynchus mykiss*), brook trout (*Salvelinus fontinalis*), suckers (*Catostomus* spp.), several genera of shiners, and rock bass (*Ambloplites rupestris*), among others. Smelt (*Osmerus mordax*), sea lamprey (*Petromyzon marinus*), alewife (*Alosa pseudoharengus*), and zebra mussels (*Dreissena polymorpha*) are nonnative species that have a pronounced impact on the aquatic environment and native biota. The invasion of the sea lamprey, a nonnative species to the Great Lakes, has harmed the native lake

trout stock. The alewife invasion of the Great Lakes has also caused major biological and shoreline fouling problems. A recent invader to the Great Lakes, the round goby (*Neogobius melanostomus*) is believed to be a prime factor in the recent waterfowl die-offs attributed to type E botulism along Lake Michigan beaches within the National Lakeshore.

The introduction of the coho (*Oncorhynchus kisutch*) and other nonnative species of salmon to the area has resulted in a large seasonal supply of these fish in area streams, providing for a large sport fishery every late summer and fall. Fishing for coho salmon is concentrated near the mouth of the Platte River and Platte Bay, but sport-fishing activity occurs in other bays of Lake Michigan and also in the inland lakes. The Michigan Department of Natural Resources maintains the Platte River State Fish Hatchery, located approximately 10 miles southeast of the Lakeshore. This facility raises coho and chinook salmon and is the main egg take station for coho salmon in the Upper Great Lakes. Another component of the state salmon program is the harvest weir that the Michigan Department of Natural Resources operates on the lower Platte River, on state land within the park boundary. This weir blocks the returning salmon swimming up the Platte River from Lake Michigan. The fish are harvested at this point during their fall run.

### Federal Threatened and Endangered Species

The Endangered Species Act of 1973 prohibits the harming of any species listed by the U. S. Fish and Wildlife Service (USFWS) as being either threatened or endangered. Harming such species includes not only directly injuring or killing them, but also disrupting the habitat on which they depend. Section 7 of the act also requires federal agencies to consult with the U. S. Fish and Wildlife Service when any activity permitted, funded, or conducted by that agency may affect a listed species or designated critical habitat, or is

likely to jeopardize proposed species or adversely modify proposed critical habitat.

Table 8 displays federal and state-listed species (threatened, endangered, and species of concern) whose occurrence has been documented in the Lakeshore and in one or both of Benzie and Leelanau counties, the two counties in which Sleeping Bear Dunes National Lakeshore occurs (MNFI 2006b).

**Piping Plover.** The Great Lakes population of the piping plover (*Charadrius melodus*) is a federally endangered species and is listed as endangered by the state of Michigan as well. The piping plover is a small shorebird (length about 7 inches) with a black collar, orange legs, and a short, stubby tail (USGS 2000).

Piping plovers breed in three locations in North America — along the Atlantic Coast from North Carolina to Southern Canada, along the shores of the Great Lakes, and along rivers and wetlands of the northern Great Plains. In Michigan, piping plovers prefer wide, sandy, open beaches along the shores of the Great Lakes. Nesting territories generally have sparse vegetation and scattered cobblestones and may include river, lagoon, or other wetland habitat to provide additional food for chicks (Hyde 1999a). In the winter, piping plovers migrate to the Gulf Coast between Florida and Texas and on into Mexico and the Caribbean, as well as migrating to the Atlantic Coast between southern North Carolina and Florida. Initial declines of the species in the late 1800s and early 1900s were caused by hunting. Declines in the 1950s were attributed to habitat loss, recreational pressure, predation, and contaminants. In the 1970s and mid 1980s high water levels in the Great Lakes reduced available breeding habitat in that region (Hyde 1999a). Habitat destruction and alteration and human development along the shores of the Great Lakes continue to impact the piping plover and have lead to their extirpation over much of their former Great Lakes nesting range.

Protecting current, past, and potential piping plover nesting habitat from development is essential for expanding the Great Lakes population. Protection from predators at nesting sites and the reduction of human-related disturbance to nesting piping plovers is needed to expand the breeding population in the Great Lakes region.

The U.S. Fish and Wildlife Service has designated critical habitat for the piping plover along certain shorelines within the National Lakeshore (see Natural Resources Base map), including 2.1 miles (3.3 km) along North Manitou Island and 14.2 miles (22.5 km) along the mainland lakeshore (USFWS 2001). These are areas that must be protected because they are considered essential to the conservation of the Great Lakes breeding population of the species. Because actions proposed in the alternatives have the potential to impact the habitat supporting this species, this species is carried forward as an impact topic under “Federal Threatened and Endangered Species” in chapter 5.

**Indiana Bat.** The Indiana bat (*Myotis sodalis*) is on the federal list as endangered and is listed as endangered by the state of Michigan. Habitat requirements for this species can be divided into summer habitat characteristics and winter hibernating habitat characteristics. In the summer, female Indiana bats roost singly or in maternity colonies where they raise their single offspring (Humphrey et al. 1977). Maternity colonies use several roost trees each season in closed canopy floodplain, riparian and upland forests. Males roost individually or in small groups as well, generally near female colonies (NJDFW 2007). Preferred roost sites are in cavities or under the exfoliating bark of dead tree snags or in trees exposed to warm sunlight (MNFI 2007). In Michigan, a reproductively active colony roosted under the bark of eight different trees, all of which were sunlit green ash (*Fraxinus pennsylvanica*) trees (Kurta et al. 1993). At night Indiana bats emerge to forage

Table 8: Special Status Plant and Animal Species

TABLE 8: SPECIAL STATUS PLANT AND ANIMAL SPECIES

	SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	MICHIGAN STATUS	HABITAT COMMENTS AND OTHER NOTES	REASONS FOR DISMISSING FROM DETAILED ANALYSIS, IF DISMISSED
<b>INSECTS</b>						
<b>Analyzed</b>	<i>Stenelmis douglasensis</i>	Douglas Stenelmis riffle beetle	—	Species of Concern	Found in the shallow, unpolluted bodies of water including lakes, spring-fed bodies of water, large to small streams and tributaries with soft or sandy substrates. Adults often found on pieces of wood. Documented in Lakeshore and Benzie County.	—
<b>Analyzed</b>	<i>Trimerotropis huroniana</i>	Lake Huron Locust	—	Threatened	Found in undisturbed, high-quality sand dunes with sparse vegetation on the shores of the Great Lakes. Often found with Pitcher's thistle ( <i>Cirsium pitcher</i> ). Documented in Lakeshore and Benzie and Leelanau counties.	—
<b>AMPHIBIANS</b>						
<b>Analyzed</b>	<i>Acris crepitans blanchardi</i>	Blanchard's cricket frog	—	Species of Concern	Inhabits areas of permanent water in marshes, marsh ponds, lakes, bogs, and slow-moving streams in open wetland areas. Prefers areas of low emergent vegetation to submergent vegetation. May range into surrounding non-wetland habitats. Documented in Lakeshore and Leelanau County.	—
<b>REPTILES</b>						
<b>Analyzed</b>	<i>Glyptemys insculpta</i>	Wood turtle	—	Species of Concern	Generally found within 500 feet (152 m) of water. Prefers clear, moving, hard-bottom streams, rivers, or creeks with sand or gravel substrates. Also found in a variety of shallow wetland habitats, including woodland bogs and marshy pastures. Will use a range of terrestrial habitats including wet mesic forest, riparian shrub forests, deciduous forests, and cultivated fields. Needs sunny sand banks or gravel bars in streams or similar human-disturbed sites for nesting. Documented in Lakeshore and Benzie County.	—

	SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	MICHIGAN STATUS	HABITAT COMMENTS AND OTHER NOTES	REASONS FOR DISMISSING FROM DETAILED ANALYSIS, IF DISMISSED
<b>Analyzed</b>	<i>Terrapene carolina carolina</i>	Eastern box turtle	—	Species of Concern	Prefers forested areas with sandy soil near a source of water (pond, stream, lake, marsh, or swamp). Also found in forest-brush, fields, and marshy meadows. Requires unshaded sandy sites for nesting. Documented in Benzie and Leelanau counties.	—
<b>BIRDS</b>						
<b>Dismissed</b>	<i>Accipiter gentilis</i>	Northern goshawk	—	Species of Concern	Inhabits forested habitats including deciduous, coniferous, and riparian forests and conifer plantations. Prefers forest stands with intermediate canopy cover, small forest clearings, and an open understory. Documented in Lakeshore and Benzie County.	The only documented occurrence of northern goshawk in the Lakeshore is in the area south of the Platte River and on South Manitou Island. Minor differences between the alternatives relative to management of or potential activities in this area are not anticipated to differentially affect the suitability of this area for northern goshawks.
<b>Dismissed</b>	<i>Ammodramus savannarum</i>	Grasshopper sparrow	—	Species of Concern	Prefers grasslands, including cultivated fields, fallow fields, and hayfields where tall grassy vegetation occurs. Documented in Lakeshore and Benzie and Leelanau counties.	Known from the southern portion of the mainland. Alternatives do not differ relative to the management of the cultural landscapes in this area. Management zones common to all alternatives would conserve the habitat supporting this species.
<b>Analyzed</b>	<i>Buteo lineatus</i>	Red-shouldered hawk	—	Threatened	Nests are typically in mature deciduous trees in relatively mature deciduous or mixed forest complexes. Wetland areas and upland open areas are used for hunting. This species is observed throughout the park.	—

Table 8: Special Status Plant and Animal Species

	SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	MICHIGAN STATUS	HABITAT COMMENTS AND OTHER NOTES	REASONS FOR DISMISSING FROM DETAILED ANALYSIS, IF DISMISSED
<b>Analyzed</b>	<i>Charadrius melodus</i>	Piping plover	Endangered	Endangered	Found on wide sandy lakeshore beaches with scattered cobbles and sparse vegetation. Also found on Lake Michigan islands in areas with same characteristics. Nesting area may include interdunal wetland or small stream. Documented in Lakeshore and Benzie and Leelanau counties.	—
<b>Analyzed</b>	<i>Cygnus buccinator</i>	Trumpeter swan	—	Threatened	Use marshes and wetlands associated with ponds and lakes. Nests are frequently placed on muskrat houses. Reintroduced in the southern area of the park in 2006 and 2007.	—
<b>Analyzed</b>	<i>Dendroica discolor</i>	Prairie warbler	—	Endangered	Found in early successional habitats, including young pine plantations, clear-cuts in oak forest, upland scrub, fallow fields, young jack pine stands, Christmas tree farms, powerline rights-of-way, and areas of brush or thickets. Documented in Lakeshore and Benzie and Leelanau counties.	—
<b>Analyzed</b>	<i>Falco columbarius</i>	Merlin	—	Threatened	Typically nest in boreal forest in lakeshore and island contexts, open areas of which provide hunting opportunity. Reported by Lakeshore staff to nest on both islands and the mainland portions of the Lakeshore.	—
<b>Analyzed</b>	<i>Gavia immer</i>	Common loon	—	Threatened	Found on inland lakes and rivers. Nest where fish populations are good. Prefer lakes with islands, bog mats, or undeveloped shoreline on which to build nests. Quiet sheltered coves and limited boating activity are also important. Documented in Lakeshore and Benzie and Leelanau counties.	—
<b>Analyzed</b>	<i>Haliaeetus leucocephalus</i>	Bald eagle	—	Threatened	Found near coastal areas, rivers, lakes, or other bodies of water with a supply of fish, waterfowl, or seabirds. Generally nest within about 13,000 feet (4 km) of water in dead snags or live trees. Documented in Lakeshore and Benzie and Leelanau counties.	—

	SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	MICHIGAN STATUS	HABITAT COMMENTS AND OTHER NOTES	REASONS FOR DISMISSING FROM DETAILED ANALYSIS, IF DISMISSED
<b>Dismissed</b>	<i>Ixobrychus exilis</i>	Least bittern	—	Threatened	Uses a variety of freshwater and brackish marshes with dense tall growths of aquatic or semiaquatic vegetation interspersed with clumps of woody vegetation and open water. Reported by park staff as nesting at the Mill pond.	Actions proposed in alternatives would not be expected to impact suitable habitat.
<b>Analyzed</b>	<i>Sterna caspia</i>	Caspian tern	—	Threatened	Although nesting habitat is sandy or pebble beaches, no nests are known for the Lakeshore. This species is reported by Lakeshore staff to use the area around the mouth of the Platte River for courtship.	—
<b>MAMMALS</b>						
<b>Dismissed</b>	<i>Myotis sodalis</i>	Indiana bat	Endangered	Endangered	Summer roosts and forages are in riparian, bottomland, and upland forests with trees that have loose or exfoliating bark. Not documented in either Benzie or Leelanau counties.	Not documented in either Benzie or Leelanau counties. Actions proposed in alternatives would not be expected to impact suitable habitat.
<b>PLANTS</b>						
<b>Analyzed</b>	<i>Asplenium rhizophyllum</i>	Walking fern	—	Threatened	Found on shaded, moss-covered boulders and ledges, usually on limestone or other basic rocks, but occasionally on sandstone or other acidic rocks, rarely found on fallen tree trunks. Documented in Lakeshore and Leelanau County.	—
<b>Analyzed</b>	<i>Asplenium trichomanes-ramosum</i>	Green spleenwort	—	Threatened	Found on limestone and other basic rocks. Documented in Lakeshore and Leelanau County.	—
<b>Analyzed</b>	<i>Berula erecta</i>	Cut-leaved water-parsnip	—	Threatened	Found in wet areas; springs, streams, shallows; or often found in water in valleys and plains. Documented in Lakeshore and Benzie and Leelanau counties.	—
<b>Analyzed</b>	<i>Botrychium campestre</i>	Prairie moonwort	—	Threatened	Found in prairies, dunes, grassy railroad sidings, and fields over limestone. Extremely inconspicuous. Documented in Lakeshore and Benzie and Leelanau counties.	—



Table 8: Special Status Plant and Animal Species

	SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	MICHIGAN STATUS	HABITAT COMMENTS AND OTHER NOTES	REASONS FOR DISMISSING FROM DETAILED ANALYSIS, IF DISMISSED
<b>Analyzed</b>	<i>Bromus pumpellianus</i>	Pumpelly's brome grass	—	Threatened	Found on sandy and gravelly stream banks and lake shores, sand dunes, meadows, dry grassy slopes, and road shoulders. Documented in Lakeshore and Leelanau County.	—
<b>Dismissed</b>	<i>Calypso bulbosa</i>	Calypso or fairy-slipper	—	Threatened	Found in mesic to wet coniferous forests, mixed forests, and bogs. Documented in Lakeshore and Benzie and Leelanau counties.	No actions proposed in the alternatives would be anticipated to affect this species.
<b>Dismissed</b>	<i>Carex concinna</i>	Beauty sedge	—	Species of Concern	Found in moist to dry meadows; riverbanks; thickets; floodplains; and open spruce, pine, cedar, birch, aspen, and willow woodlands, usually on calcareous substrates. Documented in Lakeshore and Leelanau County.	No actions proposed in the alternatives would be anticipated to affect this species.
<b>Dismissed</b>	<i>Carex platyphylla</i>	Broad-leaved sedge	—	Threatened	Found in rich, moist deciduous forests, on rocky or gravelly slopes; soils above limestone, shale, or calcareous metamorphic rocks; and often on clay soils. Documented in Lakeshore and Leelanau County.	No actions proposed in the alternatives would be anticipated to affect this species.
<b>Analyzed</b>	<i>Cirsium pitcheri</i>	Pitcher's thistle	Threatened	Threatened	Found only on the open sand dunes along the shores of the western Great Lakes. Documented in Lakeshore and Benzie and Leelanau counties.	—
<b>Analyzed</b>	<i>Cypripedium arietinum</i>	Ram's head lady's-slipper	—	Species of Concern	Found in dry to moist open coniferous and mixed forests, coniferous forested fens, beach thickets. Documented in park and Benzie and Leelanau counties.	—
<b>Analyzed</b>	<i>Mimulus glabratus</i> var. <i>michiganensis</i>	Michigan monkey-flower	Endangered	Endangered	Occurs in sunny areas, roots in silty, sandy, alkaline mud, and grows out of a stream of cool, running water. Documented in Lakeshore and Benzie and Leelanau counties.	—
<b>Analyzed</b>	<i>Orobanche fasciculata</i>	Fascicled broom-rape	—	Threatened	Found in drier areas — foothills to rocky ridges, prairies, inland sands; in sandy soil; and as parasites on a variety of plants. Documented in Lakeshore and Benzie and Leelanau counties.	—

# CHAPTER 4: AFFECTED ENVIRONMENT

	SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	MICHIGAN STATUS	HABITAT COMMENTS AND OTHER NOTES	REASONS FOR DISMISSING FROM DETAILED ANALYSIS, IF DISMISSED
<b>Analyzed</b>	<i>Panax quinquefolius</i>	Ginseng	—	Threatened	Found in cool moist woods; shade; in rich soil. Documented in Lakeshore and Benzie and Leelanau counties.	—
<b>Analyzed</b>	<i>Pterospora andromedea</i>	Pine-drops	—	Threatened	Found in deep humus of coniferous forests. Documented in Lakeshore and Leelanau County.	—
<b>Analyzed</b>	<i>Triphora trianthophora</i>	Three-birds orchid	—	Threatened	Found in rich, mesic woods, swamp edges, and floodplains. Documented in Lakeshore and Leelanau County.	—

Analyzed = impact topics considered and analyzed in detail in this environmental impact statement

Dismissed = impact topics considered but not analyzed in detail in this environmental impact statement

Four federally listed or candidate species were historically found in the National Lakeshore but are no longer present — the endangered gray wolf (*Canis lupus*), the endangered eastern puma (*Puma concolor cougar*), the threatened Canada lynx (*Lynx canadensis*), and the candidate eastern massasauga (*Sistrurus catenatus catenatus*).

on flying insects. Reproductively active females prefer to forage in closed-canopy floodplain forest and around farm ponds. In the late summer, northern populations move as much as 480 km to winter hibernating caves in Alabama, Tennessee, Kentucky, Indiana, Missouri, and West Virginia (NatureServe 2007). A new hibernating population has been identified at a hydroelectric facility in northern Michigan (MNFI 2007). Typical hibernation sites are limestone caves with a mean midwinter temperature of 4-8°C and an average humidity of 87% throughout the year (NJDFW 2007). Females leave the hibernacula first, in late March to April. Males leave later, with some males spending the summers in the area of the hibernacula (USFWS 1991). Declines in the population of Indiana bats can be attributed to human disturbance at hibernacula, including caving, vandalism, and research (USFWS 1991, MNFI 2007). Alterations to the cave environment can also cause the abandonment of hibernacula and can result from the opening of additional entrances, blocking entrances, or improperly designed or installed gates (intended to protect hibernating bats) that alter airflow or exclude Indiana bats (USFWS 1991). The losses of forested riparian habitat and suitable roosting snags, along with stream alteration and agricultural development, have also affected Indiana bats in their summer foraging range (MNFI 2007).

The breeding range of the Indiana bat occurs within the southern half and western coastal counties of the Lower Peninsula of Michigan, including Benzie and Leelanau counties (USFWS 2006). However, even with suitable habitat in the Lakeshore (highly variable forested landscapes in riparian, bottomland, and upland areas that have roosting trees with crevices or exfoliating bark), this species has not been confirmed within the Lakeshore. The Indiana bat is dismissed from detailed discussion as an impact topic because any potential impacts on suitable habitat would be negligible to minor and because the Indiana bat has not been confirmed in the Lakeshore.

**Michigan Monkey Flower.** The Michigan monkey-flower (*Mimulus glabratus* var. *michiganensis*) is listed as endangered under the Endangered Species Act, and by the state. This aquatic to semi-aquatic plant is known from only 15 extant occurrences in northern Michigan, 12 of which are currently considered viable (USFWS 1997). This plant is restricted entirely to Michigan, where it occurs in the Grand Traverse and Straits of Mackinac regions (Voss 1996). It is concentrated in Charlevoix, Cheboygan, Emmet, and Mackinac counties, with outliers in Benzie and Leelanau counties. There is a single large, exemplary occurrence in the National Lakeshore. The plant blooms from about mid-June to mid-July and occasionally to mid-August. However, pollen viability is low, suggesting that var. *michiganensis* is primarily dependent on vegetative (asexual) reproduction (USFWS 1990). Crispin and Penskar (1989) report that var. *michiganensis* is narrowly restricted to cold, saturated soils of seepages on forest edges and in small openings along streams and lakeshores. It is usually associated with Northern white-cedar (*Thuja occidentalis*) swamps. Other typical associates include touch-me-not (*Impatiens biflora*), forget-me-not (*Myosotis scorpioides*), water-cress (*Nasturtium officinale*), spearmint (*Mentha arvensis*), and liverwort (*Conocephalum conicum*) (USFWS 1990).

The primary threat to this species is the destruction and adverse modification of its habitat. Its historic range in the Mackinac Straits and Grand Traverse regions in Michigan are being rapidly developed for recreational and residential purposes. The monkey flower appears to be highly dependent on continuous supplies of cold spring water. It is also particularly vulnerable because of the low numbers of individuals occurring at most sites and because of its tendency for asexual reproduction (USFWS 1990). Critical habitat has not been designated for this species. Because actions proposed in the alternatives have the potential to impact the habitat supporting this species, this species

is carried forward as an impact topic under “Federal Threatened and Endangered Species” in chapter 5.

**Pitcher’s Thistle.** Pitcher’s thistle (*Cirsium pitcheri*) is listed as threatened under the Endangered Species Act and by the state. It is endemic to beach and dune habitats around Lakes Huron, Michigan, and Superior and requires active sand dune processes to maintain its early successional habitat (USFWS 2002b). The range of this Great Lakes thistle falls primarily within Michigan’s borders, occurring along the entire shoreline of Lake Michigan. Pitcher’s thistle populations are concentrated in the major dune landscapes of the northern Lake Michigan basin, especially in the Lower Peninsula counties of Emmet, Charlevoix, Leelanau, Benzie, Manistee, and Oceana (Higman and Penskar 1999a).

Although the plant is still widespread in Michigan, it depends on dynamic dune processes that have largely disappeared (USFWS 1988). One of the world’s largest populations of *Cirsium pitcheri* is within Sleeping Bear Dunes National Lakeshore (Higman and Penskar 1999a). Associated plants include beach grass, little bluestem, wild rye (*Elymus canadensis*), common milkweed, dune willows (*Salix cordata* and *S. myricoides*), and many other common dune species (Higman and Penskar 1999a). Development, loss, and disturbance of dunes by people are the principal threats to the species (USFWS 1988). Critical habitat has not been designated for this species. Because actions proposed in the alternatives have the potential to impact the habitat supporting this species, this species is carried forward as an impact topic under “Federal Threatened and Endangered Species” in chapter 5.

**Bald Eagle.** The Bald Eagle (*Haliaeetus leucocephalus*) was recently delisted as a federal species, but it is discussed below under Michigan state-listed species.

### Michigan State-Listed Species

Plant and animal species listed as threatened, endangered, or species of special concern by the state are not afforded the same formal protection provided by the federal Endangered Species Act, but they are monitored and may one day become candidates for the federal list if their numbers continue to trend downwards. As such, those state-listed species that have been documented in the National Lakeshore (table 8) have been considered for dismissal or detailed discussion in this document. Species that are analyzed in detail are discussed below, and species dismissed from detailed analysis are discussed in the “Impact Topics Considered but Not Analyzed in Detail” section of this chapter.

**Douglas Stenelmis Riffle Beetle.** The Douglas Stenelmis riffle beetle (*Stenelmis douglasensis*) is a small aquatic beetle and a Species of Concern in Michigan. This little beetle inhabits spring-fed lakes, shore lines, streams, and river margins where the water is shallow, clear, and unpolluted and has high dissolved oxygen content and a sandy substrate. Individuals are frequently observed on pieces of wood. This species has a limited range and is only found within a 150-mile radius of Lake Michigan and in a few locations in the Lower Peninsula of Michigan. The beetle is vulnerable to the degradation of aquatic habitats, including alterations to the shore structure, dams, increased siltation, changes in nutrient inflow, and reductions in dissolved oxygen levels. Suggested management includes maintaining forested buffer zones around aquatic habitats and avoiding altering stream characteristics. (MNFI 2007, NatureServe 2007.)

In the Lakeshore, these beetles are associated with the Platte River and Otter Creek corridors. Because actions proposed in the alternatives have the potential to impact the habitat supporting this species, this species is carried forward as an impact topic under “Michigan State-Listed Species” in chapter 5.

**Lake Huron Locust.** The Lake Huron locust (*Trimerotropis huroniana*) is listed as a threatened species in Michigan and is confined to high-quality, sparsely vegetated coastal sand dunes along northern Lake Michigan and Lake Huron and eastern Lake Superior. Its primary diet includes beach grass, wormwood, dune grass (*Calamovilfa longifolia*), and dune wheatgrass; however, it is also known to feed on the federally protected Pitcher's thistle. In Michigan, the Lake Huron locust is found in 18 counties of the eastern Upper Peninsula and northern Lower Peninsula. The primary cause of this species' decline is loss and degradation of dune habitat from residential and recreational development. This dune-obligate species can tolerate some human disturbance, but conservation efforts should focus on preserving sand dune habitat to the degree that the natural process of dune blowout and revegetation maintain sufficient preferred habitat. *Note:* Most of this information came from Rabe 1999.

In the Lakeshore, the Lake Huron locust is known only in the southern section of the Lakeshore. Because actions proposed in the alternatives have the potential to impact the habitat supporting this species, this species is carried forward as an impact topic under "Michigan State-Listed Species" in chapter 5.

**Blanchard's Cricket Frog.** Blanchard's cricket frog (*Acris crepitans blanchardi*), listed as a Species of Concern in Michigan, is considered one of the most aquatic of tree frogs. They can be found in habitats associated with a permanent or near permanent source of water, such as a lake, pond, slow stream, bog, seep, or man-made water source (Harding 1997 as cited in HerpCenter 2004). Polluted water is not tolerated well, but shoreline fen habitats with alkaline water are commonly used by this species in Michigan (Lee et al. 2000). They prefer open or partially vegetated mud flats, sandy or muddy shorelines, and emergent water vegetation. Blanchard's cricket frog is found from southern Michigan and western Ohio, west to southeast South

Dakota, east to northern Tennessee, and south to northern Mexico (Lee et al. 2000). This is a particularly short-lived frog, with most individuals surviving only one or two breeding seasons (Burkett 1984 as cited in Lee et al. 2000, Harding 1997 as cited in HerpCenter 2004). Mortality is generally through predation, parasitism, desiccation, winter kill, and natural death. The causes of Blanchard's cricket frog population declines in Michigan are not fully understood, but the loss and pollution of wetlands are likely important factors. In addition, reductions in habitat from vegetation succession and competition with other frog species have also likely influenced Blanchard's cricket frog populations.

In the Lakeshore, Blanchard's cricket frog is known only in the northern section of the Lakeshore. Because actions proposed in the alternatives have the potential to impact the habitat supporting this species, this species is carried forward as an impact topic under "Michigan State-Listed Species" in chapter 5.

**Wood Turtle.** The wood turtle (*Glyptemys insculpta*), listed as a Species of Concern in Michigan, is found in portions of the eastern U.S. and Canada. It lives in riparian floodplain habitat along moderately moving rivers and streams. Typical wood turtle habitat includes a hard-bottom stream substrate, herbaceous vegetation for foraging, and a sandy substrate for nesting (Lee 1999). In Michigan, wood turtles are found in the northern portion of the Lower Peninsula and throughout the Upper Peninsula. Primary threats to this species are poaching for the pet trade and collecting by the general public (Lee 1999). Minor threats include loss and degradation of habitat, road kill, and increased predation by natural predators that travel road corridors (Soule 1992 as cited in Lee 1999). Wood turtles can survive in areas of moderate human activities, provided that the essential characteristics of their habitat are maintained, water quality is maintained, and adult mortality is maintained at a natural rate. Predator

control may be necessary at some nesting sites (Soule 1992 as cited in Lee 1999). Stream channelization, dams, road construction near streams, and intense human activity at nest sites are detrimental to this species.

In the Lakeshore, wood turtles are known only in the southern section of the Lakeshore. Because actions proposed in the alternatives have the potential to impact the habitat supporting this species, this species is carried forward as an impact topic under “Michigan State-Listed Species” in chapter 5.

**Eastern Box Turtle.** Michigan’s only true terrestrial turtle, the eastern box turtle (*Terrapene carolina carolina*) is listed as a state Species of Concern. The eastern box turtle can be found in forested habitats with sandy soils and a source of water (Tinkle et al. 1979 as cited in Hyde 1999b). They can also be found in fallow fields, pastures, some wetland habitats, and vegetated dunes. Eastern box turtles also require sandy sites in full sun for laying eggs. They range along the east coast of the U. S. from Massachusetts to Georgia and west to Michigan, Illinois, and Tennessee. In Michigan they are found in the south and western portions of the Lower Peninsula.

Eastern box turtles are absent from much of their historic range due to the conversion of woodlands and wetlands to agriculture over the last century (Hyde 1999b). Today, continued development fragments the remaining habitat, cutting turtles off from nesting sites and increasing the risk of road kill (Hyde 1999b). Poaching for the pet trade has also reduced populations. Protecting large tracts of habitat on public lands from development and maintaining wetland hydrologic processes and water quality should benefit the eastern box turtle. Nesting locations should be identified and protected, and where necessary additional ones should be created. New roads should be constructed to avoid cutting turtles off from nesting sites (Hyde 1999b).

There were no document occurrences of eastern box turtles within the National Lakeshore until recently, when one individual was reported. Due to this recent observation, this species is carried forward as an impact topic under “Michigan State-Listed Species” in chapter 5.

**Red-Shouldered Hawk.** The red-shouldered hawk (*Buteo lineatus*) is listed as threatened by the state of Michigan. In Michigan red-shouldered hawks use mature forested flood-plain habitat, with most nests found in large (usually >300 acres), relatively mature deciduous or mixed forest complexes associated with or interspersed by wetlands. Wetland areas and upland open areas are used for foraging habitat. Although American beech is the most commonly documented nest tree in Michigan, a variety of nest trees have been used, including aspen, birch, ash, and oak, which seems to indicate that tree structure and not tree species is the most important factor that influences use of a tree for nest placement. Nests tend to be placed in dense stands of timber with a closed canopy structure and very near wetland habitat (typically within 1/8 mile). The primary threat to this species in Michigan is habitat alteration and destruction due to timber harvest, road construction, and residential development. (Cooper 1999b.)

Red-shouldered hawks are observed throughout the National Lakeshore. As such, this species is carried forward as an impact topic under “Michigan State-Listed Species” in chapter 5.

**Trumpeter Swan.** The trumpeter swan (*Cygnus buccinator*) is listed by the state as a threatened species. Trumpeter swans use marshes and wetlands associated with lakes and ponds for cover and food, and they require large open water areas for takeoff and landing (MNFI 2007). Nesting areas should be buffered by a no-activity zone to eliminate human disturbance by boats, personal watercraft, and birdwatchers (MNFI 2007b).

Competition from the Mute swan, a nonnative aggressive species, has been documented, and steps have been taken to reduce mute swan populations within the Lakeshore.

Trumpeter swans were reintroduced to the southern mainland portion of the Lakeshore in 2006 and 2007. Because of potential impacts of various activities proposed in the alternatives, this species is carried forward as an impact topic under “Michigan State-Listed Species” in chapter 5.

**Prairie Warbler.** The prairie warbler (*Dendroica discolor*) is listed as endangered in Michigan. This species is typically associated with old fields, shrublands, and coniferous woodlands (NatureServe 2007), as well as coastal dune areas (MDRN 2005).

In the Lakeshore, prairie warblers have been documented in the shrubby dune-forest interface along the mainland shoreline. Within the context of the dynamics natural to this shifting zone between dunes and encroaching forest, this habitat is thought to have been “stable” for thousands of years (NatureServe 2007). Because actions proposed in the alternatives have the potential for impacts to this habitat, the prairie warbler is carried forward as an impact topic in chapter 5.

**Merlin.** The merlin (*Falco columbarius*) is listed by the state as a threatened species. Merlins typically nest in boreal forest, preferring spruce forests near bogs or open water (Cuthrell 2002). Open to semi-open areas associated with lakeshores and islands are used most frequently, probably to facilitate hunting. Merlins are likely limited by adequate food items and a source of available nesting sites. The food base is normally provided by small- to medium-sized birds of grasslands, wetlands, or forest edges (Cuthrell 2002). Merlins do not build their own nests, typically using those of other birds such as crows or ravens. They will occasionally nest in tree cavities, on cliffs, or on the ground (Cuthrell 2002). Merlins return to Michigan in

early spring, following the main migration of small birds — their primary food source. Males arrive up to a month before females and usually establish territories in the same general area each year.

Merlins are reported to nest on both islands and on the mainland portion of the National Lakeshore. Therefore, this species is carried forward as an impact topic under “Michigan State-Listed Species” in chapter 5.

**Common Loon.** The common loon (*Gavia immer*) is listed as threatened in Michigan. Common loons are known to breed throughout northern North America and northern Europe, reflecting the general distribution of boreal coniferous and northern hardwood forests. Common loons breed on inland lakes that have an abundant population of fish and a large proportion of undeveloped shoreline. They prefer lakes with a small island or bog mat where it can hold the nest inaccessible to raccoons and other egg-eating predators and where there is little or no high-speed boat traffic (MNFI 2007). In Michigan, common loons are now known to breed only in the Upper Peninsula and the very northern portions of the Lower Peninsula. They are most common on Isle Royale and western portions of the Upper Peninsula (MNFI 2007). Adult common loons are easily disturbed and stressed and may desert their nest if approached too closely by a person, boat, or other water vehicle, or even the wake from such a vehicle (MNFI 2007).

In 2006 there was a large die-off of more than 2,900 water birds in the Lakeshore, including about 180 common loons, due to Type E Botulism toxin poisoning. This die-off continued in 2007, including an additional 60 loons and more than 1,000 other birds. A combination of invasive species (including quagga mussels and round gobies), enhanced native algae and Type E bacteria growth, and a rapidly changing lake ecosystem have led to conditions that are believed to be ongoing and

devastating to common loons as well as other native bird and fish species.

In the Lakeshore, common loons have been documented on several lakes. Because actions proposed in the alternatives have the potential to impact the habitat supporting this species, the common loon is carried forward as an impact topic for discussion in chapter 5.

**Bald Eagle.** The bald eagle (*Haliaeetus leucocephalus*), although recently delisted under the Endangered Species Act, is still listed as threatened by the state. The reason for historic declines in bald eagle populations in the 1950s and 1960s included the use of chemicals such as PCBs (polychlorinated biphenyls), DDT (dichlorodiphenyltrichloroethane), DDE (dichlorodiphenyldichloroethylene), and mercury, and disturbance and displacement by humans. DDT was the primary cause, and the banning of DDT in the early 1970s led to a resurgence in bald eagle numbers throughout the U.S. as well as the Great Lakes region. Although bald eagles are seen throughout almost all counties of Michigan during the winter, they nest mainly in the Upper Peninsula (especially the western portion) and the northern portion of the Lower Peninsula (MNFI 2007).

Because their primary diet consists of fish, bald eagles tend to feed, roost, and nest near water bodies (NPS 2005a). The nest is usually located in the tallest tree in the area, often a white pine or dead snag (MNFI 2007). Eagles in some parts of the country are particularly sensitive to human disturbance. Adult birds appear to flush more quickly when foraging than when on the nest (NatureServe 2007). In Michigan, 75% of all alert responses to human activity occurred when activity was within 1,640 feet (500 m) and flight responses occurred when activity was within 656 feet (200 m); vehicles and pedestrians elicited the highest response frequencies (NatureServe 2007).

Bald eagles have been documented in all but the central mainland portion of the Lakeshore, and nests have been identified in the northern and southern mainland portions of the Lakeshore as well as on both North Manitou and South Manitou islands. Because actions proposed in the alternatives have the potential to impact the habitat supporting this species, the bald eagle is carried forward as an impact topic under “Michigan State-Listed Species” in chapter 5.

**Caspian Tern.** The Caspian tern (*Sterna caspia*) is listed by the state as threatened. Caspian tern nesting habitat is open sandy or pebble beaches, usually on islands in large bodies of water. Caspian terns are a migratory species. They arrive at their breeding grounds from mid-April to mid-May with most individuals returning to the same general breeding area for more than one season (Hyde 1996).

Caspian terns are not known to nest within the Lakeshore. However, they do perform courtship rituals on the shoreline in the southern section of the National Lakeshore. Therefore, this species is carried forward as an impact topic under “Michigan State-Listed Species” in chapter 5.

**Walking Fern.** Walking fern (*Asplenium rhizophyllum*) is listed as threatened in Michigan. It occurs in eastern North America, and in Michigan most occurrences are in the eastern Upper Peninsula. This fern typically occurs in association with shaded, moist boulders and outcrops of Niagaran limestone and dolomite. Typical canopy trees include sugar maple, basswood (*Tilia americana*), and balsam fir (*Abies balsamea*). Other associates include northern holly fern, common polypody (*Polypodium virginianum*), herb-Robert (*Geranium robertianum*), and maidenhair spleenwort (*Asplenium trichomanes*). Moist moss mats composed of several different moss species appear to be a critical element of this species’ microhabitat, as well as the availability of moist crevices and other depressions that



serve as colonization niches (Penskar and Higman 1997).

The occurrence of walking fern on South Manitou Island is in habitat that is atypical for this species. There are no rocks in the area it occupies, and it grows over decaying logs on the floor of the forest (Thompson 1962). This is the only known occurrence of walking fern within the Lakeshore. Because actions proposed in the alternatives have the potential to impact the area supporting this species, this species is carried forward as an impact topic under “Michigan State-Listed Species” in chapter 5.

**Green Spleenwort.** Green spleenwort (*Asplenium trichomanes-ramosum*) is listed as threatened in Michigan. This small evergreen fern prefers a moist, shaded environment, sometimes in sheltered crevices on rocky limestone bluffs or talus slopes. This fern is a circumboreal species of subarctic and alpine areas that favors limestone rock and, in Michigan, is best known from the limestone cliffs of the Niagara Escarpment. Green spleenwort is not limited to any one forest type and occurs in both conifer swamps and upland hardwood forests dominated by sugar maple and birch (*Betula alleghaniensis*). Associated fern species include maidenhair spleenwort, fragile fern (*Cryptopteris fragilis*), bulbet fern (*Cystopteris bulbifera*), common polypody, and northern holly fern. The major existing and potential threats to this species in Michigan include overstory removal through logging activities and periodic defoliation of canopy vegetation by insect pests such as gypsy moths. (USFWS 2002c.)

The only known occurrence of green spleenwort within the National Lakeshore is on South Manitou Island, where it has been documented growing in sandy loam (Thompson 1962). Because actions proposed in the alternatives have the potential to impact the area supporting this species, this species is carried forward as an impact topic under “Michigan State-Listed Species” in chapter 5.

**Cut-Leaved Water-Parsnip.** Cut-leaved water-parsnip (*Berula erecta*) is listed as threatened in Michigan. This perennial aquatic plant grows in shallow, clear-flowing water, typically occurring within prairie fens where it grows in the unshaded marshy borders of cold streams and springs. This species’ primary ecological need is the protection of hydrologic processes and the perpetuation of cool groundwater sources. Prescribed burns to maintain open, grassy wetlands are also likely beneficial because this species requires a mostly open canopy. (MNFI 2007.)

Only one occurrence of this species is known from the Lakeshore, in the southern section of the mainland. Because actions proposed in the alternatives have the potential to impact the habitat supporting this species, this species is carried forward as an impact topic under “Michigan State-Listed Species” in chapter 5.

**Prairie Moonwort.** Prairie moonwort (*Botrychium campestre*) is listed as threatened in Michigan. In Michigan it occurs primarily in freshwater dune systems, especially perched dunes along the northern Lake Michigan shoreline, with one occurrence in southern Benzie County and seven occurrences in Leelanau County, including North Manitou Island, South Manitou Island, and South Fox Island, as well as mainland portions of Sleeping Bear Dunes National Lakeshore (Higman and Penskar 1999b). It also occurs in roadside habitats, abandoned orchards, and other disturbed grassy sites (MNFI 2007). Associated species include wormwood, bearberry, dune grasses (e.g., *Calamovilfa longifolia*), and other grape-ferns. This species requires protection of habitat and maintenance of natural dune processes (e.g., shoreline fluctuation, erosion, sand deposition, wind, water level fluctuation, and sand movement) that create the necessary micro habitats (MNFI 2007).

In the National Lakeshore, this species occurs in dune habitats on both islands and along the

shore of the mainland NPS units. Because actions proposed in the alternatives have the potential to impact the habitat supporting this species, this species is carried forward as an impact topic under “Michigan State-Listed Species” in chapter 5.

**Pumpelly’s Brome Grass.** Pumpelly’s brome grass (*Bromus pumpellianus*) is listed as threatened in Michigan. It occurs primarily in western North America and, in Michigan, is restricted to the northwestern Lower Peninsula in Emmet, Charlevoix, and Leelanau counties. This rare grass grows on low sand dunes and along beaches in Lake Michigan, usually in association with beach grass, bearberry, wormwood, dune wheatgrass (*Agropyron dasystachyum*), Pitcher’s thistle, and sand cherry. Pumpelly’s brome grass is a perennial that spreads vegetatively via rhizome growth. Its spikelets mature from late June to September. (Higman and Penskar 1996a.)

Pumpelly’s brome grass occurs near the shoreline throughout the National Lakeshore. Because actions proposed in the alternatives have the potential to impact the habitat supporting this species, it is carried forward as an impact topic under “Michigan State-Listed Species” in chapter 5.

**Ram’s-Head Lady’s-Slipper.** Ram’s-head lady’s-slipper (*Cypripedium arietinum*) is listed as a species of concern in Michigan and is considered rare throughout its range. Eighty-one occurrences of this orchid have been reported in Michigan, scattered through northern Lower Michigan and across the Upper Peninsula from Drummond Island to Ontonagan County (Penskar and Higman 1999). Ram’s-head lady’s-slipper occurs on South Manitou Island and mainland areas of the National Lakeshore (MNFI 2006b). Michigan occurrences of this orchid are found either in dense balsam/white cedar/black spruce swamps and bogs or in conifer uplands characterized by pine or cedar needles over sand (Case 1987). It is a plant of

cool, sub-acid or neutral soil and occurs in three general situations — (1) cool, dense white balsam/cedar/spruce swamps (*Thuja occidentalis*/*Abies balsamea*/*Picea mariana*); (2) nearly pure sand over limestone beach cobblestones or bedrock mulched with juniper ((*Juniperus communis*, *J. horizontalis*), jack pine (*Pinus banksiana*), red pine (*Pinus resinosa*) or white cedar needles; and (3) mesic soils of sandy loam, or clay under the partial shade of mixed forest (USFS 2000). Ram’s-head lady’s-slipper flowers in late May to early June and is notoriously difficult to locate because of its small size, short flowering period, sporadic flowering nature, and sparseness (Penskar and Higman 1999). Threats to the viability of this orchid include habitat loss or alteration, competition, and collecting (USFS 2000).

Because actions proposed in the various alternatives could impact the habitat for ram’s-head lady’s-slipper, and thus its populations within the Lakeshore, this species is carried forward as an impact topic under “Michigan State-Listed Species” in chapter 5.

**Fascicled Broom-Rape.** Fascicled broom-rape (*Orobanche fasciculata*) is listed as threatened in Michigan. This parasitic plant species reaches its easternmost distribution in the Great Lakes region, and, in Michigan, is restricted to the Lake Michigan shore from Charlevoix to Oceana counties. Most occurrences are in Leelanau and Benzie counties. The species is relatively scarce at all sites except one occurrence in Sleeping Bear Dunes National Lakeshore where six colonies have been found (Higman and Penskar 1996c). In Michigan, this species flowers in late June and produces fruit in the latter part of July and August. Wormwood (*Artemisia campestris*) is its only known host plant in Michigan. Other associates include beach grass, little bluestem, common milkweed, dune willows, and Pitcher’s thistle.

Fascicled broom-rape occurs in near-shore habitat in all three mainland units of the

Lakeshore and on South Manitou Island (MNFI 2006b). Because actions proposed in the alternatives have the potential to impact the habitat supporting this species, and thus its populations within the Lakeshore, this species is carried forward as an impact topic under “Michigan State-Listed Species” in chapter 5.

**Ginseng.** Ginseng (*Panax quinquefolius*) is listed as threatened in Michigan. Michigan occurrences of ginseng are concentrated in the southern Lower Peninsula, primarily in woodlots and wooded coastal dunes, where populations typically are small. There are scattered occurrences in the northern Lower Peninsula. Flowering and fruiting occurs from June to October. This species is found in rich hardwoods, often on slopes or ravines. It also occurs in wooded dune hollows and leeward slopes along the Lake Michigan shoreline. Associates include sugar maple (*Acer saccharum*), white baneberry (*Acetaea pachypoda*), maidenhair fern (*Adiantum pedatum*), and rattlesnake fern (*Botrychium virginianum*). The primary cause of decline for this species is exploitation by collectors. (Penskar and Higman 1996.)

Ginseng occurs in several areas in the National Lakeshore. Because actions proposed in the alternatives have the potential to impact the habitat supporting this species, and thus its populations within the Lakeshore, this species is carried forward as an impact topic under “Michigan State-Listed Species” in chapter 5.

**Pine-drops.** Pine-drops (*Pterospora andromedea*) are listed as threatened in Michigan. The majority of Michigan occurrences are associated with forested dune communities ranging from Ottawa to Keweenaw Counties, with concentrations in Keweenaw, Emmet, and Leelanau counties. Pine-drops are known from dry woods containing conifers such as pines, hemlock, spruce, balsam fir, or white cedar. Many occurrences are associated with dry to dry-

mesic forests of sand dunes along the Great Lakes shorelines. Associated herbaceous species include large leaved aster (*Aster macrophyllus*), Hepatica (*Hepatica* spp.), spotted coralroot (*Corallorhiza maculate*), wintergreen (*Gaultheria procumbens*), and various ferns. *Pterospora* is above ground from June through early September and flowers /fruits are in their prime from July through August. (Higman and Penskar 1999c.)

Pine-drops have been documented across the northern mainland portion of the Lakeshore. Because actions proposed in the alternatives have the potential to impact the habitat supporting this species, and thus its populations within the Lakeshore, this species is carried forward as an impact topic under “Michigan State-Listed Species” in chapter 5.

**Three-birds orchid.** Three-birds orchid (*Triphora trianthophora*) is listed as threatened in Michigan. It is found in rich oak-hickory forests and old wooded dune forests with well developed humus layers. Natural community types include mesic southern forest (southern hardwood forest), dry-mesic southern forest (oak-hardwood forest), and mesic northern forest (northern hardwood forest; hemlock-hardwood forest) (MNFI 2007). Stems for this species do not appear above ground each year; plants may persist as subterranean tubers for extended periods. Periodic dormancy may result in a site containing hundreds of aboveground stems in some years and few or no stems in other years. This inconsistency and the fact that it grows, flowers, and fruits in about a month in late summer, makes determination of population trends very difficult (USFS 2005).

Three-birds orchid has been documented in the central portion of the Lakeshore mainland. Because actions proposed in the alternatives have the potential to impact the habitat supporting this species, and thus its populations within the Lakeshore, this species

is carried forward as an impact topic under “Michigan State-Listed Species” in chapter 5.

## Wetlands

Wetlands in the National Lakeshore can be roughly categorized into three groups: classic bogs, interdunal wetlands, and wetlands associated with lakes or streams. The Lakeshore contains about 750 acres (300 hectares) of wetlands in total (NPS 2005a). (See also Natural Resources Base map.)

The Lakeshore contains a few classic bogs with floating mats. The plant species of these bogs include sphagnum peat moss (*Sphagnum* sp.), black spruce, water sedge (*Carex aquatilis*), cottongrass (*Eriophorum* sp.), speckled alder (*Alnus incana*), pitcher plant (*Sarracenia purpurea*), Labrador tea (*Ledum groenlandicum*), bog laurel (*Kalmia polifolia*) leatherleaf (*Chamaedaphne calyculata*), cranberry (*Vaccinium macrocarpon*), and sundew (*Drosera* sp.). Examples of such bogs can be found in the Bow Lakes area.

Interdunal wetlands occur in the low areas or swales between the ancient beach ridges, remain wet much of the year, and are a component of the dune and swale complex. These wetlands contain an association of rushes (*Juncus* spp.) and sedges (*Carex* spp.), willows (*Salix* spp.), gray dogwood (*Cornus racemosa*), Joe-pye weed (*Eupatorium* sp.), and cardinal flower (*Lobelia cardinalis*) (NPS 2005a, NatureServe 2007). The dune and swale complex is one of the dominant physiographic and vegetative features of the Lakeshore, paralleling the shoreline and extending 1 to 2 miles inland in many areas. The dune and swale complex comprises most of the area from Otter Creek to the southernmost border of the Lakeshore, and is found near Good Harbor Bay and the Crystal River areas as well.

Finally, wetlands are often found along the margins of streams, ponds, and lakes. Wetland plants in these settings may be submerged,

emergent, or floating. Plants typical of these wetlands include cattail (*Typha latifolia*), pondweeds (*Potamogeton* spp.), arrowhead (*Sagittaria* sp.), bulrushes (*Schoenoplectus* sp.), sedges (*Carex* spp.), yellow pond-lily (*Nuphar lutea*), grass of Parnassus (*Parnassia glauca*), marsh cinquefoil (*Comarum palustre*), fringed gentian (*Gentianopsis crinita*), and bladderwort (*Utricularia* sp.) (NPS 2005a, NatureServe 2007).

## Water Quality

Water quality discussion in this document pertains to inland lakes and streams. Although waters of Lake Michigan do occur within the Lakeshore boundaries, no actions proposed in the alternatives would result in effects on the water quality in Lake Michigan.

Sleeping Bear Dunes National Lakeshore waters include 26 named inland lakes of varying size and character; four sizable streams (all of Otter Creek and parts of the Platte River, Crystal River, and Shalda Creek); and many bogs, springs, and interdunal wetlands (Lafrancois and Glase 2005). All water bodies in the Lakeshore are designated Outstanding State Resource Waters (Ledder 2003). This designation indicates that no lowering of water quality is allowed for the designated high-quality water body (Ledder 2003).

During the mid-1980s, the U.S. Geological Survey collected water quality data on the Lakeshore's waters. It was found that the National Lakeshore had extremely good water quality with little or no excessive minerals or heavy metals. A biological study undertaken by NPS staff in 1988 showed that Lakeshore rivers and streams had all pollution-sensitive invertebrates present, indicating good water quality (NPS 2005a).

Ledder (2003) summarized a review of all available data for water resources in the Lakeshore for the period from 1962 to 1996. Only two lakes, Big and Little Glen Lakes, had

been issued non-compliance status, in both cases for fish consumption due to high levels of polychlorinated biphenyls (PCBs), mercury, and chlordane. Exceedances recorded at least once within the Lakeshore and during the time frame covered by the review were dissolved oxygen, pH, cadmium, copper, zinc, lead, and indicator bacteria. The overall conclusion of the Ledder (2003) review was that surface waters in the Lakeshore generally appeared to be of good quality. Potential man-made threats included wastewater, septic leakage, runoff, and recreational use.

The Platte River has been the subject of a number of studies addressing water quality, physical processes and integrity, and visitor perception (Lafrancois and Glase 2005). The Platte River is affected by a number of activities. Increased phosphorous levels have been attributed to the state fish hatchery on the Platte River, both from feeds provided for the salmon and the decay of returning salmon. Steps have been and continue to be taken to reduce this impact (Lafrancois and Glase 2005). Bank erosion and degradation of water quality occurs on the Platte River due to high visitor use. The occasional use of motorboats increases erosion issues and, at times, conflicts with other visitors using the river (Lafrancois and Glase 2005).

The Crystal River has also been studied relative to biological integrity and visitor use (Lafrancois and Glase 2005). Biological diversity in the Crystal River was considered relatively high, with 15 species of macrophytes and 35 species of fish documented in several studies (NPS 2002). The Crystal River has the highest number of riffles (four) of any stream reach in the Lakeshore. Canoeing, kayaking, and tubing are increasingly popular activities on the Crystal River (NPS 2002). Although many consider the Crystal River pristine, there is concern that increased wading and tubing in the channel, bottoming of canoes and kayaks, and disruption of the banks will degrade habitat to the detriment of the aquatic community (NPS 2002).

The Crystal River is the second largest stream in the park and drains the Glen Lake watershed down to Lake Michigan. Water levels in the river are controlled by a small low-head dam that regulates discharges from Glen Lake and Fisher Lake.

The NPS Inventory and Monitoring (I&M) Program conducted water quality sampling of the following nine lakes in the Lakeshore in 2005 — Manitou, Florence, Shell, Bass (Leelanau County), School, Tucker, North Bar, Loon, and Round. The following paragraphs summarize the relevant findings reported by Elias (2007).

With the exception of Florence Lake, lakes in the Lakeshore were generally well buffered and hard. All lakes were alkaline, with average lake pH values ranging from 8.3 for Tucker Lake to 8.8 for School Lake. Several lakes had high chloride and sodium ion concentrations, with Round Lake having concentrations twice those of the next highest lake (School for sodium and Loon for chloride). These lakes are close to roads and may be receiving road salt via runoff. Calcium concentrations were high enough to support zebra mussels at all lakes except Florence, and several lakes already host this exotic species. Several lakes also have relatively high sulfate concentrations, which is not unusual in calcareous regions. (Elias 2007.)

Most of the lakes sampled had surface water connections, with the exceptions of North Bar (which is intermittently connected to Lake Michigan), Shell, and Florence. The chemistry of Florence Lake suggests that this lake is isolated from the groundwater. Shell and North Bar lakes likely receive water from groundwater discharge as well as their immediate watershed. Round, Tucker, and at times, School and Bass (Leelanau County) lakes, receive inflow from surface water but do not have a surface outlet. These lakes likely have slower flushing rates than flow-through lakes. (Elias 2007.)

Total nitrogen and total phosphorus values exceeded EPA criteria for Ecoregion VII in

Shell and School Lakes consistently throughout the season. Criteria for the subecoregion in which the Lakeshore lies (Level III ecoregion 51) are 0.81 mg/L for total nitrogen and 20 micrograms/L for total phosphorus (USEPA 2000). High levels of nitrogen and phosphorous can lead to excessive aquatic plant growth, which interferes with wildlife and recreational uses while the plant populations thrive, and leads to reduced oxygen availability when bacteria break down large quantities of dead plant material. Nitrogen and phosphorous often enter water bodies from agricultural runoff.

Dissolved silica concentrations were below detection level at the beginning of the season at all lakes except North Bar and Loon. It is possible that low silica concentrations may have affected algal community composition, especially early in the season, at several lakes. (Elias 2007.)

Profiles of temperature and dissolved oxygen showed that a thermocline had not strongly developed in any of the sampled lakes (School Lake was omitted because it is too shallow, at <2 m, to collect profile data) during the May 2005 sampling. (Because warm water is less dense than colder water, it tends to rise toward the top of water bodies and colder waters settle toward the bottom. A thermocline is a relatively rapid shift in temperature as depth increases within a water body. Thermoclines tend to indicate layers across which exchange of nutrients, including dissolved oxygen, is greatly reduced. Thermoclines often develop in water bodies through the course of the open water season. The presence of thermoclines and related rapid shifts in dissolved oxygen (i.e., oxyclines) indicate a seasonal decrease in water quality due to reduced mixing of nutrients throughout the water column and reduced capacity of the water body to support aquatic life. Thermoclines typically form during mid to late summer and are then resolved by the fall turnover, which happens when temperatures drop for a long enough period of time to cool

the surface layers, causing water and nutrients to redistribute throughout the water column.)

Except for Shell and Tucker lakes, both of which are shallow, all lakes had begun to develop an oxycline in May although it was not yet strongly established. During the late June/early July and August sampling periods, most lakes had a clearly recognizable thermocline. Shell and Tucker Lakes remained fairly well-mixed throughout the season. Loon and Round lakes had an increase in dissolved oxygen concentration slightly below the Secchi depth in early July, suggesting a deeper layer of photosynthetic activity. Several lakes had dissolved oxygen concentrations below the EPA criterion of 4 mg/L for fresh water in a substantial portion of the lake. For example, in Loon Lake, the bottom 9-10 m, or nearly half of the total depth, was below the EPA criterion in July, August, and September. Most lakes had turned over by the time of the September sampling, with the exceptions of Lake Manitou and Loon Lake, both of which are relatively deep and both of which maintained an anoxic layer below the thermocline. (Elias 2007.)

The alternatives considered in this document could result in impacts to water bodies within the Lakeshore. Therefore, water quality is considered as an impact topic in chapter 5.

## VISITOR OPPORTUNITIES

This section focuses on what visitors do at Sleeping Bear Dunes National Lakeshore — for example the variety of visitor activities and experiences.

### Fundamental Resources and Values

Several aspects of visitor opportunities and experiences at Sleeping Bear Dunes National Lakeshore are among the “Fundamental Resources and Values” presented in chapter 1. These opportunities are fundamental because they are closely tied to the National

Lakeshore's purpose and significance (see chapter 1 "Purpose" and "Significance" sections). The National Park Service believes that the National Lakeshore should be managed to maintain these important opportunities for visitors. Fundamental visitor opportunities include the following:

- Dune Climb
- Pierce Stocking Scenic Drive
- scenic views of historic farmsteads, inland lakes, Lake Michigan shoreline (Empire Bluffs, Sleeping Bear Plateau, Pyramid Point), to/from the shoreline of Manitou Islands, and emergence from dense canopy to open dunes
- Lake Michigan beaches
- experiences of North Manitou and South Manitou islands
- opportunities for quiet, solitude, and naturalness
- Platte River and Crystal River experiences
- learning about the natural and cultural heritage of the area (glacial phenomena, diverse habitats, human history)
- the opportunity for visitors to understand the complex and rapidly disappearing natural history of the ecosystems that evolved along the Great Lakes shoreline

### **Primary Interpretive Themes**

The National Park Service also believes that a key component of the National Lakeshore visitor experience includes the provision of opportunities to learn about the National Lakeshore's primary interpretive themes — the ideas and concepts communicated to the public about the Lakeshore that are the core of all interpretive programs and media (see chapter 1 section "Primary Interpretive Themes").

### **Information, Interpretation, and Education**

The main center for information and visitor orientation is the centrally located Philip A. Hart Visitor Center in Empire, Michigan. The visitor center offers a wealth of information about the National Lakeshore and the natural and human history of the area. Open year-round and with rangers and volunteers to answer questions, visitors may purchase a park pass, find out about various areas to visit, view interpretive exhibits, obtain free informational brochures, and purchase educational and informational items from Eastern National. Campsites are available for a fee on a first-come basis, by phone or on-line reservations. The Dune Center Bookstore is staffed and open seasonally; visitors may purchase educational, informational, and convenience items from Eastern National at the Dune Climb.

The National Lakeshore also offers many interpretive programs and services centered around the interpretive themes, including ranger-guided walks, hikes, snowshoe tours, evening campground programs, and a variety of educational/interpretive programs for school groups of varying ages. Detailed information about these programs is available at the visitor center and on the National Lakeshore website.

The Glen Haven Village Historic District provides many informational, interpretive, and educational opportunities. The Glen Haven General Store is staffed and operated seasonally. The store appears much as it did in the 1920s and offers typical merchandise and items related to the history of the Glen Haven area, including kitchenware, packaged foods, toys, maritime items, and books from Eastern National. At the restored Glen Haven Blacksmith Shop, visitors learn about the blacksmith trade and local history from volunteers who seasonally staff the site. The Glen Haven Cannery Boat Museum is seasonally staffed by volunteers who interpret some of the historic boats used around Glen Haven and the

Manitou Islands. The Sleeping Bear Point Coast Guard Station Maritime Museum is open seasonally. Here visitors may see exhibits about the U.S. Life-Saving Service, the U.S. Coast Guard, and Great Lakes shipping history and participate in many popular interpretive demonstrations and talks.

The Port Oneida Rural Historic District encompasses a large collection of farmsteads, which provide interpretive opportunities related to the area's human history. Many visitors take scenic driving tours of the district, participate in interpretive activities offered on site, or attend the annual Port Oneida Fair. The National Lakeshore also contains many additional farmsteads that offer interesting insights into the area's history and culture.

On South Manitou Island, visitor interpretation and orientation are concentrated in the village and lighthouse complex area. The former general store for the island serves as a seasonally operated, unstaffed visitor contact station. It houses a collection of photos and artifacts that depict life of the loggers, farmers, and U.S. Life-Saving Service members who lived on the island. Motorized interpretive tours of historic island farms (farm loop tours) are offered by a concessioner. Interpretive tours are also available of the historic South Manitou Island Lighthouse. Upon arrival at North Manitou and South Manitou islands, overnight visitors receive basic orientation to the visitor rules and island resources.

### Recreational Activities

Access to the National Lakeshore is facilitated through a network of state, county, and NPS roads; National Lakeshore trails; and concession-operated ferries that provide seasonal access to the Manitou Islands. The "NPS Facilities and Infrastructure" section of this chapter provides details on National Lakeshore facilities that support visitor access

and use (e.g., beach access points, roads, trails, and campgrounds). The scale of recreation-oriented development in the National Lakeshore is relatively modest, and most development is rustic.

The scenic resources in the National Lakeshore are predominately natural in character. The National Lakeshore purpose and significance statements (see chapter 1) refer to the area's natural features, setting, and character and also to its scenic beauty, publicly accessible resources, and cultural landscapes. Many scenic views are fundamental visitor opportunities as mentioned in the "Fundamental Resources and Values" section in chapter 1. National Lakeshore scenic resources also include features that reflect the area's history and culture (e.g., various farmsteads, a lighthouse, U.S. Life-Saving Service stations); these resources are described in the "Historic Resources" section of this chapter.

The varied access and settings provide for a wide range of warm and cold-weather recreational opportunities. Recreational activities include the following:

- scenic driving (e.g., Pierce Stocking Scenic Drive, Port Oneida, two-track dirt roads)
- climbing the dunes
- hiking or backpacking on about 100 miles of designated trails
- swimming, scuba diving, snorkeling, and beach activities on inland lakes and Lake Michigan
- canoeing, kayaking, tubing, or motorboating (as allowed) on rivers, inland lakes, and Lake Michigan
- bicycling on roads open to automobiles
- camping (e.g., Platte River Campground, D.H. Day Campground, and backcountry camping)
- fishing and hunting (per state, federal, and National Lakeshore rules and regulations)



- visiting North Manitou and South Manitou islands via ferry
- picnicking, wildlife viewing, and bird watching
- horseback riding on the Alligator Hill Trail or along state and county road rights-of-way
- snowshoeing and cross country skiing on more than 50 miles of ungroomed trails
- snowmobiling on state and county road rights-of-way
- launching and landing powerless flight craft (e.g., hang gliders, paragliders, and sailplanes) in designated areas

Trapping, off-road vehicle use, and personal watercraft use are not permitted in the National Lakeshore.

Only a small portion of the Benzie Corridor is owned by the National Park Service, so there are currently no visitor opportunities in this location.

Visitor opportunities related to wilderness are described in the “Wilderness Character” section of this chapter.

### **Natural Soundscapes and Night Sky**

Natural sounds dominate the National Lakeshore except along roadways, in developed areas, and along rivers, specific inland lakes, and Lake Michigan where motorized boats are allowed. Vehicular lights from state, county, and NPS roads and residential, commercial, and National Lakeshore developed areas introduce light into the otherwise naturally dark night sky of the National Lakeshore.

### **VISITOR USE**

This section focuses on visitor statistics and characteristics (e.g., how many people visit the

National Lakeshore and when, where they come from, and how long they stay).

An estimated 1,213,026 recreation visits occurred at Sleeping Bear Dunes National Lakeshore in 2006. Of that total, more than 1.1 million were day visits and 109,572 included an overnight stay in the National Lakeshore. The latter includes 17,889 backcountry camping visits, many of those on North Manitou and South Manitou islands.

Recreation visitation at the Lakeshore has been relatively consistent over time. Since 1990 the lowest level of visitor use of 1.09 million visits occurred in 1996, with the high of 1.36 million visits recorded in 1999 (see figure 1). The 17-year average of 1.19 million recreation visits, including about 110,000 overnight stays, nearly matches the visitation in 2006.

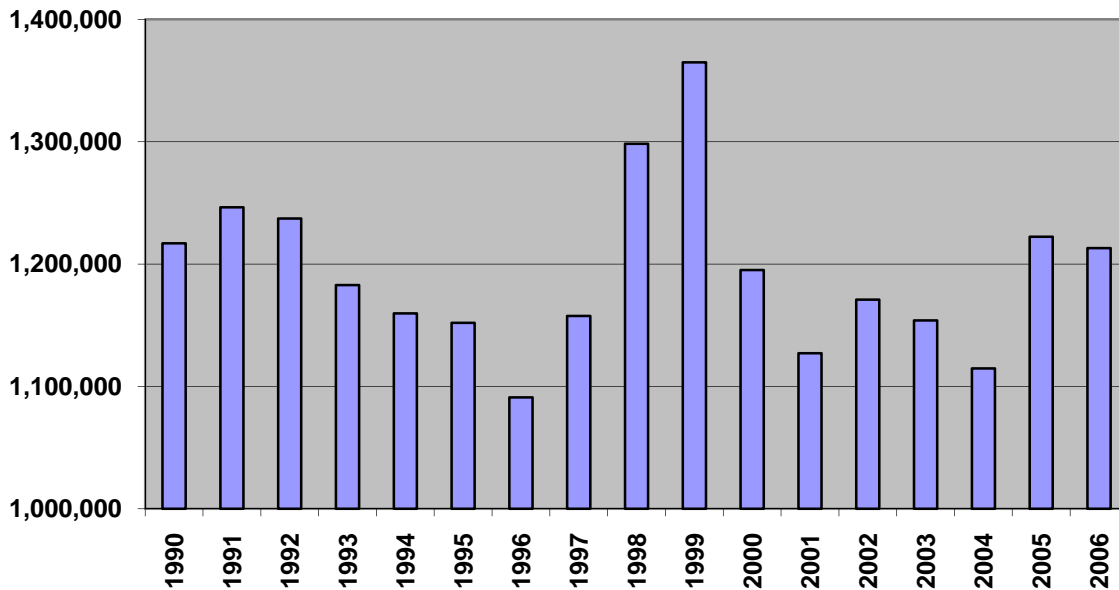
Recreation visitation to the Lakeshore is highly seasonal. Peak monthly visitation, averaging 388,200 visits over the past 17 years (33% of the annual average) occurs in July, followed by August (338,100 visits or 28%). The lowest use occurs during the winter with average monthly visitor use of 4,600 in January and 5,600 in December (see figure 2).

### **Origin of Visitors and Length of Stay**

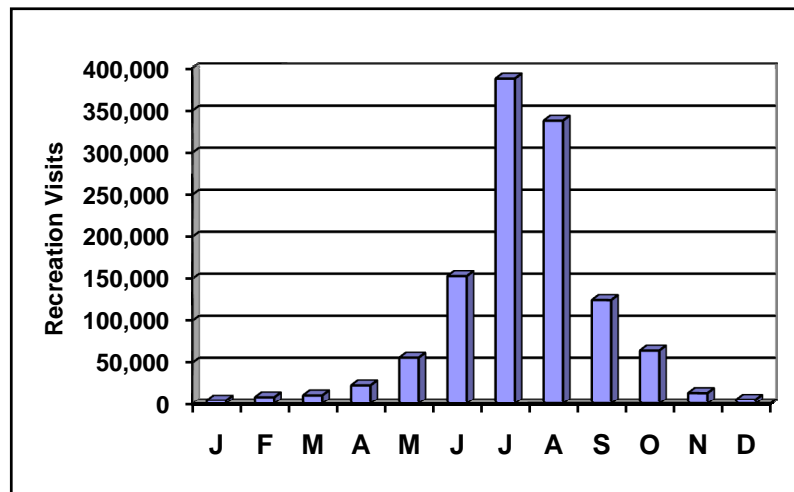
Recent visitor origin data are not available for the National Lakeshore. Visitor origin data for the region indicate that most travelers (70% to 80%) to the area are from Michigan. Other major origin states include Illinois, Indiana, Ohio, Missouri, and California. (Travel Michigan 2004 and Traverse City Convention and Visitors Bureau 2006).

Most use at the National Lakeshore is day use — an estimated 91%. Day use visitors include residents of the local area, Michigan residents from outside the local area, and residents from other states. Residents of the local area

**Figure 1: Recreation Visits by Year at the National Lakeshore**

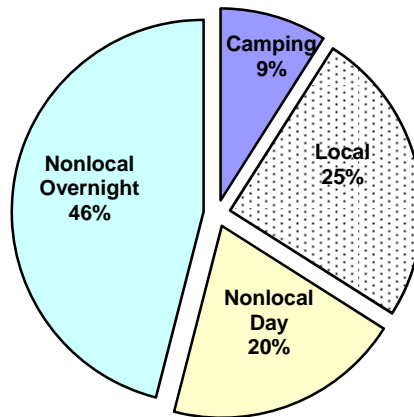


**Figure 2: Average Monthly Recreation Visitation at Sleeping Bear Dunes National Lakeshore, 1990 to 2006**



account for an estimated 25% of all use (see figure 3). Many of the day visitors to the National Lakeshore spend one or more nights in the area, either with friends or relatives, at vacation homes, or in local lodging accommodations. About 46% of all users spend at least one night in the area; another 20% are day

users from outside the area or nonlocals who continue their travels and spend the night elsewhere. Approximately 9% of the use is overnight use, primarily at the Platte River and D. H. Day campgrounds, but also including backcountry camping on the mainland and on the islands.

**Figure 3: Types of Use at the National Lakeshore**

### Primary Destinations within Sleeping Bear Dunes National Lakeshore

Vehicle counters located throughout the park's mainland areas and ticket sales for the ferry provide insights into the primary destinations for visitor use at the National Lakeshore. These monitors show visitor use at the National Lakeshore is heavily concentrated at the Dune Climb, Pierce Stocking Scenic Drive, Philip Hart Visitor Center, and the Platte River area. Vehicle counts for August 2005 tallied 20,000 or more vehicles at each of those locations. Overnight camping at the Platte River and D.H. Day campgrounds and other locations also received substantial use (see figure 4). However, these data are not fully representative of use in the National Lakeshore, as not all locations are currently monitored (other beach accesses, and the Port Oneida area, for example).

### WILDERNESS CHARACTER

The 1964 Wilderness Act refers to the following qualities that contribute to wilderness character:

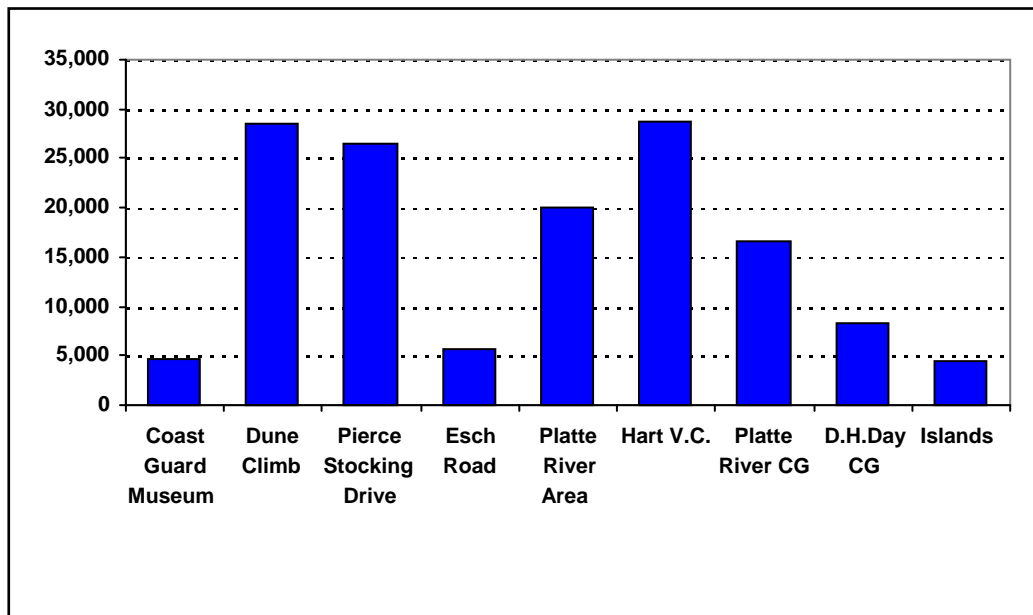
- Areas are largely natural and undeveloped.

- There are outstanding opportunities for solitude or "primitive, unconfined recreation."

### Current Management of Areas Proposed for Wilderness

A brief history of wilderness evaluation at Sleeping Bear Dunes National Lakeshore is provided in the "Purpose and Need for the Wilderness Study" section in chapter 1. That section also provides information about uses and management in wilderness areas. See chapter 3 for information about the current wilderness study, which is a fresh look at wilderness options at the National Lakeshore.

An amendment (Public Law 97-361, passed in 1982) to the legislation that established the National Lakeshore stated that the lands identified in the 1981 "Wilderness Recommendation" "shall, until Congress determines otherwise, be administered by the Secretary so as to maintain their presently existing wilderness character." NPS *Management Policies 2006* reinforces this direction by stating that no action should be taken "that would diminish the wilderness eligibility of an area . . . until the legislative process of wilderness designation has been completed." By law and policy then, since 1981 the National Lakeshore has

**Figure 4: Monthly Visitation at Selected Locations, August 2005**

Units are in numbers of vehicles except for campgrounds (CG) and the islands, which are in numbers of individuals.

been managing 30,903 acres (see the No-action Alternative map) to maintain their wilderness character. Until the wilderness legislative process is complete (a congressional determination), these lands will continue to be managed to maintain their wilderness character.

### Natural and Undeveloped

Much of Sleeping Bear Dunes National Lakeshore is largely natural and undeveloped, with large expanses of forest land, dunes, and wetlands. Some areas that were once agricultural fields are gradually returning to woodland. Numerous former home sites, buildings, and driveways have been removed and the sites restored to more natural conditions. Several large areas in the National Lakeshore, such as Good Harbor, Sleeping Bear Plateau, Otter Creek, and Platte Plains, have little if any noticeable human imprint other than hiking trails, backcountry campgrounds, and an occasional historic structure, all of which are consistent with the Wilderness Act and NPS

wilderness management policies. Most of the National Lakeshore's visitor support facilities, such as visitor contact stations, drive-to campgrounds, trailheads, and picnic areas, are clustered on the periphery of or well outside these natural and undeveloped areas.

North Manitou Island is by far the largest of the National Lakeshore's natural and undeveloped areas. This island is nearly all forested and has no roads. Development (other than hiking trails) is concentrated within easy walking distance of the ferry dock.

Most development on South Manitou Island is also concentrated within walking distance of the dock. However, this island has a few county roads that are used a few times per day during the summer by concessions tour vehicles and less often by administrative vehicles. Historic farmsteads and a historic schoolhouse are featured along the concessions tour route. Compared to North Manitou Island, this island has more old fields that the National Park Service is maintaining as cultural landscapes. Nonetheless, much of

South Manitou Island is relatively natural and undeveloped.

### **Outstanding Opportunities for Solitude**

Areas where relatively large numbers of people (10-30+) occur at times include the Dune Climb; beach access areas and overlooks; drive-to campgrounds; picnic areas; popular historic areas such as Glen Haven, and the life-saving stations; the Platte River; and on the islands within walking distance of the ferry dock. Opportunities for solitude are often not available in these areas, particularly during the summer. Due to long sight distances or the tendency for sound to travel over water, solitude is sometimes hard to find on Lake Michigan beaches and some inland lakes. However, solitude can be found even in many of these areas early in the morning and during the spring, fall, and winter months.

In most other areas of the National Lakeshore, outstanding opportunities for solitude are available nearly year-round. In many places it is possible to walk or hike for miles without encountering another person.

### **Outstanding Opportunities for Primitive, Unconfined Recreation**

There are opportunities for primitive, unconfined recreation in nearly every portion of the National Lakeshore. Backcountry camping opportunities are available in two locations on the mainland and on each Manitou Island. In 2006 there were nearly 18,000 visitor days of backcountry camping at the National Lakeshore. There are more than 50 miles of hiking trails on the mainland alone, and many more on the islands (see the “NPS Operations” section of this chapter for details.) It is unknown how many people use the National Lakeshore’s hiking trails, but the numbers are substantial and opportunities are plentiful.

Primitive, unconfined recreation at Sleeping Bear Dunes National Lakeshore also includes activities such as hunting, fishing, canoeing, kayaking, exploring, swimming, sand play, wildlife watching, snowshoeing, and cross-country skiing. Opportunities for these types of activities are plentiful and occur throughout the National Lakeshore.

## **REGIONAL SOCIOECONOMICS**

The influence area for economic and social considerations associated with the Sleeping Bear Dunes National Lakeshore encompasses Benzie, Leelanau, and Grand Traverse counties on the upper northwest side of Michigan’s Lower Peninsula. Benzie and Leelanau are directly affected as portions of the National Lakeshore are within their boundaries, whereas Grand Traverse is indirectly affected due to its role as a regional trade and service center and a center of seasonal migration and tourism for the entire region. The region is largely rural, though along with neighboring Kalkaska County, the three counties comprise the Traverse City micropolitan statistical area.<sup>1</sup> Traverse City, the largest community in the region (2006 population 14,407), is about 25 miles east of the National Lakeshore. The communities of Empire, Glen Arbor, Leland, Beulah, and others are located in nearby areas surrounding the National Lakeshore. Timber, maritime commerce, and agriculture were important in the region’s economic development, with tourism and outdoor recreation emerging as more recent economic drivers.

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<sup>1</sup> As defined by the U.S. Office of Management and Budget, a micropolitan statistical area (micro area) contains an urban core of at least 10,000 (but less than 50,000) population. Each micro area consists of one or more counties and includes the counties containing the core urban area, as well as adjacent counties that have a high degree of social and economic integration (as measured by commuting to work) with the urban core.

## Population

All three counties have experienced long-term population growth, characterized by relatively rapid growth in the 1970s, tempered by state and national economic slowdowns in the early/mid 1980s, and growth resuming thereafter. Between 1990 and 2006, net population growth of 45%, 32%, and 34% occurred in Benzie, Grand Traverse and Leelanau counties, respectively, out-pacing the statewide growth of 9% for the same period. The pace of population growth has moderated in recent years (see table 9).

The three counties had a combined total of 124,716 residents in 2006, more than two-thirds of whom lived in Grand Traverse County. Benzie County's population of 17,652 accounted for 14% of the total, with Leelanau County having 18% of the total.

Most of the region's year-round residents live in rural, unincorporated areas. In addition to Traverse City, only Kingsley (Grand Traverse) and Frankfort (Benzie) have more than 1,000 residents. The remaining communities generally range from 250 to 650 residents. Population size in these communities has remained relatively constant in recent years because most of the new development and population growth has been in the outlying areas (U.S. Census Bureau 2007b).

In Leelanau County, Empire, Glen Arbor, and Leland are the three communities most

directly affected by the National Lakeshore — the first two because of proximity to key visitor use/activity centers in the National Lakeshore. Leland is the base for the ferry to the Manitou Islands. The portions of the Lakeshore in Leelanau County are located in Centerville, Cleveland, Empire, Glen Arbor, Kasson, and Leland townships.

In Benzie County, the communities of Benzonia, Beulah, Frankfort, and Honor are also affected by the National Lakeshore, because of their proximity to the Lakeshore and location along major roads that access the Lakeshore. The portions of the Lakeshore in Benzie County are located in Benzonia, Lake, and Platte, townships.

## Economic Overview

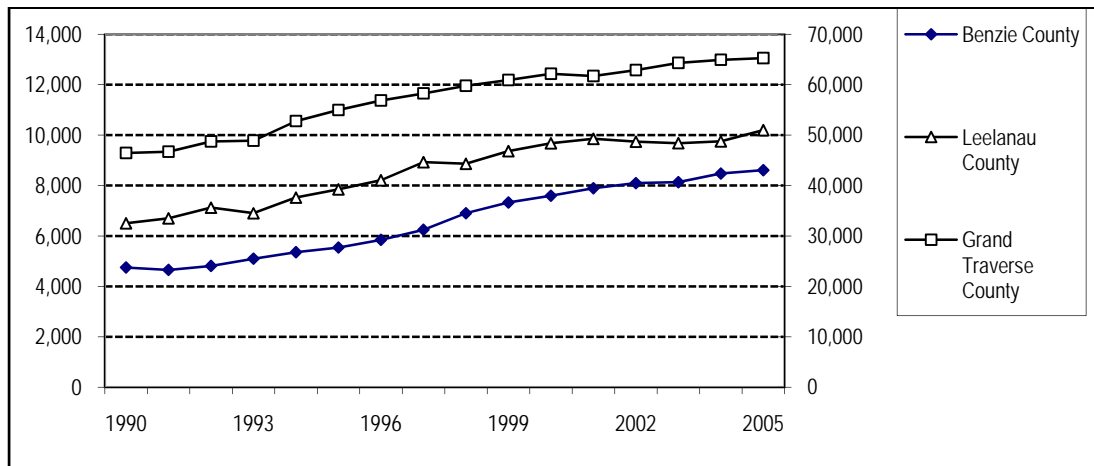
Strong economic growth accompanied the region's population growth. Total full- and part-time employment in Benzie County increased by 55% between 1995 and 2005. Employment gains in Grand Traverse County increased by 19% during the same 10 years. In Leelanau County employment increased by 30% during the same 10 years (see figure 5).

Recent economic growth and development has brought about differences in the economic structures of the individual counties. Employment data for 2005 highlight those differences (see table 10). Benzie County's economy tends

**TABLE 9: POPULATION GROWTH TRENDS, 1990 TO 2006**

	1990	2000	2006	Change 1990–2006	% Change 1990–2006
Benzie	12,200	15,988	17,652	5,452	45%
Grand Traverse	64,273	77,654	84,952	20,679	32%
Leelanau	16,527	21,119	22,112	5,585	34%
Michigan	9,295,297	9,938,444	10,095,643	800,346	9%

SOURCE: U.S. Census Bureau, 2002 and 2007(a)

**Figure 5: Total Employment in the Region, 1990 to 2005**

SOURCE: U.S. Bureau of Economic Analysis 2007

**TABLE 10: EMPLOYMENT BY MAJOR CATEGORY, 2005**

County	Total Employment	Agriculture*	Industrial**	Trade and Services***	Government****
Benzie	8,611	3%	27%	61%	9%
Grand Traverse	65,301	1%	24%	64%	10%
Leelanau	10,200	10%	17%	53%	20%

SOURCE: U.S. Bureau of Economic Analysis 2007

\* Includes farming, forestry and logging, hunting and fishing, and agricultural support activities.

\*\* Includes mining, utilities, construction, manufacturing, transportation &amp; warehousing, and administration &amp; waste services.

\*\*\* Includes wholesale and retail trade, information services, finance &amp; insurance, real estate, professional &amp; technical services, management of companies, educational services, health care, arts &amp; recreation, accommodation &amp; food services, and other services.

\*\*\*\* Includes federal, state and local government.

to be more industrial, that of Grand Traverse more trade and services oriented, and that of Leelanau more dependent on agriculture, government, and trade and services. Public sector employment, particularly local government employment, is important across the region, but particularly in Leelanau County. The latter reflects the substantial workforce employed by the Grand Traverse Band of Ottawa and Chippewa Indians (Grand Traverse Band).

Local employment and unemployment generally follow statewide trends, likely indicative of a correlation between statewide economic health and people's vacation/travel

patterns and spending. That pattern is evident over the past seven years as local unemployment rates climbed from 2000 through 2003/04, then stabilized or declined (see table 11). Unemployment rates are generally below the statewide averages in Leelanau and Grand Traverse counties; those in Benzie County tend to be higher. The latter is the result of multiple factors, including a less diverse economy base and higher reliance on seasonal industries.

In terms of employment, the federal government has a relatively modest presence in the regional economy. Federal agencies with the largest presence include the National Park

**TABLE 11: UNEMPLOYMENT RATES, 2000 TO 2006**

Area of Interest	Annual Average						
	2000	2001	2002	2003	2004	2005	2006
Benzie County	4.5%	5.8%	6.9%	7.9%	7.6%	7.7%	7.6%
Grand Traverse County	3.4%	4.7%	5.6%	6.2%	6.5%	5.9%	5.9%
Leelanau County	3.0%	3.7%	4.8%	5.6%	5.4%	5.1%	5.0%
Michigan	3.7%	5.2%	6.2%	7.1%	7.0%	6.8%	6.9%
United States	4.0%	4.7%	5.8%	6.0%	5.5%	5.1%	4.6%

SOURCES: U.S. Bureau of Labor Statistics, 2007

Service, U.S. Postal Service, U.S. Coast Guard, and Transportation Security Administration. Together these agencies reported a total of 1,105 (about 1.2%) of all jobs. The economic significance of these jobs is amplified by their relatively high average earnings and the associated operating, maintenance, and capital expenditures by the entities in the local economies.

Agriculture historically played a major role in the region, both in terms of land use and economics. Agriculture's economic significance has waned over time, but it continues to be important in terms of direct farm employment and indirectly through its support for agricultural services, trade, and tourism.

A total of 1,099 individual farms, encompassing a total of 147,729 acres, were operating in the three counties in 2002 (see table 12). Compared to five years earlier, those totals reflect 29 more farms but a reduction of more than 10,000 acres of farmland. These

changes reflect both recent subdivisions of large farms into smaller units, as well as the loss/conversion of farmland — typically to low-density rural residential uses (USDA-NASS 2004).

In 2002, 181 of the farms were in Benzie County, collectively covering 23,055 acres or 11% of the county's land area. Agricultural operations in Grand Traverse County involved 489 farms or about 21% of the county's land area, and the 429 farms in Leelanau encompassed 28% of the county's land area. (The calculations are based on the land area in each county. The area covered by lakes, streams, and other water bodies is excluded.) In 2002 sales of local crops and livestock generated more than \$60 million in the region. Fruit orchards and fields used to grow hay, corn silage, or other forage for livestock feed accounted for the largest uses of farm land. Apples, sweet cherries, tart cherries, and Christmas trees were the principal cash crops. Maple syrup is another

**TABLE 12: OVERVIEW OF AGRICULTURAL OPERATIONS IN THE REGION, 2002**

County	Number of Farms	Total Farm Employment	Acres in Farms	Average Size (Acres)	Market Value of Sales (Millions)
Benzie	181	200	23,055	127	\$ 8.0
Grand Traverse	489	594	62,268	127	\$ 20.6
Leelanau	429	662	62,406	159	\$ 32.8

SOURCES: USDA-NASS 2004 and U.S. Bureau of Economic Analysis 2007



important local farm product (USDA-NASS 2004). A local wine industry is emerging, with more than a dozen vineyards and wineries located on the Leelanau Peninsula. (Michigan Grape and Wine Industry Council 2007).

Outdoor recreation and tourism are vital cornerstones for the regional economy. In addition to the National Lakeshore, the following other recreation and tourism attractions are located in the Grand Traverse region:

- outstanding stream and lake fishing
- abundant boating and canoeing opportunities
- world-class golf courses
- museums and other heritage and cultural attractions, including the Point Betsie, Grand Traverse, and Old Mission lighthouses
- snowmobiling, along with Nordic and alpine skiing
- beaches
- natural areas, open space and state forests
- picnic areas; campgrounds; local, regional, and state parks; and trail systems
- winery tours on the Leelanau and Old Mission peninsulas
- casino gaming and entertainment
- local arts and cultural festivals

In addition, Michigan state routes M-22 and M-109 carry tourists who are following the Great Lakes Circle Tour. The tour connects all five Great Lakes and the St. Lawrence River and is a cooperative effort between the Great Lakes Commission, its eight member states, and the Canadian province of Ontario. Visitors and travelers support numerous jobs in the region's retail trade, accommodations and dining, and entertainment and other affiliated industries.

### **Commercial and Noncommercial Services Provided at Sleeping Bear Dunes National Lakeshore**

A variety of necessary and appropriate commercial visitor services are provided in the National Lakeshore, including non-motorized watercraft rentals, ferry services to the islands, vending machine snacks, and campground firewood sales. These services will be provided through concession contracts and/or commercial use authorizations, as applicable. Two concessions currently operate in the National Lakeshore. Manitou Island Transit, based in Leland, offers ferry service for day trips to South Manitou Island and overnight camping trips to both North Manitou and South Manitou islands. The other concession provides beverages and snacks from vending machines at the Dune Climb. Commercial use authorization holders based in nearby communities provide incidental commercial services such as educational programs, guided fishing, professional photography, and other services.

The Eastern National cooperating association operates three bookstores in the National Lakeshore — at the visitor center in Empire, at the Dune Climb, and at the Glen Haven General Store (the latter two seasonally).

The Friends of Sleeping Bear Dunes, Preserve Historic Sleeping Bear, Manitou Islands Memorial Society, and the Glen Arbor Art Association partner with the National Lakeshore to provide informational materials, extensive volunteer interpretation, restoration and preservation efforts, and other activities in concert with NPS staff. Preserve Historic Sleeping Bear and the Glen Arbor Art Association occupy historic buildings in the National Lakeshore.

### **Income and Poverty**

Total personal income in the three-county region was nearly \$4.0 billion in 2005 — \$469

million in Benzie County, \$804 million in Traverse County.<sup>2</sup> All three counties registered higher than average gains in total personal income, relative to the statewide average, between 2000 and 2005. The largest gains occurred in Leelanau County — 35% (see table 13).

More than 15% of all earnings paid by employers in Grand Traverse County, nearly \$375 million, was to workers commuting from outside the county. Residents of Benzie County benefited from a net inflow of \$87 million, while residents in Leelanau County generated a net inflow of \$221 million. In fact, such earnings by commuting workers were nearly 80% of wages and salaries earned by all workers within the county (see table 14). Net earnings inflows to Leelanau County have increased sharply in the past five years.

Dividends, interest, and retirement benefits and other nonearned income are significant sources of income for local residents — ranging from \$220 million in Benzie County to nearly \$907 million in Grand Traverse County. Such income actually exceeded total local wage and salary earnings of employees and proprietors in Benzie and Leelanau County. High levels of nonearned income are commonly indicative of a relatively high retired population in an area.

Recent favorable economic conditions are also manifested in local per capita incomes. Gains in per capita personal income ranged from 11% (Grand Traverse County) to 30% (Leelanau County) between 2000 and 2005 (see table 15). The statewide average increased

Leelanau County, and \$2.69 billion in Grand Traverse County by 13%. Per capita income in Leelanau County, which historically lagged behind the statewide average, is now 11% above the state average. Per capita incomes in Grand Traverse and Benzie counties continue to lag behind the statewide average (Benzie County residents by 19%). In terms of per capita income, Benzie, Grand Traverse, and Leelanau counties ranked 37th, 9th, and 4th in the state, respectively.

Another perspective on the economic welfare of residents is presented by data on median household incomes and poverty rates (see table 16). The incidence of poverty in all three counties is substantially lower than either the state or national averages. Grand Traverse and Leelanau counties have median household incomes that are above the state and national averages, and Benzie County has median household incomes that are below the state and national averages.

## Demographics

Residents of the region tend to be older than the general population statewide, with median ages ranging from 37.7 years in Grand Traverse County, to 40.8 years in Benzie County, to 42.6 years in Leelanau County. Leelanau and Benzie counties have relatively higher proportions of residents 55 years and older, many of whom are retired or semi-retired (see table 17).

The resident populations of all three counties are predominately white, with low minority populations and few Hispanic and Latino residents. American Indians are the largest minority population in the region, with 2,449 residents identifying themselves as such in the 2000 census. Many are members of the Grand Traverse Band of Ottawa and Chippewa

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<sup>2</sup>Personal income includes work-related earnings, social security, and other income maintenance payments, unemployment benefits, retirement, and income derived from investments. Total personal income is an indicator of the relative size of an economy, while changes in income over time may reflect changes in economic welfare, but also changes in the levels of economic activity, population, and inflation. Per capita, median, and other income measures provide a basis for comparing economic welfare between areas.

**TABLE 13: TOTAL PERSONAL INCOME**

Area	2000	2005	Percent Change 2000 to 2005
Benzie County	\$380,997,000	\$468,796,000	23%
Grand Traverse County	\$2,254,827,000	\$2,694,009,000	19%
Leelanau County	\$594,926,000	\$804,150,000	35%
Three-county total	\$3,230,750,000	\$3,966,955,000	23%
Michigan	\$294,226,742,000	\$331,348,575,000	13%

SOURCE: U.S. Bureau of Economic Analysis 2007

**TABLE 14: COMPOSITION OF TOTAL PERSONAL INCOME, 2005 (IN MILLIONS)**

	Benzie County	Grand Traverse County	Leelanau County
Earnings by Place of Work	\$183.1	\$2,430.5	\$281.7
Residency Adjustment	\$87.1	(\$374.6)	\$221.3
Social Security Deductions	(\$21.6)	(\$268.7)	(\$31.7)
Other Income to Residents	\$220.2	\$906.8	\$332.9
<b>Total Personal Income — Residents</b>	<b>\$468.8</b>	<b>\$2,694.0</b>	<b>\$804.2</b>

Notes:

1. A positive residency adjustment reflects a net inflow of earnings by residents of a county who are employed in another county, as compared to earnings paid by local employers to residents of other counties.
2. Other income includes dividends, interest, and rent, and personal current transfer receipts.
3. Social security deductions includes employee paid and employer paid social security taxes.

Source: US Bureau of Economic Analysis 2007

**TABLE 15: PER CAPITA PERSONAL INCOME, 2000 AND 2005**

	2000	2005	% Change 2000–2005	% of State Average	Statewide Rank (of 83)
Benzie County	\$ 23,647	\$ 26,676	13%	81%	37
Grand Traverse County	\$ 28,911	\$ 32,089	11%	98%	9
Leelanau County	\$ 27,978	\$ 36,502	30%	111%	4
Michigan	\$ 29,551	\$ 32,804	13%	NA	NA

SOURCE: U.S. Bureau of Economic Analysis 2005

**TABLE 16: MEDIAN HOUSEHOLD INCOME AND INCIDENCE OF POVERTY — 2004**

Area	Median Household Income	Individuals in Poverty (% of residents)
Benzie County	\$ 41,037	9.0%
Grand Traverse County	\$ 45,542	9.0%
Leelanau County	\$ 52,141	7.2%
Michigan	\$ 44,409	12.5%
United States	\$ 44,334	12.7%

SOURCE: U.S Census Bureau 2007d

**TABLE 17: SELECTED DEMOGRAPHIC CHARACTERISTICS, 2000**

Area of Interest	Median Age (Years)	Persons 19 or younger	Persons 55 years and older	Race: White	Race: Hispanic or Latino
Benzie County	40.8	25.4%	29.1%	97.6%	1.5%
Grand Traverse County	37.7	28.0%	21.9%	97.5%	1.5%
Leelanau County	42.6	26.6%	28.8%	94.4%	3.3%
Michigan	35.5	29.0%	20.1%	81.8%	3.3%

SOURCE: U.S Census Bureau 2002

Indians, given federal recognition as a tribe in 1980. The Grand Traverse Band has administrative headquarters in Peshawbestown, in Leelanau County, and holds lands in trust and in title in Benzie and Grand Traverse Counties. Tribal membership was 3,983 in 2005, though not all members reside on tribal lands or within the region (Grand Traverse Band 2007).

At the time of the 2000 census, approximately one in four residents in the three-county region had moved to their residence since 1995. Most of the recently migrated residents moved from elsewhere in Michigan, though 30% migrated from other states or from another country.

### Housing

At the time of the 2000 census, housing vacancy rates in all three counties were higher than the statewide average of 10.6%. Overall vacancy rates in both Leelanau and Benzie

counties were 37%, with more than 4,800 and 3,800 vacant units, respectively (see table 18). However, the majority of these units are second homes for seasonal, recreational, or occasional use, reflecting the region's vacation/tourism destination history.

Recent immigration and the region's continued attraction for vacation/second homes are reflected in new residential construction activity. Building permits were issued for more than 9,500 new housing units in the three counties from 2000 through 2006; the total represents a 16% increase over the total existing housing stock in 2000. Two-thirds of the permitted units were in Grand Traverse County, although Leelanau and Benzie Counties each issued permits for more than 1,600 new units. Many new units are located near the Lakeshore, including around Glen Arbor, Empire, and the areas near the southern portion of the National Lakeshore.

**TABLE 18: SELECTED HOUSING CHARACTERISTICS**

County	Total Units	Percent Occupied	Total Vacant Units	Vacant Units for Seasonal, Recreational or Occasional Use (Number / % of Total)	New Units Permitted, 2000 to 2006
Benzie	10,312	63%	3,812	3,181 / 31%	+ 1,625
Grand Traverse	34,482	87%	4,446	3,026 / 9%	+ 6,157
Leelanau	13,297	63%	4,861	4,111 / 31%	+ 1,725

SOURCE: U.S. Census Bureau 2002 and 2007c

Existing housing facilities at the National Lakeshore include 28 dwelling units used on a full-time or seasonal basis. The inventory includes 13 units on the mainland and the remainder on North Manitou or South Manitou islands. Most of the Lakeshore's housing resources are historic structures acquired by the National Park Service and renovated/ rehabilitated over time as part of the Lakeshore's ongoing cultural resource preservation efforts.

### Highway Traffic and Emergency Services

The National Park Service owns and maintains about 25 miles of road in the National Lakeshore. All are two-lane roadways, with the exception of the Pierce Stocking Scenic Drive and numerous one-way segments within campgrounds.

The primary highway access to and through the Lakeshore is Michigan State Route 22 (M-22), which runs north-south through or adjacent to the full length of the Lakeshore. M- 22 is a paved, two-lane facility, with paved shoulders varying from 1 to 5 feet in width.

Two other state routes, M-109 and M-72, are of particular importance to the National Lakeshore. Route M-109, branching from M-22 in Glen Arbor and reconnecting north of Empire, accesses Glen Haven, the Dune Climb, and Pierce Stocking Scenic Drive. Route M-72 provides the most direct highway connection between Empire and the Traverse City area. Both are two-lane, paved roads.

Leelanau and Benzie counties both have public road rights-of-way within the Lakeshore boundaries. These roads access private properties as well as providing access for many National Lakeshore recreational activities.

Traffic on the major state roads in the region, shown in table 19, is heaviest in the northern portion of the Lakeshore and near NPS headquarters in Empire. Traffic is highly seasonal, with peak traffic volumes of 40% to 50% above the annual average occurring in July and August during peak visitor use. Winter time traffic volumes are 30% to 40% below the annual averages.

**TABLE 19: TRAFFIC VOLUMES 2005/06, SELECTED LOCATIONS NEAR THE NATIONAL LAKESHORE**

Route/Location	Annual Average Daily Traffic (AADT)	Average Daily Commercial Traffic
M-22, north of the Lakeshore, south of SR 204	3,500	60
M-22, east of Port Oneida	2,000	60
M-22, south of Glen Arbor	1,300	50
M-22, north of Empire	2,700	40
M-22, south of Empire	1,300	NA
M-22, south of Benzie/Leelanau line	1,900	120
M-22, south of the Lakeshore, north of Frankfort	2,400	NA
M-109, west of Glen Arbor in the vicinity of Glen Haven	1,800	30
M-109, vicinity of Dunes Climb and Pierce Stocking Scenic Drive	1,300	20
M-72, east of Empire	2,400	300
US 31 north of Beulah and east of Honor	7,100	NA

SOURCE: Michigan Department of Transportation 2007

NA — commercial traffic volumes were not reported for this location

A 2001 transportation study analyzed then current and 20-year traffic forecasts for the major roads in the Lakeshore. The travel demand forecasts assumed a 1% annually compounded growth rate in traffic volumes. That analysis concluded that all of the major roads could accommodate the expected 2020 traffic volumes without expansions or major improvements. That analysis also examined the level of service at the key intersections in the National Lakeshore. At the time of the analysis, all major intersections were operating within the desired level of service, and with the exception of the intersection of M-22 and M-109 (in Glen Arbor) would continue to do so through 2020. (Robert Peccia & Associates 2001.)

The segments of M-22 and M-109 in Leelanau County through and near the Lakeshore comprise part of the state-designated Leelanau Scenic Heritage Route, a locally sponsored effort to preserve and enhance the natural, historic, cultural, and scenic resources and qualities in the area. The project has received approvals from the federal and state departments of transportation and has also received funding for further planning studies. The efforts include plans to develop a hard surfaced/paved 25-mile nonmotorized hike/bike trail along these roads. The hike/bike trail would generally be separated from the road shoulder.

Visitation to the National Lakeshore can increase highway traffic and subsequent public safety demands on local law enforcement and emergency medical service responders. The Benzie County Sheriff's Department responds to incidents in the Lakeshore from its office in Beulah. The Leelanau County Sheriff's Department responds to incidents in the Lakeshore from its office in Lake Leelanau. The Michigan State Police respond to incidents in the Lakeshore from a Post in Traverse City and Detachments in Honor and at the Leelanau County Sheriff's Office in Lake Leelanau.

NPS rangers and wildland firefighters also support public safety. NPS rangers respond to law enforcement, emergency medical service, and search-and-rescue incidents within the National Lakeshore. Federal law allows NPS rangers to respond to other emergency situations outside the Lakeshore's boundaries. The need for such response arises infrequently. Local fire departments and emergency medical responders provide additional capacity, including rescue capabilities. Emergency medical transport is via ambulance services associated with area hospitals. Hospitals are located in Manistee, Traverse City, and Frankfort.

NPS wildland firefighters respond to fires in and around the Lakeshore and also support wildland firefighting efforts throughout the United States.

### **Land Use and Landownership**

The predominant land uses in the study area include agriculture, forested areas; natural areas supporting wildlife and ecological conservation; outdoor recreation and other open space; rural residential use; and developed residential, commercial, and industrial lands. Industrial uses are concentrated in and near Traverse City, other communities in the area, and along the major highway corridors through the region.

Land use adjacent to the Lakeshore is a combination of private forested and farm lands and rural residential development, the latter including clustered developments around private inland lakes. Most of the three counties are zoned as agricultural, with residential uses allowed. Other uses in unincorporated areas require approvals from the respective zoning administrators and commissions. The majority of lands in all three counties are privately owned, although the state and local governments manage substantial tracts of public lands as well.

As a result of the federal lands included in the National Lakeshore, Benzie and Leelanau counties receive payments in lieu of taxes, or PILT. The PILT program is administered by the U.S. Bureau of Land Management and distributes payments to county governments containing qualified federal lands within their jurisdictional boundaries. The payments, which are subject to congressional appropriations, are to help offset the diminished property tax receipts due to nontaxable federal lands within their boundaries. A total of 8,091 eligible acres were located in Benzie County in fiscal year 2007, 39,889 acres in Leelanau County, and 2 acres in Grand Traverse County. Of these PILT-eligible lands, all but 3 acres were in the National Lakeshore.

Fiscal year 2007 PILT payments were \$14,250 to Benzie County and \$71,795 to Leelanau County. Grand Traverse County did not receive PILT payments in 2007 due to the limited acreage of PILT entitlement land within its boundaries. In recent years, congressional appropriations have funded the PILT program at about 68% of the statutorily approved levels (US DOI 2007).

### **Economic Contributions of Sleeping Bear Dunes National Lakeshore**

The Lakeshore is an important component of the regional economy. Spending by visitors to the Lakeshore, as well as NPS personnel and operating and maintenance expenditures, support local businesses and generate tax revenues to help support local governments.

**Visitor Spending.** An estimated 1,213,026 recreation visits occurred at Sleeping Bear Dunes National Lakeshore in 2006. Recreation visitation at the Lakeshore has been relatively consistent over time. The 17-year average of 1.19 million recreation visits, including about 110,000 overnight stays, nearly matches the visitation in 2006 (see

chapter 4 “Visitor Opportunities and Use” for more information on visitation).

Based on an estimated origin profile of Lakeshore visitors and typical spending patterns, a 2006 study of the economic contributions of national park system units estimated total annual visitor spending associated with the Lakeshore to be about \$33.4 million. The bulk of the total, about \$26.5 million (79%), is by non-local visitors staying overnight in area motels, bed-and-breakfasts, other lodging, and camping. (Stynes 2007).

Total spending by visitors includes entry and camping fees at the Lakeshore. In 2006, such receipts totaled about \$1,200,000. About 80% of the fees collected are retained by the Lakeshore for use in projects and programs that directly benefit visitors, such as facility maintenance and construction, visitor services and interpretive programs, and natural resource projects.

Visitor spending associated with the National Lakeshore supports an estimated 528 jobs across the region, generating \$9.2 million in annual personal income (Stynes 2007). Those sums are in addition to the NPS jobs at the Lakeshore and those supported indirectly by the payroll, operating expenses, and construction contracts issued by the National Park Service.

**Lakeshore Operations.** The annual budget for NPS operations at Sleeping Bear Dunes National Lakeshore helps the regional economy (utilities, supplies, and services support additional sales, jobs, and income). Spending of income by NPS employees also stimulates the regional economy. The effects of NPS operations are an addition to the effect of visitor spending associated with the National Lakeshore.

The annual base operating budget at the Lakeshore for fiscal year 2006 was \$3.51 million. The base budget was supplemented by funding for specific projects and funding

retained from entry and camping fees. These funds supported a staff of 46 full- and part-time, year-round employees and 84 seasonal employees. Annual payroll funding from the base budget was \$2.54 million in salaries and benefits, with another \$892,000 spent for utilities, services and travel, supplies, small equipment items, vehicles, and contracts for services. In addition, annual expenditures of about \$539,000 for salaries and personnel services and \$395,000 in other expenditures were funded via the portion of entry and camping fees retained by the National Lakeshore.

NPS payroll and spending in the local economy supports an estimated 25 to 30 additional jobs and \$1.4 million in personal income in the region.

Partner organizations and the large cadre of volunteers provide additional benefits to the regional economy in the form of purchases of goods and services, as well as spending by members and guests at events and activities hosted by the organizations. Many of the estimated 965 volunteers (FY 2007) active in the Lakeshore are themselves residents in the area, either year-round, or seasonal residents returning year after year. The economic value of the contributions by volunteers is estimated at \$600,000 and 17 full-time equivalent-employees per year.

**Combined Effects of Visitor Spending and Lakeshore Operations.** The combined effects of the visitor spending and NPS operations include nearly 700 full- and part-time jobs and \$13.6 million in personal income. Local spending supports local businesses and generates various fees and tax revenues to help support local government.

#### **Attitudes and Lifestyle Issues Associated with the National Lakeshore**

Although there is no single, established, defined gateway community associated with

Sleeping Bear Dunes National Lakeshore, there is a community comprised of the staff, visitors, partners, neighbors, and adjacent landowners, Lakeshore volunteers, American Indians, and many other interested individuals and entities. The latter include local, nonlocal, and even international residents, private enterprises, public interest groups, governmental agencies, and other institutions and organizations. The broader community also encompasses the residents and business owners of the surrounding region.

A wide spectrum of views, perspectives, and attitudes exist within that broad community regarding the Lakeshore and associated resources and opportunities. For some, the Lakeshore is seen primarily as an outdoor recreational resource; for others it is a unique and significant environment warranting conservation. Even among outdoor enthusiasts, attitudes regarding the Lakeshore vary among those who seek solitude and backcountry experiences commonly associated with wilderness, those who prefer enhanced motorized access to more of the Lakeshore (especially to Lake Michigan), and those who see the Lakeshore and the surrounding environs as contributing to their spiritual or emotional well-being.

Members of this community, be they individuals, groups, or institutions, ascribe to multiple views toward the Lakeshore, how it currently affects them, and how it could affect them if the Lakeshore were managed differently in the future. Moreover, many may see both benefits and adverse effects on their personal and community lifestyles, depending on how the Lakeshore is managed. For example, some residents of the Glen Arbor community may see economic development potentials associated with future recreation use while also being concerned about the potential traffic impacts of such use.

Among local residents, the subject of public access to various areas of the Lakeshore and the recreational opportunities afforded



thereby is perhaps the single most critical issue associated with future management of the Lakeshore, and resolution of that issue may shape their sentiments toward the Lakeshore over the long term. For others, efforts to preserve and interpret the historical and cultural resources in the Lakeshore are of paramount concern. And for others, preservation and protection of the natural environment and scenic vistas is of utmost importance.

The range and divergence of attitudes regarding the Lakeshore has been apparent in the high level of active participation in the GMP process, including attendance at open houses, comments during scoping, and responses to the GMP newsletters.

## **NPS OPERATIONS**

### **Operations and Management**

Sleeping Bear Dunes National Lakeshore is administered by a superintendent, assistant superintendent, and several division chiefs. Management of the Lakeshore is organized into the superintendent's office and five functional divisions. The functional divisions are discussed in the sections that follow. As of 2007, there were 66 full-time-equivalent (FTE) employees at the National Lakeshore.

The superintendent is directly responsible for the assistant superintendent, the environmental protection specialist, the superintendent's secretary, and indirectly for the five division chiefs. In addition to responsibilities for overall leadership and coordination, the superintendent's staff (four FTE employees in 2007) is responsible for public and external affairs, planning and compliance, and safety. The main base of operations for the superintendent's office is the leased visitor/administrative center building in Empire.

### **Interpretation and Visitor Services Division**

Interpretation and visitor services includes education services for diverse audiences, interpretation of themes, staffing the visitor center, providing information and orientation for visitors through personal (guided) and nonpersonal services (e.g., web site, publications, exhibits, and Volunteer-in-the-Parks program). This division is also responsible for managing the library, fee collection, campground management, and museum collections. The main base of operations for interpretive and visitor services staff is the visitor/administrative center building in Empire. As of 2007, there were 14 FTE employees in this division.

### **Resource and Visitor Protection Division**

The resource and visitor protection division is responsible for visitor and employee safety, resource protection, emergency response, park and facility patrols, security, emergency medical services, search and rescue, structural fires, law enforcement, air operations, resource protection education, dispatch, and concession operations in the Lakeshore. As of 2007, there were 12 FTE employees in this division. The main base of operations for this division is the visitor/administration center building in Empire, with district ranger offices at the Platte River Campground (Platte River District) and the D.H. Day Store in Glen Haven (Leelanau District). The Leelanau District has responsibility for protection operations on the Manitou Islands.

### **Facility Maintenance Division**

The facility maintenance division is responsible for operation and maintenance of park facilities and equipment, including structures and grounds, utilities, roads and parking areas, trails and trailheads, picnic areas, signs, and vehicles. This division is also responsible for managing cultural resources (archeological

sites, historic structures, cultural landscapes, and ethnographic resources). The main base of operations for the division is the maintenance area located about a mile south of Empire. As of 2007, there were 26 FTE employees in this division.

### **Natural Resources Management Division**

The natural resources management division is responsible for management of natural resources, including natural resource inventory and monitoring, managing natural resource research, protecting threatened and endangered species, restoring disturbed sites, managing invasive nonnative species, monitoring water quality, operating the Geographic Information System, and managing wildland fires. This division is operated out of the visitor/administrative center in Empire. Biological technicians work out of the natural resources field station in the central part of the Lakeshore. As of 2007, there were five FTE employees in this division.

### **Administration Division**

The administration division is responsible for the Lakeshore's budget, fiscal, purchasing, property management activities, and the lands program. Administration also has responsibility for human resources, information technology, communications, and housing. The main base of operations for administrative staff is the visitor/administrative center building in Empire. As of 2007, there were five FTE employees in this division.

### **Volunteers and Partners**

Sleeping Bear Dunes has an unusually large volunteer program that is coordinated by the interpretation and visitor services division. Volunteers contributed 35,544 hours of volunteer services in FY 2007. The National Lakeshore also benefits from the contribu-

tions of several cooperative partner organizations (see below).

Eastern National is a nonprofit cooperating association that provides educational products and services to Lakeshore visitors. A portion of proceeds are donated back to Lakeshore interpretive and educational programs. Eastern National operates bookstores at the visitor center in Empire, the Dune Center (at the Dune Climb), and the Glen Haven General Store.

Friends of Sleeping Bear Dunes helps with preserving and restoring the National Lakeshore's natural, historic, and recreational resources. This group raises funds via donations and grants, and helps by volunteering on a variety of projects, such as trail maintenance and revegetating disturbed areas.

Preserve Historic Sleeping Bear is a nonprofit organization committed to preserving historic structures and cultural landscapes of the National Lakeshore through fund-raising and volunteer services.

The Manitou Islands Memorial Society helps preserve the Manitou Islands' cultural traditions, provides educational materials and programs, promotes care and maintenance of the islands' historic assets, keeps island burial records, and provides volunteer help.

The Glen Arbor Art Association has been working with the National Lakeshore in recent years to restore the historic Thoreson Farm in Port Oneida. Through a special use permit, the association uses the farm for art and education programs.

### **Facilities and Infrastructure**

**Introduction.** Infrastructure at Sleeping Bear Dunes National Lakeshore includes a diverse set of facilities or "assets" (e.g., structures, roads, parking areas, picnic areas, utility and wastewater systems, maintained landscapes,

campgrounds, and communication systems). Increased operational requirements, reduced funding, and lapsed staff positions have caused the staff to defer routine maintenance of some facilities. Deferred maintenance is work that should ideally have been done at specific times but was not, primarily due to budget constraints. Deferred maintenance often leads to costly repairs over time.

The National Park Service monitors deferred maintenance in park units using a facility management tracking system. The National Park Service is striving to reduce the deferred maintenance backlog throughout the national park system by prioritizing projects and funding them through various sources, including the Federal Lands Recreation Enhancement Act. During 2006-2007, the National Lakeshore updated information in the facility management tracking system relating to the condition and importance of its assets.

**Structures.** National Lakeshore staff is responsible for maintaining about 475 structures, more than 360 of which are historic. Examples include ranger and visitor contact stations, maintenance shops, employee residences, and historic Life-Saving Service stations and homesteads.

**Roads.** The primary vehicle travel corridor through the National Lakeshore is along state-managed M-22 and M-109. This road corridor is a state scenic heritage route. Most road rights-of-way in the National Lakeshore are managed by Benzie or Leelanau counties. Some of these roads provide access to Lake Michigan beaches or other Lakeshore features, while others provide access to private property. Some roads do not access any particular feature or property, having formerly served private properties that no longer exist.

A few roads are owned and managed by the National Park Service. Tiesma Road, located near the Platte River in the south part of the

National Lakeshore, is a 1-mile-long gravel road that approaches the Lake Michigan shoreline. Pierce Stocking Scenic Drive, in the central portion of the Lakeshore, is a popular 7.4-mile, one-way, slow-speed scenic loop road. Facilities along the scenic drive include an entrance station, parking areas, pull-offs, wayside exhibits, scenic overlooks, restrooms, and trailheads. The scenic drive includes a bicycle lane that is suitable for experienced cyclists. Interpretive pamphlets that highlight features along the scenic drive are available for visitors.

**Trails.** The National Lakeshore includes more than a dozen trails and trail systems, ranging in length from just over a mile to nearly 15 miles. The trails vary in terms of terrain and habitat. Table 20 summarizes characteristics of the mainland trails. In addition to the mainland trails, North Manitou and South Manitou islands have extensive trail systems.

**Campgrounds and Camping.** Platte River campground, in the south portion of the National Lakeshore, is the most developed campground in the Lakeshore. Amenities include paved roads, showers, flush toilets, water, a few sites with electrical hook-ups, and a canoe launch. The campground includes walk-in and group sites. Campsites can be reserved in advance.

The D. H. Day campground, in the central part of the National Lakeshore mid-way between Glen Haven and Glen Arbor, is more rustic. It has potable water, a small amphitheater, a nature center, vault toilets, dirt roads, and beach access. Campsites are assigned on a first-come, first-served basis.

A group campground is located northwest of Little Glen Lake. This campground is referred to as the D. H. Day group campground, but it is separate from the D. H. Day campground referred to above.

**TABLE 20: TRAILS AND TRAIL SYSTEMS AT SLEEPING BEAR DUNES NATIONAL LAKESHORE**

Trail Name	Length (miles)	Terrain	Vegetation	Location in the Lakeshore	Notes
Old Indian Trail	2.5	Flat to gently rolling with a few sections of steep hills	Evergreens and hardwoods	south	Trail leads to a view of Lake Michigan
Platte Plains Trail	14.7	Mostly flat	Pine-oak-aspen	south	Three views of Lake Michigan
Empire Bluff Trail	1.5	Hilly	Beech-maple, fields, dune plants	south	Overlook on a high bluff over Lake Michigan
Windy Moraine Trail	1.5	Hilly	Beech-maple, old fields, pine plantation	central	Views of Glen Lake
Shauger Hill Trail	2.4	Hilly	Beech-maple	central	Crosses Shauger Hill Road and Scenic Drive
Cottonwood Trail	1.4	Rolling Dunes	Grasses, shrubs, wildflowers of the dunes	central	Loose sand (strenuous). Views of Lake Michigan and sand dunes
Dunes Trail	3.5	Steep, rugged dunes	Grasses, shrubs and wildflowers of the dunes	central	Strenuous hike through dunes leads to Lake Michigan. 2–4 hour round trip.
Duneside Accessible Trail	0.9	Flat	Field and beech-maple, white cedar	central	Wheelchair accessible
Sleeping Bear Point	2.8	Rolling Dunes	Grasses, shrubs, wildflowers	central	Loose sand, views and access to Lake Michigan.
Alligator Hill Trail	9	Hilly	Beech-maple, fields, pine plantation	central	Several loops, overlooks of Lake Michigan and Glen Lake. Horses permitted.
Bay View Trail	8	Hilly	Beech-maple, fields, pine plantation	north	Panoramic view of Lake Michigan and fields of wildflowers
Pyramid Point Trail	2.7	Hilly	Beech-maple and fields	north	Overlook of Lake Michigan
Good Harbor Bay Trail	2.8	Flat, wet in places	Wooded, some dunes	north	Boardwalk over creek

There are two backcountry campgrounds on the National Lakeshore's mainland. White Pine campground is on the Platte Plains trail system near the Platte River campground, within walking distance of Lake Michigan. Valley View campground is northeast of Glen Arbor. This campground has no potable water service and relatively little use.

On South Manitou Island, camping is allowed at three designated campgrounds; backcountry permits are required. On North Manitou Island, backcountry camping in nondesignated areas is allowed in most areas (special restrictions apply and backcountry permits are required) and at the Village campground.

There are a variety of non-NPS campgrounds outside the National Lakeshore.

**Dune Climb.** The Dune Climb, located west of Little Glen Lake in the central part of the National Lakeshore, is one the Lakeshore's most popular family attractions. Facilities include an entrance station, large gravel parking area (scheduled for paving in 2008), picnic tables, Dune Center (bookstore and restrooms), and food and beverage vending area.

**Beach Access Points.** Lake Michigan beaches are accessible by motor vehicle at various points within the National Lakeshore. The beach access points are accessed via county-owned roads unless noted otherwise below.

In the south part of the National Lakeshore, the Platte River Point beach access area, near the mouth of the Platte River, is especially popular. Platte River Point has three paved parking lots (two NPS-owned and one owned by Lake Township), restrooms, picnic tables, paved paths, a boat ramp, and a canoe landing. Other beach access points in the south part of the National Lakeshore include one at the end of NPS-owned Tiesma Road, one at the end of Peterson Road ("Peterson Beach"), and one at the end of Esch Road ("Esch Beach"). These beach access points are minimally developed, with vault toilets (except Tiesma Road) and parking along the road ends.

Beach access points in the central part of the National Lakeshore include North Bar Lake, Glen Haven, and the Sleeping Bear Point maritime museum area. Facilities at North Bar Lake include a paved parking area, picnic tables, and vault toilets. Glen Haven has a restroom, picnic area, and parking scattered throughout the site, but a large parking area is being designed. Sleeping Bear Point access points are available along Sleeping Bear Drive and at the Maritime Museum. Also, more remote beaches at Sleeping Bear Point may be

accessed from the Sleeping Bear Point trailhead.

Beach access points in the north part of the National Lakeshore are the County Road 651 and 669 road ends at Good Harbor Bay. These beach access points are minimally developed, with vault toilets and uncontrolled parking along the road ends. Modest improvements (potable water, picnic facilities, and expanded parking) will soon be implemented.

**Facilities at Inland Lakes and Rivers.** There are 26 inland lakes in the boundaries of Sleeping Bear Dunes National Lakeshore. Motorized boats are permitted on Loon Lake, North Bar Lake, Bass Lake (Leelanau County), and School Lake. Lakes with motor vehicle access or facilities for visitors are described briefly below.

In the south part of the Lakeshore, Loon Lake has a boat ramp, dock, restrooms, and a picnic shelter. Bass Lake (Benzie County) has a dock, hand launch boat ramp, and restroom. Otter Lake has a small dock and a boat launch for canoes and kayaks.

North Bar Lake is in the central part of the Lakeshore. In addition to paved parking, restrooms, and picnic tables, North Bar Lake has a modest launch for small boats.

In the north part of the Lakeshore, School Lake has a launch for small boats and a vault toilet. Shell and Tucker lakes are accessible by vehicle but have no facilities.

National Lakeshore facilities at Platte River are fully developed, and at Crystal River are modestly developed (small parking area and put-in for paddlers).

**Picnic Areas.** Picnic areas in the National Lakeshore include Platte River picnic area in the south part of the Lakeshore, Glen Lake

picnic area in the central part of the Lakeshore, and Good Harbor picnic area in the north part of the Lakeshore. Picnic tables are also available at the Dune Climb, North Bar Lake, Glen Haven, Pierce Stocking Scenic Drive, and a few other locations around the Lakeshore.

**Historic Sites and Areas.** There are a variety of historic sites and areas in the National Lakeshore, such as Glen Haven, Port Oneida, and life-saving stations. These facilities are described in the “Historic Resources” section of this chapter.

**Accessible Facilities.** Most public facilities in the Sleeping Bear Dunes National Lakeshore are wheelchair accessible. Each campground has handicap-accessible campsites. The wheelchair-accessible Duneside Trail is available near the Dune Climb. Some locations are wheelchair accessible with assistance, such as the overlooks along the Pierce Stocking Scenic Drive. Sand wheelchairs are available at the Maritime Museum boathouse and at the

Dune Climb to enable disabled individuals to enjoy the dunes and beaches.

For visitors and staff who have some degree of hearing loss, the National Lakeshore has installed a permanent assistive listening device at the Philip A. Hart Visitor Center information desk. A compact text telephone (TTY) device is available at the visitor center’s pay telephone. Portable wireless FM assistive listening devices are also available for interpretive programs in the visitor center, ranger-led walks outdoors, and evening programs in the campgrounds.

**Operational Facilities.** The National Lakeshore’s main administrative offices are in the Philip A. Hart Visitor Center building in Empire, Michigan. The National Park Service leases this structure. The main maintenance facility is about a mile south of Empire, with smaller maintenance support facilities at Platte River Campground and on each of the Manitou Islands. Ranger stations are located at Platte River, Glen Haven, and on each of the Manitou Islands. A natural resources field station is located on Harwood Road.

## IMPACT TOPICS CONSIDERED BUT NOT ANALYZED IN DETAIL

### MUSEUM COLLECTIONS

The National Lakeshore's collections are made up of archeological objects, both prehistoric and historic, and natural history specimens that have been systematically recovered from within the Lakeshore's boundaries and historic items associated with the history and development of the agricultural and maritime economy of the region. The collections also include natural history categories on biology, paleontology, and geology associated with the origins of the National Lakeshore and its native flora and fauna. The museum collections and archives support the National Lakeshore's interpretive themes and assist in research and resource management programs.

The collection itself consists of more than 66,000 objects. Many are on display at the Philip A. Hart Visitor Center, the Cannery Boat Museum, the Sleeping Bear Point Coast Guard Station/Maritime Museum, and at various other locations throughout the National Lakeshore. Other curated items are stored in two climate-controlled structures in the National Lakeshore and at various off-site museums and universities.

The collections can be expected to grow with continuing archeological investigations, inventory and monitoring activities, and other permitted research. Moreover, archival collections can be expected to expand as historical research continues.

Under all alternatives, museum objects would be stored or exhibited outside the floodplain. Museum objects would continue to be acquired, accessioned and cataloged, preserved, protected, and made available for access and use according to NPS standards and guidelines (*NPS Museum Handbook* and Director's Order 24, "Museum Collections Management"). Museum objects would not be

affected under any of the alternatives, and this topic has been dismissed from further consideration.

### ETHNOGRAPHIC RESOURCES

Ethnographic resources are defined by the National Park Service as any "site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it."

Ethnographic studies are needed to formally identify groups of people with traditional associations to park lands and waters. Although no groups have been formally identified yet, several American Indian tribes were consulted about ethnographic resources and tribal concerns related to actions that might be proposed within the plan. No sacred sites were identified. A Consent Decree on the *U.S. v. Michigan 1836 Inland Treaty Rights* case was signed in November 2007. The Consent decree recognizes a treaty-retained right for tribal members to engage in certain hunting, fishing, and gathering activities in the ceded territory (including the National Lakeshore). The five Michigan Indian tribes involved in the agreement are the Bay Mills Indian Community, the Sault Ste. Marie Tribe of Chippewa Indians, the Little Traverse Bay Bands of Odawa Indians, the Grand Traverse Band of Ottawa and Chippewa Indians, and the Little River Band of Ottawa Indians.

It is likely that other ethnographic resources exist in the National Lakeshore. The National Lakeshore will conduct ethnographic studies when funding becomes available. Until such studies are conducted, there is insufficient information upon which to analyze ethnographic resources.

No actions are proposed in this plan's alternatives that would affect specific known ethnographic resources; therefore, the topic has been dismissed. Should any ethnographic resources be identified after the plan has been published, they would be treated according to the requirements of the applicable laws and policies.

Copies of the *General Management Plan* will be forwarded to each associated tribe for review and comment. If subsequent issues or concerns are identified, appropriate consultations would be undertaken. Because ethnographic resources would be unaffected, and because all provisions of the 1990 Native American Graves Protection and Repatriation Act (25 USC 3001) would be followed to protect any human remains, funerary objects, sacred objects, or objects of cultural patrimony inadvertently discovered, ethnographic resources were dismissed as an impact topic.

## ARCHEOLOGICAL RESOURCES

Archeological resources — the physical evidence of past human activity — represent both prehistoric and historic occupations at Sleeping Bear Dunes National Lakeshore. A complete assessment and documentation of the National Lakeshore's archeological resources has not been undertaken; however, identification of such resources is ongoing.

Despite the lack of a comprehensive archeological survey, approximately 120 prehistoric sites have been identified over the years. By law and policy, prior to activities that require disturbance of previously undisturbed lands, an archeological evaluation is undertaken to ensure that no resources on or eligible for inclusion on the national register are lost or damaged due to NPS activities. As appropriate, archeological surveys and/or monitoring would precede any construction. Known archeological resources would be avoided to the greatest extent possible. If National Register eligible or listed archeological

resources could not be avoided, an appropriate mitigative strategy would be developed in consultation with the state historic preservation officer and, if necessary, associated American Indian tribes. Due to the avoidance of archeological resources during construction, few if any adverse effects would be anticipated.

If during construction previously undiscovered archeological resources were uncovered, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and an appropriate mitigation strategy developed in consultation with the state historic preservation officer and, if necessary, associated American Indian tribes.

At present, one American Indian-related archeological site within the National Lakeshore is listed on the national register. An archeological site in Benzie County was entered onto the National Register of Historic Places on April 27, 1990. It is a locally significant, multi-component campsite, with evidence of repeated prehistoric occupations over both the Middle and Late Woodland periods in addition to late historic Euro-American occupation. Its period of significance was from ca. AD 300–1100.

Because the National Park Service is required by law and policy to evaluate archeologically any site proposed for development, and because this plan does not entail actions that would affect specific known archeological resources, this topic has been dismissed from further consideration.

## INDIAN TRUST RESOURCES

The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian



and Alaska Native tribes. Secretarial Order 3175 requires that any anticipated impacts to Indian trust resources from a proposed project or action by U.S. Department of the Interior agencies be explicitly addressed in environmental documents.

There are no Indian trust resources in Sleeping Bear Dunes National Lakeshore. The lands comprising the National Lakeshore are not held in trust by the secretary of the interior for the benefit of Indians due to their status as Indians. Therefore, Indian trust resources was dismissed as an impact topic.

## **AIR QUALITY**

The Clean Air Act of 1955, as amended (42 USC 7401 et seq.) was established to promote the public health and welfare by protecting and enhancing the nation's air quality. The act established specific programs that provide special protection for air resources and air quality-related values associated with NPS units. Section 118 of the Clean Air Act requires parks to meet all state, federal, and local air pollution standards. NPS *Management Policies 2006* addresses the need to analyze potential impacts on air quality during park planning.

The Clean Air Act and pursuant regulations classified areas of the country by existing and desired air quality conditions. Sleeping Bear Dunes National Lakeshore is listed as a Class II area by Congress. Class II areas of the country are protected under the act, but less stringently than Class I areas, which include a limited number of specially designated wilderness areas and national parks (such as the Grand Canyon) where outstanding visibility is critical.

Baseline air quality studies were conducted in the Lakeshore during 1987 and 1988 with indications that air was of very good quality. Examination of sulfur dioxide-sensitive lichens in the Lakeshore revealed very little

impact from this pollutant. White pine needles showed the least damage due to air pollution of all parks tested in Michigan. The area has only light industry, and as a result has extremely good visibility most of the time. Fog from Lake Michigan is the only occasional hindrance to good visibility at Sleeping Bear Dunes. (NPS 2005a.)

None of the actions described in the *General Management Plan* would violate any air quality standard or result in a cumulative net increase of any criteria pollutant under federal or state ambient air quality standards. Implementation of any of the alternatives described in the *General Management Plan* would have negligible effects on air quality, and the Lakeshore's Class II air quality would be unaffected. Therefore, air quality was dismissed as an impact topic.

## **MICHIGAN STATE-LISTED SPECIES**

### **Northern Goshawk**

The northern goshawk (*Accipiter gentilis*) is a Species of Concern and a resident in Michigan. Northern goshawks use a range of forest habitats that include conifers, deciduous stands, riverine forests, or plantation stands. These forest habitats are generally characterized by an intermediate degree of canopy closure, small gaps in the forest, and an open understory. Nest tree species will vary, but birch, maple, and conifers are common (Cooper 1999a). The northern goshawk ranges from Alaska and Canada in the north, down to central California, southeast Arizona, and southern New Mexico in the western United States. In the eastern United States, populations range along the Appalachian Mountains to Tennessee and North Carolina. In Michigan, the goshawk is found primarily in the northern Lower Peninsula and across much of the Upper Peninsula. Northern goshawk populations in Michigan suffer from habitat alteration and destruction, primarily as a result of timber harvest, road construction,

and urban development (Cooper 1999a). Fragmentation of forest habitats encourages invasion by nest competitors and predators such as red-tailed hawks (*Buteo jamaicensis*) and great-horned owls (*Bubo virginianus*). Management practices should aim to preserve large blocks of contiguous forest habitat with intermediate canopy closure and large trees for nesting.

The only documented occurrences of northern goshawk in the Lakeshore are in an area north of the Platte River and on South Manitou Island. Because none of the alternatives propose activities that are anticipated to have measurable impacts on the suitability of this area for northern goshawks, this species is not carried forward for detailed consideration as an impact topic in chapter 5.

### Grasshopper Sparrow

The grasshopper sparrow (*Ammodramus savannarum*) is a Species of Concern in Michigan. It inhabits a range of grassland habitats including cultivated and fallow fields, hay fields, and other sites with tall dense grass (MNFI 2007). This species ranges from southern Canada and eastern Washington south through the plains states and along the East Coast down to the Gulf Coast. Breeding populations can also be found in coastal California and southern Idaho. The non-breeding range extends into Mexico and Central America and the Caribbean. In Michigan, the grasshopper sparrow is found primarily in the Lower Peninsula and a few counties of the central Upper Peninsula. This species is in decline due to the loss, degradation, and incompatible management of grassland habitats throughout its North American range. Grasshopper sparrow habitats should be managed to maintain grass-dominated habitat and prevent shrub encroachment. Prescribed burns or mowing for vegetation management should be conducted in the fall after birds have migrated (MNFI 2007).

Grasshopper sparrows are found in open, cultural landscapes in the northern section of the Lakeshore. Because all alternatives would conserve the habitat supporting this species, and no actions are proposed in the alternatives that would be anticipated to impact this species, this species is not carried forward for detailed consideration as an impact topic in chapter 5.

### Least Bittern

The least bittern (*Ixobrychus exilis*) is listed as threatened by the state of Michigan. This species occupies a variety of freshwater and brackish marshes with dense, tall growths of aquatic or semiaquatic vegetation interspersed with clumps of woody vegetation and open water (Monfills 2003).

In the Lakeshore, this species is known only in the central section of the Lakeshore. As no alternatives include actions that may be anticipated to potentially impact this species, the least bittern is not carried forward as an impact topic.

### Calypso or Fairy-slipper

The Calypso orchid or fairy-slipper (*Calypso bulbosa*) is listed as threatened by the state of Michigan. This widespread species nearly circles the globe in the northern hemisphere, ranging throughout North America, Europe, and Asia. Calypso is widely distributed in the northern Lower Peninsula and the Upper Peninsula of Michigan. At least eight counties have records dating since 1980. Most mainland — especially more southerly — colonies consist of few plants, but large colonies with hundreds of plants occur occasionally to the north, especially on Isle Royale. Calypso is an inhabitant of moist coniferous forests with cool soils. In Michigan, it is found in spruce balsam-cedar swamps, and also in drier cedar-fir thickets along the shores of the upper Great Lakes.

When found in boggy areas, it inhabits drier hummocks or the bases of old trees or stumps. It is nearly always in the shade (Higman and Penskar 1996b).

In the lakeshore, Calypso is known only from the eastern side of South Manitou Island. No actions within the alternatives would be anticipated to impact this location or species. Therefore, this species is not carried forward for further analysis as an impact topic.

### **Beauty Sedge**

Beauty sedge (*Carex concinna*) is a species of special concern in Michigan. It is found on cobbly gravelly limestone shores of northern Lake Huron and northern Lake Michigan. It is also found inland in glades, especially where limestone bedrock is close to the surface, occurring at the edges and within coastal forests of cedar, fir, and spruce. Recent surveys have determined that this species is more common than previously thought, and it has been proposed for delisting.

In the National Lakeshore, beauty sedge is known from one location in the northern part of the central mainland section. None of the alternatives propose activities that would be anticipated to impact this location or species. Therefore, this species is not carried forward for further analysis as an impact topic.

### **Broad-leaved Sedge**

This species (*Carex platyphylla*) is listed as threatened by the state of Michigan and is known from four Michigan localities, with one site each in Berrien and Van Buren counties, one St. Clair County record within a state game area, and a relatively recent discovery in 1988 in Leelanau County in Sleeping Bear Dunes National Lakeshore. Most of these populations were observed to be very sparse and localized. Over its broader

range, this sedge prefers well-drained to rocky slopes in rich deciduous woods.

In the National Lakeshore, broad-leaved sedge is known from one location in the central mainland section. None of the alternatives propose activities that would be anticipated to impact this location or species. Therefore, this broad-leaved sedge is not carried forward for further analysis as an impact topic.

## **FLOODPLAINS**

Executive Order 11988, "Floodplain Management," requires federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with occupancy and modifications of floodplains, and to avoid direct and indirect support of floodplain development whenever there is a practicable alternative. Section 4.6.4 of NPS *Management Policies 2006* states that the National Park Service will manage for the preservation of floodplain values and minimize potentially hazardous conditions associated with flooding. NPS Director's Order 77-2 and the accompanying "Procedural Manual" (2003) provide guidance and procedures for implementing floodplain protection and management actions in units of the national park system.

Approximately 20 miles (32 km) of streams that contain floodplains traverse the National Lakeshore on the way to Lake Michigan. No episode of flooding has occurred in the Lakeshore within the past 13 years. Flooding is not typically a concern in this area because of the high porosity and rapid drainage of the sandy soils and the limited size of surrounding watersheds. This topic was therefore dismissed from detailed analysis.

## COASTAL ZONE MANAGEMENT

Michigan established a coastal management program in response to the Coastal Zone Management Act (1972). The Michigan program was developed to improve protection of sensitive shoreline resources, identify coastal areas appropriate for development, designate areas hazardous to development, and improve public access to the coastline. The program includes grants, administration of sections of Michigan's Natural Resource and Environmental Protection Act that are related to coastal resources (1994 PA 451), and review of federal agency activities for consistency with Michigan's approved program. The three elements of the coastal zone management program — high-risk erosion areas, flood risk areas, and environmental areas — provide consumer protection from the natural hazards of coastal erosion and flooding as well as environmental protection.

The only designated Coastal Zone Management Area on the Lakeshore mainland is a narrow band in the south end of the Lakeshore. No actions proposed in the alternatives in this plan would alter the Lake Michigan shoreline. The National Park Service proposes no development in any area of the National Lakeshore that would conflict with the coastal management program. This topic was therefore dismissed from detailed analysis.

## WATER QUANTITY

Analysis of potential impacts on water resources typically includes consideration of both water quality and water quantity. Because no water withdrawals, diversions, or other activities are proposed in the alternatives that would affect water quantity in rivers, ponds, or lakes, this topic was dismissed from detailed analysis.

## PRIME OR UNIQUE FARMLAND

In 1980 the Council on Environmental Quality directed that federal agencies must assess the effects of their actions on farmland soils classified by the Natural Resources Conservation Service as prime or unique. Prime farmland is defined as soil that produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts.

Some prime and unique farmlands exist in the National Lakeshore, but these have essentially been removed from potential agricultural production in perpetuity due to creation of the Lakeshore. There could be some limited site-specific disturbance to prime and unique soils from development of an M-22/M-109 hike/bike trail, but because these soils are not in production, there would be no loss of agricultural production. Should it be determined that these soils qualify for consideration as prime and unique farmlands relative to potential construction of the M-22/M-109 hike/bike trail, they would be addressed in a future compliance document. This topic was therefore dismissed from detailed analysis.

## ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL

The implementing regulations of the National Environmental Policy Act require that energy requirements, natural or depletable resource requirements, and conservation potential be analyzed. Any differences between the alternatives in terms of these factors would be localized and negligible. Therefore, this topic was dismissed from detailed analysis.

## ENVIRONMENTAL JUSTICE

Presidential Executive Order 12898, *General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires all federal agencies to

incorporate environmental justice into their missions by identifying and addressing the disproportionately high and/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. According to the Environmental Protection Agency, environmental justice is the

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

Benzie and Leelanau counties contain both minority and low-income populations and communities; however, environmental justice was dismissed as an impact topic for the following reasons:

- The Lakeshore staff and planning team actively solicited public participation as part of the planning process and gave equal consideration to input from all persons regardless of age, race, income status, or other socioeconomic or demographic factors.

- The alternatives would not result in any disproportionate human health or environmental effects on minorities or low-income populations and communities.
- The alternatives would not result in any effects that would be specific to any minority or low-income community. Any anticipated impacts, such as increased traffic or demand for emergency services, would not disproportionately affect minority or low-income populations. Impacts would not occur all at one time but would be spread over a number of years.

## **WILD AND SCENIC RIVERS**

The National Park Service maintains a Nationwide Rivers Inventory, which is a register of river segments that potentially qualify as national wild, scenic, or recreational river areas. The Crystal River and the Platte River are included on the National Rivers Inventory (see appendix E for more information). Through management zoning, user capacity management, and modest facility modifications or upgrades, the alternatives in this plan would enhance the qualities that make these rivers eligible or suitable for designation as wild or scenic rivers. This impact topic was therefore dismissed from detailed analysis.



*Dunes Photographers*



*South Manitou Island Lighthouse*

5

## Environmental Consequences



*Corn Crib Detail*



## INTRODUCTION

The National Environmental Policy Act of 1969 (40 CFR 1500-1508) mandates that environmental impact statements disclose the environmental impacts of a proposed federal action. In this case, the proposed federal action is implementation of the *General Management Plan / Wilderness Study / Environmental Impact Statement* for Sleeping Bear Dunes National Lakeshore. The alternatives in this document provide broad management direction. Thus, this environmental impact statement should be considered a programmatic document. Before undertaking specific actions to implement the approved plan, NPS managers will need to determine if more detailed environmental documents must be prepared, consistent with the provisions of the National Environmental Policy Act.

The first part of this chapter discusses terms and assumptions used in the discussions of impacts. The next two parts cover policy and terminology related to cumulative impacts and impairment of National Lakeshore resources. The third part discusses the relationship of the impact analyses to requirements of section 106 of the National Historic Preservation Act. The impacts of the alternatives are then analyzed in this order — the no-action alternative, the preferred alternative, alternative A, alternative B, and alternative C. Each impact topic includes a description of the impacts of the alternative, a discussion of cumulative effects, and a conclusion. At the end of the discussion for each alternative there is a required brief discussion of unavoidable adverse impacts, irreversible and irretrievable commitments of resources, and effects on short-term uses and long-term productivity.

### TERMS AND ASSUMPTIONS

Each impact topic includes a discussion of impacts, including the intensity, duration, and

type of impact. *Intensity* of impact describes the degree, level, or strength of an impact as negligible, minor, moderate, or major. Because definitions of intensity vary by resource topic, separate intensity definitions are provided for each impact topic. *Duration* of impact considers whether the impact would occur over the short term or long term. Unless otherwise noted, *short-term* impacts are those that, within a short period of time — generally less than five years — would no longer be detectable as the resource or value returns to its pre-disturbance condition or appearance. *Long-term* impacts refer to a change in a resource or value that is expected to persist for five or more years. The *type* of impact refers to whether the impact on the resource or value would be *beneficial* (positive) or *adverse* (negative).

The impact analyses for the action alternatives (preferred alternative and alternatives A, B, and C) describe the difference between implementing the no-action alternative and implementing the action alternative. In other words, to understand the consequences of any action alternative, the reader must also consider what would happen if no action were taken. For all but the no-action alternative, all impact analysis assumes that areas proposed for designated wilderness are ultimately designated as such by Congress. For the no-action alternative, this analysis assumes continuation of the current management direction — that is, the National Park Service continues to manage the areas to maintain their existing wilderness character to the extent possible given current conditions and constraints until “Congress determines otherwise.”

### CUMULATIVE IMPACTS

Council on Environmental Quality regulations, which implement the National Environmental Policy Act (NEPA), require



assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of who undertakes such other actions. Cumulative impacts can result from individually minor but collectively important actions taking place over a period of time.

Cumulative impacts are considered for both the no-action and the action alternatives. These impacts were determined by combining the impacts of the alternatives proposed in this document with the impacts of other past, present, and reasonably foreseeable future actions. To do this, it was necessary to identify other such projects or actions at Sleeping Bear Dunes National Lakeshore and in the surrounding area. For the purposes of most impact topics in this analysis, the cumulative impact analysis area was Benzie and Leelanau counties, Michigan. For other impact topics, the area was the northwestern lower peninsula of Michigan. The time horizon for the cumulative impacts analysis depends on the impact topic under consideration but in most cases was plus or minus five years.

The following ongoing projects or projects planned for the near future were identified for the purposes of conducting the cumulative effects analysis (see the “Ongoing NPS Projects and Projects Planned for the Near Future” section in chapter 1 for more information on these actions):

- Restoration of individual sites within the National Lakeshore (past, ongoing)
- Improvements to parking areas — ends of Leelanau County Roads 651 and 669 (future)
- Glen Haven Village improvements (ongoing)
- Lake Michigan overlooks improvements—Pierce Stocking Scenic Drive (future)

- Restore sites of the former Water Wheel and Casey’s Canoe Liveries — Platte River (ongoing)
- South Manitou Lighthouse Complex — exterior restoration and interior rehabilitation (future)
- Dune Climb parking area — paving and other minor improvements (future)

In addition, the following projects or actions were included.

#### **Fire Management Plan (2005a)**

The National Lakeshore’s “Fire Management Plan,” approved in 2005, will be implemented. The plan emphasizes protection of human life and property, both public and private, from wildfire within and adjacent to NPS lands. It includes measures to reduce hazardous fuels.

#### **Dredging of the Platte River Mouth (Past, Ongoing)**

The mouth of the Platte River is dredged annually for approximately 30 days, beginning immediately after Labor Day in September. Dredging allows larger boats to access Lake Michigan, primarily for sport fishing of Coho salmon, from the county launch ramp at the end of Lake Michigan Road. Dredging was originally performed by the state Department of Natural Resources, but the National Lakeshore took over dredging about 25 years ago, after the state indicated it intended to discontinue the activity. Dredging involves using heavy equipment to remove sand and sediment from the river channel and relocating it to an open sandy area adjacent to the river.

### **IMPAIRMENT OF NATIONAL LAKESHORE RESOURCES**

In addition to determining the environmental consequences of implementing the preferred

and other alternatives, *NPS Management Policies 2006* (section 1.4) requires analysis of potential effects to determine whether or not proposed actions would *impair* National Lakeshore resources and values.

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give NPS managers discretion to allow impacts on park resources and values when necessary and appropriate to fulfill the purposes of the park, as long as the impact does not constitute impairment of the affected resources and values. That discretion is limited by the statutory requirement that the National Park Service must leave resources and values unimpaired unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that would, in the professional judgment of the responsible NPS manager, harm the integrity of park resources and or values and violate the 1916 NPS Organic Act's mandate (*NPS Management Policies 2006* 1.4.5). An impact on a park resource or value may, but does not necessarily, constitute an impairment. An impact is more likely to constitute impairment to the extent that it affects a resource or value whose conservation is

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

Impairment may result from visitor activities; NPS administrative activities; or activities undertaken by concessioners, contractors, and others operating in the park. Impairment may also result from sources or activities outside the park. A determination on impairment is made in the conclusion section for each impact topic related to the park's cultural and natural resources. A determination of impairment is not required for impact topics such as visitor experience, regional socioeconomics, and NPS operations.

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

In this *General Management Plan*, impacts on cultural resources are described according to the Advisory Council on Historic Preservation "Regulations for the Protection of Historic and Cultural Properties" (36 CFR 800) implementing Section 106 of the National Historic Preservation Act of 1966, as amended (16 USC 470(f)).

Section 106 requires federal agency officials to take into account the effects of their undertakings on historic properties, and to afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment.

Unlike analyses under the National Environmental Policy Act, under the Section 106 process, an "effect" is defined as "an alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register" (36 CFR 800.16i). According to the criteria of "adverse effect" in the regulations (36 CFR 800.5(a)(1)),

an adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the

property's location, design, setting, materials, workmanship, feeling, or association.

The regulations further specify that

consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

The federal agency official consults with the state historic preservation officer and other consulting parties (possibly including the Advisory Council on Historic Preservation) regarding measures to avoid, minimize, or mitigate adverse effects to a historic property. These agreed-upon measures are memorialized in a memorandum of agreement that is signed by the agency, the state historic preservation officer, and other consulting parties.

The Advisory Council regulations do not specify thresholds for effects and do not recognize adverse versus beneficial effects. Effects are determined relative to the character-defining features of the National Register of Historic Places (NRHP) listed or eligible property—36 CFR 800 does not define what constitutes mitigation, but it provides a process for determining appropriate mitigation in consultation with the state historic preservation officer and other parties. Cultural resources, including historic properties, are nonrenewable. Adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss of integrity of the property that can

never be recovered. Therefore, although actions to mitigate the adverse effect may be carried out in compliance with Section 106, the effect on a historic property remains adverse.

A determination of no adverse effect means there is an effect, but the effect would not meet the criteria of adverse effect (36 CFR 800.5(b)).

The impact analyses in this *General Management Plan* are for the purposes of the National Environmental Policy Act. They are intended to assist the National Park Service with coordinating its compliance with this act and with Section 106 of the National Historic Preservation Act, as amended. However, it must be emphasized that the National Park Service does not intend to use this *General Management Plan* / *Wilderness Study* / *Environmental Impact Statement* to meet section 106 compliance for individual actions discussed in the document in accordance with 36 CFR 800.8(c). The National Park Service will comply with Section 106 in accordance with 36 CFR 800 as it continues land and resource planning and refines its management options with alternatives analyses and specific proposals for individual properties. As is required under 36 CFR 800, the National Park Service will consult with the Michigan state historic preservation officer and other consulting parties to determine areas of potential effects; to identify cultural resources and evaluate their National Register of Historic Places eligibility; to determine effects on historic properties; and to develop measures to avoid, minimize, or mitigate adverse effects on historic properties. Measures to avoid, minimize, or mitigate adverse effects would be outlined in a memorandum of agreement (or programmatic agreement). A Section 106 summary is included for each of the cultural resource topics discussed (in this case historic resources only).

## METHODS AND ASSUMPTIONS FOR ANALYZING IMPACTS

### HISTORIC RESOURCES

In chapter 4, it was determined that archaeological resources, ethnographic resources, and museum collections would be considered but not analyzed in detail in this *General Management Plan / Wilderness Study / Environmental Impact Statement*. Only historic resources (buildings, sites, structures, objects, districts, and landscapes) are analyzed in detail in the environmental analysis.

Potential impacts to historic resources either listed in or eligible to be listed in the National Register of Historic Places were identified and evaluated in accordance with the Advisory Council on Historic Preservation's regulations implementing Section 106 of the National Historic Preservation Act (36 CFR 800, Protection of Historic Properties) by: (1) determining the area of potential effects; (2) identifying historic resources present in the area of potential effect that are national register listed or eligible; (3) applying the criteria of adverse effect to affected resources; and (4) considering ways to avoid, minimize, or mitigate adverse effects.

In this document the criteria for characterizing the severity or intensity of impacts to national register listed or eligible historic resources are the Section 106 determinations of effect: adverse effect or no adverse effect.

### SOILS AND GEOLOGIC RESOURCES

Analysis of the soils and geologic resources of the park area relative to the alternatives revealed two primary potential impact sources—impacts from visitor use and impacts from infrastructure development.

Visitor uses that impact soils and geologic resources (in this case, primarily the dunes and their dynamic processes) include hiking

and dispersed camping, use of rivers and lakes, and parking in nondesignated areas. Hiking on the dunes destabilizes the substrate in sandier areas of the dunes, and packs the soil down in areas with higher clay content. These actions can lead to *soil erosion* and *soil compaction*, respectively, either of which is an adverse impact on the dunes and their natural processes, as well as to other soils. The same kinds of impacts can occur to soils in other portions of the Lakeshore due to hiking and other off-trail activities. Dispersed camping can also lead to compaction and erosion through very similar mechanisms. Repeated use of an area for camping can compact the soils, leading to plant failure and then erosion.

Visitor use on the rivers and lakes, and particularly on the Platte River where use is relatively high during the summer, impacts soils in a number of ways. Informal entry and exit points along the water, where people get out to use or explore the adjacent area, cause bank destabilization, which leads to erosion. Loss of dune vegetation can cause sand to fill stream or lake beds as it is blown by the wind. Heavy foot traffic in the adjacent floodplain tramples vegetation, reducing plant cover, which can lead to erosion. Heavy foot traffic can also compact the soil to the point that plants can no longer grow; without this plant cover, the soils become more susceptible to erosion. Finally, high levels of *E. coli* from human excrement are found in the soils of some of these areas.

Vehicular parking in nondesignated areas can also lead to soil compaction and erosion, depending on the nature of the substrate and the soil moisture conditions. Parking in such areas when it is muddy can leave deep ruts, initiating erosion. On the other hand, parking on non-sandy soils when it is dry can lead to compaction, loss of plant cover, and then erosion.

Development activities frequently result in *soil disturbance* during the construction phase. Clearing of vegetation to provide a camping area would disturb soils. Removal of topsoil to build a foundation for a building or parking lot would be a soil disturbance. Representative activities considered in this document include site restoration activities, development of trails, campsites or campgrounds, picnic areas, parking area development or improvement, and upgrade or relocation of access points to rivers and lakes. Large-scale (i.e., NPS or private) development along the Benzie Corridor could impact soils and perhaps even underlying geologic strata, depending upon the nature and scale of the development.

To reduce repetitiveness, the discussions presented later in this chapter about impacts to soils and geologic resources will only briefly allude to the impacts detailed in the above paragraphs. Key words such as *compaction*, *erosion*, and *disturbance* refer the reader back to the cause and effect descriptions provided above.

Information describing soils and geologic resources was compiled and reviewed from existing research reports, planning documents, and consultation with park specialists. The impacts of potential visitation increases have been factored into the analysis.

The thresholds to determine the intensity of impacts on soils or geologic resources are defined as follows:

**Negligible:** The impact is barely detectable and/or would result in no measurable or perceptible changes to soils or geologic resources.

**Minor:** The impact is slight but detectable, and/or would result in small but measurable changes in soils or geologic resources; the effects would be localized.

**Moderate:** The impact is readily apparent and/or would result in easily detectable

changes to soils or geologic resources; the effects would be localized.

**Major:** The impact is severely adverse or exceptionally beneficial and/or would result in appreciable changes to soils or geologic resources; the effects would be regionally important.

## VEGETATION AND WILDLIFE

Because a discussion of potential impacts to wildlife necessarily involves discussion of wildlife habitat, which is primarily the vegetation communities within the park, vegetation and wildlife are addressed together in this section. Preliminary analysis of potential impacts to the vegetation and wildlife resources of the Lakeshore indicated that impacts could be associated with two primary activities — visitor use and development of infrastructure.

Visitor use can impact vegetation and wildlife through a number of mechanisms. Obvious and direct impacts include *trampling* of vegetation when hiking off the trail or camping in nondesignated areas (i.e., dispersed camping, which is allowed only on North Manitou Island). A single *trampling* event might impact one or more individuals of a species. Repeated *trampling* of the vegetation along a path or in a campsite, as well as removal of down and dead wood for campfires, can lead to changes in the vegetation at the population level, which results in *habitat alteration*.

*Habitat alteration* can, in turn, further impact remaining populations by making the habitat less suitable for the species.

Introduction or spread of *invasive species* can also result from visitor activities.

Establishment of invasive species often results in change in both the plant and wildlife composition of the infested area. Visitors often unwittingly introduce or spread propagules (e.g., seeds or larvae) of invasive species during recreational activities.

Although the potential to disturb wildlife when hiking off the trail is apparent to most, even when hiking or bicycling on established trails or roads, visitors can disturb wildlife with loud or unusual noises, or even just the sight or scent of visitors. Disturbance of wildlife due to noises, sights, or scents associated with visitor use is referred to as **sensory-based disturbance**. **Sensory-based disturbance** applies primarily to the individual response level but can lead to population level responses if the disturbance is intense or prolonged. An example would be individual abandonment of a nest in response to a disturbance. If such a disturbance were to occur over a large area, or for a long period of time, individual nest abandonment could translate to population level impacts.

Development of infrastructure can also impact vegetation and wildlife. The most obvious impact is the direct removal or loss of vegetation that serves as wildlife habitat (i.e., **habitat loss**). Consider development of a new road through an area of relatively native forest. The swath of vegetation removed to construct the road would represent habitat loss. That would not, however, be the only impact on the wildlife habitat. Opening the forest canopy where the road is constructed now creates an edge effect, with greater insolation of the forest edge and consequent changes in plant species composition. In some cases this can cascade into changes in wildlife species utilization. Further, new use of this road would increase sensory-based disturbance to wildlife along the new road corridor. Obviously, the larger the corridor required for the road, the greater these impacts can be. Therefore, a trail would have far less impact than a road. The placement of a road or trail within the area of forest is also important. Roads or trails established through the middle of a habitat tend to fragment the habitat, making it less usable for some wildlife species. Alternatively, placing the road or trail close to another road or a natural habitat boundary (e.g., the shoreline) may lessen this impact. The more indirect impacts of infrastructure

development described above are referred to as **habitat degradation**. **Habitat loss** and **habitat degradation** can impact a species at the individual or population level depending upon their extent.

To reduce repetitiveness, the discussions presented later in this chapter of impacts on vegetation and wildlife anticipated for each alternative will only briefly allude to the impacts detailed in the above paragraphs. Key words such as **trampling**, **habitat alteration**, **invasive species**, **sensory-based disturbance**, **habitat loss**, and **habitat degradation** refer the reader back to the cause and effect descriptions provided above.

Available information describing vegetation communities and distribution, and the wildlife species that inhabit them, including published scientific papers, NPS and USGS research reports, planning documents, state programs, national databases and mapping efforts, and consultation with park specialists, was gathered, reviewed, and summarized. Impacts on vegetation and wildlife were evaluated by comparing projected changes resulting from the action alternatives (preferred, A, B, and C) to the no-action alternative. The impacts of potential visitation increases have been factored into the analysis.

The thresholds to determine impacts on vegetation and wildlife are defined as follows:

**Negligible:** Impacts are barely detectable and/or would affect a minimal area of vegetation. Impacts to the plant and wildlife communities are not detectable.

**Minor:** Impacts are slight, but detectable, and/or would affect a small area of vegetation or few members of the wildlife community. The severity and timing of changes are not expected to be outside natural variability spatially or temporally. Key ecosystem processes and community structure are retained at the local level.

**Moderate:** Impacts are readily apparent and/or would affect a large area of

vegetation and/or a large portion of the wildlife community. The severity and timing of changes are expected to be outside natural variability spatially and/or temporally; however, key ecosystem processes and community structure are retained at the landscape (regional) level.

**Major:** Impacts are severely adverse or exceptionally beneficial and/or would affect a substantial area of vegetation and/or the majority of the inhabiting wildlife community. The severity and timing of changes are expected to be outside natural variability both spatially and temporally. Key ecosystem processes and community structure may be disrupted. Habitat for wildlife species may be rendered nonfunctional at the landscape level.

## FEDERAL THREATENED AND ENDANGERED SPECIES

Federal threatened and endangered species addressed in this document include plants (Michigan monkey flower and Pitcher's thistle) and wildlife (piping plover). As such, the impacts associated with visitor use and infrastructure development described above for vegetation and wildlife would also apply to these federally listed species. Therefore, the reader is encouraged to refer to the above descriptions of activities leading to *trampling*, *habitat alteration*, *sensory-based disturbance*, *habitat loss*, and *habitat degradation*. These key words will be used in the alternative-specific impact analyses later in this chapter to remind the reader of, or refer the reader back to, the cause and effect descriptions of the nature of impacts and species responses to those impacts provided above.

In accordance with 50 CFR § 402(a), federal agencies are required to review all actions to determine whether an action may affect listed species or critical habitat. If such a determination is made, formal consultation is required,

unless the federal agency determines, with the written concurrence of the U.S. Fish and Wildlife Service, that the proposed action is not likely to adversely affect any listed species or critical habitat. It is NPS policy to survey for, protect, and strive to recover all species native to national park system units that are listed under the Endangered Species Act. The National Park Service strives to fully meet its obligations under the National Park Service Organic Act and the Endangered Species Act to both proactively conserve listed species and prevent detrimental effects on these species. This is accomplished by cooperating with the U.S. Fish and Wildlife Service to ensure that NPS actions comply with both the written requirements and the spirit of the Endangered Species Act, and by cooperating with the U.S. Fish and Wildlife Service and other agencies/entities to facilitate delineation of critical habitat, development and implementation of species recovery plans and candidate conservation agreements, and proactively managing for proposed and candidate species.

NPS staff evaluated impacts on federally listed threatened and endangered species and provided an Endangered Species Act determination as defined in 50 CFR Section 402 and the *Endangered Species Consultation Handbook* (1998) for each alternative. Based on this analysis, anticipated impacts to the federally listed candidate species that have the potential to occur within the park, with the exception of the Indiana Bat (see table 8), are discussed in this chapter.

Impacts to the addressed federally listed or candidate species were evaluated by comparing projected changes resulting from the action alternatives to existing conditions. These evaluations were based on documented occurrences of the species within the park, the distribution of their preferred habitats within the park, and the distribution of designated critical habitat (piping plover). The impacts of potential visitation increases have been factored into the analysis.

Impact thresholds for the addressed federally listed or candidate species are defined based on USFWS Section 7 impact terminology as follows:

**No effect** means there are absolutely no effects to the species or its critical habitat, either positive or negative. A no-effect determination does not include small effects or effects that are unlikely to occur. If effects are insignificant (in size) or discountable (extremely unlikely), a determination of “not likely to adversely affect” is appropriate.

**Not likely to adversely affect** means that all effects to the species or its critical habitat are beneficial, insignificant, or discountable. Beneficial effects have contemporaneous positive effects without adverse effects to the species (for example, there cannot be “balancing” so that the benefits of the action would outweigh the adverse effects). Insignificant effects relate to the size of the impact and should not reach the scale where take occurs. Discountable effects are considered extremely unlikely to occur. Determinations of “not likely to adversely affect, due to beneficial, insignificant, or discountable effects” typically require written concurrence from the U.S. Fish and Wildlife Service.

**Likely to adversely affect** means that an adverse effect to the species or its critical habitat may occur as a direct or indirect result of an action, and the effect is not discountable, insignificant, or beneficial. In the rare event that adverse effects could not be avoided, the project would either be discontinued or NPS staff would request formal consultation with the U.S. Fish and Wildlife Service.

In addition, table 21 provides a summary of past, present and ongoing (future) activities considered in the cumulative impacts analysis

for threatened and endangered species. This table will be referenced in the cumulative impacts section for threatened and endangered species under each of the alternatives.

## MICHIGAN STATE-LISTED SPECIES

Michigan state-listed species addressed in this document include plant (e.g., walking fern and prairie moonwort) and wildlife (e.g., wood turtle and common loon) species. As such, the impacts associated with visitor use and infrastructure development described above for vegetation and wildlife would also apply to these state-listed species. Therefore, the reader is encouraged to refer to the above descriptions of activities leading to **trampling, habitat alteration, sensory-based disturbance, habitat loss, and habitat degradation**. These key words will be used in the alternative-specific impacts analyses later in this chapter to remind the reader of, or refer the reader back to, the cause and effect descriptions provided above.

NPS *Management Policies 2006* dictate that, to the greatest extent possible, parks will inventory, monitor, and manage state and locally listed species in a manner similar to the treatment of federally listed species. In addition, the parks are to inventory other native species that are of special management concern to parks (such as rare, declining, sensitive, or unique species and their habitats) and manage them to maintain their natural distribution and abundance.

The National Park Service considers how to protect and perpetuate federally, state, or locally listed species during park management planning, and consults with lead federal and state agencies, as appropriate.



**TABLE 21: SUMMARY OF PAST, PRESENT, AND ONGOING (FUTURE) ACTIONS AND THEIR IMPACTS ON THREATENED AND ENDANGERED SPECIES**

Activity	Species Potentially Affected	Potential Impacts
<b>NPS ACTIVITIES</b>		
Dredging the mouth of the Platte River*	Piping plover and its critical habitat	Positive — adds nesting habitat (cobble) Negative — removes some rearing habitat
Site restoration activities*	Pitcher's thistle, Michigan monkey flower, and piping plover critical habitat	Positive — net gain of restored habitat Negative — loss of individual plants (no loss of individual birds due to appropriate timing of activities)
Nonnative plant control*	Pitcher's thistle	Positive — net gain of restored habitat Negative — loss of individual plants
Piping plover recovery program*	Piping plover and its critical habitat	Positive — net gain in population Negative — loss of individuals from banding, handling, nest disturbance
Dredging at the island docks*	Pitcher's thistle	Positive — beach nourishment from deposition of dredged materials (provides better habitat) Negative—loss of individual plants from coverage
<b>ACTIVITIES OF OTHERS</b>		
Dogs disrupting wildlife on the beach	Piping plover and its critical habitat	Negative — disturbance, mortality
Private adjacent landowners actively managing habitat	Michigan monkey flower	Positive — supports recovery of listed species
Nonnative plants used by adjacent landowners for landscaping	Piping plover and its critical habitat, Pitcher's thistle	Negative — nonnative plants invade habitat
Shipping industry releases exotic species in ballast water (Lake Michigan)	Piping plover and its critical habitat	Negative — invasives directly linked to listed species mortality
Visitor use	Pitcher's thistle piping plover and its critical habitat	Negative — foot or vehicle traffic causes plant mortality and disturbance to piping plover during breeding season Positive — human-caused disturbance provides seedbed

\* Potential impacts on threatened and endangered species are avoided to the extent possible. NPS staff coordinate closely with the U.S. Fish and Wildlife Service through recovery plans, biological assessments, and regular communications.

Plant and animal species listed by Michigan as threatened, endangered, or as species of concern that have the potential to occur within the Lakeshore (see table 8), were analyzed

relative to the anticipated impacts of, and differences of those impacts among, the five alternatives. To facilitate analysis and discussion of potential environmental

consequences, these species were grouped according to shared habitat requirements and will be discussed as follows:

Shoreline/Dunes/Near-shore Associates

- Caspian tern
- fascicled moonwort
- Lake Huron locust
- prairie moonwort
- prairie warbler

Lakes/Wetlands/Riparian Associates

- bald eagle
- Blanchard's cricket frog
- common loon
- cut-leaved water parsnip
- Douglas stenelmis riffle beetle
- Eastern box turtle
- ram's-head lady's-slipper
- trumpeter swan
- wood turtle

Mature Forest Associates

- merlin
- red-shouldered hawk
- green spleenwort
- walking fern
- Pumpelly's brome grass
- ginseng
- pine-drop
- three-birds orchid

Impacts on Michigan state-listed species were evaluated by comparing projected changes resulting from the action alternatives compared to the no-action alternative. The impacts of potential visitation increases have been factored into the analysis.

Impact thresholds for Michigan state-listed plant and wildlife species are defined as follows:

**Negligible:** Impacts on state-listed plant and wildlife species would not be observable or measurable and would be well within the range of natural variability.

**Minor:** Impacts on species or their habitat would be detectable, but still within the

range of natural variability both spatially and temporally. No interference with feeding, reproduction, or other activities affecting population viability would result from the impacts. Sufficient functional habitat would remain to support viable populations.

**Moderate:** Impacts on activities necessary for survival, and on species habitats, can be expected on an occasional basis, but are not anticipated to threaten potential or continued existence of the species in the park. Changes to population characteristics could be outside the natural range of variability spatially or temporally but would not be anticipated to result in loss of population viability.

**Major:** Impacts on Michigan state-listed plant and wildlife species or their habitats would be detectable, outside of the natural range of variability both spatially and temporally, and would be anticipated to result in loss of viability at the population level.

## WETLANDS AND WATER QUALITY

Wetlands, in addition to the biodiversity they support (addressed above under "Vegetation and Wildlife" and "Michigan State-Listed Species") serve critical roles as water purifiers, facilitating settling of particulates out of the water column and filtering remaining impurities. Because of the importance of wetlands to water quality, potential impacts to wetlands and water quality will be addressed together in this chapter.

Similar to the other natural resources already addressed, wetlands and water quality can be impacted by two major types of activities — visitor use and development of infrastructure. Wetlands and water quality can be affected by mechanisms previously described such as *trampling* and *erosion*. Described below are how these and other mechanisms are related to visitor use and development, and how they impact wetlands and water quality.

Visitor use probably has a greater potential to impact wetlands and water quality along riparian areas (e.g., the Platte and Crystal Rivers, Otter Creek), around lakes (e.g., School, North Bar, and Loon), and in the Bow Lakes area than in the numerous wetlands associated with the dune and swale topography common in certain less developed portions of the park. When a visitor walks through a wetland, the vegetation is trampled into the mud, and invertebrates living in the wetland can be crushed or buried in muck from which they cannot escape. If there is standing water, sediments from the bottom get stirred up into the water column. This *resuspension of sediments* reduces water quality and its suitability for biota dependent upon it. The overall physical nature of the wetland is altered in a way that typically reduces its ability to filter water. Thus wetland *trampling* impacts a wetland and its function at a variety of levels and ends up impacting not only the wetland but the resultant water quality in any water body serviced by that wetland.

Other visitor activities that could impact wetlands and water quality include activities such as swimming, bathing, and motorized boating, which may result in *pollution* of wetlands and water bodies with petroleum products, soaps, and other substances. This pollution of the wetlands can lead to loss of both structure and function over time, and thus further reduced water quality.

Development actions proposed in the alternatives of this document, such as development of parking areas, boat accesses, and other infrastructure, would be located to the extent feasible to avoid direct dredging or filling of wetlands and other “Waters of the U.S.” However, *runoff* from such development activities could change the hydrology (quality or amount of water) entering adjacent wetlands and waterways. Paved parking lots may increase the amount of runoff entering a wetland. If the runoff is filtered first, removing petroleum products originating from cars in the parking lot and other potential pollutants,

this runoff could potentially augment the wetland and waterways during drier periods. However, installation of filtering systems often increases the footprint and initial cost of a project and the ongoing maintenance costs associated with such systems. Packed dirt or graveled parking lots are not free of potential impacts to wetlands and waterways. Runoff from these areas can also contaminate wetlands, not only with chemicals, but also with a heavier sediment load. Additionally, under the right conditions, *dust* from packed dirt or even gravel parking lots or roads can blow onto and impact adjacent wetlands and waterways.

To reduce repetitiveness, the discussions presented later in this chapter of impacts to wetlands and water quality anticipated for each alternative will only briefly allude to the impacts detailed in the above paragraphs. Key words such as *trampling*, *resuspension of sediments*, *pollution*, *runoff*, and *dust* refer the reader back to the cause and effect descriptions provided above.

Available information describing wetlands characteristics and distribution and water quality for various water bodies across the park, including existing research reports, planning documents, state programs, national mapping efforts, and consultation with park specialists, was gathered, reviewed, and summarized for this document.

Wetlands are a protected resource managed under the following federal executive and director’s orders:

Executive Order 11990, “Protection of Wetlands,” was issued in 1977 “to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative.” This order directs the National Park Service to: (1) provide leadership and to take action to

minimize the destruction, loss, or degradation of wetlands; (2) preserve and enhance the natural and beneficial values of wetlands; and (3) to avoid direct or indirect support of new construction in wetlands unless there are no practicable alternatives to such construction and the proposed action includes all practicable measures to minimize harm to wetlands.

Approved in 1998, Director's Order 77-1: "Wetland Protection" was developed for use by the National Park Service in carrying out its responsibilities under Executive Order 11990. The general policies, requirements, and standards included in the manual are: (1) no net loss of wetlands and a long-term goal of net wetlands gain, (2) parkwide wetlands inventories, (3) restoration and enhancement of degraded wetlands habitats, (4) planning and siting facilities to avoid or minimize effects on wetlands, (5) restoration of degraded wetlands as compensation for adverse effects to wetlands, and (6) compliance with federal environmental regulations.

Impacts to wetlands and water quality were evaluated by comparing projected changes resulting from implementing the alternatives to implementing the no-action alternative. The impacts of potential visitation increases have been factored into the analysis. The thresholds to determine wetlands impacts are defined as follows:

**Negligible:** The impact is barely detectable and/or would result in no measurable or perceptible changes to wetlands or water quality.

**Minor:** The impact is slight, but detectable, and/or would result in small but measurable changes in wetlands or water quality; the effects would be localized to one area in a drainage.

**Moderate:** The impact is readily apparent and would result in easily detectable

changes to wetlands or water quality; the effects would be localized to a drainage.

**Major:** The impact is severely adverse or exceptionally beneficial and/or would result in appreciable changes to wetlands or water quality; the effects would be regionally important.

## VISITOR OPPORTUNITIES AND USE

### Visitor Opportunities

This topic covers opportunities for recreation and interpretive experiences, access, scenic resources, natural soundscapes, and night skies. Throughout this plan's public involvement process, wide-ranging opinions about Lakeshore visitor opportunities (e.g., access, recreational infrastructure, activities, and educational opportunities) were expressed. Impacts on visitor opportunities were evaluated by comparing projected impacts from the action alternatives to the no-action alternative. These evaluations included consideration of the Lakeshore's purpose, significance, and fundamental resources and values and what contributes or detracts from desirable visitor opportunities.

### Visitor Use

This topic addresses numbers of visitors. Visitor use at the Lakeshore has been relatively steady over time, though with some positive correlation to overall economic conditions in the broader Great Lakes region and to local population growth. Thus, visitor use at the National Lakeshore in the future will be primarily a function of population growth and continuing residential development in the vicinity of Benzie, Leelanau, and Grand Traverse counties; increases in the region's seasonal population; long-term growth across the Great Lakes and the range and type of visitor opportunities associated with the various alternatives. Population gains of nearly 3.3 million residents are projected for

Michigan, Ohio, Illinois, and Indiana between 2000 and 2030 (U.S. Census Bureau 2005). Year-to-year changes in visitor use will vary, with periods of faster or slower growth, and even periods of short-term declines. Peak visitor use is expected to continue to occur in July and August.

Changes in annual visitor use could also be affected by the management zoning, visitor opportunities, wilderness, and other aspects of the various alternatives. Those differences and uncertainties about when specific actions might occur provide a limited basis upon which to project changes in visitor use over time. Consequently, the approach to projecting visitor use relies on the professional judgment of the Lakeshore staff and their assessment as to the effects of changes in opportunities, capacities, activities, and wilderness proposals in promoting or discouraging use. The lack of predictive estimates reflects the lack of any major changes in visitor facilities and programs and uncertainties as to the timing and/or type of changes in recreational, cultural heritage, and other visitor opportunities associated with the alternatives.

Long-term increases in visitor use, albeit relatively modest in scale, are foreseen under

all of the alternatives. Changes in future use levels were established in terms of discrete increments over and above the change under the no-action alternative. Estimates of future visitor use are not intended to be predictive or absolute but rather provide a means of comparing the likely relative order in visitation changes — alternative A being the smallest and alternative C the largest. The projected long-term changes, on an annual basis are shown in table 22.

The long-term increase in average annual visitor use for the no-action alternative is estimated at about 5% above the long-term average since 1990. The estimated increase for the action alternatives ranges from about 1.6% to 8.2% above that of the no-action alternative.

The thresholds for this impact topic are as follows:

**Negligible:** Visitors would likely be unaware of any effects associated with implementation of the alternative. There would be no noticeable change in visitor use and experience or in any defined indicators of visitor satisfaction or behavior.

**TABLE 22: PROJECTED LONG-TERM INCREASES IN ANNUAL VISITOR USE ASSOCIATED WITH IMPLEMENTATION OF THE GENERAL MANAGEMENT PLAN (ROUGHLY 20 YEARS)**

Alternative	Long-Term Annual Visitor Use	Increase in Long-Term Average Use*
<b>Historical Average (1990-2006)</b>	1,194,000	NA
<b>No-Action Alternative</b>	1,278,000	84,000
<b>Preferred Alternative</b>	1,341,000	147,000
<b>Alternative A</b>	1,299,000	105,000
<b>Alternative B</b>	1,362,000	168,000
<b>Alternative C</b>	1,383,000	189,000

\* Peak annual visitor use of 1,364,834 at the National Lakeshore occurred in 1999.

**Minor:** Changes in visitor use and/or experience would be slight but detectable, but would not appreciably diminish or enhance critical characteristics of the visitor experience. Visitor satisfaction would remain stable.

**Moderate:** Few critical characteristics of the desired visitor experience would change and/or the number of participants engaging in an activity would be altered. The visitor would be aware of the effects associated with implementation of the alternative and would likely be able to express an opinion about the changes. Visitor satisfaction would begin to either decline or increase as a direct result of the effect.

**Major:** Multiple critical characteristics of the desired visitor experience would change and/or the number of participants engaging in an activity would be greatly reduced or increased. The visitor would be aware of the effects associated with implementation of the alternative and would likely express a strong opinion about the change. Visitor satisfaction would markedly decline or increase.

## WILDERNESS CHARACTER

The 1964 Wilderness Act states, “it is hereby declared to be the policy of Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness.” One of the central mandates of this act is to preserve wilderness character. Section 2.(a) states that wilderness areas shall be administered “so as to provide for the protection of these areas, the preservation of their wilderness character . . . .” Section 4.(b) states: “Except as otherwise provided in this Act, each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character.” Because the Lake-shore has proposed wilderness in each of the

action alternatives, and based on the act’s mandate to preserve wilderness character, this impact topic focuses on the extent to which a particular wilderness proposal secures for the public the benefits of an enduring (permanent) resource of wilderness, including preservation of wilderness character.

For all but the no-action alternative, this impact assessment assumes that areas proposed for designated wilderness are ultimately designated as such by Congress. For the no-action alternative, this assessment assumes continuation of the current management direction — that is, the NPS continues to manage the areas to maintain their existing wilderness character until “Congress determines otherwise.”

Wilderness character is not specifically defined in the 1964 Wilderness Act, nor is its meaning discussed in the act’s legislative history. However, the Wilderness Act identifies the following qualities that unify wilderness areas regardless of their size, location, or any other feature.

- Undeveloped— “an area of undeveloped Federal land retaining its primeval character and influence without permanent improvements or human habitation . . . .” This refers to areas that are essentially without permanent structures, enhancements, or modern human occupation. To retain its primitive character, a wilderness ideally is managed without the use of motorized equipment or mechanical transport.
- Natural — “protected and managed so as to preserve its natural conditions . . . .” This means areas that are largely free from effects of modern civilization. It also refers to maintenance of natural ecological relationships and processes, continued existence of native wildlife and plants in largely natural conditions, and absence of distractions (e.g., large groups of people; mechanization; and evidence of human

manipulation, unnatural noises, signs, and other modern artifacts.)

- Outstanding Opportunities for Solitude or Unconfined Recreation — “has outstanding opportunities for solitude or a primitive and unconfined type of recreation . . .” Solitude means encountering few, if any, people, and experiencing privacy and isolation. Primitive and unconfined recreation refers to freedom to explore with few restrictions, and the ability to be spontaneous. It means self sufficiency without support facilities or motorized transportation, and experiencing weather, terrain, and other aspects of the natural world with minimal shelter or assistance from devices of modern civilization.

Impact intensity definitions for wilderness character are as follows.

**Negligible:** Effects on opportunities for solitude or primitive and unconfined recreation would be confined to a small, localized area; any changes would not be perceived (or would be barely perceived) by most visitors. Also, any effects on the degree of development and the prevalence of natural conditions would be confined to a relatively small, localized area and would be barely perceived by most visitors.

**Minor:** Effects on opportunities for solitude or primitive and unconfined recreation would be slightly beneficial or adverse and confined to a limited area of a proposed wilderness area; (or a wilderness-eligible area); changes would be perceived by some visitors. Also, effects on the degree of development and the prevalence of natural conditions would be apparent and confined to a limited area of a proposed wilderness area (or a wilderness-eligible area) and would be perceived by some visitors; natural conditions would continue to predominate.

**Moderate:** Effects on opportunities for solitude or primitive and unconfined recreation would be apparent in one or

more proposed wilderness areas; (or wilderness-eligible areas); changes would be apparent to many visitors. Also, effects on the degree of development and the prevalence of natural conditions would be readily apparent in one or more proposed wilderness areas; (or wilderness-eligible areas); natural conditions would predominate overall; some changes in wilderness character would be apparent to many visitors.

**Major:** Effects on opportunities for solitude or primitive and unconfined recreation would be obvious in one or more proposed wilderness areas; (or wilderness-eligible areas); changes would be obvious to most visitors. Also, effects on the degree of development and the prevalence of natural conditions would be substantial in one or more proposed wilderness areas; (or wilderness-eligible areas); some changes in wilderness character would be obvious to most visitors.

## REGIONAL SOCIOECONOMICS

Scoping identified potential economic and social implications of the alternatives as a topic of keen public interest. Economic effects are commonly expressed in terms of the number and types of jobs supported by the Lakeshore, changes in income, visitor use at the Lakeshore, and associated changes in visitor spending. Less well defined economic effects include the indirect effects from NPS operations and the effects on local government tax revenues. Examples of social impacts include effects on local and regional population growth, housing, community facilities and services, and effects on individual and community quality of life and lifestyles and attitudes.

The analytical approach used in this analysis considers the following three main factors:

- projected future expenditures for construction, rehabilitation, restoration

and maintenance of facilities and infrastructure

- changes in staffing and federal spending to operate the National Lakeshore
- changes in the levels of visitor use at the National Lakeshore

Implementation costs of the alternatives, including staffing, operations, and capital construction and maintenance, were estimated based on current budgets and actual project costs at the National Lakeshore and other NPS units. Actual future outlays would reflect future NPS policies, actual on-the-ground conditions, unanticipated events and opportunities, and budgets approved by Congress for the National Park Service in general, or Sleeping Bear Dunes National Lakeshore specifically.

Estimated changes in projected visitor use for the alternatives are presented in the “Visitor Opportunities and Use” section). Management guidance and zoning established under the *General Management Plan* is expected to attract higher visitor use under all of the action alternatives, as compared to the no-action alternative. Estimates of future visitor use are not intended to be predictive but rather reflective of the relative order in visitation changes — alternative A being the lowest and alternative C the highest. Actual visitor use over time will depend on temporary and multiyear variations due to such factors as regional or national economic conditions.

### Impact Thresholds and Characterization

Economic and social impacts associated with the alternatives are assessed in terms of scale/intensity, duration, and type/character. These parameters are defined as follows.

**Scale/Intensity.** The scale or intensity of impacts refers to the change(s) associated with the alternatives when compared to current and future conditions under the no-action

alternative. In addition to the relative magnitude of changes, factors considered in assessing scale and intensity include the likelihood of people being aware of the changes, the ability to measure the effects of the changes, and the number of people or size of geographic region that would be affected. The scale/intensity thresholds for economic and social conditions are defined below.

**None/Negligible:** Effects on adjacent landowners, neighbors, businesses, agencies, community infrastructure, social conditions, etc. would be nonexistent, barely detectable, or detectable only through indirect means and with no discernible impact on local social or economic conditions.

**Minor:** Effects on adjacent landowners, neighbors, businesses, agencies, community infrastructure, social conditions, etc. would be small but detectable, geographically localized, affect few people, comparable in scale to typical year-to-year or seasonal variations, and not expected to substantively alter established social or economic structures over the long term.

**Moderate:** Effects on adjacent landowners, neighbors, businesses, agencies, community infrastructure, social conditions, etc. would be readily apparent or observable across a wider geographic area and affect many people, and could have noticeable effects on the established economic or social structure and conditions over the long term.

**Major:** Effects on adjacent landowners, neighbors, businesses, agencies, community infrastructure, social conditions, etc., would be readily detectable or observable, affect a large segment of the population, extend across much of a community or region, and have a substantial influence on the established social or economic conditions.

**Duration.** Social and economic changes caused by an alternative may be temporary or last for an extended time. Temporary impacts



may be noticeable locally, but not result in long-term changes of underlying economic and social conditions. Long-term impacts, on the other hand, may lead to changes in the economic base, construction or closure of public facilities, changes in real estate markets and how people and groups relate to one another, and other changes in established social and economic conditions. Many long-term effects would extend beyond the life of the approved *General Management Plan / Wilderness Study / Environmental Impact Statement*.

**Short-Term:** Short-term effects are those that occur during and in response to planning; design; construction and major maintenance of buildings, trails, parking lots and other facilities. These effects diminish or disappear after the activity is completed. The “short-term” may include the initial response(s) in social or economic conditions to fundamental changes in park management and operations and changing visitor use, which later give way to broader changes over time. Generally, “short-term” captures effects lasting up to five years. The short-term, however, is not a specific five-year period tied to the signing of the “Record of Decision.” Distinct actions, implemented over time, could each trigger short-term effects, such that there are multiple “short-term” time horizons over time.

**Long-Term:** Long-term effects are generally those lasting longer than five years, including some that may not begin until after completion of direct activities associated with the initial federal government spending or changes in management associated with an alternative. Such changes include increases in the Lakeshore’s base budget for operations and maintenance and effects related to changes in visitation over time.

**Type/Character.** Social and economic consequences may be beneficial, adverse, or indeterminate.

**Beneficial:** Effects that many individuals or groups would accept or recognize as improving economic or social conditions, either in general or for a specific group of people, businesses, organizations, or institutions. Examples of beneficial effects include lower unemployment, higher personal income, and economic and social diversity and sustainability.

**Adverse:** Effects that most individuals or groups would accept or generally recognize as diminishing economic or social welfare, either in general or for a specific group of people, businesses, organizations, or institutions. Examples of adverse effects include fewer job opportunities, increases in the cost of living without matching increases in higher income, or an erosion of public sector fiscal resources to fund public facilities and services.

**Indeterminate:** Effects for which the size, timing, location, or individuals or groups that would be impacted cannot be determined, or those that include both beneficial and negative effects, in some instances affecting different communities, populations, or public entities or jurisdictions, such that the net effect is indeterminate.

## NPS OPERATIONS

This impact topic refers to the ability of NPS staff to protect and preserve National Lakeshore resources and provide opportunities for effective and enjoyable visitor experiences. It also addresses the effectiveness and efficiency with which NPS staff are able to perform such tasks. Information about NPS operations was compiled from various sources, especially Sleeping Bear Dunes National Lakeshore managers and other NPS staff. Information gathered includes park staffing, maintenance, and expense records, business plans, annual reports, volunteer records, and documents. Examples of operational considerations include needs for maintenance, protection, and patrol activities, and time required for

park staff to get to/from various park sites requiring attention (e.g., research or monitoring sites, trailheads, campsites, etc.)

### **Impact Intensity Definitions**

***Negligible:*** Effects on NPS operations would be at or below the level of detection.

***Minor:*** Effects on NPS operations would be small but detectable. The change would be noticeable to staff but probably not to the public.

***Moderate:*** Effects on NPS operations would be readily apparent to staff and possibly to the public.

***Major:*** Effects on NPS operations would be substantial, widespread, and apparent to staff and the public.

## IMPACTS OF THE NO-ACTION ALTERNATIVE

### HISTORIC RESOURCES

Under the no-action alternative the National Lakeshore would continue to preserve and protect all of its identified historic properties (buildings, sites, structures, objects, districts, and landscapes) to the best of its ability given the limitations of available funds. Prioritization decisions would be based on such factors as national register eligibility and/or listing, the Lakeshore's fundamental resources, interpretive values, resource condition, and suitability for NPS operations. Individual actions would require consultation with the Michigan state historic preservation officer and the Advisory Council on Historic Preservation, if needed, and would be appropriately documented through compliance with Section 106 of the National Historic Preservation Act of 1966, as amended.

*The Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995) identifies four treatment approaches that apply to a wide variety of resource types, including buildings, sites, structures, objects, districts, and landscape features and patterns. Three of those treatments are included in this plan — preservation, rehabilitation, and restoration — and they are defined on page 40. These treatment approaches apply to a wide variety of resource types, including buildings, sites, structures, objects, districts, and landscape features and patterns. The simplest of these treatment approaches is preservation, in which measures are undertaken to stabilize the resource to ensure that it does not deteriorate further from its existing condition and then to maintain and repair historic features and materials. The second option is rehabilitation, in which the resource is made useable for some purpose while preserving those features that convey its historical, cultural, or architectural value. The third is restoration, in which the historic appearance at a particular time is accurately

regained. The fourth treatment, reconstruction, is not proposed in this plan.

All preservation, rehabilitation or restoration efforts would be undertaken in accordance with the standards. Any materials removed during rehabilitation or restoration efforts would be evaluated to determine their value to the Lakeshore's museum collection and/or for their comparative use in future preservation work at the sites. Preservation, rehabilitation, or restoration would have no adverse effects on historic resources.

With more than 300 buildings, sites, structures, objects, districts, and landscapes present in the park, it is likely that many historic properties will not be restored to their historic appearance. Most structures would be preserved, or they would be rehabilitated if an appropriate use for them can be identified and funding procured either through federal appropriation or through partnerships with state or local organizations. Many of the properties include smaller outbuildings that such partnerships might take on, either to rehabilitate for some use or to continually monitor and repair to ensure their continued existence. Where possible, partner organizations would be identified to fund and/or undertake work on historic properties.

In the Glen Haven/Sleeping Bear Point U.S. Life-Saving Service Station area, all buildings, structures, and grounds would continue to be maintained in their current condition. Structures such as the Sleeping Bear Inn and associated garage may be leased out under the NPS historic leasing program; such structures would undergo rehabilitation for an adaptive modern use.

In the Port Oneida Rural Historic District, all buildings, structures, and the associated agricultural landscape would be maintained in their current condition. Buildings, structures,

and landscape features that are deteriorating and at risk would undergo stabilization measures. Those currently in a stabilized condition await a decision about possible future uses that might allow for rehabilitation by the National Park Service or by an NPS partner organization.

On North Manitou Island, continuation of the no-action alternative would result in the preservation (stabilization) of structures, buildings, and grounds that are currently unmaintained and maintenance of all others in their current condition.

South Manitou Island structures, buildings, and grounds would undergo mostly stabilization of structures not currently stabilized and maintenance of all others in their current condition.

All other properties on or determined eligible for inclusion in the National Register of Historic Places would undergo stabilization where that action has not already occurred or maintenance in the current condition where some preservation treatment has already been implemented.

The actions proposed above are general. The treatments for each resource (preservation, stabilization, and/or rehabilitation with adaptive use) have not yet been determined so impacts cannot be fully described. However, it is the National Park Service's intent that no action proposed be "adverse." All actions affecting these historic structures and landscapes will be undertaken in consultation with the Michigan state historic preservation officer.

The no-action alternative would not directly or indirectly affect any properties outside the boundary of the National Lakeshore that are listed on or eligible for the National Register of Historic Places, or that are listed by the state.

## Cumulative Impacts

Over the years historic resources in the Lakeshore have been and continue to be adversely impacted by natural processes such as weathering, vegetative encroachment, and the wear and tear associated with visitor use. Actions proposed for the South Manitou Island Lighthouse Complex would result in both the restoration of the exterior of the keeper's quarters and connecting passageway and the rehabilitation of the interior for adaptive reuse. In addition, actions proposed for Glen Haven Village include the stabilization and maintenance of historic structures or their rehabilitation for adaptive reuse. All preservation, rehabilitation, or restoration efforts would be undertaken in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995), and would result in no adverse effects on historic resources.

As described above, implementation of the no action alternative would result in no adverse effects on historic resources. The no adverse impacts of this alternative, in combination with both the adverse and no adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a no adverse effect cumulative impact. The no adverse effects of the no-action alternative would contribute modestly to the no adverse effect cumulative impact.

## Conclusion

The no-action alternative would have a determination of no adverse effect under the Advisory Council on Historic Preservation "Regulations for the Protection of Historic and Cultural Properties" (36 CFR 800). There would be *no impairment* of cultural resources from implementation of the no-action alternative (see specific definition of impairment in the "Impairment of National Lakeshore Resources" section of this chapter.

## NATURAL RESOURCES

### Soils and Geologic Resources

Readers are encouraged to refer back to the “Soils and Geologic Resources” discussion in the “Methods and Assumptions for Analyzing Impacts” section for additional details on the types of impacts resulting from visitor use and development.

Under the no-action alternative, current visitor activities that negatively impact dunes would continue. Although dunes impacts, primarily soils compaction and erosion, would be reduced in some areas by the use of sand ladders, boardwalks, and sidewalks, placement and maintenance would be limited to what the staff can accomplish with current resources. As such, short- and long-term adverse impacts on dunes resources, ranging from minor to moderate depending upon the specific location, would continue.

Ongoing high use of the Platte River would continue to impact soil resources within that corridor. Informal entry and exit points along the river and proliferation of informal social trails in the adjacent floodplain would continue to contribute to erosion of the riverbank and compaction of floodplain soils, resulting in long-term moderate adverse impacts on soil resources in that corridor.

No new trails or different use of existing trails would be proposed in the no-action alternative. Use of existing formalized trails would continue to have long-term minor adverse impacts on the soils due to erosion and compaction.

Soil disturbance or destruction from development of additional infrastructure would not occur in the no-action alternative because no changes to existing roads, parking areas, or campgrounds are proposed in this alternative. Parking area and road end upgrades that are underway are discussed under cumulative impacts. During periods of peak visitation,

visitors might continue to park in nondesignated areas for access, disturbing those soils and leading to soil compaction or erosion. This would continue to result in short- and long-term minor to moderate adverse impacts on soils resources, depending upon the specific location and the conditions under which parking in nondesignated areas occurred.

Under this alternative, the National Park Service would continue to acquire lands on a willing-seller basis within the Benzie Corridor but would not implement any development within the corridor during the life of this plan. Continued NPS acquisition of lands in the Benzie Corridor would protect the soils and geologic resources on NPS-owned parcels from development for the life of this plan, providing short- and long-term, moderate, beneficial effects. Private development within the corridor would probably continue at its current pace and would continue to have minor to moderate adverse impacts to these resources.

**Cumulative Impacts.** Other past, present, and anticipated projects that would contribute to impacts on soils and geologic resources include 1) improvements to the parking areas at the ends of Leelanau County Roads 651 and 669; (2) Glen Haven Village improvements; (3) improvements to the Lake Michigan overlooks accessed from the Pierce Stocking Scenic Drive; (4) riverbank stabilization on the Platte River at the former Water Wheel and Casey’s Corner canoe liveries; (5) restoration of the natural topography, hydrology, and native vegetative cover of nonhistoric areas disturbed by past land uses — particularly those in critical dunes areas; (6) minor improvements to the Dune Climb parking area; and (7) continued dredging of the mouth of the Platte River. Although activities 1-6 would likely result in short-term adverse impacts during the construction phase, the net result would likely be long-term, minor to moderate beneficial impacts because all projects would contribute to a reduction of

the potential for soil compaction and erosion. Dredging the mouth of the Platte River results in continued addition of dredged material to the shoreline. During low-water periods deeper dredging is required and results in dredge materials with high clay content being deposited on the shoreline, resulting in armoring of the beach surface and consequent profile changes. This results in short- and long-term minor to moderate adverse impacts.

The impacts of other actions described above, in combination with those of the no-action alternative, would result in short- and long-term minor to moderate adverse, and long-term minor to moderate beneficial cumulative impacts. The no-action alternative is expected to contribute a small component to these impacts.

**Conclusion.** The no-action alternative would have short- and long-term, minor to moderate adverse impacts and short- and long-term moderate beneficial impacts on soils and geologic resources. Cumulative impacts would be anticipated to be short and long term, minor to moderate adverse, and long term, minor to moderate beneficial. There would be *no impairment* of soils or geologic resources from implementation of the no-action alternative (see definition of impairment in the “Impairment of National Lakeshore Resources” section).

## **Vegetation and Wildlife**

Readers are encouraged to refer back to the “Vegetation and Wildlife” discussion in the “Methods and Assumptions for Analyzing Impacts” section for additional details on the types of impacts resulting from visitor use and development.

Under the no-action alternative, 43% (30,903 acres) of the National Lakeshore would continue to be managed as wilderness. No new trails or roads would be constructed, so no further fragmentation of habitats would be

anticipated. No loss of habitat to infrastructure development is anticipated in this alternative. Lands along the Benzie Corridor would continue to be purchased on a willing-seller basis by the National Park Service, thus protecting those lands from development for the life of this plan. Access to the Giant Cedars area would continue to be by foot or, less frequently, via the lake (i.e., by boat), resulting in continued low visitor use of this sensitive area. The sum of these effects would be long-term, moderately beneficial impacts on the vegetation and wildlife of the Lakeshore.

Continuing to allow motorboats on School, Bass (Leelanau County), North Bar, and Loon lakes would result in short- and long-term, minor, adverse impacts on wildlife due to sensory-based disturbance at these locations. The no-action alternative would also continue to allow the use of motorized boats on the Crystal and Platte rivers, which could have short-term, minor adverse impacts on the wildlife along those rivers due to sensory-based disruption. High, unconstrained visitor use of the Platte River would continue to have short- and long-term, moderately adverse impacts on the vegetation and wildlife in or adjacent to that corridor due to visitors going up and down the riverbanks to use the areas alongside the river for a variety of activities. The effects of these activities include direct trampling of vegetation, sensory-based disruption of wildlife behaviors, and potential spread of invasive and pest species.

Continuation of the vehicle tours around the farm loop would have short- and long-term, negligible adverse impacts on habitat suitability and wildlife behaviors in that area because of the minor noise and visual disturbance associated with those tours and the introduction and spread of invasive species. The lack of a formal trail system in the Bow Lakes area would continue to encourage random movement of visitors through that habitat, resulting in short- and long-term, minor adverse impacts on the vegetation and wildlife of the

area due to trampling, habitat alteration, and sensory-based disruption. Dispersed camping on North Manitou Island would continue to have short- and long-term, minor adverse impacts on the vegetation and wildlife in the vicinity of repeatedly used sites for camping. Formation of new informal campsites, or repeated use of old ones, results in habitat alteration and sensory-based disturbance to the wildlife in the vicinity of the campsite.

Under this alternative, the National Park Service would continue to acquire lands within the Benzie Corridor but would not implement any development within the corridor during the life of this plan. Continued NPS acquisition of lands in the Benzie Corridor would protect the vegetation and wildlife on NPS-owned parcels from development for the life of this plan, providing short- and long-term, moderate, beneficial effects. Private development within the corridor would probably continue at its current pace and would continue to have minor to moderate adverse impacts to these resources.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on vegetation and wildlife include (1) the improvements to the parking areas at the ends of Leelanau County Roads 651 and 669; (2) implementation of the “Fire Management Plan”; (3) improvements to the Lake Michigan overlooks accessed from the Pierce Stocking Scenic Drive; (4) river bank stabilization on the Platte River at the former Water Wheel and Casey’s Corner canoe liveries; and (5) restoration approximating the natural topography, hydrology, and native vegetative cover of nonhistoric areas disturbed by past land uses — particularly those in critical dunes areas. These combined actions would likely have short- and long-term minor to moderate adverse impacts on vegetation and wildlife due to disturbance during the actions, and long-term minor beneficial impacts on vegetation and wildlife due to habitat restoration and enhancement. The impacts of the other

actions described above, together with the impacts of the no-action alternative, would result in short- and long-term minor to moderate adverse cumulative impacts, and long-term minor to moderate beneficial cumulative impacts on the vegetation and wildlife of the Lakeshore. The no-action alternative is expected to contribute a relatively small component to these cumulative impacts.

**Conclusion.** The no-action alternative would have long-term, moderately beneficial impacts, and short- and long-term negligible to moderate adverse impacts on the vegetation and wildlife of the Lakeshore. The impacts of other actions combined with those of the no-action alternative would likely result in short- and long-term negligible to moderate adverse cumulative impacts, and long-term, minor to moderate beneficial cumulative impacts on the vegetation and wildlife of the Lakeshore. There would be *no impairment* of vegetation or wildlife resources from implementation of the no-action alternative (see specific definition of impairment in the “Impairment of National Lakeshore Resources” section).

### Federal Threatened and Endangered Species

Readers are encouraged to refer back to the “Federal Threatened and Endangered Species” discussion in the “Methods and Assumptions for Analyzing Impacts” section for additional details on the types of impacts resulting from visitor use and development.

Under the no-action alternative, as under all alternatives, the active Lake Michigan beach area is used for a variety of recreational activities. The beach area is also a means of access to the National Lakeshore for boaters, kayakers, etc. The U. S. Fish and Wildlife Service has designated 2.1 miles (3.3 km) around the southern end of North Manitou Island and 14.2 miles (22.5 km) along the Lakeshore’s mainland as critical piping plover habitat (USFWS 2001). Federally endangered

pipin plover nest in the active zone of the beach and are easily disturbed by human activity during the nest site selection, egg-laying, and incubation phases of nesting (approximately mid-May to mid-June) (USFWS 2001). Sensitivity to human activity declines as the nesting season progresses from mid-June to mid-July, by which time many of the young plovers are capable of flight. Although the critical habitat within the Lakeshore coincides with the actively used recreational beach area, NPS staff have demonstrated success in minimizing impacts on nesting piping plovers in areas with relatively high human activity (e.g., the mouth of the Platte River) through various actions (see “Mitigative Measures for the Action Alternatives” section in chapter 2). Human activity is currently restricted in breeding areas by use of a specialized fence system.

Although dogs are allowed in many parts of the National Lakeshore, they are required to be on a 2-meter (6-foot) leash at all times. Furthermore, the park issues a notice each year at the beginning of the piping plover reproductive season that prohibits pets on those segments of beaches where piping plovers have established territories or nests. That prohibition is kept in place until the piping plover reproductive season has ended (NPS 2006c). Other actions include further provision of information about the species and its habits and designating alternate access points.

No trail or other development is proposed within designated critical habitat under the no-action alternative.

Under the no-action alternative the one area in the Lakeshore where the federally endangered Michigan monkey flower is known to occur would continue to be managed for protection of this species. No new roads, trails, or other developments are proposed under the no-action alternative that could negatively impact this species.

Pitcher’s thistle occurs throughout the vegetated portions of the shoreline dunes on both the mainland and the islands. Most occurrences of this federally threatened species within the National Lakeshore are in areas managed for conservation of natural resources under the no-action alternative. No new roads, trails, or other developments are proposed under the no-action alternative that could negatively impact this species.

At the landscape level, the no-action alternative may affect but is not likely to adversely affect listed species (piping plover, Michigan monkey flower, and Pitcher’s thistle) because continuing the current management direction would result in conditions that are beneficial to preserving habitat and minimizing impacts on listed species.

Under this alternative, the National Park Service would continue to acquire lands within the Benzie Corridor but would not implement any development within the corridor during the life of this plan. Private development within the corridor would probably continue at its current pace. These activities and conditions would have no effect on listed species because neither the species nor their habitats occur within the corridor.

**Conservation Measures.** Conservation measures are undertaken to reduce potential impacts on federally listed species or candidate species. Initiation of conservation measures would occur in consultation with the U. S. Fish and Wildlife Service and would be required if any of the following occurred:

- initiation of activities anticipated to have impacts on piping plovers or their designated critical habitat beyond those addressed in this document
- additional Michigan monkey flower occurrences within the Lakeshore were identified in areas where they might potentially be impacted



- initiation of activities anticipated to have impacts on Michigan monkey flower populations
- initiation of activities anticipated to have impacts on Pitcher's thistle populations beyond those addressed in this document

Renewed discussion and consultation with the U. S. Fish and Wildlife Service, should any of the above events occur, would focus on development of specific conservation measures to reduce potential impacts on these species and/or designated critical habitat. Such conservation measures would be based on the recommendations provided by the U.S. Fish and Wildlife Service.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on federally listed species and designated critical habitat include (1) the improvements to the parking areas at the ends of Leelanau County Roads 651 and 669; (2) implementation of the "Fire Management Plan"; (3) improvements to the Lake Michigan overlooks accessed from the Pierce Stocking Scenic Drive; and (4) those activities presented in table 21. Most of these actions would benefit natural resources including federally listed species and their designated critical habitats. Some past projects at the National Lakeshore, however, such as the site restoration project near Big Glen Lake, have adversely affected federally listed species, i.e., Michigan monkey flower. These resulted in formal consultation with the U.S. Fish and Wildlife Service. During implementation, actions would be taken to avoid or minimize potential adverse impacts on such species. This would result in actions that might affect but would not be likely to adversely affect federally listed species. The actions described above, in combination with the no action alternative, would result in no more than insignificant or discountable cumulative impacts resulting in overall impacts that may affect but are not likely to adversely affect these species. The no-action alternative would

be expected to contribute a relatively small component to these cumulative impacts.

**Conclusion.** The no-action alternative may affect but would not be likely to adversely affect addressed federally listed species and designated critical habitat. The cumulative effects of other projects, combined with the no-action alternative, may affect but would not be likely to adversely affect these species. There would be *no impairment* of federal threatened and endangered species from this alternative (see specific definition of impairment in the "Impairment of National Lakeshore Resources" section).

### Michigan State-Listed Species

Readers are encouraged to refer back to the "Michigan State-Listed Species" discussion in the "Methods and Assumptions for Analyzing Impacts" section for additional details on the types of impacts resulting from visitor use and development.

Access to the Giant Cedars area would continue to be by foot from the ranger station, or, less frequently, via the lake (i.e., by boat). Management actions that occur or would be considered for reduction of impacts to plants and soils in this sensitive area would include educating visitors about the sensitive nature of the area, fencing to reduce compaction of root zones and/or trampling of vegetation, and the strategic use of boardwalks. As such, the no-action alternative would be anticipated to have short- and long-term minor adverse impacts on the Michigan state-listed species occurring in this general area.

The primary activity that would continue under the no-action alternative, and which would have the potential to impact state-listed species in the shorelines/dunes/near-shore complex would be recreational hiking. Hiking would likely continue to have short-term, minor adverse impacts on the fascicled moonwort, Lake Huron locust, prairie

moonwort, and prairie warbler due to soil disturbance, erosion, compaction, and trampling for the plant species, and trampling and sensory-based disruption for the animal species.

Several activities that would continue under the no-action alternative and would likely adversely impact state-listed species associated with lakes, wetlands, and riparian areas (i.e., bald eagle, Blanchard's cricket frog, common loon, cut-leaved water parsnip, Douglas stenelmis riffle beetle, ram's-head lady's-slipper, and wood turtle). Continued use of motorized boats on School, Bass (Leelanau County), North Bar, and Loon lakes would likely prevent common loons and trumpeter swans from using these lakes because they are sensitive to human disturbance, particularly loud noises. Continued high and relatively unconstrained visitor use of the Platte River corridor reduces the suitability of this corridor habitat for the Douglas stenelmis riffle beetle, wood turtle, and bald eagle due to sensory-based disruptions. Collectively, these activities would result in short- and long-term, minor to moderate, and adverse impacts on state-listed species associated with lakes, wetlands, and riparian areas.

Ongoing activities that might affect the mature forest associates — merlins and red-shouldered hawks — include dispersed camping on North Manitou Island; motorized boats on Bass (Leelanau County), North Bar and Loon Lakes; and hang gliding at designated sites.

Under this alternative, the National Park Service would continue to acquire lands within the Benzie Corridor but would not implement any development within the corridor during the life of this plan. Private development within the corridor would probably continue at its current pace. These activities and conditions would have negligible effects on state-listed species because although some occurrences are

known near the corridor, none are known or anticipated within the corridor.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on Michigan state-listed plant and animal species include the improvements to the parking areas at the ends of Leelanau County Roads 651 and 669; Glen Haven Village improvements; implementation of the "Fire Management Plan"; improvements to the Lake Michigan overlooks accessed from the Pierce Stocking Scenic Drive; riverbank stabilization on the Platte River at the former Water Wheel and Casey's Corner canoe livery; restoration approximating the natural topography, hydrology, and native vegetative cover of nonhistoric areas disturbed by past land uses — particularly those in critical dunes areas; and minor improvements to the Dune Climb parking area. Each of these projects would result in short-term adverse impacts during construction. The long-term impacts would likely be minor to moderate and beneficial. The no-action alternative would contribute short- and long-term, minor to moderate, adverse impacts to these effects on Michigan state-listed species. The impacts of the other actions, together with the impacts of the no-action alternative, would result in short- and long-term minor to moderate adverse, and long-term, minor to moderate, beneficial cumulative impacts. The no-action alternative would be expected to contribute a relatively small component of these cumulative impacts.

**Conclusion.** The no-action alternative would have short- and long-term, minor to moderate, adverse impacts on Michigan state-listed species. Cumulative impacts are predicted to be short- and long-term minor to moderate, adverse, and long-term, minor to moderate, beneficial. There would be *no impairment* of Michigan state-listed species from this alternative (see specific definition of impairment in the "Impairment of National Lakeshore Resources" section).

## Wetlands and Water Quality

Readers are encouraged to refer back to the “Wetlands and Water Quality” discussion in the “Methods and Assumptions for Analyzing Impacts” section for additional details on the types of impacts resulting from visitor use and development.

Visitor activities that would continue under the no-action alternative and that could impact wetlands and water quality include visitor use of riparian areas, wetlands, and lakes, including those in the Bow Lakes area. Visitor use impacts in these areas includes wetland trampling due to walking through the wetlands, and pollution of wetlands through introduction of petroleum-based and other chemicals (e.g., motorized boats and swimming/bathing). Collectively, these impacts would likely have short- and long-term, minor to moderate, adverse impacts on wetlands and water quality within the National Lakeshore.

No development activities are proposed in the no-action alternative that would be anticipated to impact wetlands or water quality. Continued NPS acquisition of lands within the Benzie Corridor would help protect wetlands and water quality below this area, resulting in short- and long-term, negligible to minor beneficial impacts. Private development within the corridor would probably continue at its current pace and would continue to have minor to moderate adverse impacts to these resources.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on wetlands and water quality include implementation of the “Fire Management Plan”; river bank stabilization on the Platte River at the former Water Wheel and Casey’s Corner canoe liveries; restoration approximating the natural topography, hydrology, and native vegetative cover of nonhistoric areas disturbed by past land uses — particularly those in critical dunes areas,

minor improvements to the Dune Climb parking area, and dredging of the Platte River mouth. Although each of these projects would involve short-term adverse impacts (e.g. dredging of the Platte River resulting in short-term suspension of particulates in the water and resulting lower water quality immediately downstream (lakeside) of the dredging), the net result would likely be long-term, minor to moderate beneficial impacts (e.g. dredging the mouth of the Platte River allows boats to pass without continuously hitting the bottom, stirring up material, and reducing water quality). The no-action alternative would contribute short- and long-term, minor to moderate, adverse and short-and long-term, negligible to minor, beneficial impacts to the cumulative effects on wetlands and water quality. The impacts of the other actions, together with the impacts of the no-action alternative, would result in short- and long-term minor to moderate, adverse; short-term, negligible to minor beneficial; and long-term negligible to moderate beneficial cumulative impacts. The no-action alternative would likely contribute a relatively small component to these cumulative impacts.

**Conclusion.** The no-action alternative would have short- and long-term, minor to moderate, adverse impacts on wetlands and water quality. The cumulative impacts would be short- and long-term minor to moderate, adverse; short-term, negligible to minor beneficial; and long-term negligible to moderate beneficial. There would be *no impairment* of wetlands or water quality from this alternative (see specific definition of impairment in the “Impairment of National Lakeshore Resources” section).

## VISITOR OPPORTUNITIES AND USE

### Visitor Opportunities

Visitors would continue to have access to information, interpretation, and educational opportunities at a variety of locations,

including the visitor center in Empire, at Glen Haven, and at the visitor contact station on South Manitou Island. Interpretive and educational activities throughout the Lakeshore would be similar to those currently offered (see chapter 4 “Visitor Opportunities and Use” section). Continuation of these opportunities would have long-term, moderate, beneficial impacts.

Access to and through the Lakeshore would continue on the existing network of state, county, and NPS roads and Lakeshore trails, trailheads, and beach access points (see chapter 4 “Facilities and Infrastructure” section under “NPS Operations”). Seasonal ferry service would continue to be provided for overnight trips to North Manitou Island and day and overnight trips to South Manitou Island. Visitor access to the Benzie Corridor would not be provided due to the current limited NPS ownership. Continuation of the above-noted Lakeshore access would have long-term, moderate, beneficial impacts.

The scenic resources of the Lakeshore would largely reflect existing conditions. Visitors could experience relatively large areas of the Lakeshore that are natural in character, sites that reflect the area’s culture and history (e.g., Glen Haven, Port Oneida, and cultural resources on North Manitou and South Manitou islands), and areas with facilities that support recreational use (e.g., the Dune Climb and Trails End). NPS land acquisition would continue in the Benzie Corridor, on a willing-seller basis. The development of private properties within the Benzie Corridor might continue to occur although NPS properties would remain undeveloped. Currently the corridor is relatively undeveloped and the views of Crystal Ridge from below or more distant points within and outside the Lakeshore are natural in character. The largely natural scenic resources of the Lakeshore would continue to have long-term, moderate beneficial impacts on visitors.

The scale of recreation-oriented development would continue to be relatively modest (see chapter 4 “Facilities and Infrastructure” section). Some visitors would be disappointed not to have some additional improvements in recreation-oriented development. The current level of development would continue to have long-term, minor beneficial impacts for most visitors. For those wanting additional developments there would be long-term, minor adverse impacts as a result of limitations in available developed recreational opportunities and amenities.

A wide range of recreational activities would continue to be available. Visitors would continue to experience crowding on the Platte River during peak use times, and there would be no visitor opportunities in the Benzie Corridor. Visitor opportunities related to wilderness are described in the “Wilderness Character” section of this chapter. The range of current recreational activities would provide an overall long-term, beneficial impact on visitors. However, the occasional crowding on the Platte River would continue to have long-term, minor adverse effects to some river users and might result in some visitor displacement.

Natural sounds would continue to dominate the Lakeshore except along roadways, in developed areas, where motorized boats are allowed (along rivers, at specific inland lakes, and on Lake Michigan), and when aircraft are flying over. The predominance of natural sounds would continue to have long-term, minor, beneficial impacts on visitors.

The naturally dark night sky would continue to be predominant in the Lakeshore despite vehicular lights along roadways and lighting in nearby developed areas. These conditions would continue to have long-term, minor, beneficial impacts for those who value dark night skies.

### Visitor Use

Visitor opportunities under the no-action alternative would remain essentially unchanged. Consequently, visitor use at Sleeping Bear Dunes under the no-action alternative would be expected to increase modestly over the life of this plan (primarily as a result of regional population growth) — perhaps on the order of 5% to 7% (up to 84,000 additional visitors per year). Year-to-year changes in visitor use would vary, with periods of faster or slower growth, and even periods of declining visitor use. However, the long-term growth trend would be expected to be positive. Peak visitor use would likely continue to occur in July and August. Current visitor use levels would have long-term and minor effects that may be concurrently viewed as beneficial or adverse. The differences between beneficial and adverse would depend on the expectations and preferences of the visitor related to the anticipated increased visitation.

### Cumulative Effects

Other past, present, and reasonably foreseeable projects that would affect visitor opportunities and use include: (1) improvements to parking areas at the ends of Leelanau County Roads 651 and 669; (2) Glen Haven Village improvements; (3) improvements to the Pierce Stocking Scenic Drive Lake Michigan overlooks 9 and 10; (4) South Manitou Lighthouse Complex exterior restoration and interior rehabilitation; and (5) Dune Climb parking area paving and other minor improvements. These actions would improve visitor opportunities by improving enjoyment, access, and/or range of available opportunities for visitors and would have an overall long-term, minor, beneficial effect on visitor opportunities and use. The development of private properties within the Benzie Corridor and rural residential developments near the Lakeshore (particularly along the access roads and in/near Glen Arbor and Empire) might

continue to occur; these would result in a degradation of natural scenic quality, natural soundscapes, and night sky. These actions would have a long-term, minor, adverse effect on visitors. Combined with the no-action alternative, these actions would have a long-term, minor, beneficial cumulative effect. Impacts of the no-action alternative would comprise a relatively modest portion of the overall cumulative effect.

### Conclusion

Visitors seem satisfied overall with most current opportunities in the Lakeshore. Maintaining the current access, scenic resources, range of visitor opportunities, experiences, and recreation-oriented facilities would have a long-term, minor to moderate beneficial impact on visitor opportunities and use. Some visitors would prefer some additional improvements in recreation-oriented facilities, a few additional visitor opportunities, or a reduction of crowding on the Platte River, and the lack of these would result in a long-term, minor adverse impact on these visitors. The cumulative effects would be long-term, minor, and beneficial.

## WILDERNESS CHARACTER

### Natural and Undeveloped

Under this alternative, 30,903 acres (43% of the National Lakeshore) would continue to be managed to maintain their existing wilderness character “until Congress determines otherwise.” For simplicity, these areas are referred to simply as “wilderness areas” in this section. In the no-action alternative, “wilderness areas” would continue to be interrupted by or interspersed with non-wilderness in some places (e.g., at Port Oneida, near Good Harbor, and on South Manitou Island), so adjacent motorized or mechanized uses (e.g., vehicle use, the motorized farm tour on South Manitou Island) would continue to intrude

upon the “wilderness areas” undeveloped, primeval character. *Within* the “wilderness areas,” the presence of secondary roads with active motor vehicle and bicycle use and presence of historic structures would continue to locally diminish the areas’ naturalness. These would be continuing (not new) adverse, localized, and minor long-term impacts.

### **Opportunities for Solitude**

Outstanding opportunities for solitude would continue to be available in the “wilderness areas” on the mainland (particularly at the north and south ends) and on the Manitou Islands. Most portions of the “wilderness,” especially away from trails and developed areas, would continue to offer excellent prospects for privacy and isolation, although modest gradual increases in visitation would slightly diminish these opportunities over time. Solitude would continue to be more available on North Manitou Island than on South Manitou because the former is larger, has fewer visitors (many of whom are seeking solitude themselves), and lacks day use. This alternative would have continuing moderate beneficial impacts and long-term, minor, adverse impacts on opportunities for solitude.

### **Opportunities for Primitive, Unconfined Recreation**

Due to the nature of the ferry schedule there would continue to be opportunities for both day and overnight wilderness experiences on South Manitou Island, but only overnight experiences on North Manitou. For visitor safety and resource reasons, permits are required for backcountry camping, and campers must stay in designated campgrounds except on North Manitou Island where camping would continue to be dispersed. Although most visitors would agree that there are outstanding opportunities for primitive, unconfined recreation both on the mainland

and on the islands, permit and camping requirements would continue to diminish these qualities to some degree, resulting in a minor, long-term, adverse impact.

### **Cumulative Impacts**

Over time, the Lakeshore’s ongoing program to restore nonhistoric areas disturbed by past land uses to more natural conditions has substantially increased the natural, undeveloped character of the Lakeshore. In 2006 alone, restoration was accomplished on 21 tracts amounting to 135 acres, and another 14 tracts were partially restored. The work includes removing nonnative trees and remnants of human enhancements such as house foundations, gravel, wells, and septic systems, plus reestablishing more natural contours and native vegetation. This restoration work would continue to have a long-term beneficial effect on naturalness. Combined with this ongoing program, the no-action alternative would have long term, moderate, beneficial cumulative effects. The contribution of the no-action alternative to these cumulative effects would be substantial.

### **Conclusion**

As the result of ongoing management of nearly 31,000 acres to maintain its existing wilderness character, as directed by Congress, the National Lakeshore would continue to include extensive, largely natural undeveloped areas where outstanding opportunities for solitude or primitive, unconfined recreation would continue to be available. Impacts of the no-action alternative would continue to be mostly beneficial, moderate, and long term — but there would also be some continuing localized, minor adverse impacts on wilderness character. The no-action alternative, combined with other actions, would result in long-term moderate, beneficial cumulative effects.

## REGIONAL SOCIOECONOMICS

Implementing the no-action alternative would occur at the same time as other economic, demographic and social changes in the region. Economic projections for the region anticipate population growth of about 5% through 2010 and more than 25% through 2030, a net gain of more than 30,000 residents (NWMCOG 2006 and MDOT 2007). Most of the growth is expected in Grand Traverse County, although nearly 10,000 additional year-round residents are projected in Benzie and Leelanau counties. Seasonal population is also expected to climb. The influx of new residents will affect the social dynamics in the region. Employment increases will accompany the population growth, particularly the number of jobs in retail trade and services and in the residential construction industries.

### Visitor-Related Economic Impacts

Visitor use at Sleeping Bear Dunes under the no-action alternative would be expected to increase modestly over the life of this plan — perhaps on the order of 5% to 7% (see “Impacts of the No-Action Alternative — Visitor Use” section in this chapter).

Increased visitor spending at local stores, motels and hotels, and other tourism-related businesses and attractions would accompany the rising visitation. Annual spending could climb to \$34.5 million over the life of this plan, a \$1.7 million increase over current levels. Future visitor use and spending would vary by season, with peak visitor use in the summer. Future visitor spending would include increases in entry and camping fees and sales of merchandise through the Eastern National cooperating association’s operations at the Lakeshore.

Projected spin-offs from the visitor spending include 30 to 35 additional jobs and increased personal income in the region. The visitor-related economic impacts would be long-term

benefits, but negligible to minor relative to the 84,000-plus jobs and \$3.97 billion in personal income in the three-county region in 2005.

Visitor spending under no action would continue to be concentrated in Glen Arbor, Empire, Traverse City, and businesses located along M-22, M-72, and other highways providing access to the Lakeshore. Market opportunities created by the spending would help sustain the retail trade and service establishments in the region, with these businesses realizing a collective, albeit limited-scale increase in business revenues. The economic stimulus associated with visitor spending would remain highly seasonal.

The state and local governments would collect additional sales tax from the increased visitor spending.

The visitor-related economic impacts would be beneficial, but negligible in the short term and minor and beneficial over the long term due to the limited scale of increased visitation over time.

### Economic Impacts Related to Implementation and NPS Operations

Implementing the no-action alternative would provide a sustained economic infusion to the region over the life of this plan. The infusion would result from ongoing Lakeshore operating expenditures, including payroll, and expenditures on projects beyond basic operations. Major project needs over the life of this plan include \$3.2 million in construction spending and \$3.4 million in other major spending (for total construction costs of \$6.6 million, plus funds to address deferred maintenance and continued maintenance of the Lakeshore’s infrastructure and resources.

NPS maintenance staff would perform much of the work to address deferred maintenance and preservation, restoration, and rehabilitation activities. The Lakeshore’s future outlays

for materials and equipment to support construction and major maintenance would create short-term economic impacts in the region. Local merchants, equipment suppliers, specialty contractors, and related industries would capture a substantial portion of those outlays. The timing and amount of these expenditures are uncertain, depending on the budgetary approvals by Congress, budget allocations within the National Park Service, and future collections of entry and camping fees at the Lakeshore that can be used to support projects. Annual NPS payroll, operating, and maintenance would produce long-term effects on employment, business sales, income, and other related measures.

No major changes in budgeted resources to fund NPS operations would be anticipated under the no-action alternative. Supportable staffing needs under the no-action alternative are estimated at about 66 full-time equivalent employees, and the Lakeshore would continue to benefit from substantial levels of volunteer efforts. Available resources would include about \$3.9 million in annual base budget appropriations, about \$1.0 million per year in entry and camping fees, and roughly \$1.5 million per year in various nonrecurring funding for other projects. Continued supplemental land acquisition funding would be required for land acquisition in the Benzie Corridor.

Establishment of the National Lakeshore and subsequent land acquisition removed lands and improvements from the local tax rolls. Some adverse effects on local businesses might have also resulted. These effects were offset in part by PILT payments, the likely boost in area property values due to the proximity and “amenity” values of the National Lakeshore, tax revenues associated with sales to Lakeshore visitors, and the economic infusions from NPS operations and staff. Some additional effects on tax rolls would result from future land acquisition in the Benzie Corridor and Bow Lakes areas.

Activities sponsored by the Lakeshore’s partners would provide additional sources of economic stimulus. The timing, magnitude, and indirect economic consequences of those activities are indeterminate.

Economic effects associated with the Lakeshore’s operations would be beneficial and minor to moderate in the short and long term.

### **Effects on Regional Population**

The Lakeshore would not be a major catalyst for future population growth under the no-action alternative. Staffing levels would remain about the same, and little economic expansion would result due to the modest increases in long-term visitor use.

The Lakeshore would continue to be an important “amenity” for many residents and for people considering relocation to the region, and thus could contribute indirectly to population growth. However, implementation of the no-action alternative would not dramatically affect the region’s heritage and outdoor recreation opportunities that contribute to its seasonal tourism economy.

The effects on regional population growth under the no-action alternative would be indeterminate, but likely negligible, both in the short and long terms.

### **Community Services**

Little or no change in Lakeshore-related demands on community services and facilities across the region would result from implementing the no-action alternative. Local water and wastewater systems would be marginally affected by more people traveling through the area and staying locally in second homes or lodging accommodations. However, the incremental demands associated with the increased visitation would not require



additional capacity or staffing, due to its seasonal nature, limited scale, and geographical dispersion. Tax revenues generated by visitor spending would help provide resources to meet future needs.

Effects on community services under this alternative would be indeterminate and negligible over the short and long terms.

### **Traffic and Emergency Services**

Traffic would increase marginally on area highways and roads as a result of travel associated with higher visitation under the no-action alternative. The incremental traffic would be highest on summer weekends. Traffic increases would be most noticed on M-22, M-109, and M-72, the main access roads to the Lakeshore, though future traffic volumes would be within the design capacities of these roads. Over time, increases in traffic volumes would lower the level of service below desired conditions at the intersection of M-22 and M-109 (Robert Peccia & Associates, 2001). Most Lakeshore-related traffic would consist of light-duty vehicles and self-contained recreational vehicles (RVs) that do not result in heavy wear on the paved roads and thus, would not require much additional maintenance.

More traffic would cause more traffic accidents and demands on local law enforcement, emergency medical and fire protection agencies. The scale of changes associated with the no-action alternative would not require law enforcement agencies to hire more staff, though they could contribute to overall needs for more staff. Although the frequency of incidents would remain relatively low, the distances and response times involved and the fact that many local emergency medical and fire protection agencies are staffed partially by volunteers, could impose burdens on these providers.

The effects of the no-action alternative on traffic and emergency services would be adverse, but negligible over the short term and long term.

### **Attitudes and Lifestyles**

The Lakeshore's influence on community attitudes and lifestyles would not dramatically change under the no-action alternative. Continuing NPS operation within the current management framework would not substantially alter existing visitor use opportunities or patterns. Maintaining current land and lakeshore access plus management of some lands to preserve their wilderness characteristics would encourage continued low use levels in many areas of the Lakeshore. Such management would enjoy support from several affected publics.

For some members of the community, continued management under the no-action alternative would not be satisfactory because they might see it as lacking clear management direction for the National Lakeshore. People and groups who promote a positive commitment to continued county road access, specific recreation opportunities, preservation of historical and cultural resources and landscapes, or enhanced protection of natural resources might not view the management direction in this alternative favorably. At the same time, some may see benefits with the no-action alternative, either because it avoids situations or impacts that they would find less desirable, or because they believe it leaves open their desired management options to be considered in the future.

The net effects of the no-action alternative on community attitudes and lifestyles are indeterminate.

## **Cumulative Impacts**

From the economic and social perspectives, one cannot readily isolate what happens at the Lakeshore from past, present, and future development in the surrounding areas.

Forestry, maritime, and agricultural uses along with the establishment of the Lakeshore are largely responsible for existing land use patterns. Those uses are also tied to the cultural and historical landscapes that are among the Lakeshore's fundamental resources. If not for establishment of the Lakeshore, the affected lands would undoubtedly provide far fewer opportunities for public use and natural resource protection.

Social and economic effects of the above actions include moderate short- and long-term increases in traffic on local roads, short-term moderate demands on local construction trades and services, short- and long-term moderate demands on community services, and changes in the seasonal resident and visitor population. Social and economic effects of ongoing or planned improvements/restoration at the Lakeshore would result in long-term negligible economic effects on visitor-related businesses due to changes in visitor use levels and distribution. Combined with these effects, the no-action alternative would result in short- and long-term minor to moderate beneficial and adverse cumulative effects. The no-action alternative would comprise a small portion of these overall cumulative impacts.

## **Conclusion**

The economic and social effects of the no-action alternative would include negligible to minor short-term and long-term economic benefits and negligible, indeterminate, or adverse effects on population growth and demands on community services and facilities. Long-term consequences on attitudes and lifestyle are indeterminate, but in general would be more likely to be adverse than

beneficial. The no-action alternative would have short- and long-term minor to moderate beneficial and adverse cumulative social and economic effects.

## **NPS OPERATIONS**

Under the no-action alternative, NPS operations would continue to be characterized by (1) a substantial number of facilities or assets (e.g., visitor contact stations, parking and picnic areas, campgrounds, trails, and historic structures and landscapes) that must be maintained; (2) visitor-related operational demands (e.g., interpretative services, patrols, and campground maintenance) that are much greater in the busy summer visitor season than at other times of year; (3) island operations that command a disproportionate share of the Lakeshore's annual operating budget due to the logistics of transporting equipment, materials, and staff to and from the islands; and (4) increasingly better and stronger relationships with outside entities and organizations who are interested in the Lakeshore.

Assuming current funding trends continue and staffing levels remain similar to present, the Lakeshore would continue to be unable to fully achieve desired conditions in program areas such as resource protection, visitor services, cyclic maintenance, and the deferred maintenance backlog would continue to grow over time. Wilderness minimum requirement analysis would continue to be required for the 30,903 acres managed to maintain their existing wilderness character. The no-action alternative would have continuing long-term minor to moderate beneficial and adverse impacts on NPS operations, but there would be no new impacts.

## **Cumulative Impacts**

Ongoing and planned facility upgrades and restoration/rehabilitation projects would have

mostly beneficial impacts over the long term because these projects would result in reduced resource protection and cyclic maintenance needs. Minor adverse impacts would occur in the short term. Dredging of the Platte River mouth would continue to place demands on the NPS maintenance staff and budget, a minor, long-term, adverse effect. Combined with impacts of the above actions, the no-action alternative would have long-term, minor beneficial and adverse cumulative effects. This alternative's contribution to these cumulative impacts would be substantial.

### **Conclusion**

Ongoing impacts (long-term minor to moderate beneficial and adverse) would continue, but the no-action alternative would have no *new* impacts on NPS operations. The no-action alternative, combined with other actions, would result in long-term minor beneficial and adverse cumulative effects.

### **UNAVOIDABLE ADVERSE IMPACTS**

Some negligible to moderate impacts to soils, vegetation, wildlife, water resources and wilderness character caused by ongoing recreational use or facilities are essentially unavoidable (e.g., soil compaction, vegetation trampling, wildlife disturbances, and decreased opportunities for solitude). Gradual increases in visitor use would have low level adverse impacts on regional socioeconomics (e.g., increased traffic).

### **IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES**

Irreversible commitments of resources are actions that result in loss of resources that cannot be reversed. Irretrievable commitments of resources are actions that result in the loss of resources but only for a limited period of time.

With the exception of consumption of fuels and raw materials for maintenance activities, no actions in this alternative would result in consumptions of nonrenewable natural resources or use of renewable resources that would preclude other uses for a period of time.

### **RELATIONSHIP OF SHORT-TERM USES AND LONG-TERM PRODUCTIVITY**

The National Lakeshore would continue to be used by the public, and most areas would be protected in a natural state. The National Park Service would continue to manage the Lakeshore to maintain ecological processes and native biological communities and to provide appropriate recreational opportunities consistent with preservation of cultural and natural resources. Actions would be taken with care to ensure that uses do not adversely affect the productivity of biotic communities. Under the no-action alternative there would be virtually no new development and no appreciable loss of long-term ecological productivity.

## IMPACTS OF THE PREFERRED ALTERNATIVE

### HISTORIC RESOURCES

*The Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995) identifies four treatment approaches that apply to a wide variety of resource types, including buildings, sites, structures, objects, districts, and landscape features and patterns. Three of those treatments are included in this plan — preservation, rehabilitation, and restoration. See page 40 for more detailed definitions. The simplest of these treatment approaches is preservation, in which measures are undertaken to stabilize the resource to ensure that it does not deteriorate further from its existing condition and then to maintain and repair historic features and materials. The second option is rehabilitation, in which the resource is made useable for some purpose while preserving those features that convey its historical, cultural, or architectural value. The third is restoration, in which the historic appearance at a particular time is accurately regained. The fourth treatment, reconstruction, is not proposed in this plan.

Although each alternative calls for preserving and protecting all historic properties, each action alternative provides a different management zone configuration based on that alternative's overall vision, and each management zone prescribes which of the three treatments could be used for historic properties. Thus, potential treatments for the National Lakeshore's various historic properties differ among the alternatives. Based on the locations and relative proportions of management zones in the preferred alternative, 78% of historic structures would undergo preservation, rehabilitation, or restoration (experience history zone), 13% of historic structures would undergo preservation or rehabilitation (recreation zone), and 8% of historic structures would undergo preservation

(experience nature zone). This information is summarized in table 3 on page 74.

All preservation, rehabilitation or restoration efforts would be undertaken in accordance with the standards. Any materials removed during rehabilitation or restoration efforts would be evaluated to determine their value to the Lakeshore's museum collection and/or for their comparative use in future preservation work at the sites. Implementation of the actions described above for this alternative, which would bring all historic resources up to a good condition, would result in no adverse effects on historic resources.

At Glen Haven the Glen Haven Historic District and Sleeping Bear Point Life-Saving Station would be preserved, rehabilitated, or restored (same action in all alternatives). Some buildings would be rehabilitated for visitor and/or staff use. The Sleeping Bear Inn and garage would be placed in the NPS historic leasing program to allow rehabilitation for adaptive use. All other structures would be stabilized and maintained in their current condition.

At Port Oneida historic structures and landscapes would be preserved, rehabilitated, or restored (same action in all alternatives). Structures on at least one farmstead would be restored for interpretive purposes. Some buildings in the district would be rehabilitated for visitor and/or staff use, including a visitor contact station and staff housing. At least one farmstead would be placed in the NPS historic leasing program to allow rehabilitation and adaptive use. All other structures and landscapes would be stabilized and maintained in their current condition.

On North Manitou Island the historic life-saving station and Cottage Row structures would be preserved, rehabilitated, or restored. Preservation and/or adaptive use of the

rehabilitated historic former Manitou Island Association structures for administrative and operational purposes would continue. Historic structures and landscapes elsewhere on the island would be preserved.

On South Manitou Island the historic life-saving station, lighthouse complex, village historic structures, schoolhouse, and farm loop tour historic structures would be preserved, rehabilitated, or restored. Structures and landscapes elsewhere on the island would be preserved.

Other mainland historic structures and landscapes would be managed as specified for the management zone in which they lie (see alternative map and zone descriptions).

Actions involving other than historic property treatments, such as developing new trails, improving beach parking and access at selected locations, and providing new campgrounds on North Manitou Island and elsewhere in the National Lakeshore, would have no effect on historic properties because they would be designed to avoid possible impacts on properties on or eligible for the national register.

All properties on or determined eligible for inclusion in the National Register of Historic Places would, at a minimum, undergo stabilization (where that action has not already occurred) or maintenance in the current condition (where some preservation treatment has already been implemented).

The actions proposed above are general. The treatments for each resource (preservation [stabilization], rehabilitation with adaptive use, restoration) have not yet been determined so impacts cannot be fully described. However, it is the National Park Service's intent that no action proposed be adverse. All actions affecting these historic structures and landscapes would be undertaken in consultation with the Michigan state historic preservation officer.

The preferred alternative would not directly or indirectly affect any properties outside the boundary of the National Lakeshore that are listed on or eligible for the National Register of Historic Places, or that are listed by the state.

### Cumulative Impacts

Over the years historic resources in the Lakeshore have been adversely impacted by natural processes such as weathering, vegetative encroachment, and the wear and tear associated with visitor use. Actions proposed for the South Manitou Island Lighthouse Complex would result in both the restoration of the exterior of the keeper's quarters and connecting passageway and the rehabilitation of the interior for adaptive reuse. In addition, actions proposed for Glen Haven Village include the stabilization and maintenance of historic structures or their rehabilitation for adaptive reuse. All preservation, rehabilitation, or restoration efforts would be undertaken in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995), and would result in no adverse effects on historic resources.

As described above, implementation of the preferred alternative would result in no adverse effects on historic resources. The no adverse impacts of this alternative, in combination with both the adverse and no adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a no adverse effect cumulative impact. The no adverse effects of the preferred alternative would be a sizeable contribution to the no adverse effect cumulative impact.

### Conclusion

The preferred alternative would have a determination of no adverse effect under the Advisory Council on Historic Preservation

“Regulations for the Protection of Historic and Cultural Properties” (36 CFR 800). There would be *no impairment* of cultural resources from implementation of the preferred alternative (see specific definition of impairment in the “Impairment of National Lakeshore Resources” section in this chapter).

## NATURAL RESOURCES

### Soils and Geologic Resources

Readers are encouraged to refer back to the “Soils and Geologic Resources” discussion in the “Methods and Assumptions for Analyzing Impacts” section for additional details on the types of impacts resulting from visitor use and development.

Use of motorized boats on School and Loon lakes and the Crystal and Platte rivers would also continue. Soil compaction and erosion of the dunes would be reduced in some areas by using sand ladders, boardwalks, and sidewalks to protect the substrate. These ongoing activities would continue to have minor to moderate (depending on location and activity), short- and long-term adverse impacts on soils and geologic resources. Implementation of user capacity management (see discussion in chapter 2) to reduce impacts of visitor use in sensitive and yet popular areas such as the Platte River corridor, would have short- and long-term, minor to moderate beneficial impacts.

Development of the bay-to-bay trail and the M-22/M-109 hike/bike trail could result in soil disturbance and erosion during construction, and subsequent visitor use would result in erosion and compaction. Assuming use of best management practices (such as using silt fences and avoiding steep slopes and inundated areas) during construction and later use to prevent erosion and compaction, the overall adverse impacts would likely be short term and moderate and long term and minor.

The concession tours to near the Giant Cedars area on South Manitou Island and day trips to and camping in newly designated areas on North Manitou Island could increase visitor use and associated soil compaction and erosion; adverse impacts in such areas above the current level might be anticipated. However, careful monitoring and the use of sand ladders, boardwalks, or fencing to reduce compaction and erosion would result in short-term moderate and long-term minor adverse impacts on soils.

Improving the parking area at the end of Esch Road, improving the Glen Lake Picnic area, improving boat access to several inland lakes and the Crystal River, providing campgrounds associated with the bay-to-bay trail, and providing additional designated campsites on North Manitou Island would typically disturb soils and cause compaction and sometimes erosion. Assuming implementation of best management practices during design and construction, adverse impacts could be minimized. The development activities proposed in the preferred alternative would likely have short-term, moderately adverse impacts due to construction activities. The long-term impacts on soils would be minor and beneficial because, for example, trails in the Bow Lakes area would focus pedestrian traffic on the trails (reducing impacts in the rest of the area), North Bar Lake would be closed to all motorized boats, and the current Valley View campground, which would be removed, would be restored to more natural conditions.

Under this alternative, the National Park Service would continue to acquire lands on a willing-seller basis within the Benzie Corridor but would not implement any development within the corridor during the life of this plan. Continued NPS acquisition of lands in the Benzie Corridor would protect the geology and soils on NPS-owned parcels from development for the life of this plan, providing short- and long-term, moderate, beneficial effects. Private development within the

corridor would probably continue at its current pace and would continue to have minor to moderate adverse impacts to these resources.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on soils and geologic resources include (1) the improvements to the parking areas at the ends of Leelanau County Roads 651 and 669; (2) Glen Haven Village improvements; (3) improvements to the Lake Michigan overlooks accessed from the Pierce Stocking Scenic Drive; (4) riverbank stabilization on the Platte River at the former Water Wheel and Casey's Corner canoe liveries; (5) restoration approximating the natural topography, hydrology, and native vegetative cover of nonhistoric sites disturbed by past land uses — particularly those in critical dunes areas; (6) minor improvements to the Dune Climb parking area, and (7) continued dredging of the mouth of the Platte River. Although activities 1-6 would likely result in short-term adverse impacts during the construction phase, the net result would likely be long-term, minor to moderate beneficial impacts because all projects would contribute to a reduction of the potential for soil compaction and erosion. Dredging the mouth of the Platte River results in continued addition of dredged material to the shoreline. During low-water periods deeper dredging is required and results in dredge materials with high clay content being deposited on the shoreline, resulting in armoring of the beach surface and consequent profile changes. This results in short- and long-term minor to moderate adverse impacts.

The impacts of other actions described above, in combination with the impacts of the preferred alternative, would result in short- and long-term, minor to moderate adverse cumulative impacts, and short- and long-term, minor to moderate, beneficial cumulative impacts. The preferred alternative's contribution to these cumulative impacts would be minimal.

**Conclusion.** The preferred alternative would have short- and long-term, minor to moderate adverse and beneficial impacts on soils and geologic resources. Cumulative impacts would be anticipated to be short term, moderately adverse, and short and long term, minor to moderate beneficial. There would be *no impairment* of soils or geologic resources from implementation of preferred alternative (see specific definition of impairment in the "Impairment of National Park Resources" section).

### Vegetation and Wildlife

Readers are encouraged to refer back to the "Vegetation and Wildlife" discussion in the "Methods and Assumptions for Analyzing Impacts" section for additional details on the types of impacts resulting from visitor use and development.

The use of motorized boats on School and Loon lakes and the Crystal and Platte rivers would continue to result in trampling of vegetation, habitat alteration, introduction and spread of invasive species, and sensory-based disruption of wildlife. Impacts on vegetation and wildlife from such activities would likely continue to be short and long term, negligible to moderate, and adverse. Implementation of user capacity management (see discussion in chapter 2) to reduce impacts of visitor use in sensitive and yet popular areas such as the Platte River corridor, would have short- and long-term, minor to moderate beneficial impacts.

Under the preferred alternative, 45% (32,100 acres) of the National Lakeshore would be managed as wilderness (assuming that Congress acts to designate wilderness), an increase of 1,197 acres (2%) over the no-action alternative. Management of these areas as wilderness conveys a higher level of protection to the vegetation and wildlife of the areas than any management zone. This wilderness proposal would likely have short- and long-

term minor beneficial impacts on vegetation and wildlife of the Lakeshore.

The development and use of the bay-to-bay trail and the M-22/M-109 hike/bike trail would impact vegetation and wildlife through trampling of vegetation, habitat loss and alteration, introduction and spread of invasive species, and sensory-based disruption of wildlife. Assuming the use of best management practices (such as placement of trails/paths as close to existing disturbances as possible, minimization of construction footprint for both temporary and permanent impacts, and timing of construction outside peak breeding and nesting seasons), and careful monitoring of impacts during use, the overall impacts would likely be short and long term, negligible to minor, and adverse.

Cessation of all motorized boating on North Bar Lake would likely have short- and long-term, minor beneficial impacts due to reductions in trampling, habitat alteration, and sensory-based disturbances, and the likelihood of introducing nonnative species.

Day trips to North Manitou Island and concession auto tours to near the Giant Cedars area on South Manitou Island, would increase visitor use resulting in associated increases in trampling of vegetation, habitat alteration, introduction and spread of invasive species, and sensory-based disruption of wildlife. Assuming practicable levels of monitoring and remediation of visitor-related impacts, overall impacts of these types of new activities would likely be short and long term, negligible to minor, and adverse.

The loop trail and small parking area at Bow Lakes, improvements to inland lake boat access and Crystal River access points, and the provision of additional designated campsites on North Manitou Island could result in habitat loss and degradation, both of which could be reduced by strategic location and design. These improvements could result in introduction and spread of invasive species

to inland waterways. Other development, such as improvements to the parking area at the end of Esch Road and improvements to the Glen Lake picnic area, and providing campgrounds associated with the bay-to-bay trail might result in increased visitor use and associated increases in vegetation trampling, habitat alteration, introduction and spread of invasive species, and sensory-based disruption of wildlife in those areas. The sum of these impacts on vegetation and wildlife in the Lakeshore would likely be short- and long-term negligible to minor adverse impacts, and long-term, minor, beneficial impacts (e.g., development of a loop trail in the Bow Lakes area concentrating use on trails and leaving areas away from the trails relatively undisturbed, and removing and restoring the Valley View campground to more natural conditions).

Under this alternative, the National Park Service would continue to acquire lands within the Benzie Corridor but would not implement any development within the corridor during the life of this plan. Continued NPS acquisition of lands in the Benzie Corridor would protect the vegetation and wildlife on NPS-owned parcels from development for the life of this plan, providing short- and long-term, moderate, beneficial effects. Private development within the corridor would probably continue at its current pace and would continue to have minor to moderate adverse impacts on these resources.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on vegetation and wildlife include (1) the improvements to the parking areas at the ends of Leelanau County Roads 651 and 669; (2) implementation of the “Fire Management Plan”; (3) improvements to the Lake Michigan overlooks accessed from the Pierce Stocking Scenic Drive; (4) riverbank stabilization on the Platte River at the former Water Wheel and Casey’s Corner canoe liveries; and (5) restoration approximating the natural topography, hydrology, and native vegetative



cover of nonhistoric areas disturbed by past land uses — particularly those in critical dunes areas. These actions would likely have short- and long-term negligible to minor adverse impacts due to trampling and sensory based disturbance during the activity and long-term minor beneficial impacts on vegetation and wildlife due to rehabilitation and enhancement of habitat. The impacts of other actions described above, together with the impacts of the preferred alternative, would result in short- and long-term, negligible to minor adverse cumulative impacts, and short- and long-term minor to moderate beneficial cumulative impacts. The contribution of the preferred alternative to these cumulative effects would be relatively small.

**Conclusion.** The preferred alternative would have short- and long-term negligible to minor adverse impacts, and short- and long-term minor to moderate beneficial impacts. The impacts of actions in the preferred alternative, combined with other past, present, and reasonably foreseeable actions, would likely result in short- and long-term, negligible to minor adverse cumulative impacts, and short- and long-term minor beneficial cumulative impacts. There would be *no impairment* of vegetation or wildlife resources from implementation of the preferred alternative (see specific definition of impairment in the “Impairment of National Lakeshore Resources” section).

### Federal Threatened and Endangered Species

Readers are encouraged to refer back to the “Federal Threatened and Endangered Species” discussion in the “Methods and Assumptions for Analyzing Impacts” section for additional details on the types of impacts resulting from visitor use and development.

The federally listed species considered are the Michigan monkey flower, piping plover (both populations and designated critical habitat),

and Pitcher’s thistle. The piping plover and Pitcher’s thistle are found primarily in near-shore dunes; the Michigan monkey flower is restricted to one lakeside location in the Lakeshore interior. Although part of the designated critical habitat within the Lakeshore coincides with actively used recreational beach areas, NPS staff have demonstrated success in minimizing impacts on nesting piping plovers in areas with relatively high human activity (e.g., the mouth of the Platte River) through various actions (see “Mitigative Measures for the Action Alternatives” section in chapter 2). All impact analyses assume continued protection of threatened and endangered species as outlined in the Lakeshore-wide desired condition statements (see chapter 1).

Under the preferred alternative, 45% of the National Lakeshore would be managed as wilderness (assuming that Congress acts to designate wilderness), a 1,197-acre (2%) increase over existing conditions. This increase would potentially benefit the Pitcher’s thistle, and that benefit would be insignificant because much of the Lakeshore is currently managed to benefit native ecosystems regardless of its designation status. This increase in proposed wilderness would have insignificant effects on piping plovers and piping plover critical habitat because management of the Lake Michigan shoreline and near-shoreline areas would remain essentially the same despite the changes in wilderness status, and because piping plovers successfully nest and fledge under current management. This increase would have no effect on Michigan monkey flower because wilderness is not proposed in the area where this species is known to occur. Thus, overall, this increase in proposed wilderness would have only insignificant beneficial impacts on listed species.

Developing the bay-to-bay trail and associated campgrounds and providing additional designated campsites on North Manitou Island could result in habitat alteration and

degradation, both of which could be reduced by strategic location and design. Other development, such as improvements to the parking area at the end of Esch Road, might result in increased visitor use and associated increases in Pitcher's thistle trampling, habitat alteration for both Pitcher's thistle and piping plover, and sensory-based disruption of piping plover in those areas.

Use of the proposed bay-to-bay trail and campgrounds, and the provision of day trips to North Manitou Island could have impacts on piping plover and Pitcher's thistle populations and habitat due to potential trampling and associated habitat alteration, and on piping plover populations due to sensory-based disturbance. These impacts could be reduced by strategic location and design such as careful selection and demarcation of trails outside of sensitive areas (e.g., away from piping plover critical habitat) and use of boardwalks.

Under the preferred alternative, the National Park Service would continue to acquire lands within the Benzie Corridor but would not implement any development within the corridor during the life of this plan. Private development within the corridor would probably continue at its current pace. These activities and conditions would have no effect on listed species because neither the species nor their habitats occur within the corridor.

For projects proposed in the preferred alternative, the National Park Service would implement measures to ensure that adverse effects on listed species do not occur. These avoidance measures might include, but are not limited to, the following:

- Safeguarding the known locations of listed species.
- Restricting human activity in piping plover breeding areas by use of a specialized fence system.

- Increasing the number of NPS/volunteer piping plover nest monitors, should conditions warrant.
- Restricting human activity in piping plover breeding areas.
- Restricting dogs from piping plover breeding areas during the breeding season.
- Flagging or fencing plants prior to any work in or adjacent to Pitcher's thistle habitat. Every effort would be made to avoid any impacts to these plants.
- Providing education about the listed species and their habitats.
- Designating alternate access points away from areas occupied by listed species.

The National Park Service staff anticipates that adverse effects could be avoided in all the projects proposed under the preferred alternative. The National Park Service cannot foresee at this time any project proposed in this *General Management Plan* for which adverse effects could not be avoided. In the rare event that adverse effects could not be avoided, the project would either be discontinued or NPS staff would request formal consultation with the U.S. Fish and Wildlife Service. As such, any impacts from implementation of the preferred alternative would likely have only beneficial, insignificant, or discountable effects on piping plover and piping plover critical habitat, Michigan monkey flower, and Pitcher's thistle.

At the landscape level, the preferred alternative may affect but would not be likely to adversely affect listed species because the proposed management direction would result in conditions that are beneficial to preserving habitat and would minimize adverse impacts on listed species to either insignificant or discountable. As such, implementation of the preferred alternative may affect but would not be likely to adversely affect piping plover and piping plover critical habitat, Michigan monkey flower, and Pitcher's thistle.

**Conservation Measures.** Conservation measures are activities above and beyond avoidance measures and are undertaken to reduce potential impacts on federally listed species or candidate species. Initiation of conservation measures would occur in consultation with the U. S. Fish and Wildlife Service and would be required if any of the following occurred:

- initiation of activities anticipated to have impacts on piping plovers or their designated critical habitat beyond those addressed in this document
- additional Michigan monkey flower occurrences within the Lakeshore were identified in areas where they might potentially be impacted
- initiation of activities anticipated to have impacts on Michigan monkey flower populations
- initiation of activities anticipated to have impacts on Pitcher's thistle populations beyond those addressed in this document

Renewed discussion and consultation with the U. S. Fish and Wildlife Service, should any of the above events occur, would focus on development of specific conservation measures to reduce potential impacts on these species and/or designated critical habitat. Such conservation measures would be based on the recommendations provided by the U.S. Fish and Wildlife Service.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on federally listed species and designated critical habitat include (1) the improvements to the parking areas at the ends of Leelanau County Roads 651 and 669; (2) implementation of the "Fire Management Plan"; (3) improvements to the Lake Michigan overlooks accessed from the Pierce Stocking Scenic Drive; and (4) activities presented in table 21. Most of these actions would benefit natural resources including federally listed species and their designated critical habitats. Some past projects at the National Lakeshore,

however, such as the site restoration project near Big Glen Lake, have adversely affected federally listed species, i.e., Michigan monkey flower. These resulted in formal consultation with the U.S. Fish and Wildlife Service. During implementation, actions would be taken to avoid or minimize potential adverse impacts on such species. Any adverse impacts, such as trampling or sensory based disruption, would be insignificant or discountable. The impacts of the other actions described above, together with the impacts of the preferred alternative, may affect but would not be likely to adversely affect piping plover, Pitcher's thistle, or Michigan monkey flower. The preferred alternative would likely contribute a relatively small component to these cumulative impacts.

**Conclusion.** Any adverse impacts of the preferred alternative on the addressed federally listed species and designated critical habitat would be no more than insignificant or discountable over both the short and long terms. Implementation of the preferred alternative may affect but would not likely adversely affect the addressed listed species and critical habitat. The impacts of other projects, combined with the impacts of the preferred alternative, may affect but would not likely adversely affect piping plover, piping plover critical habitat, Michigan monkey flower, and Pitcher's thistle. There would be *no impairment* of federal threatened and endangered species from this alternative (see specific definition of impairment in the "Impairment of National Lakeshore Resources" section).

### Michigan State-Listed Species

Readers are encouraged to refer back to the "Michigan State-Listed Species" discussion in the "Methods and Assumptions for Analyzing Impacts" section for additional details on the types of impacts resulting from visitor use and development.

Under the preferred alternative, 45% of the National Lakeshore would be managed as wilderness (assuming that Congress acts to designate wilderness), a 1,197-acre (2%) increase over the no-action alternative. Management of these areas as wilderness conveys a higher level of protection to the Michigan state-listed species in those areas than any management zone. This level and amount of protection would likely have short- and long-term, minor beneficial impacts on state-listed species of the Lakeshore.

Concession auto tours to near the Giant Cedars area could negatively impact the state-listed species occurring in that vicinity through trampling, and habitat alteration due to soil compaction and erosion. However, NPS staff would monitor use of and impacts to this area and implement measures such as boardwalks or fencing to prevent trampling and habitat alteration. As such, new opportunities for visitor activities would likely have only short-term moderate and long-term minor adverse impacts on the state-listed species that are associated with this area.

Use of the new bay-to-bay trail and the provision of day trips to North Manitou Island might impact state-listed species associated with shoreline/dunes/near-shore habitat (i.e., fascicled moonwort, Lake Huron locust, prairie moonwort, and prairie warbler). Impacts would include trampling, habitat alteration due to soil compaction and erosion, and sensory-based disruption of the prairie warbler. Assuming continued monitoring and protection efforts, these activities would likely have short-term moderate and long-term minor adverse impacts on these state-listed species.

The ongoing use of motorized boats on School and Loon lakes and the Crystal and Platte rivers and development and use of the loop hiking trail in the Bow Lakes area could impact state-listed species associated with lakes, wetlands, and riparian areas (i.e., bald eagle, Blanchard's cricket frog, common loon,

cut-leaved water parsnip, Douglas stonemaster riffle beetle, ram's-head lady's-slipper, and wood turtle). Impacts might include trampling, habitat alteration and degradation, and sensory-based disruption of behaviors. Assuming continued monitoring and protection efforts, these activities would likely have short-term, moderate and long-term minor adverse impacts on these state-listed species. Implementation of user capacity management (see discussion in chapter 2) to reduce impacts of visitor use in sensitive and yet popular areas such as the Platte River corridor, would have short- and long-term, minor to moderate beneficial impacts.

Developing the bay-to-bay trail and associated campgrounds, and providing additional designated campsites on North Manitou Island could impact shoreline/dunes/near-shore species as well as mature forest species through habitat loss and degradation, both of which could be reduced by strategic location and design. Improvements to the parking area at the end of Esch Road might result in increased visitor use and associated increases in trampling and habitat alteration for both plants and animals, and sensory-based disruption of wildlife in those areas. The sum of these impacts on state-listed species associated with these habitats in the Lakeshore would likely be short and long term, minor to moderate, and adverse.

The M-22/M-109 hike/bike trail, a loop trail and small parking area at Bow Lakes, and improvements to the Glen Lake picnic area could result in habitat loss and degradation, both of which could be reduced by strategic location and design. These developments could also result in increased visitor use and associated increases in vegetation trampling, habitat alteration, and sensory-based disruption of state-listed species associated with wetlands, lakes, and rivers. The sum of these impacts on state-listed species in the Lakeshore would likely be short term, minor to moderate, and adverse during construction, and long term, minor, and adverse and

beneficial (e.g., development of a loop trail in the Bow Lakes area would protect wetland-associated species over the long term).

Under this alternative, the National Park Service would continue to acquire lands within the Benzie Corridor but would not implement any development within the corridor during the life of this plan. Private development within the corridor would probably continue at its current pace. These activities and conditions would have negligible effects on state-listed species because although some occurrences are known near the corridor, none are known or anticipated within the corridor.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on Michigan state-listed plant and animal species include (1) the improvements to the parking areas at the ends of Leelanau County Roads 651 and 669; (2) Glen Haven Village improvements; (3) implementation of the “Fire Management Plan”; (4) improvements to the Lake Michigan overlooks accessed from the Pierce Stocking Scenic Drive; (5) riverbank stabilization on the Platte River at the former Water Wheel and Casey’s Corner canoe liveries; (6) restoration approximating the natural topography, hydrology, and native vegetative cover of nonhistoric sites disturbed by past land uses — particularly those in critical dunes areas; and (7) minor improvements to the Dune Climb parking area. Each of these projects would result in short-term adverse impacts during construction (such as sensory-based disturbance). The long-term impacts would likely be minor to moderate and beneficial (such as habitat rehabilitation and enhancement). The impacts of the other actions described above, together with the impacts of the preferred alternative, would result in short- and long-term, minor to moderate, adverse cumulative impacts, and minor to moderate beneficial cumulative impacts. The preferred alternative would be

expected to contribute a relatively small component to these cumulative impacts.

**Conclusion.** The preferred alternative would have short- and long-term, minor to moderate adverse and beneficial impacts on state-listed species. The cumulative impacts would likely be short and long term, minor to moderate adverse, and minor to moderate beneficial. There would be *no impairment* of state-listed species from implementing this alternative (see specific definition of impairment in the “Impairment of National Lakeshore Resources” section).

### Wetlands and Water Quality

Readers are encouraged to refer back to the “Wetlands and Water Quality” discussion in the “Methods and Assumptions for Analyzing Impacts” section for additional details on the types of impacts resulting from visitor use and development.

Use of motorized boats on School and Loon lakes and the Crystal and Platte rivers would continue. Impacts on wetlands and water quality from motorboat use would include resuspension of sediments and pollution of wetlands and water bodies. Impacts on wetlands and water quality from such activities would likely continue to be short and long term, minor to moderate, and adverse. Implementation of user capacity management (see discussion in chapter 2) to reduce impacts of visitor use in sensitive and yet popular areas such as the Platte River corridor, would have short- and long-term, minor to moderate beneficial impacts.

The bay-to-bay trail and the M-22/M-109 hike/bike trail could impact wetlands and water quality through erosion, runoff, and pollution during construction, and trampling, erosion, resuspension of sediments, and pollution. Assuming use of best management practices during construction, and careful monitoring and management of impacts

during use, the overall impacts would likely be short and long term, minor, and adverse.

Discontinuing all motorboat use on North Bar Lake would reduce trampling, erosion, resuspension of sediments, and pollution. The resulting beneficial impacts would be short and long term and minor to moderate.

Providing additional designated campsites on North Manitou Island, improving the Glen Lake picnic area, developing a short loop trail and small parking area in the Bow Lakes area, and relocating and upgrading the access point for the Crystal River could result in both adverse and beneficial impacts to wetlands and water quality. New visitor activities as a result of these new developments could contribute to impacts on wetlands and water quality through trampling, resuspension of sediments, erosion, and dust. Assuming implementation of best management practices during construction and practicable levels of impact monitoring and management by NPS staff, impacts of the Glen Lake picnic area improvements and the Bow Lakes trail and parking area would likely be short term, minor to moderate, and adverse during construction, and long term, minor to moderate, and beneficial after construction. These actions would focus visitor use on less sensitive areas (e.g., designated trails), thereby protecting the surrounding wetlands and areas adjacent to the water. Impacts of the remaining developments, assuming use of best management practices, would likely vary from minor to moderate over both the short and long terms, and would be adverse.

Under this alternative, the National Park Service would continue to acquire lands within the Benzie Corridor but would not implement any development within the corridor during the life of this plan. Continued NPS acquisition of lands in the Benzie Corridor would help protect the wetlands and water quality near the corridor from development for the life of this plan, providing short- and long-term, negligible to

minor, beneficial effects. Private development within the corridor would probably continue at its current pace and would continue to have negligible to minor adverse impacts to these resources near the corridor.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on wetlands and water quality include (1) implementation of the “Fire Management Plan”; (2) riverbank stabilization on the Platte River at the former Water Wheel and Casey’s Corner canoe liveries; (3) restoration approximating the natural topography, hydrology, and native vegetative cover of nonhistoric sites disturbed by past land uses — particularly those in critical dunes areas; (4) minor improvements to the Dune Climb parking area, and (5) dredging of the Platte River mouth. Although each of these projects would involve short-term adverse impacts (e.g., dredging of the Platte River resulting in short-term suspension of particulates in the water and resulting lower water quality immediately downstream (lakeside) of the dredging), the net result would likely be long-term, minor to moderate beneficial impacts (e.g., dredging the mouth of the Platte River allows boats to pass without continuously hitting the bottom, stirring up material, and reducing water quality).

The impacts of the other actions described above, together with the impacts of the preferred alternative, would result in short- and long-term, minor to moderate adverse cumulative impacts and short- and long-term negligible to moderate beneficial cumulative impacts; and long-term, negligible to moderate beneficial cumulative impacts. The preferred alternative would be expected to contribute a relatively small component to these cumulative impacts.

**Conclusion.** The preferred alternative would have short- and long-term, negligible to moderate adverse, and short- and long-term negligible to moderate beneficial impacts on wetlands and water quality. There would be

short- and long-term, minor to moderate adverse cumulative impacts and short- and long-term negligible to moderate beneficial cumulative impacts. There would be *no impairment* of wetlands or water quality from this alternative (see specific definition of impairment in the “Impairment of National Lakeshore Resources” section).

## VISITOR OPPORTUNITIES AND USE

### Visitor Opportunities

Opportunities would be available for visitors to experience the fundamental resources and values of the Lakeshore and to learn about the Lakeshore’s primary interpretive themes (see chapter 1 “Fundamental Resources and Values” and “Primary Interpretive Themes” sections). Visitors would have access to information, interpretation, and educational opportunities at a variety of locations, including the visitor center in Empire, at Glen Haven, and at the visitor contact station on South Manitou Island. Interpretive and educational activities throughout the Lakeshore would be similar to those currently offered. These opportunities would have long-term, moderate beneficial impacts.

Access to and through the Lakeshore would be on the existing network of state, county, and NPS roads (similar to the no-action alternative). Visitors would have increased Lakeshore access with the addition of the M-22/M-109 hike/bike trail (initiated by others) and the bay-to-bay hiker/paddler trail, and concessioner-operated interpretive tours to near the Giant Cedars area would be considered. Seasonal ferry service would be provided for day and overnight trips to South Manitou Island, overnight trips to North Manitou Island (similar to the no-action alternative), and additional occasional day trips to North Manitou Island would be allowed. Under the preferred alternative a scenic road and/or hike/bike trail would not be developed within the Benzie Corridor

within the life of this plan, so there would be no new recreational opportunities or access in this area. The above-noted Lakeshore access would have long-term, moderate beneficial impacts.

Similar to the no-action alternative, visitors could experience relatively large areas of the Lakeshore that are natural in character; sites that reflect the area’s culture and history (e.g., Glen Haven, Port Oneida, and cultural resources on North Manitou and South Manitou islands); and areas with facilities that support recreational use (e.g., the Dune Climb and Trails End). NPS land acquisition would continue in the Benzie Corridor on a willing-seller basis. For the life of the plan, the development of private properties within the Benzie Corridor might continue to occur, although NPS properties would likely remain undeveloped. Views of the Crystal Ridge from below or more distant points within and outside the Lakeshore would likely remain natural in character. Even with some modest new development, there would be long-term, moderate, beneficial impacts on opportunities to experience the natural and cultural scenic resources of the Lakeshore.

New recreation-oriented development would include the two trails identified above, associated primitive campgrounds, designated campgrounds on North Manitou Island, upgraded/expanded facilities at Little Glen Lake picnic/beach area, improved boat access at some inland lakes, parking and boat access upgrades at the Crystal River, improved parking at the end of Esch Road, and a trailhead parking area and loop trail in the Bow Lakes area. Valley View backcountry campground would be abandoned. Even with these changes, the scale of recreation-oriented development in the Lakeshore would be relatively modest. This level of development would have long-term, moderate beneficial impacts on visitors.

There would continue to be a wide range of recreational activities in the Lakeshore

(similar to the no-action alternative); however, opportunities for nonmotorized recreational activities such as hiking, biking, backpacking, paddling, cross-country skiing, and backcountry camping would be facilitated and expanded.

There would be a reduction in the number of lakes available for gas-powered motorboats, which some visitors might view as a reduction in recreational opportunities. However, new opportunities for visitors using electric-powered boats would be provided at three lakes. User capacity management would improve visitor experiences on the Platte River. These changes to the range of recreational activities in the Lakeshore would have long-term, minor beneficial impacts.

Similar to the no-action alternative, natural sounds would dominate the Lakeshore except along roadways, in developed areas, where motorized boats are allowed (along rivers, at specific inland lakes, on Lake Michigan), and when aircraft are flying over. Two fewer inland lakes than in the no-action alternative would allow gas-powered motorboats (and accompanying sounds) resulting in a slight improvement in the natural soundscape. Natural sounds would also be temporarily disrupted locally by construction activities, and visitors could be inconvenienced. However, mitigative measures would minimize impacts. Overall impacts on those who value dark night skies would be long-term, minor, and beneficial, with some impacts that are short term, minor, and adverse.

Similar to the no-action alternative, the naturally dark night sky would continue to be predominant in the Lakeshore despite vehicular lights along roadways and lighting in developed areas. These conditions would have long-term, minor, beneficial impacts for those who value the dark night sky.

## **Visitor Use**

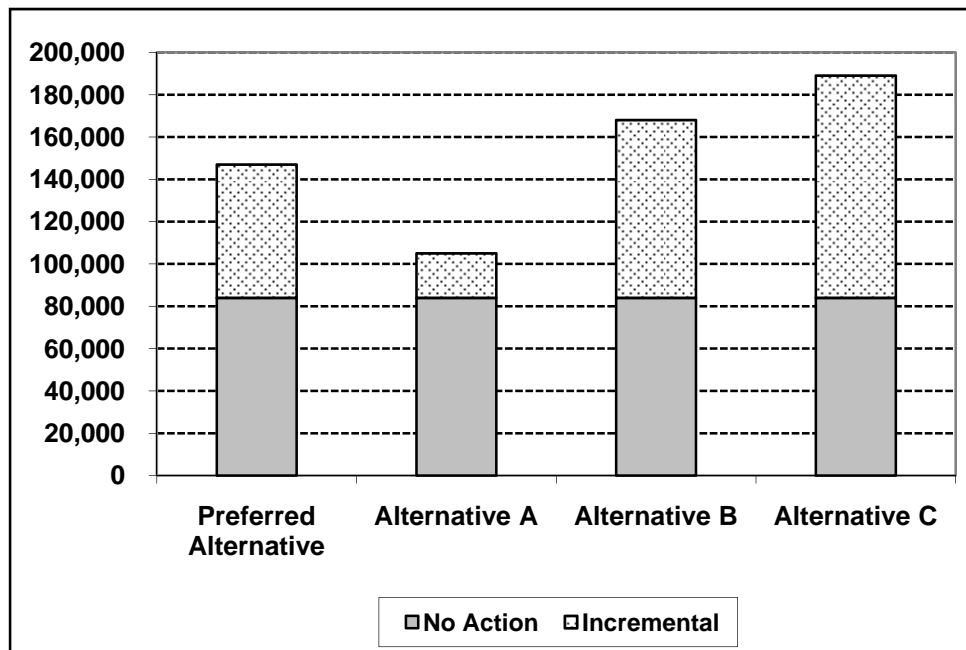
Implementation of the preferred alternative would result in higher annual visitor use at the National Lakeshore over the long term than would occur under the no-action alternative. The increases would result from improved access to the Giant Cedars area, upgrades at Little Glen Lake picnic/beach area, facility improvements at road ends and inland lakes, the potential addition of day trip excursions to North Manitou Island, expanded hiking, an M-22/M-109 hike/bike trail (initiated by others) and the bay-to-bay hiker/paddler trail and associated primitive campgrounds.

The timing of increased visitor use is difficult to predict because it would depend on when projects are funded or carried out. Moreover, none of the projects represent major expansions in capacity, and most new opportunities would be focused on dispersed and back-country recreation use. Depending on the strategy(ies) chosen, implementation of user capacity management on the Platte River might locally reduce visitor numbers. Future completion of the M-22/M-109 hike/bike trail could result in more off-season use in the Lakeshore compared to the no-action alternative. Consequently, an eventual long-term visitation increase of up to an estimated 60,000 additional visits per year, over that expected for the no-action alternative could be foreseen.

Visitors to the Lakeshore from outside the region would likely account for the majority of future visits, though the number of visits by residents of the region would also increase. Increased visitor use levels would have long-term and minor effects that might be concurrently viewed as beneficial or adverse. The differences between beneficial and adverse would depend on the expectations and preferences of the visitor related to the new opportunities and increased visitation in the preferred alternative.



**Figure 6: Comparison of Long-Term Increases in Average Annual Visitor Use to Sleeping Bear Dunes National Lakeshore under the Action Alternatives**



### Cumulative Impacts

Other past, present, and reasonably foreseeable projects that would affect visitor opportunities and use include: (1) improvements to parking areas at the ends of Leelanau County Roads 651 and 669; (2) Glen Haven Village improvements; (3) improvements to the Pierce Stocking Scenic Drive Lake Michigan overlooks 9 and 10; (4) South Manitou Lighthouse Complex exterior restoration and interior rehabilitation; and (5) Dune Climb parking area paving and other minor improvements. These actions would improve visitor opportunities by improving enjoyment, access, and/or range of available opportunities for visitors and would have an overall long-term, minor, beneficial effect on visitor opportunities and use. The development of private properties within the Benzie Corridor and rural residential developments near the Lakeshore (particularly along the access roads and in/near Glen Arbor and Empire) might continue to occur; these could result in a

degradation of natural scenic quality, natural soundscapes, and night sky. These actions would have a long-term, minor, adverse effect on visitors. Combined with the actions proposed in the preferred alternative, these actions would have a long-term, minor, beneficial cumulative effect. Impacts of the preferred alternative would comprise a relatively small portion of the overall cumulative effect.

### Conclusion

Increased access and visitor opportunities related to additional recreation-oriented facilities would have a long-term, moderate beneficial impact on visitor opportunities and use. Implementation of user capacity management strategies would have a long-term, minor beneficial impact on visitor opportunities, but potentially long-term minor adverse effects on use. The removal of Valley View campground and disallowing gas-powered motorboats on two inland lakes would have

long-term, minor, adverse impacts on visitor opportunities and use. The increased visitor opportunities and facilities would have a long-term, minor, adverse impact on natural sound and the night sky. Construction activities would have short-term, minor, adverse impacts. The cumulative effects would be long-term, moderate, and beneficial.

## **WILDERNESS CHARACTER**

### **Natural and Undeveloped**

Under the preferred alternative, 32,100 acres (45% of the National Lakeshore) would be proposed for wilderness designation, a 1,197-acre (2%) increase over the no-action alternative. Assuming Congress acted to designate the proposed areas as wilderness, wilderness values would be protected forever in designated areas within the north, central, and south mainland portions of the Lakeshore and each island. In contrast to the no-action alternative, none of the Port Oneida Rural Historic District would be included, and a new area of designated wilderness and associated experiences would be available on the Sleeping Bear Plateau. Impacts on wilderness character would be long-term, moderate, and beneficial.

Similar to the no-action alternative, wilderness areas would be interrupted by or interspersed with nonwilderness in some places (e.g., near the Treat farmstead and on South Manitou Island), so adjacent motorized or mechanized uses (e.g., the motorized farm tour on South Manitou Island) would intrude upon naturalness and primitive character in some wilderness areas. In contrast to the no-action alternative, there would be no nonconforming motor vehicle or bicycle use *within* wilderness because county road rights-of-way would be excluded from wilderness. However, as in the no-action alternative, the presence of historic structures would continue to locally diminish the areas' undeveloped primeval character. Impacts would be long term, minor, and adverse.

### **Opportunities for Solitude**

Outstanding opportunities for solitude would be available due to designated wilderness in all three portions of the mainland and on the Manitou Islands. In particular, areas away from trails and facilities would continue to offer excellent prospects for privacy and isolation. Solitude would be more easily found on North Manitou Island than on South Manitou Island due to the former's larger size and fewer visitors. However, on days with day ferry trips to North Manitou Island (once or twice per week), wilderness opportunities for solitude could be reduced within a few hours walk from the ferry dock, a long-term, minor, adverse impact.

### **Opportunities for Primitive, Unconfined Recreation**

Due to the addition of occasional day ferry service to North Manitou Island there would be opportunities on both Manitou Islands for day and overnight wilderness experiences, a minor beneficial impact. The permit requirement for backcountry camping would continue. In contrast to the no-action alternative, backcountry campers would be required to stay in designated campgrounds not only on the mainland and South Manitou Island, but also on some portions of North Manitou Island. Outstanding opportunities for primitive, unconfined recreation would continue to be available on both the mainland and the islands, but permit and camping requirements would have a minor, long-term, adverse impact on these opportunities.

### **Cumulative Impacts**

Over time, the Lakeshore's ongoing program to restore former nonhistoric sites to more natural conditions has substantially increased the natural, undeveloped character of the Lakeshore. The work includes removing nonnative trees and human enhancements,

plus reestablishing more natural contours and native vegetation. Combined with ongoing restoration work, the preferred alternative would have long-term, moderate, beneficial cumulative effects. The contribution of the preferred alternative to these cumulative effects would be substantial.

## Conclusion

Establishment of 32,100 acres of designated wilderness in all three portions of the mainland and on both islands would permanently protect wilderness values (naturalness and opportunities for solitude or primitive, unconfined recreation). Impacts of the preferred alternative on wilderness character would be mostly beneficial, moderate, and long term (permanent), but there would also be some continuing localized, minor adverse impacts. Combined with other actions, the preferred alternative would have long-term, moderate, beneficial cumulative effects on wilderness character.

## REGIONAL SOCIOECONOMICS

Implementing the preferred alternative would occur against the same backdrop of economic, demographic, and social conditions across the region described under the no-action alternative, i.e., a gain of more than 30,000 year-round residents between 2005 and 2030. The effects of the preferred alternative would add one more set of influences affecting the region's economic and social environment, but leave the basic foundation of the area's economic and demographic outlook unchanged.

### Visitor-Related Economic Impacts

Implementation of the preferred alternative would result in higher annual visitor use at the Lakeshore over the long term than would occur under the no-action alternative (see

chapter 5 "Impacts of the Preferred Alternative — Visitor Use" section).

The timing of increased visitor use is difficult to predict because it would depend on when projects are funded or carried out and other factors. Moreover, none of the projects represent major expansions in visitor use opportunities or facility capacity, and most new opportunities would be focused on dispersed and backcountry recreation use. Implementation of capacity limits on the Platte River, if necessary, might adversely impact private canoe/kayak livery operations. Future completion of the M-22/M-109 hike/bike trail could result in more off-season visitor use in the Lakeshore as compared to the no-action alternative. An eventual long-term visitation increase of up to 63,000 additional visits per year over that expected for the no-action alternative could be foreseen.

Changes in visitor opportunities with implementation of the preferred alternative might affect the geographic distribution, timing, and activity of visitor use within the National Lakeshore, for instance, indirectly promoting motorized boating use on School Lake and electric-powered boating and boat fishing on Otter Lake. Such geographic shifts, combined with possible changes in visitor participation in various activities, could indirectly cause limited increases or reductions in visitor use at nearby lakes, parks, and other outdoor recreation resources managed by the state, local governments, and other entities. Given their limited scale, such changes probably would not affect future management and operations of these resources to any large extent.

Visitors to the Lakeshore from outside the region would be expected to account for the majority of future visits, though the number of visits by residents of the region would also increase.

Retail, lodging, and other tourism-type spending would accompany the increased use

with expenditures projected to reach \$36.2 million per year, \$4.2 million higher than at the present time and \$1.7 million per year higher than for the no-action alternative. Some merchants and other recreation-oriented establishments might experience subtle changes in demands for goods and services in response to shifts in visitor use over time. The National Lakeshore would collect more in entry fees and sales of various passes, and Eastern National would sell more merchandise.

Economic spin-offs of visitor spending include higher personal income and 20–25 more jobs than under the no-action alternative. Most of these effects would be seasonal, concentrated in the summer. The visitor-related impacts would occur gradually over the long term but would be limited in scale relative to current employment and personal income in the two counties. Implementation of the preferred alternative could provide additional concession/commercial service opportunities, for example, in conjunction with the bay-to-bay hiking/paddling trail. Many of these benefits would accrue outside the Lakeshore, including in Leland where the Manitou Island Transit's ferry and tour service is based.

The state and local governments would collect additional sales tax from the increased visitor spending.

The above visitor-related economic impacts would be beneficial, but negligible in the short term and minor and beneficial over the long term.

### **Economic Impacts Related to Implementation and NPS Operations**

Implementing the preferred alternative would provide a sustained economic infusion to the region over the life of this plan—larger than that under the no-action alternative. The infusion would result from the Lakeshore's

ongoing operating expenditures, including payroll, and \$17.5 million in future construction needs (\$10.9 million above that for no action). Projected budget needs for other major projects and deferred maintenance would be the same as for the no action alternative.

As under the no-action alternative, NPS maintenance staff would perform much of the work to address facility and infrastructure maintenance and preservation, restoration, and rehabilitation activities. Future construction needs would be higher than under the no-action alternative, supporting the local construction trades industry and associated vendors and suppliers.

Annual NPS payroll, operating, and maintenance would produce long-term effects on employment, business sales, income and other related measures. Completion of specific projects and the implementation of programs and management would support increased staffing levels over time.

A need for a modest long-term increase in budgeted funds for NPS operations is identified in conjunction with the preferred alternative (there are no assurances that such increases will occur). Available resources would include about \$4.4 million base budget appropriations (\$500,000 per year above the no-action alternative), about \$1.0 million in entry and camping fees, and various nonrecurring funding for supplemental and specific project construction. Retained revenues from entry and camping fees would likely increase with higher visitation.

As with the no-action alternative, supplemental funding would be required for future land acquisition in the Benzie Corridor.

Activities sponsored by the Lakeshore's partners would provide additional sources of economic stimulus. The timing, magnitude, and indirect economic consequences of those activities are indeterminate.

The economic effects associated with NPS operations would be beneficial and minor to moderate in the short and long terms.

### **Effects on Regional Population**

The preferred alternative would have little direct impact on regional population growth. The increases in construction and long-term jobs and visitor use over the life of this plan would provide a negligible impetus for growth, relative to other factors, and would be insufficient to trigger additional new economic development and job-related migration. It is more likely that many of the jobs would be filled by individuals already residing in the area.

Implementation of the preferred alternative could indirectly enhance the region's attractiveness for economic development as a result of enhanced recreational opportunities and establishment of wilderness on the mainland.

The effects on regional population growth under this alternative would be negligible, both in the short and long terms.

### **Community Services**

Impacts on community services associated with implementing the preferred alternative would be similar to those under the no-action alternative, although the demands related to levels of visitor use would be slightly higher. The limited scale, seasonal nature, and spatial dispersion of such demands across the region would be such that no facility expansions and additional staffing would be required.

Effects on community services under this alternative would be indeterminate and negligible over the short and long terms.

### **Traffic and Emergency Services**

Traffic impacts of the preferred alternative on the highways and roads that serve the Lakeshore would be similar to but slightly higher than under the no-action alternative. Most of the additional traffic would be concentrated on M-22 and M-109, connecting local roads around the Glen Lakes area, and local roads connecting M-22 to US-31 in Benzie County.

Seasonal increases in traffic volumes could be noticeable in Glen Arbor and Empire, particularly on summer weekends. During the summer, some travelers might have to wait longer at intersections, or experience slightly slower travel speeds, but most travelers would see little change in travel conditions due to implementing the preferred alternative. Even with the increases in traffic, future traffic volumes would be below the roadway design capacities and would not necessitate substantially more road maintenance. Increases in traffic volumes could accelerate the onset of less than desirable levels of service at the M-22/M-109 intersection in Glen Arbor, possibly triggering intersection improvements (Robert Peccia & Associates. 2001).

The frequency and number of traffic accidents and demands on first responders would be higher than under the no action alternative. The scale of demands associated with the preferred alternative would be such that they would not require additional law enforcement or emergency response staffing, though the increases in the number of "call outs" could burden area first response agencies because they are staffed partially by volunteers.

The effects of implementing the preferred alternative on traffic and emergency services would be adverse and negligible to minor over the short and long terms across most of the region.

## **Attitudes and Lifestyles**

The preferred alternative establishes future management direction for the Lakeshore that best reflects public input, the fundamental resources and opportunities at the Lakeshore, and the mission of the Lakeshore and the National Park Service as a whole. In terms of attitudes, some individuals might still believe that the management zones and wilderness proposals do not go far enough to achieve their particular preferences, although they may also acknowledge the efforts made to balance the desired outcomes of a large and divergent public. As such, this alternative might be characterized as offering management direction, a wilderness proposal, recreational opportunities, and preservation and interpretation of cultural heritage resources for all to appreciate, but also aspects for some to disfavor.

The recreation, conservation, and resource management direction associated with the preferred alternative would have direct and indirect lifestyle consequences, with the direct consequences most apparent to neighbors and visitors to the Lakeshore. For example, future visitors would have access to a broader range of experiences and options, including wilderness on the mainland and enhanced access to backcountry use along the shoreline. Individuals desiring improved boating access to Lake Michigan would be encouraged by the potential prospect for a feasibility study of providing such access. Many residents and local government officials would approve of the explicit statements and policies regarding state and county road rights-of-way and other valid existing rights reflected in this plan.

The management and access policies established under the preferred alternative might have indirect consequences on attitudes and lifestyles. Such consequences could arise primarily in terms of the extent to which the preferred alternative influences or changes recreation and resource conditions at a broader level over the long term. For example,

changes in shoreline access might contribute to higher population growth in the region and attract new residents to the Lakeshore, which would mean more use at the Lakeshore and conflicts with the preferences and desires of others to discourage more use. Given the relatively small size of the community, such conflicts can become sources of long-term division or strength.

## **Cumulative Impacts**

Social and economic impacts arising from implementing the preferred alternative are of the same type as those associated with past, present, and future residential development near the Lakeshore; the establishment of the Lakeshore; and those associated with the no-action alternative. The former includes population and economic growth across the region that would result in moderate long-term increases in traffic on highways and roads in the area; moderate, long-term increases in resident and visitor spending, bolstering retail trade and service-oriented businesses in the region; long-term demands on community services; and additional public sector revenues to fund public services and facilities. The other cumulative actions could result in some long-term negligible economic effects on visitor-related businesses, and on local traffic and safety, due to changes in visitor use levels and distribution.

The incremental effects of the preferred alternative to these impacts would be small. For example, the incremental traffic would be small in relationship to travel by area residents, commercial and other personal travel passing through the area, and current demands associated with the Lakeshore. Additional visitor use under the preferred alternative would increase visitor spending, benefiting existing businesses and enhancing the commercial development potential for private lands along the access roads to the Lakeshore. Any subsequent development of those lands would have economic

implications, as well as changing the visitor experience. Completion of the M-22/M-109 hike/bike trail could result in cumulative effects in the area of motorist/visitor safety along highway corridors in the region.

The contributions of the preferred alternative to the cumulative economic and social effects, including those associated with increases visitor and NPS operating expenditures, would be negligible to minor in the short term and minor in the long term, and beneficial. Impacts of other actions, in combination with those attributable to the preferred alternative, would result in minor short- and long-term adverse cumulative effects on traffic and highway safety. Impacts of the preferred alternative would comprise a small portion of these overall cumulative social and economic effects.

## Conclusion

The economic effects of the preferred alternative would include negligible to minor short-term and moderate long-term economic benefits, the latter due to increased visitation tied to this alternative. Short- and long-term effects on lifestyles and attitudes would be minor benefits, because many interested parties could support the management direction established in the preferred alternative. Long-term social consequences would include a negligible to minor contribution to long-term population growth and demands on community infrastructure and services. Overall, the cumulative social and economic effects associated with the preferred alternative would be minor, short and long term, and indeterminate because they include effects that might be concurrently viewed as beneficial or adverse.

## NPS OPERATIONS

Under the preferred alternative, the Lakeshore's maintenance and operational load

would be increased by (1) the addition of a limited number of new trails and backcountry campgrounds, (2) upgrading the Glen Lake picnic area to support beach and picnic use, (3) possible occasional day trips by the ferry to North Manitou Island, (4) possible day use on North Manitou Island (with increased interpretive and ranger patrol needs), (5) possible concession tours to near the Giant Cedars area, and (6) modest increases in National Lakeshore visitation. Some increased maintenance would also be incurred with a new M-22/M-109 hike/bike trail. Most other facility-based changes, such as improving parking at the end of Esch and Lake Michigan roads, relocation or upgrading the Crystal River access area, and closure/removal of the Valley View campground, would decrease maintenance needs for individual areas or change the nature of the maintenance needs without increasing the burden. Wilderness minimum requirement analysis would be required for 32,100 acres, a 1,197-acre (2%) increase over the no-action alternative. Impacts of the preferred alternative would be long term and minor, and both beneficial and adverse.

## Cumulative Impacts

Ongoing and planned facility upgrades and restoration/rehabilitation projects would have mostly beneficial impacts because these projects would result in reduced resource management and cyclic maintenance needs. Dredging of the Platte River mouth would continue to place demands on the Lakeshore's maintenance staff and budget, a minor adverse effect. Combined with these impacts, the preferred alternative would have both long-term minor beneficial and adverse cumulative effects. Impacts of the preferred alternative would comprise a substantial portion of these overall cumulative effects.

## **Conclusion**

The preferred alternative would have long-term, minor beneficial and adverse impacts on NPS operations. The preferred alternative, combined with other actions, would have both long-term minor beneficial and adverse cumulative effects.

## **UNAVOIDABLE ADVERSE IMPACTS**

Some negligible to moderate impacts to soils, vegetation, wildlife, water resources, wilderness character, scenic resources, natural sound, and night sky caused by recreational use and facilities would be essentially unavoidable (e.g., soil compaction, vegetation trampling, wildlife disturbances, decreased opportunities for solitude, and decreased naturalness). Increases in visitor use would have low level adverse impacts on regional socioeconomics (e.g., increased traffic).

## **IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES**

Irreversible commitments of resources are actions that result in loss of resources that cannot be reversed. Irretrievable commitments of resources are actions that result in the loss of resources but only for a limited period of time.

With the exception of consumption of fuels and raw materials for maintenance or construction activities, no actions in this alternative would result in consumptions of nonrenewable natural resources or use of renewable resources that would preclude other uses for a period of time.

## **RELATIONSHIP OF SHORT-TERM USES AND LONG-TERM PRODUCTIVITY**

The National Lakeshore would continue to be used by the public and most areas would be protected in a natural state. The National Park Service would continue to manage the Lakeshore to maintain ecological processes and native biological communities and to provide appropriate recreational opportunities consistent with the preservation of cultural and natural resources. Actions would be taken with care to minimize adverse effects on the long-term productivity of biotic communities. Under the preferred alternative there would be a modest number of new recreational facilities such as trails, which could reduce ecological productivity in some localized areas. However, the preferred alternative would yield long-term benefits from a visitor experience perspective.



## IMPACTS OF ALTERNATIVE A

### HISTORIC RESOURCES

*The Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995) identifies four treatment approaches that apply to a wide variety of resource types, including buildings, sites, structures, objects, districts, and landscape features and patterns. Three of those treatments are included in this plan — preservation, rehabilitation, and restoration. See page 40 for more detailed definitions. The simplest of these treatment approaches is preservation, in which measures are undertaken to stabilize the resource to ensure that it does not deteriorate further from its existing condition and then to maintain and repair historic features and materials. The second option is rehabilitation, in which the resource is made useable for some purpose while preserving those features that convey its historical, cultural, or architectural value. The third is restoration, in which the historic appearance at a particular time is accurately regained. The fourth treatment, reconstruction, is not proposed in this plan.

Although each alternative calls for preserving and protecting all historic properties, each action alternative provides a different management zone configuration based on that alternative's overall vision, and each management zone prescribes which of the three treatments could be used for historic properties. Thus, potential treatments for the National Lakeshore's various historic properties differ among the alternatives. Based on the locations and relative proportions of management zones in alternative A, 68% of historic structures would undergo preservation, rehabilitation, or restoration (experience history zone), 3% of historic structures would undergo preservation or rehabilitation (recreation zone), and 29% of historic structures would undergo preservation

(experience nature zone). This information is summarized in table 3 on page 74.

All preservation, rehabilitation, or restoration efforts would be undertaken in accordance with the standards. Any materials removed during rehabilitation or restoration efforts would be evaluated to determine their value to the Lakeshore's museum collections and/or for their comparative use in future preservation work at the sites. Implementation of the actions described above for this alternative, which would bring all historic resources up to a good condition, would result in no adverse effects on historic resources.

At Glen Haven the Glen Haven Historic District and Sleeping Bear Point Life-Saving Station would be preserved, rehabilitated, or restored (same action in all alternatives). Some buildings would be rehabilitated for visitor and/or staff use. The Sleeping Bear Inn and garage would be placed in the NPS historic leasing program to allow rehabilitation for adaptive use. All other structures would be stabilized and maintained in their current condition.

At Port Oneida historic structures and landscapes would be preserved, rehabilitated, or restored (same action in all alternatives). Structures on at least one farmstead would be restored for interpretive purposes. Some buildings in the district would be rehabilitated for visitor and/or staff use, including a visitor contact station and staff housing. At least one farmstead would be placed in the NPS historic leasing program to allow rehabilitation and adaptive use. All other structures and landscapes would be stabilized and maintained in their current condition.

On North Manitou Island the historic life-saving station structures would be preserved, rehabilitated, or restored. Preservation and/or adaptive use of the rehabilitated historic

former Manitou Island Association structures for administrative and operational purposes would continue. Historic structures and landscapes on Cottage Row and elsewhere on the island would be preserved.

On South Manitou Island the historic life-saving station, lighthouse complex, and village historic structures would be preserved, rehabilitated, or restored. Historic structures and landscapes elsewhere on the island would be preserved.

Other mainland historic structures and landscapes would be managed as specified for the management zone in which they lie (see alternative map and zone descriptions).

Actions involving other than historic property treatments, such as the new bay-to-bay trail and campgrounds, would have no effect on historic properties because they would be designed to avoid possible impacts on properties on or eligible for the national register.

All properties in or determined eligible for inclusion in the National Register of Historic Places would, at a minimum, undergo stabilization (where that action has not already occurred) or maintenance in the current condition (where some preservation treatment has already been implemented).

The actions proposed above are general. The treatments for each resource (preservation [stabilization], rehabilitation with adaptive use, restoration) have not yet been determined so impacts cannot be fully described. However, it is the National Park Service's intent that no action proposed be adverse. All actions affecting these historic structures and landscapes will be undertaken in consultation with the Michigan state historic preservation officer.

Alternative A would not directly or indirectly affect any properties outside the boundary of the National Lakeshore that are listed on or

eligible for the National Register of Historic Places, or that are listed by the state.

### Cumulative Impacts

Over the years historic resources in the Lakeshore have been adversely impacted by natural processes such as weathering, vegetative encroachment, and the wear and tear associated with visitor use. Actions proposed for the South Manitou Island Lighthouse Complex would result in both the restoration of the exterior of the keeper's quarters and connecting passageways and the rehabilitation of the interior for adaptive reuse. In addition, actions proposed for Glen Haven Village include the stabilization and maintenance of historic structures or their rehabilitation for adaptive reuse. All preservation, rehabilitation, or restoration efforts would be undertaken in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995), and would result in no adverse effects on historic resources.

As described above, implementation of alternative A would result in no adverse effects on historic resources. The no adverse impacts of this alternative, in combination with both the adverse and no adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a no adverse effect cumulative impact. The no adverse effects of alternative A would contribute modestly to the no adverse effect cumulative impact.

### Conclusion

Alternative A would have a determination of no adverse effect under the Advisory Council on Historic Preservation "Regulations for the Protection of Historic and Cultural Properties" (36 CFR 800). There would be no impairment of cultural resources from implementation of the preferred alternative (see specific

definition of impairment in the “Impairment of National Lakeshore Resources” section).

## NATURAL RESOURCES

### Soils and Geologic Resources

Readers are encouraged to refer back to the “Soils and Geologic Resources” discussion in the “Methods and Assumptions for Analyzing Impacts” section for additional details on the types of impacts resulting from visitor use and development.

Use of motorized boats on School, Loon, and North Bar lakes and the Crystal and Platte rivers would also continue. Although soil compaction and erosion of the dunes would be reduced in some areas by using sand ladders, boardwalks, and sidewalks to protect the substrate, placement and maintenance would be limited to what can be accomplished with current resources. These ongoing activities would continue to have minor to moderate (depending on location and activity) short- and long-term adverse impacts on soils and geologic resources. Implementation of user capacity management (see discussion in chapter 2) to reduce impacts of visitor use in sensitive and yet popular areas such as the Platte River corridor, would have short- and long-term, minor to moderate beneficial impacts.

Development of the bay-to-bay trail and the M-22/M-109 hike/bike trail could result in soil disturbance and erosion during construction and subsequent visitor use would result in erosion and compaction. Assuming use of best management practices, such as using silt fencing and avoiding steep or inundated terrain, during construction, and later use to prevent erosion and compaction, the overall adverse impacts would likely be short-term and moderate and long-term and minor.

Closing the farm loop road at the west end of Chicago Road on South Manitou Island and

Tiesma Road on the mainland and no longer allowing motorized boats on Bass Lake (Leelanau County) would result in short- and long-term minor beneficial impacts on soils and geologic resources through reduction of soil erosion and compaction in these areas.

Proposed development and associated visitor use under alternative A, such as a loop trail and small parking area at Bow Lakes and restoration of the Glen Lake picnic area to a natural state, could result in short-term negligible to moderate adverse impacts during construction (due to soil disturbance, erosion, and compaction) and long-term minor beneficial impacts due to protecting adjacent resources (e.g., designated trail focusing visitors on the trail and sparing the adjacent soils).

Cessation of NPS acquisition of lands within the Benzie Corridor (the corridor would no longer be part of the Lakeshore under this alternative) would make the soils of this area susceptible to soil disruption, compaction, and erosion from private development. These impacts could range from negligible to moderate and would likely be adverse over the short and long terms.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on soils and geologic resources include (1) the improvements to the parking areas at the ends of Leelanau County Roads 651 and 669; (2) Glen Haven Village improvements; (3) improvements to the Lake Michigan overlooks accessed from the Pierce Stocking Scenic Drive; (4) riverbank stabilization on the Platte River at the former Water Wheel and Casey’s Corner canoe livery; (5) restoration approximating the natural topography, hydrology, and native vegetative cover of nonhistoric sites disturbed by past land uses — particularly those in critical dunes areas; (6) minor improvements to the Dune Climb parking area; and (7) continued dredging of the mouth of the Platte River. Although activities 1-6 would likely

result in short-term adverse impacts during the construction phase, the net result would likely be long-term, minor to moderate beneficial impacts because all projects would contribute to a reduction of the potential for soil compaction and erosion. Dredging the mouth of the Platte River results in continued addition of dredged material to the shoreline. During low-water periods deeper dredging is required and results in dredge materials with high clay content being deposited on the shoreline, resulting in armoring of the beach surface and consequent profile changes. This results in short- and long-term minor to moderate adverse impacts.

The impacts of other actions described above, in combination with the impacts of alternative A, would result in short- and long-term, negligible to moderate adverse cumulative impacts, and short- and long-term minor to moderate and beneficial cumulative impacts. Alternative A's contribution to these cumulative impacts would be minimal.

**Conclusion.** Alternative A would have short- and long-term, negligible to moderate adverse impacts, and long-term, minor beneficial impacts on soils and geologic resources. Cumulative impacts would likely be short and long term, negligible to moderate and adverse, and short and long term, minor to moderate and beneficial. There would be *no impairment* of soils or geologic resources from implementation of alternative A (see specific definition of impairment in the "Impairment of National Lakeshore Resources" section).

## Vegetation and Wildlife

Readers are encouraged to refer back to the "Vegetation and Wildlife" discussion in the "Methods and Assumptions for Analyzing Impacts" section for additional details on the types of impacts resulting from visitor use and development.

The use of motorized boats on School, Loon, and North Bar lakes and the Crystal and Platte rivers would continue to result in trampling of vegetation, habitat alteration, introduction and spread of invasive species, and sensory-based disruption of wildlife. Continuing impacts on vegetation and wildlife from such activities would likely continue to be short and long term, negligible to moderate, and adverse. Implementation of user capacity management (see discussion in chapter 2) to reduce impacts of visitor use in sensitive and yet popular areas such as the Platte River corridor, would have short- and long-term, minor to moderate beneficial impacts.

Development of the bay-to-bay trail and the M-22/M-109 hike/bike trail would impact vegetation and wildlife through trampling of vegetation, habitat loss and alteration, introduction and spread of invasive species, and sensory-based disruption of wildlife. Assuming use of best management practices (such as placement of trails/paths near existing disturbances, minimization of the construction footprint, and timing of construction outside of peak breeding/nesting periods) during construction, and careful monitoring and management of impacts during use, the overall impacts would likely be short and long term, negligible to minor, and adverse.

Under alternative A, 47% (33,600 acres) of the National Lakeshore would be managed as wilderness (assuming that Congress acts to designate wilderness), with wilderness on both islands and in all three mainland portions of the Lakeshore. This would be a 2,697-acre (4%) increase over the existing conditions. Management of these areas as wilderness conveys a higher level of protection to the vegetation and wildlife of the areas than any management zone. This wilderness proposal would likely have short- and long-term minor beneficial impacts on vegetation and wildlife of the Lakeshore.

Under alternative A, motorized boats would no longer be allowed on Bass (Leelanau County) Lake, reducing impacts there caused by shoreline erosion, habitat alteration, introduction and spread of invasive species, and sensory-based disruptions. Closure of the farm loop to vehicles at the west end of Chicago Road on South Manitou Island and closure of Tiesma Road, along with cessation of motorized boat use on Bass (Leelanau County) Lake, would have short- and long-term negligible to minor beneficial impacts on the vegetation and wildlife of those areas.

Activities proposed and their associated visitor use under alternative A, such as developing a loop trail and small parking area at Bow Lakes and restoring the Glen Lake picnic area to a natural state, could result in short-term negligible to moderate adverse impacts during construction due to habitat loss and alteration, introduction and spread of invasive species, and sensory-based disruptions. Long-term, minor beneficial impacts would also result due to protecting adjacent resources (e.g., designated trail would focus visitor use there, protecting the habitat and wildlife) and restoration of the natural conditions around the Glen Lake picnic area.

Cessation of NPS acquisition of lands within the Benzie Corridor would make the vegetation and wildlife of this area susceptible to impacts associated with private development, including habitat loss, alteration, and degradation, sensory-based disruptions, and the likelihood of introducing nonnative species. These impacts could range from negligible to moderate and would likely be adverse over the short and long terms.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on vegetation and wildlife include (1) the improvements to the parking areas at the ends of Leelanau County Roads 651 and 669; (2) implementation of the “Fire Management Plan”; (3) improvements to the Lake Michigan

overlooks accessed from the Pierce Stocking Scenic Drive; (4) riverbank stabilization on the Platte River at the former Water Wheel and Casey’s Corner canoe liveries; and (5) restoration approximating the natural topography, hydrology and vegetative cover of nonhistoric sites disturbed by past land uses — particularly those in critical dunes areas. These actions would likely have short- and long-term negligible to minor adverse impacts due to trampling and sensory-based disturbance during the activity, and long-term minor beneficial impacts on vegetation and wildlife due to habitat restoration and enhancement.

The impacts of actions described above, together with the impacts of the alternative A, would result in short- and long-term, minor to moderate adverse cumulative impacts and short- and long-term minor to moderate beneficial cumulative impacts. The contribution of alternative A to these cumulative impacts would be relatively small.

**Conclusion.** Alternative A would have short- and long-term negligible to moderate adverse impacts, and short- and long-term negligible to moderate beneficial impacts. The impacts of alternative A combined with other past, present, and reasonably foreseeable actions would likely be short- and long-term, minor to moderate adverse cumulative impacts, and short- and long-term minor to moderate beneficial cumulative impacts. There would be *no impairment* of vegetation or wildlife resources from implementing alternative A (see specific definition of impairment in the “Impairment of National Lakeshore Resources” section).

### Federal Threatened and Endangered Species

Readers are encouraged to refer back to the “Federal Threatened and Endangered Species” discussion in the “Methods and Assumptions for Analyzing Impacts” section

for additional details on the types of impacts resulting from visitor use and development.

The federally listed species considered are the Michigan monkey flower, piping plover (populations and designated critical habitat), and Pitcher's thistle. The piping plover and Pitcher's thistle are found primarily in near-shore dunes; the Michigan monkey flower is restricted to one lakeside location in the Lakeshore interior. Although part of the designated critical habitat within the Lakeshore coincides with actively used recreational beach areas, NPS staff have demonstrated success in minimizing impacts on nesting piping plovers in areas with relatively high human activity (e.g., the mouth of the Platte River) through various actions (see "Mitigative Measures for the Action Alternatives" section in chapter 2). All impact analyses assume continued protection of threatened and endangered species as outlined in the Lakeshore-wide desired condition statements (see chapter 1).

Under alternative A, 47% of the National Lakeshore would be managed as wilderness (assuming that Congress acts to designate wilderness), with wilderness on both islands and in all three mainland portions of the Lakeshore. This would be a 2,697-acre (4%) increase over the no-action alternative. This increase would potentially benefit the Pitcher's thistle, and that benefit would be insignificant because much of the Lakeshore is currently managed to benefit native ecosystems regardless of its designation status. This increase in proposed wilderness would have insignificant effects on piping plovers and piping plover critical habitat because management of the Lake Michigan shoreline and near-shoreline areas would remain essentially the same and because piping plovers successfully nest and fledge under current management. This increase would have no effect on Michigan monkey flower because wilderness is not proposed in the area where this species is known to occur. Thus, overall, this increase in proposed wilderness

would have only insignificant beneficial impacts on listed species.

New visitor activities such as use of the new bay-to-bay trail and campgrounds would have the same impacts as described for the preferred alternative and include trampling, habitat alteration, and sensory-based disturbance. These impacts could be reduced by strategic location and design such as careful selection and demarcation of trails outside of sensitive areas (e.g., away from piping plover critical habitat) and use of boardwalks.

Under this alternative, NPS acquisition of property within the Benzie Corridor would cease and the corridor would be removed from the Lakeshore boundary. The rate of private development would probably substantially increase in this corridor. However, this would not be anticipated to affect listed species because neither they nor their habitats occur within the corridor.

For projects proposed under alternative A, NPS staff would implement measures that would ensure that adverse effects on listed species do not occur. These avoidance measures might include, but are not limited to, the following:

- Safeguarding the known locations of listed species.
- Restricting human activity in piping plover breeding areas by use of a specialized fence system.
- Increasing the number of NPS/volunteer piping plover nest monitors, should conditions warrant.
- Restricting human activity in piping plover breeding areas.
- Restricting dogs from piping plover breeding areas during the breeding season.
- Flagging or fencing plants prior to any work in or adjacent to Pitcher's thistle habitat. Every effort would be made to avoid any impacts to these plants.

- Providing education about the listed species and their habitats.
- Designating alternate access points away from areas occupied by listed species.

The National Park Service staff anticipates that adverse effects could be avoided in all projects that are proposed under alternative A. The National Park Service cannot foresee at this time any project for which adverse effects could not be avoided. In the rare event that adverse effects could not be avoided, the project would either be discontinued or NPS staff would request formal consultation with the U.S. Fish and Wildlife Service. As such, any impacts from implementation of alternative A would likely have only beneficial, insignificant, or discountable effects on piping plover and piping plover critical habitat, Michigan monkey flower, and Pitcher's thistle.

At the landscape level, alternative A is not likely to adversely affect listed species because the proposed management direction under this alternative would result in conditions that are beneficial to preserving habitat and would minimize adverse impacts on listed species to insignificant or discountable. As such, implementation of alternative A may affect but would not be likely to adversely affect piping plovers and piping plover critical habitat, Michigan monkey flower, and Pitcher's thistle.

**Conservation Measures.** Conservation measures are activities above and beyond avoidance measures and are undertaken to reduce potential impacts on federally listed species or candidate species. Initiation of conservation measures would occur in consultation with the U. S. Fish and Wildlife Service and would be required if any of the following occurred:

- initiation of activities anticipated to have impacts on piping plovers or their designated critical habitat beyond those addressed in this document

- additional Michigan monkey flower occurrences within the Lakeshore were identified in areas where they might potentially be impacted
- initiation of activities anticipated to have impacts on Michigan monkey flower populations
- initiation of activities anticipated to have impacts on Pitcher's thistle populations beyond those addressed in this document

Renewed discussion and consultation with the U. S. Fish and Wildlife Service, should any of the above events occur, would focus on development of specific conservation measures to reduce potential impacts on these species and/or designated critical habitat. Such conservation measures would be based on the recommendations provided by the U.S. Fish and Wildlife Service.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on federally listed species and designated critical habitat include (1) the improvements to the parking areas at the ends of Leelanau County Roads 651 and 669; (2) implementation of the "Fire Management Plan"; (3) improvements to the Lake Michigan overlooks accessed from the Pierce Stocking Scenic Drive, and (4) activities presented in table 21. Most of these actions would benefit natural resources including federally listed species and their designated critical habitats. Some past projects at the National Lakeshore, however, such as the site restoration project near Big Glen Lake, have adversely affected federally listed species, i.e., Michigan monkey flower. These resulted in formal consultation with the U.S. Fish and Wildlife Service. During implementation, actions would be taken to avoid or minimize potential adverse impacts on such species. Any adverse impacts, such as trampling or sensory-based disruption, would be insignificant or discountable.

The impacts of actions described above, together with the impacts of alternative A,

may affect but would not be likely to adversely affect piping plover, piping plover critical habitat, Pitcher's thistle, and Michigan monkey flower. Alternative A would likely contribute a relatively small component to these cumulative impacts.

**Conclusion.** Any adverse impacts of alternative A on the addressed federally listed species and designated critical habitat would be no more than insignificant or discountable over both the short and long terms. Implementation of alternative A may affect but would not likely adversely affect the addressed listed species and critical habitat. Other projects, combined with the impacts of alternative A, on federally listed species and designated critical habitat may affect but would not likely adversely affect piping plover, piping plover critical habitat, Pitcher's thistle, and Michigan monkey flower. There would be *no impairment* of federal threatened and endangered species from this alternative (see specific definition of impairment in the "Impairment of National Lakeshore Resources" section).

### Michigan State-Listed Species

Readers are encouraged to refer back to the "Michigan State-Listed Species" discussion in the "Methods and Assumptions for Analyzing Impacts" section for additional details on the types of impacts resulting from visitor use and development.

Under alternative A, 47% of the National Lakeshore would be managed as wilderness (assuming that Congress acts to designate wilderness), with wilderness on both islands and in all three mainland portions of the Lakeshore. This would be a 2,697-acre (4%) increase over the no-action alternative. Management of these areas as wilderness would convey a higher level of protection to the state-listed species of the areas than any management zone. This wilderness proposal would likely have short- and long-term minor

beneficial impacts on state-listed species of the Lakeshore.

Access to the Giant Cedars area would continue to be by foot from the ranger station, or, less frequently, via the lake (i.e., by boat). Management actions that occur or would be considered for reduction of impacts to plants and soils in this sensitive area would include educating visitors about the sensitive nature of the area, fencing to reduce compaction of root zones and/or trampling of vegetation, and the strategic use of boardwalks. As such, the no-action alternative would likely have short- and long-term minor adverse impacts on the Michigan state-listed species occurring in this area.

Closure of the farm loop to vehicles at the west end of Chicago Road would likely have long-term minor beneficial impacts on state-listed species associated with the dunes west of thereby reducing the potential for trampling, habitat alteration, and sensory-based disruptions.

New activities proposed such as use of the new bay-to-bay trail and campgrounds could result in trampling, habitat alteration, and sensory-based disruption of behaviors for state-listed species associated with the shoreline/dunes/near-shore habitats. Assuming practicable levels of monitoring and remediation of visitor-related impacts by NPS staff, impacts on Michigan state-listed species from such activities under alternative A would likely be short term moderate and long term minor and adverse.

Ongoing use of motorized boats on School, Loon, and North Bar lakes, as well as on the Crystal and Platte rivers, would likely have short- and long-term minor adverse effects on state-listed species associated with lakes/wetlands/riparian due to shoreline erosion, resuspension of sediments, pollution, and sensory-based disruption of wildlife. The cessation of motorized boating on Bass Lake (Leelanau County) would likely have equal



but beneficial impacts (i.e., short- and long-term, minor, beneficial impacts). Implementation of user capacity management (see discussion in chapter 2) to reduce impacts of visitor use in sensitive and yet popular areas such as the Platte River corridor, would have short- and long-term, minor to moderate beneficial impacts.

Development of the bay-to-bay trail and associated campgrounds, the M-22/M-109 hike/bike trail and a loop trail and small parking area at Bow Lakes could result in habitat loss and degradation for lakes/wetlands/riparian species and for mature forest species, which could be reduced by strategic location and design. Return of the Glen Lake picnic area to a natural state, could have beneficial impacts on species associated with wetlands and lakes in that area. The sum of these impacts on state-listed species associated with lakes, wetlands, and riparian areas and mature forests in the Lakeshore would likely be short and long term, negligible to minor, and adverse (e.g., the bay-to-bay trail), and long term, minor, and beneficial (e.g., development of a loop trail in Bow Lakes area and return of Glen Lake picnic area to more natural conditions).

Cessation of NPS acquisition of lands within the Benzie Corridor and removal of the corridor from the Lakeshore boundary would likely expose this area to an increased rate of private development. Although no state-listed species are known to occur within the actual corridor, such development could adversely impact state-listed species close to the ridge, including species associated with lakes, wetlands, and riparian areas. Impacts associated with private development, including habitat loss, alteration, and degradation, and sensory-based disruption, could result if this area undergoes such development. These impacts could range from negligible to moderate and would likely be adverse over the short and long terms.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on Michigan state-listed plant and animal species include (1) the improvements to the parking areas at the ends of Leelanau County Roads 651 and 669; (2) Glen Haven Village improvements; (3) implementation of the “Fire Management Plan”; (4) improvements to the Lake Michigan overlooks accessed from the Pierce Stocking Scenic Drive; (5) riverbank stabilization on the Platte River at the former Water Wheel and Casey’s Corner canoe liveries; (6) restoration approximating the natural topography, hydrology, and native vegetative cover of nonhistoric areas disturbed by past land uses — particularly those in critical dunes areas; and (7) minor improvements to the Dune Climb parking area. Each of these projects would involve short-term adverse impacts during construction (such as sensory-based disturbance). The long-term impacts would likely be minor to moderate and beneficial (such as habitat protection, restoration, and enhancement). The impacts of the actions listed above, together with the impacts of the alternative A, would result in short and long term minor to moderate adverse cumulative impacts, and minor to moderate beneficial cumulative impacts. Alternative A would be expected to contribute a relatively small component to these cumulative impacts.

**Conclusion.** Alternative A would have short- and long-term negligible to moderate adverse impacts and short- and long-term minor to moderate beneficial impacts on Michigan state-listed species. The cumulative impacts would likely be short and long term, minor to moderate adverse, and minor to moderate beneficial. There would be *no impairment* of state-listed species from this alternative (see specific definition of impairment in the “Impairment of National Lakeshore Resources” section).

## **Wetlands and Water Quality**

Readers are encouraged to refer back to the “Wetlands and Water Quality” discussion in the “Methods and Assumptions for Analyzing Impacts” section for additional details on the types of impacts resulting from visitor use and development.

Current visitor activities that would continue and could impact wetlands and water quality include the use of motorized boats on School, Loon, and North Bar lakes and the Crystal and Platte rivers. Impacts would include resuspension of sediments and pollution of wetlands and water bodies. Impacts on wetlands and water quality from such activities under all action alternatives would likely continue to be short and long term, minor to moderate, and adverse. Implementation of user capacity management (see discussion in chapter 2) to reduce impacts of visitor use in sensitive and yet popular areas such as the Platte River corridor, would have short- and long-term, minor to moderate beneficial impacts.

The bay-to-bay trail and the M-22/M-109 hike/bike trail could impact wetlands and water quality through erosion, runoff, and pollution during construction, and trampling, erosion, resuspension of sediments, and pollution during use. Assuming implementation of best management practices during construction, and careful monitoring of impacts during use, the overall impacts would likely be short and long term, minor, and adverse.

Closure of the farm loop road to vehicles at the west end of Chicago Road on South Manitou Island, closure of Tiesma Road, and cessation of motorized boat use on Bass Lake (Leelanau County) would likely have short- and long-term, negligible to moderate beneficial impacts on the wetlands and waters in those areas.

Development activities proposed under alternative A that might impact wetlands and water quality include return of the Glen Lake picnic area to a more natural condition and development of a short loop trail and small parking area in the Bow Lakes area. Assuming use of best management practices during construction, the impacts of restoring the Glen Lake picnic area to more natural conditions and developing the Bow Lakes trail and parking area would likely be short term, minor to moderate, and adverse during construction, and long-term, minor to moderate, and beneficial after construction because they would be designed to protect adjacent wetlands and water bodies.

Cessation of NPS acquisition of lands within the Benzie Corridor might render wetlands and water quality below this area susceptible to impacts of private development, such as increased sediment loads and pollution, resulting in short- and long-term, negligible to moderate adverse impacts.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on wetlands and water quality include (1) implementation of the “Fire Management Plan”; (2) riverbank stabilization on the Platte River at the former Water Wheel and Casey’s Corner canoe liveries; (3) restoration approximating the natural topography, hydrology, and native vegetative cover of nonhistoric areas disturbed by past land uses — particularly those in critical dunes areas; (4) minor improvements to the Dune Climb parking area; and (5) dredging of the Platte River mouth. Although each of these projects would involve short-term adverse impacts (e.g., dredging of the Platte River resulting in short-term suspension of particulates in the water and resulting lower water quality immediately downstream [lakeside] of the dredging), the net result would likely be long-term, minor to moderate beneficial impacts (e.g., dredging the mouth of the Platte River allows boats to pass without continuously

hitting the bottom, stirring up material, and reducing water quality).

The impacts of the other actions described above, together with the impacts of the alternative A, would result in short- and long-term negligible to moderate adverse cumulative impacts, and long-term negligible to moderate beneficial cumulative impacts. Alternative A would be expected to contribute a relatively small component to these cumulative impacts.

**Conclusion.** Alternative A would contribute short- and long-term negligible to moderate adverse, and negligible to moderate beneficial impacts on wetlands and water quality. There would be short- and long-term negligible to moderate adverse cumulative impacts, and long-term negligible to moderate beneficial cumulative impacts. There would be *no impairment* of wetlands or water quality from this alternative (see specific definition of impairment in the “Impairment of National Lakeshore Resources” section).

## VISITOR OPPORTUNITIES AND USE

### Visitor Opportunities

Although natural resource interpretive and educational opportunities would be emphasized, opportunities would remain available for visitors to experience all of the fundamental resources and values of the Lakeshore as well as to learn about all of the Lakeshore’s primary interpretive themes (see “Fundamental Resources and Values” and “Primary Interpretive Themes” sections in chapter 1). Visitors would have access to information, interpretation, and educational opportunities at a variety of locations, including the visitor center in Empire, at Glen Haven, and at the visitor contact station on South Manitou Island. These opportunities would have long-term, moderate, beneficial impacts.

Access to and through the Lakeshore would generally be on the existing network of state, county, and NPS roads. However, visitors would no longer have vehicular access on Tiesma Road (for beach access) or the complete South Manitou Island farm auto tour. Visitors would have increased Lakeshore access with the addition of the M-22/M-109 hike/bike trail (initiated by others) and the bay-to-bay hiker/paddler trail, and concessioner-operated interpretive tours to near the Giant Cedars area would be considered. Seasonal ferry service would be provided for overnight trips to North Manitou Island and day and overnight trips to South Manitou Island (similar to the no-action alternative). The National Park Service would recommend to Congress that the Benzie Corridor be removed from the Lakeshore boundary; therefore there would continue to be no visitor access in this area. The above-noted increases in Lakeshore access would have long-term, moderate beneficial impacts. The loss of access would have long-term, moderate adverse impacts.

The scenic resources of the Lakeshore would reflect relatively large areas that are natural in character (this alternative has the greatest amount of the experience nature zone). Visitors would also experience Lakeshore sites that reflect the area’s culture and history (e.g., Glen Haven, Port Oneida, and cultural resources on North Manitou and South Manitou islands) and areas with facilities that support recreational use (e.g., the Dune Climb and Trails End). If Congress acted to remove the Benzie Corridor from the National Lakeshore boundary, future development would likely be similar to other locally developed ridgelines (that is, the least natural appearing of any alternative). Private development of the Benzie Corridor would have long-term, moderate, negative impacts on scenic resources. Even with very modest new development, there would be long-term, moderate, beneficial impacts on opportunities to experience the natural and cultural scenic resources of the Lakeshore.

Additions and deletions to the Lakeshore's recreation-oriented development would cause modest changes in recreational opportunities for visitors. Additions include the M-22/M-109 hike/bike trail (initiated by others), the bay-to-bay hiker/paddler trail and associated primitive campgrounds, and a trailhead parking area and a short loop trail in the Bow Lakes area. The Valley View backcountry campground would be abandoned, and the Little Glen Lake picnic area would be removed. Even with these changes, the scale of recreation-oriented development in the Lakeshore would be relatively modest. This level of development would have long-term, minor beneficial impacts on visitors.

There would continue to be a wide range of recreational activities in the Lakeshore (similar to the no-action alternative); however, opportunities for nonmotorized recreational activities such as hiking, biking, backpacking, paddling, and backcountry camping would be facilitated and expanded. User capacity management would improve visitor experiences on the Platte River. There would be a reduction in the number of lakes available for motorized boats, hang gliding use at Empire Bluff would be suspended, and there would be no future NPS recreational opportunities in the Benzie Corridor. Some visitors might perceive these actions as a reduction in recreational opportunities. These changes to the range of recreational activities in the Lakeshore would have long-term, minor beneficial impacts.

Natural sounds would continue to dominate the Lakeshore except along roadways, in developed areas, where motorized boats are allowed (along rivers, at specific inland lakes, and on Lake Michigan), and when aircraft are flying over. One less inland lake than in the no-action alternative would allow motorized boats (and accompanying sounds) resulting in a slight improvement in the natural soundscape. The Benzie Corridor would be removed from the Lakeshore boundary and development would likely be similar to other

locally developed areas. The increased residential development and its associated sounds would disrupt the natural soundscape. Natural sounds would also be temporarily disrupted locally by construction activities; however mitigation measures would minimize impacts. Overall impacts would be long term, minor, and beneficial with other impacts that are either short or long term, minor, and adverse.

The naturally dark night sky would continue to be predominant in the Lakeshore despite vehicular lights along roadways and lighting in developed areas. Overall impacts would be long-term, minor, and beneficial for those who value the dark night sky. However, the Benzie Corridor would be removed from the Lakeshore boundary and development would likely be similar to other locally developed areas. This increased private development and its associated lighting would have long term, minor, and adverse impacts on the dark night skies.

### **Visitor Use**

Annual visitor use at the Lakeshore under alternative A would be expected to be slightly higher than under the no-action alternative, but lower than under the preferred alternative. The net change would result from counterbalancing factors affecting use — implementation of user capacity management strategies on the Platte River and closing two NPS roads — would be offset by potential increases in use associated with completion of the M-22/M-109 hike/bike trail (initiated by others) and the bay-to-bay hiker/paddler trail and associated primitive campgrounds. New opportunities would be focused on dispersed and backcountry uses. Consequently, a long-term increase of up to 25% above that anticipated under the no-action alternative could be foreseen (up to an estimated 21,000 additional annual visits).

Levels of visitor use to North Manitou and South Manitou islands would see little change, with no changes in ferry service occurring under alternative A.

The increases in visitor use would occur gradually over time, reflecting not only long-term local and regional population growth, but also the implementation of specific changes or projects that are contingent upon funding, actions of others, or both. Slightly increased visitor use levels would have long-term and minor effects that might be concurrently viewed as beneficial or adverse. The differences between beneficial and adverse would depend on the expectations and preferences of the visitor related to the new opportunities and increased visitation in alternative A.

### **Cumulative Impacts**

Other past, present, and reasonably foreseeable projects that would affect visitor opportunities and use include: (1) improvements to parking areas at the ends of Leelanau County Roads 651 and 669; (2) Glen Haven Village improvements; (3) improvements to the Pierce Stocking Scenic Drive Lake Michigan overlooks 9 and 10; (4) South Manitou Lighthouse Complex exterior restoration and interior rehabilitation; and (5) Dune Climb parking area paving and other minor improvements. These actions would improve visitor opportunities by improving enjoyment, access, and/or range of available opportunities for visitors and would have an overall long-term, minor, beneficial effect on visitor opportunities and use. Combined with actions proposed in alternative A, past, present, and reasonably foreseeable actions would have a long-term, minor, beneficial cumulative effect. Impacts of alternative A would comprise a relatively small portion of the overall cumulative effect.

### **Conclusion**

Increased access and visitor opportunities related to modest additional recreation-oriented facilities would have a long-term, minor to moderate beneficial impact on visitor opportunities and use. Implementation of user capacity management strategies would have a long-term, minor beneficial impact on visitor opportunities, but potentially long-term minor adverse effects on visitor use. The loss of some vehicle access, visitor opportunities, and recreation-oriented development (e.g., Tiesma Road, Glen Lake picnic area, and part of the farm tour) would have a long-term, moderate adverse impact on visitor opportunities and use. The removal of the Benzie Corridor from the Lakeshore boundary would have long-term, minor to moderate adverse impacts on visitor access and opportunities, scenic resources, natural soundscapes, and the night sky. Construction activities would have short-term, minor adverse impacts. The cumulative effects would be long term, minor, and beneficial.

## **WILDERNESS CHARACTER**

### **Natural and Undeveloped**

Under alternative A, 33,600 acres (47% of the National Lakeshore, the most of any alternative), would be proposed for wilderness designation, a 2,697-acre (4%) increase over the no-action alternative. Assuming Congress acted to designate the proposed areas as wilderness, wilderness values would be permanently protected in designated areas of the north, central, and south portions of the Lakeshore and on each island. In contrast to the no-action alternative, none of the Port Oneida Rural Historic District would be included, and a new area of designated wilderness and associated experiences would be available on the Sleeping Bear Plateau. Impacts on wilderness character would be long term, moderate, and beneficial.

Alternative A's wilderness proposal is also the most contiguous wilderness proposal — that is, the places where wilderness areas would be interspersed with nonwilderness would be minimized. Thus, places where adjacent motorized or mechanized uses (e.g., the motorized farm tour on South Manitou Island) would intrude upon naturalness and primitive character would also be minimized. In contrast to the no-action alternative, there would be no nonconforming motor vehicle or bicycle use *within* wilderness because county road rights-of-way would be excluded. However, the presence of historic structures would continue to locally diminish the areas' undeveloped primeval character. Impacts would be long term, minor, and adverse.

### **Opportunities for Solitude**

Outstanding opportunities for solitude would be available due to wilderness designation in all three portions of the mainland and on the Manitou Islands. In particular, areas away from trails and facilities would continue to offer excellent prospects for privacy and isolation. Solitude would continue to be more easily found on North Manitou Island than on South Manitou Island because the former is larger, has fewer visitors (most of whom are seeking wilderness experiences), and would continue to lack day use.

### **Opportunities for Primitive, Unconfined Recreation**

As in the no-action alternative, there would be opportunities for both day and overnight wilderness experiences on South Manitou Island, but due to the continued lack of day ferry service to North Manitou Island there would be only overnight wilderness experiences available there (no change from the no-action alternative). The permit requirement for backcountry camping would continue, and campers would be required to stay in designated campgrounds except on North

Manitou Island where camping would continue to be dispersed. Based on the extent and configuration of designated wilderness, alternative A would provide more opportunities for primitive, unconfined recreation (mainland and both islands) than any other alternative. Permit and camping requirements would continue to diminish these qualities to some degree (a minor, long-term, adverse impact).

### **Cumulative Impacts**

Over time, the Lakeshore's ongoing program to restore former nonhistoric sites to more natural conditions has substantially increased the natural, undeveloped character of the Lakeshore. The work includes removing nonnative trees and human enhancements, plus reestablishing more natural contours and native vegetation. Combined with this ongoing restoration program, alternative A would have long-term, moderate, beneficial cumulative effects. Impacts of alternative A would comprise a substantial portion of the overall cumulative effect.

### **Conclusion**

Establishment of 33,600 acres of designated wilderness (the most of any alternative) in all three portions of the mainland and on both islands would permanently protect naturalness and opportunities for solitude or primitive, unconfined recreation. Impacts of alternative A on wilderness character would be mostly beneficial, moderate, and long term (permanent), but there would also be some localized minor adverse impacts on wilderness character. Combined with other actions, alternative A would have long-term, moderate, beneficial cumulative effects.

## REGIONAL SOCIOECONOMICS

Implementing alternative A would occur against the same backdrop of economic, demographic, and social conditions across the region described under the no-action alternative. The economic and social effects of alternative A would contribute to those conditions, but not fundamentally change the area's economic and demographic outlook.

### Visitor-Related Economic Impacts

Annual visitor use at the Lakeshore under alternative A would be expected to be slightly higher than under the no-action alternative; a long-term increase of up to 25% (up to 21,000 additional visits) above that under the no-action alternative could be foreseen. The timing of increased visitor use is difficult to predict because it would depend on when projects are funded or carried out and other factors.

Implementation of alternative A might affect the geographic distribution, timing, and activity of visitor use within the National Lakeshore and potentially indirectly affect visitor use at nearby outdoor recreation resources managed by other entities. The potential for such indirect effects is lower than for the preferred alternative. Given their limited scale, such changes would be anticipated to have little or no impact on future management and operations of these resources.

The changes in visitor use would be accompanied by modest changes in annual visitor spending, about \$550,000 per year, with correspondingly limited effects on local personal income and jobs, i.e., 5 to 10 jobs.

The state and local governments would collect additional sales tax from the increases in visitor spending.

The above visitor-related economic impacts would be beneficial, but negligible in the short term and minor and beneficial over the long term.

### Economic Impacts Related to Implementation and NPS Operations

Implementing alternative A would provide a sustained economic infusion to the region over the life of this plan. The infusion would result from the Lakeshore's ongoing operating expenditures, including \$14.4 million in future construction outlays (\$7.8 million above that for the no-action alternative). Projected budget needs for other major projects and to address deferred maintenance would be the same as for the no-action alternative.

As under the no-action alternative, NPS maintenance staff would perform much of the work to address deferred maintenance and preservation, restoration and rehabilitation activities. Identified budget needs for future construction would be higher than under the no-action alternative, which if implemented would support the local construction trades industry and associated vendors and suppliers.

Annual NPS payroll, operating, and maintenance would produce long-term effects on employment, business sales, income and other related measures. Management under alternative A could support staffing increases of 11 full-time-equivalent employees. Staff would be added over time as projects, programs, and management were implemented.

A need for a modest long-term increase in budgeted funds for NPS operations is identified in conjunction with alternative A (there are no assurances that such increases will occur). Available resources would include about \$4.2 million in base budget appropriations (\$300,000 per year above the no-action alternative), about \$1.0 million in entry and camping fees, and various nonrecurring

funding for supplemental and specific project construction. Retained revenues from entry and camping fees would likely increase with higher visitation.

If Congress acts to remove the Benzie Corridor from the National Lakeshore, land acquisition in the corridor by the National Park Service would cease and the eventual status of already acquired lands would be determined independent of this plan.

Activities sponsored by the Lakeshore's partners would provide yet additional sources of economic stimulus. The timing, magnitude, and indirect economic consequences of those activities are indeterminate.

The economic effects associated with NPS operations would be beneficial and minor to moderate in the short and long term.

### **Effects on Regional Population**

Alternative A would have little direct impact on population growth. The increases in construction and long-term jobs and visitor use over the life of this plan would provide a negligible impetus for growth relative to other factors and would be insufficient to trigger additional new economic development and job-related migration. Many of the jobs would probably be filled by individuals who already reside in the area.

Implementation of alternative A could indirectly enhance the region's attractiveness for economic development as a result of a limited number of new recreational opportunities and establishment of wilderness on the mainland.

There would be some potential effects on future residential development in the area from curtailing land acquisition in the Benzie Corridor. Although the long-term retention or disposal of already acquired lands along the corridor would be determined separately

from this plan, it is reasonable to expect the cessation of land acquisition to stimulate new residential development with corresponding increases in year-round or seasonable populations on private lands within and near the corridor boundary. However, the topography and amount of land involved might limit the amount of such development.

The effects on regional population growth under this alternative would be negligible, both in the short and long terms.

### **Community Services**

The effects of implementing alternative A on community services and facilities across the region would be comparable to those under no action, again with the exception of higher demands related to future development in the vicinity of the Benzie Corridor, spurred by the curtailment of land acquisition by the National Park Service. The limited scale, seasonal nature, and spatial dispersion of the effects across the broader region would not require facility expansions or more staff. Private development in the Benzie Corridor would primarily affect demand for services by Benzie County.

Effects on community services under this alternative would be indeterminate and negligible over the short and long terms.

### **Traffic and Emergency Services**

Traffic impacts of alternative A on the highways and roads providing access to the Lakeshore would be comparable to those under the no-action alternative. Even with the long-term increases in traffic, future traffic levels would be within the current design capacity of the roads. Needs for future highway maintenance would not increase dramatically.



Long-term impacts on the number of traffic accidents and demands on first responders would be similar to those under no action. Demands associated with implementing alternative A would not require additional law enforcement or emergency response staffing, although the increases in the number of “call outs” could burden area first response agencies because they are staffed partially by volunteers.

The effects of implementing alternative A on traffic and emergency services would be adverse, but minor over the short and long terms.

### **Attitudes and Lifestyles**

Alternative A establishes future management direction for the Lakeshore that reflects public input and the Lakeshore’s purpose, significance, and fundamental resources and values, but with relatively more emphasis on natural resource preservation. That emphasis will generally appeal to those valuing solitude, wilderness, and appreciation of the current cultural and recreation opportunities. Those more interested in developing facility-based recreation or maximizing the economic contributions associated with the Lakeshore might be less enthusiastic about the management direction set forth in alternative A.

Suspension of land acquisition in the Benzie Corridor would likely garner support from those who view the corridor as either a non-essential addition to the recreational resources at the Lakeshore or an area competing with other areas for scarce management and funding resources. Members of the public more interested in the addition of another access gateway into the Lakeshore and the expanded scenic and recreational opportunities associated with the corridor are less likely to favor alternative A. Property owners of lands in and adjacent to the corridor would be the most directly affected

due to possible changes in nearby development and use.

Like the no-action alternative, the management direction for this alternative would result in relatively few direct lifestyle consequences because the influences of the Lakeshore would generally be consistent with those established under the no-action alternative.

### **Cumulative Impacts**

Social and economic impacts due to implementation of alternative A would be similar to those of other past, current and future development across the region and those under the no-action alternative. The effects of underlying development trends in the region include long-term, moderate population and economic growth; long-term increases in traffic on local roads; related impacts on public safety; higher spending that bolsters community and recreation-oriented businesses in the region; and additional tax revenues to fund public services and facilities. The effects of the other cumulative actions include negligible to minor changes in local economic conditions in response to changes in visitor use patterns at the Lakeshore precipitated by changes in traffic parking and circulation.

The incremental economic and social effects of implementing alternative A, including those associated with increases in visitor and NPS operating expenditures, would be negligible to minor in the short term and minor in the long term, and generally beneficial. Alternative A actions, combined with other actions described above, would result in minor short- and long-term adverse cumulative effects on traffic and highway safety. Impacts of alternative A would comprise a relatively small portion of the overall cumulative social and economic effects.

## **Conclusion**

The economic and social effects of alternative A would include negligible to minor short-term and moderate long-term economic benefits compared to the no-action alternative. Short- and long-term effects on lifestyles and attitudes would be indeterminate. Long-term social consequences would include a negligible to minor contribution to long-term population growth and demands on community infrastructure and services. Alternative A actions, combined with other actions described above, would result in minor short- and long-term adverse cumulative effects on traffic and highway safety. Overall, the cumulative social and economic effects associated with the alternative A would be minor, short and long term, and indeterminate because they include effects that might be concurrently viewed as beneficial or adverse.

## **NPS OPERATIONS**

A limited number of new trails, including the M-22/M-109 hike/bike trail, and backcountry campgrounds would increase the Lakeshore's maintenance and operational load compared to the no-action alternative. However, this would be tempered by reduced maintenance and operational needs resulting from (a) removal or closure of other facilities, such as Glen Lake picnic area, NPS-owned Tiesma Road, the NPS portion of the farm loop on South Manitou Island, and Valley View campground, and (b) removal of the Benzie Corridor from the Lakeshore. Wilderness minimum requirement analysis would be required for 33,600 acres, a 2,697-acre (4%) increase over the no-action alternative. Impacts of alternative A would be long term, minor, and both beneficial and adverse.

## **Cumulative Impacts**

Ongoing and planned facility upgrades and restoration/rehabilitation projects would have

mostly beneficial impacts because these projects would result in reduced resource management and cyclic maintenance needs. Dredging of the Platte River mouth would continue to place demands upon the Lakeshore's maintenance staff and budget, a minor adverse effect. Combined with these impacts, alternative A would have both long-term minor beneficial and adverse cumulative effects. Impacts of alternative A would comprise a substantial portion of these overall cumulative effects.

## **Conclusion**

Alternative A would have long-term, minor beneficial and adverse impacts on NPS operations. This alternative, combined with other actions, would have both long-term minor beneficial and adverse cumulative effects.

## **UNAVOIDABLE ADVERSE IMPACTS**

Some negligible to moderate impacts to soils, vegetation, wildlife, water resources, wilderness character, scenic resources, natural sound, and night sky caused by recreational use and facilities would be essentially unavoidable (e.g., soil compaction, vegetation trampling, wildlife disturbances, decreased opportunities for solitude, decreased naturalness). Increases in visitor use would have low level adverse impacts on regional socioeconomics (e.g., increased traffic).

## **IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES**

Irreversible commitments of resources are actions that result in loss of resources that cannot be reversed. Irretrievable commitments of resources are actions that result in the loss of resources but only for a limited period of time.

If Congress acted to remove the Benzie Corridor from the National Lakeshore boundary, it is reasonable to assume that the corridor could be developed, subject to local zoning, development patterns, and market forces. Development of the corridor for residential or similar land uses would be an irreversible commitment of natural and scenic resources.

With the exception of consumption of fuels and raw materials for maintenance or construction activities, no other actions in this alternative would result in consumptions of nonrenewable natural resources or use of renewable resources that would preclude other uses for a period of time.

### **RELATIONSHIP OF SHORT-TERM USES AND LONG-TERM PRODUCTIVITY**

The National Lakeshore would continue to be used by the public, and most areas would be protected in a natural state. The National Park Service would continue to manage the Lakeshore to maintain ecological processes and native biological communities and to provide appropriate recreational opportunities consistent with preservation of cultural and natural resources. Actions would be taken with care to ensure that uses do not adversely affect the long-term productivity of biotic communities. Under alternative A there would be very little new development, and any losses of ecological productivity would be minimal.

## IMPACTS OF ALTERNATIVE B

### HISTORIC RESOURCES

*The Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995) identifies four treatment approaches that apply to a wide variety of resource types, including buildings, sites, structures, objects, districts, and landscape features and patterns. Three of those treatments are included in this plan — preservation, rehabilitation, and restoration. See page 40 for more detailed definitions. The simplest of these treatment approaches is preservation, in which measures are undertaken to stabilize the resource to ensure that it does not deteriorate further from its existing condition and then to maintain and repair historic features and materials. The second option is rehabilitation, in which the resource is made useable for some purpose while preserving those features that convey its historical, cultural, or architectural value. The third is restoration, in which the historic appearance at a particular time is accurately regained. The fourth treatment, reconstruction, is not proposed in this plan.

Although each alternative calls for preserving and protecting all historic properties, each action alternative provides a different management zone configuration based on that alternative's overall vision, and each management zone prescribes which of the three treatments could be used for historic properties. Thus, potential treatments for the National Lakeshore's various historic properties differ among the alternatives. Based on the locations and relative proportions of management zones in alternative B, 73% of historic structures would undergo preservation, rehabilitation, or restoration (experience history zone), 16% of historic structures would undergo preservation or rehabilitation (recreation zone), and 11% of historic structures would undergo preservation

(experience nature zone). This information is summarized in table 3 on page 74.

All preservation, rehabilitation or restoration efforts would be undertaken in accordance with the standards. Any materials removed during rehabilitation or restoration efforts would be evaluated to determine their value to the Lakeshore's museum collections and/or for their comparative use in future preservation work at the sites. Implementation of the actions described above for this alternative, which would bring all historic resources up to a good condition, would result in no adverse effects on historic resources.

At Glen Haven the Glen Haven Historic District and Sleeping Bear Point Life-Saving Station would be preserved, rehabilitated, or restored (same action in all alternatives). Some buildings would be rehabilitated for visitor and/or staff use. The Sleeping Bear Inn and garage would be placed in the NPS historic leasing program to allow rehabilitation for adaptive use. All other structures would be stabilized and maintained in their current condition.

At Port Oneida historic structures and landscapes would be preserved, rehabilitated, or restored (same action in all alternatives). Structures on at least one farmstead would be restored for interpretive purposes. Some buildings in the district would be rehabilitated for visitor and/or staff use, including a visitor contact station and staff housing. At least one farmstead would be placed in the NPS historic leasing program to allow rehabilitation and adaptive use. All other structures and landscapes would be stabilized and maintained in their current condition.

On North Manitou Island the historic life-saving station and Cottage Row structures would be preserved, rehabilitated, or restored (same action as in the preferred alternative).

Preservation and/or adaptive use of the rehabilitated historic former Manitou Island Association structures for administrative and operational purposes would continue. Historic structures and landscapes elsewhere on the island would be preserved.

On South Manitou Island the historic life-saving station, lighthouse complex, and village historic structures would be preserved, rehabilitated, or restored. Historic structures and landscapes elsewhere on the island would be preserved or rehabilitated.

Other mainland historic structures and landscapes would be managed as specified for the management zone in which they lie (see alternative map and zone descriptions).

Actions involving other than historic property treatments, such as improving access to some inland lakes, would have no effect on historic properties because they would be designed to avoid possible impacts on properties on or eligible for the national register.

All properties on or determined eligible for inclusion in the National Register of Historic Places would, at a minimum, undergo stabilization (where that action has not already occurred) or maintenance in the current condition (where some preservation treatment has already been implemented).

The actions proposed above are general. The treatments for each resource (preservation [stabilization], rehabilitation with adaptive use, restoration) have not yet been determined so impacts cannot be fully described. However, it is the National Park Service's intent that no action proposed be adverse. All actions affecting these historic structures and landscapes would be undertaken in consultation with the Michigan state historic preservation officer.

Alternative B would not directly or indirectly affect any properties outside the boundary of the National Lakeshore that are listed on or

eligible for the National Register of Historic Places, or that are listed by the state.

### Cumulative Impacts

Over the years historic resources in the Lakeshore have been adversely impacted by natural processes such as weathering, vegetative encroachment, and the wear and tear associated with visitor use. Actions proposed for the South Manitou Island Lighthouse Complex would result in both the restoration of the exterior of the keeper's quarters and connecting passageways and the rehabilitation of the interior for adaptive reuse. In addition, actions proposed for Glen Haven Village include the stabilization and maintenance of historic structures or their rehabilitation for adaptive reuse. All preservation, rehabilitation, or restoration efforts would be undertaken in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995), and would result in no adverse effects on historic resources.

As described above, implementation of alternative B would result in no adverse effects on historic resources. The no adverse impacts of this alternative, in combination with both the adverse and no adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a no adverse effect cumulative impact. The no adverse effects of alternative B would be a sizeable contribution to the no adverse effect cumulative impact.

### Conclusion

Alternative B would have a determination of no adverse effect under the Advisory Council on Historic Preservation "Regulations for the Protection of Historic and Cultural Properties" (36 CFR 800). There would be *no impairment* of cultural resources from implementation of alternative B (see specific

definition of impairment in the “Impairment of National Lakeshore Resources” section).

## **NATURAL RESOURCES**

### **Soils and Geologic Resources**

Readers are encouraged to refer back to the “Soils and Geologic Resources” discussion in the “Methods and Assumptions for Analyzing Impacts” section for additional details on the types of impacts resulting from visitor use and development.

Use of motorized boats on School, Loon, North Bar, and Bass (Leelanau County) lakes and the Crystal and Platte rivers would continue. Although soil compaction and erosion of the dunes would be reduced in some areas by using sand ladders, boardwalks, and sidewalks to protect the substrate, placement and maintenance would be limited to what can be accomplished with current resources. Therefore, short- and long-term adverse impacts on soils and geologic resources as a result of these ongoing visitor activities, ranging from minor to moderate depending upon the specific location and activity, would continue. These ongoing activities would continue to have minor to moderate (depending on location and activity), short- and long-term adverse impacts on soils and geologic resources. Implementation of user capacity management (see discussion in chapter 2) to reduce impacts of visitor use in sensitive and yet popular areas such as the Platte River corridor, would have short- and long-term, minor to moderate beneficial impacts.

Development of the bay-to-bay trail and the M-22/M-109 hike/bike trail could result in soil disturbance and erosion during construction, and subsequent visitor use would result in erosion and compaction. Assuming use of best management practices, such as using silt fencing and avoiding steep or inundated terrain, during construction and later use to

prevent soil erosion and compaction, the overall adverse impacts would likely be short-term moderate and long-term minor.

Visitor activities under alternative B such as motorized boat use on additional inland lakes (Shell and Tucker), farm loop auto tours and concession auto tours to near the Giant Cedars area on South Manitou Island, and day trips to North Manitou Island could result in soil erosion and compaction in these areas. Impacts on soils and geologic resources (e.g., dune processes) from such activities under alternative B would likely be short and long term, negligible to moderate depending upon location and activity, and adverse.

Constructing a multi-loop trail and small parking area at Bow Lakes with potential connection to the local school, providing additional designated campsites on North Manitou Island, relocating the D. H. Day group campground to the D. H. Day main campground, and improving access at a few inland lakes and the Crystal River might result in soil disturbance, erosion, and compaction, all of which could be reduced, to some extent, by strategic location and design. Other development, such as improvements to the parking area at the ends of Peterson and Esch roads, improvements to the Glen Lake picnic area, and improvements at the mouth of the Platte River, might result in increased visitor use and associated increases in soil compaction and erosion in those areas. The sum of these impacts to soils and geologic resources in the Lakeshore would be short and long term, minor to moderate, and adverse.

Continued NPS acquisition of lands on a willing-seller basis within the Benzie Corridor would have short- and long-term, moderate beneficial impacts on soils in that area by protecting them from impacts associated with development. Construction of a road and associated bike trail along the Benzie Corridor would result in short-term minor to moderate adverse impacts on soils through soil erosion

and compaction. Long-term effects would include negligible to minor adverse impacts on soil resources due to erosion associated with increased impermeable surface area. Private development within the corridor would probably continue at its current pace and would be anticipated to have minor to moderate adverse impacts on these resources.

Elimination of dispersed camping on North Manitou Island with development of additional designated campsites would likely have short- and long-term negligible to minor adverse impacts on the soils of and adjacent to the new campsites. This action would also have short- and long-term negligible to minor beneficial impacts on the soils and geologic resources in wider areas that are being impacted by repeated use.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on soils and geologic resources include (1) the improvements to the parking areas at the ends of Leelanau County Roads 651 and 669; (2) Glen Haven Village improvements; (3) improvements to the Lake Michigan overlooks accessed from the Pierce Stocking Scenic Drive; (4) riverbank stabilization on the Platte River at the former Water Wheel and Casey's Corner canoe liveries; (5) restoration approximating the natural topography, hydrology, and native vegetative cover of nonhistoric areas disturbed by past land uses — particularly those in critical dunes areas; (6) minor improvements to the Dune Climb parking area; and (7) continued dredging of the mouth of the Platte River. Although activities 1-6 would likely result in short-term adverse impacts during the construction phase, the net result would likely be long-term, minor to moderate beneficial impacts because all projects would contribute to a reduction of the potential for soil compaction and erosion. Dredging the mouth of the Platte River results in continued addition of dredged material to the shoreline. During low-water periods deeper dredging is required and results in

dredge materials with high clay content being deposited on the shoreline, resulting in armoring of the beach surface and consequent profile changes. This results in short- and long-term minor to moderate adverse impacts. The impacts of other actions described above, in combination with the impacts of alternative B, would result in short-term, negligible to moderate adverse cumulative impacts, and short- and long-term, negligible to moderate, beneficial cumulative impacts. This alternative's contribution to these cumulative impacts would likely not be large.

**Conclusion.** Alternative B would have short- and long-term, negligible to moderate adverse and beneficial impacts on soils and geologic resources. Cumulative impacts would likely be short term, negligible to moderate, and adverse, and short and long term, negligible to moderate beneficial. There would be *no impairment* of soils or geologic resources from implementation of alternative B (see specific definition of impairment in the "Impairment of National Lakeshore Resources" section).

### Vegetation and Wildlife

Readers are encouraged to refer back to the "Vegetation and Wildlife" discussion in the "Methods and Assumptions for Analyzing Impacts" section for additional details on the types of impacts resulting from visitor use and development.

Use of motorized boats on School and Loon lakes and the Crystal and Platte rivers would continue to result in trampling of vegetation, habitat alteration, introduction and spread of invasive species, and sensory-based disruption of wildlife. Impacts on vegetation and wildlife from such activities would likely continue to be short and long term, negligible to moderate, and adverse. Implementation of user capacity management (see discussion in chapter 2) to reduce impacts of visitor use in sensitive and yet popular areas such as the Platte River corridor, would have short- and

long-term, minor to moderate beneficial impacts.

Development of the bay-to-bay trail and the M-22/M-109 hike/bike trail would impact vegetation and wildlife through trampling of vegetation, habitat loss and alteration, introduction and spread of invasive species, and sensory-based disruption of wildlife. Assuming use of best management practices (such as placement of trails/paths close to existing disturbances, minimization of the construction footprint, and timing of construction outside peak breeding/nesting periods) during construction, and careful monitoring and management of impacts during use, the overall impacts would likely be short and long term, negligible to minor, and adverse.

Under alternative B, only 20% (14,400 acres) of the National Lakeshore would be managed as wilderness (assuming that Congress acts to designate wilderness), a 16,503-acre (23%) decrease over the no-action alternative. The only wilderness would be on North Manitou Island; there would be no areas managed as wilderness on South Manitou Island or in the mainland portions of the Lakeshore. This reduction in the portion of the Lakeshore conveying wilderness protection for vegetation and wildlife, combined with the majority of South Manitou Island and the mainland portions of the Lakeshore being zoned recreational, would likely have short- and long-term minor to moderate, adverse impacts on vegetation and wildlife within the Lakeshore.

Under alternative B, motorized boats would be allowed on more inland lakes than is currently allowed with the addition of Shell and Tucker lakes. Use of motorized boats on these water bodies would likely have short- and long-term minor adverse effects on their associated vegetation and wildlife due to shoreline erosion, resuspension of sediments, pollution, introduction and spread of invasive

species, and sensory-based disruption of wildlife.

The farm loop and Giant Cedars area, auto tours on South Manitou Island, and day trips to North Manitou Island could impact vegetation and wildlife through trampling of vegetation, habitat alteration, introduction and spread of invasive species, and sensory-based disruption of wildlife. Assuming practicable levels of monitoring and remediation of visitor-related impacts by NPS staff, overall impacts of these types of new activities would likely be short term and long term, negligible to minor, and adverse.

Constructing a multi-loop trail and small parking area at Bow Lakes with potential connection to the local school, providing additional designated campsites on North Manitou Island, relocating the D. H. Day group campground to the D. H. Day main campground, and improving access at a few inland lakes and on the Crystal River could result in habitat loss and degradation, both of which could be reduced, to some extent, by strategic location and design. These improvements might result in introduction and spread of invasive species to inland waterways. Other development, such as improvements to the parking area at the ends of Peterson and Esch roads, at the Glen Lake picnic area, and at the mouth of the Platte River might result in increased visitor use and associated increases in vegetation trampling, habitat alteration, and sensory-based disruption of wildlife in those areas. The sum of these impacts on vegetation and wildlife in the Lakeshore would likely be short and long term, minor to moderate, and adverse.

Continued NPS acquisition of lands in the Benzie Corridor would have short- and long-term, minor beneficial impacts on the vegetation and wildlife in that area by protecting them from impacts associated with development. Construction of a road and associated bike trail along the Benzie Corridor would result in short-term minor to moderate



adverse impacts on vegetation and wildlife resources due to habitat loss and alteration, trampling, and sensory-based disturbances. Long-term effects would include negligible to minor adverse impacts on vegetation due to trampling of adjacent vegetation and sensory-based disruption of wildlife behaviors. Private development within the corridor would probably continue at its current pace and would be anticipated to have minor to moderate adverse impacts on these resources.

Elimination of dispersed camping on North Manitou Island with development of additional designated campsites would likely have short- and long-term negligible to minor adverse impacts on the vegetation and wildlife adjacent to the new campsites and short- and long-term negligible to minor beneficial impacts on the vegetation and wildlife in wider areas that are being impacted by repeated use.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on vegetation and wildlife include (1) the improvements to the parking areas at the ends of Leelanau County Roads 651 and 669; (2) implementation of the “Fire Management Plan”; (3) improvements to the Lake Michigan overlooks accessed from the Pierce Stocking Scenic Drive; (4) riverbank stabilization on the Platte River at the former Water Wheel and Casey’s Corner canoe liveries; and (5) restoration approximating the natural topography, hydrology, and native vegetative cover of nonhistoric areas disturbed by past land uses — particularly those in critical dunes areas. These actions would likely have short- and long-term negligible to minor adverse impacts due to trampling and sensory-based disruption, and long-term minor beneficial impacts on vegetation and wildlife due to habitat protection, restoration, and enhancement. The impacts of other actions described above, together with the impacts of alternative B, would result in short- and long-term, minor to moderate adverse cumulative effects, and short- and long-term, negligible to moderate beneficial cumulative effects. Alternative B

would likely not contribute an appreciable portion to these cumulative impacts.

**Conclusion.** Alternative B would have short- and long-term negligible to moderate adverse impacts, and short- and long-term negligible to moderate beneficial impacts. The actions proposed in alternative B, together with other past, present, and reasonably foreseeable actions, would likely result in short- and long-term, minor to moderate adverse, and short- and long-term negligible to moderate beneficial cumulative effects. There would be *no impairment* of vegetation or wildlife resources from implementation of this alternative (see specific definition of impairment in the “Impairment of National Lakeshore Resources” section).

### Federal Threatened and Endangered Species

Readers are encouraged to refer back to the “Federal Threatened and Endangered Species” discussion in the “Methods and Assumptions for Analyzing Impacts” section for additional details on the types of impacts resulting from visitor use and development.

The federally listed species considered are the Michigan monkey flower, piping plover (populations and designated critical habitat), and Pitcher’s thistle. The piping plover and Pitcher’s thistle are found primarily in near-shore dunes; the Michigan monkey flower is restricted to one lakeside location in the Lakeshore interior. Although part of the designated critical habitat within the Lakeshore coincides with actively used recreational beach areas, NPS staff have demonstrated success in minimizing impacts on nesting piping plovers in areas with relatively high human activity (e.g., the mouth of the Platte River) through various actions (see “Mitigative Measures for the Action Alternatives” section in chapter 2). All impact analyses assume continued protection of threatened and endangered species as

outlined in the Lakeshore-wide desired condition statements (see chapter 1).

Under alternative B, only 20% of the National Lakeshore would be managed as wilderness (assuming that Congress acts to designate wilderness), a 16,503-acre (23%) reduction from existing conditions. The only wilderness would be on North Manitou Island; there would be no areas managed as wilderness on South Manitou Island or in the mainland portions of the Lakeshore. This reduction in area managed as wilderness would potentially affect Pitcher's thistle and piping plover. The wilderness status of areas occupied by the Michigan monkey flower would not change. Although management as wilderness would cease in some areas occupied by Pitcher's thistle, these areas would be managed as recreation zone or experience nature zone — management strategies that are very similar to existing management under which Pitcher's thistle currently does quite well in the Lakeshore. Given demonstrated persistence of this species under such management, combined with continued protection of threatened and endangered species as outlined in the Lakeshore-wide desired condition statements, this reduction in area managed as wilderness would be expected to have no more than discountable impacts on this species. The reduction in area managed as wilderness would have insignificant effects on piping plovers and piping plover critical habitat because management of the Lake Michigan shoreline and near-shoreline areas would remain essentially the same despite the change in wilderness status, and because piping plovers successfully nest and fledge under current management.

New visitor activities proposed in alternative B, such as use of the new bay-to-bay trail and campgrounds and day trips to North Manitou Island, could result in trampling and habitat alteration for all addressed federally listed plant species, and sensory-based disruption of piping plover. These impacts could be reduced by strategic location and design such

as careful selection and demarcation of trails outside of sensitive areas (e.g., away from piping plover critical habitat) and use of boardwalks.

Developing the bay-to-bay trail and associated campgrounds, providing additional designated campsites on North Manitou Island, and relocating the D. H. Day group campground to the D. H. Day main campground, could result in habitat alteration and degradation, both of which could be reduced, to some extent, by strategic location and design. Other development, such as improvements to the parking areas at the ends of Peterson and Esch roads and improvements at the mouth of the Platte River, might result in increased visitor use and associated increases in the potential for trampling and habitat alteration for piping plover and Pitcher's thistle, and sensory-based disruption of piping plover in those areas.

Under this alternative, the National Park Service would continue to acquire lands within the Benzie Corridor, and would construct a scenic road with accompanying bike lanes/trail during the life of this plan. Private development within the corridor would probably continue at its current pace. These conditions and activities are not anticipated to affect listed species as neither they nor their habitats occur within the corridor.

For projects proposed in alternative B, the National Park Service would implement measures that would ensure that adverse effects on listed species do not occur. These avoidance measures might include, but are not limited to, the following:

- Safeguarding the known locations of listed species.
- Restricting human activity in piping plover breeding areas by use of a specialized fence system.
- Increasing the number of NPS/volunteer piping plover nest monitors, should conditions warrant.

- Restricting human activity in piping plover breeding areas.
- Restricting dogs from piping plover breeding areas during the breeding season.
- Flagging or fencing plants prior to any work in or adjacent to Pitcher's thistle habitat. Every effort would be made to avoid any impacts to these plants.
- Providing education about the listed species and their habitats.
- Designating alternate access points away from areas occupied by listed species.

The National Park Service staff anticipates that adverse effects could be avoided in all projects proposed under alternative B. The National Park Service cannot foresee at this time any project for which adverse effects could not be avoided. In the rare event that adverse effects could not be avoided, the project would either be discontinued or NPS staff would request formal consultation with the U.S. Fish and Wildlife Service. As such, any impacts from implementation of alternative B would likely have only beneficial, insignificant, or discountable effects on piping plover and piping plover critical habitat, Michigan monkey flower, and Pitcher's thistle.

At the landscape level, alternative B is not likely to adversely affect listed species because the proposed management direction under this alternative would result in conditions that are beneficial to preserving habitat and would minimize adverse impacts on listed species to insignificant or discountable. As such, implementation of alternative B may affect but would not be likely to adversely affect piping plover, Michigan monkey flower, and Pitcher's thistle.

**Conservation Measures.** Conservation measures are activities above and beyond avoidance measures and are undertaken to reduce potential impacts on federally listed species or candidate species. Initiation of conservation measures would occur in

consultation with the U. S. Fish and Wildlife Service and would be required if any of the following occurred:

- initiation of activities anticipated to have impacts on piping plovers or their designated critical habitat beyond those addressed in this document
- additional Michigan monkey flower occurrences within the Lakeshore were identified in areas where they might potentially be impacted
- initiation of activities anticipated to have impacts on Michigan monkey flower populations
- initiation of activities anticipated to have impacts on Pitcher's thistle populations beyond those addressed in this document

Renewed discussion and consultation with the U. S. Fish and Wildlife Service, should any of the above events occur, would focus on development of specific conservation measures to reduce potential impacts on these species and/or designated critical habitat. Such conservation measures would be based on the recommendations provided by the U.S. Fish and Wildlife Service.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on federally listed species and designated critical habitat include (1) the improvements to the parking areas at the ends of Leelanau County Roads 651 and 669; (2) implementation of the "Fire Management Plan"; (3) improvements to the Lake Michigan overlooks accessed from the Pierce Stocking Scenic Drive; and (4) activities presented in table 21. Most of these actions would benefit natural resources including federally listed species and their designated critical habitats. Some past projects at the National Lakeshore, however, such as the site restoration project near Big Glen Lake, have adversely affected federally listed species, i.e., Michigan monkey flower. These resulted in formal consultation with the U.S. Fish and Wildlife Service. During implementation, actions would be

taken to avoid or minimize potential adverse impacts on such species. Any adverse impacts, such as trampling or sensory-based disruption, would be insignificant or discountable.

The impacts of the actions described above, together with the impacts of alternative B, would result in no more than insignificant or discountable adverse cumulative impacts and may affect but would not be likely to adversely affect piping plover, piping plover critical habitat, Pitcher's thistle, and Michigan monkey flower. Alternative B would be expected to contribute a relatively small component to these cumulative impacts.

**Conclusion.** Any adverse impacts of alternative B on the addressed federally listed species and designated critical habitat would be no more than insignificant or discountable over both the short and long terms. Implementation of alternative B may affect but would not likely adversely affect the addressed listed species and critical habitat. Other projects, combined with the impacts of alternative B, on federally listed species and designated critical habitat may affect but would not likely adversely affect piping plover, piping plover critical habitat, Pitcher's thistle, and Michigan monkey flower. There would be *no impairment* of federal threatened and endangered species from this alternative (see specific definition of impairment in the "Impairment of National Lakeshore Resources" section).

### Michigan State-Listed Species

Readers are encouraged to refer back to the "Michigan State-Listed Species" discussion in the "Methods and Assumptions for Analyzing Impacts" section for additional details on the types of impacts resulting from visitor use and development.

Under alternative B, 20% of the National Lakeshore would be managed as wilderness (assuming that Congress acts to designate

wilderness), a 16,503-acre (23%) reduction from the no-action alternative. The only wilderness would be on North Manitou Island; there would be no areas managed as wilderness on South Manitou Island or in the mainland portions of the Lakeshore. This reduction in the portion of the Lakeshore conveying wilderness protection to vegetation and wildlife, combined with the majority of South Manitou Island and the mainland portions of the Lakeshore being zoned recreational, would likely have short- and long-term, minor to moderate, adverse impacts on Michigan state-listed species within the Lakeshore.

Increased visitation associated with concession tours to near the Giant Cedars area could result in adverse impacts on the state-listed species associated with this sensitive area. However, assuming modest levels of impact monitoring and remediation by NPS staff, these adverse impacts would likely not exceed short-term moderate and long-term minor on state-listed species in this area.

Under alternative B, continued or new visitor activities that might impact state-listed species associated with the shoreline/dunes/near-shore habitat complex include the farm loop auto tours and concession tours to near the Giant Cedars area on South Manitou, day trips to North Manitou, and use of the bay-to-bay and M-22/M-109 trails. Impacts would likely include trampling, habitat alteration, and sensory-based disruption. Assuming practicable levels of impact monitoring and mitigation, these impacts would likely be long term, minor, and adverse.

Under alternative B, motorized boats would be allowed on more inland lakes than currently, with the addition of Shell and Tucker lakes. Use of motorized boats on these water bodies would likely have short- and long-term minor adverse effects on their associated state-listed species due to shoreline erosion, resuspension of sediments, pollution, and sensory-based disruption of wildlife.

Development of the bay-to-bay trail and associated campgrounds, provision of additional designated campsites on North Manitou Island, development within the high-use area at the mouth of the Platte River, and relocation of the D. H. Day group campground to the D. H. Day main campground could result in habitat loss and degradation for species associated with shoreline/dunes/near-shore habitat, both of which could be reduced, to some extent, by strategic location and design. Improvements to the parking area at the ends of Peterson and Esch roads, at the mouth of the Platte River, and at the Glen Lake picnic area might result in increased visitor use and associated increases in vegetation trampling, habitat alteration, and sensory-based disruption of shoreline/dunes/near-shore associates in those areas. The sum of these impacts on state-listed species in the Lakeshore would likely be short and long term, minor to moderate, and adverse. Implementation of user capacity management (see discussion in chapter 2) to reduce impacts of visitor use in sensitive and yet popular areas such as the Platte River corridor, would have short- and long-term, minor to moderate beneficial impacts.

Development of the M-22/M-109 hike/bike trail, development of a multi-loop trail and small parking area at Bow Lakes with potential connection to the local school, development within the high-use area at the mouth of the Platte River, and improved access (parking areas, ramps or docks) at a few inland lakes (locations to be determined), could negatively impact state-listed species associated with lakes, wetlands, and riparian areas through trampling, habitat alteration, and sensory-based disruption. These adverse impacts would likely be short term moderate and long term minor to moderate, assuming continued NPS impact monitoring and remediation.

Continued NPS acquisition of lands in the Benzie Corridor would have short- and long-term negligible beneficial impacts on state-listed species near that area by protecting

them from impacts associated with private development, which would probably continue at its current pace. Construction of a road and associated bike trail (integral or adjacent to the road footprint) along the Benzie Corridor could result in short-term negligible adverse impacts on Michigan state-listed species occurring near the corridor due to habitat loss and alteration and sensory-based disruption of wildlife behaviors. Long-term effects would include negligible to minor adverse impacts on vegetation due to habitat alteration and sensory-based disruption of wildlife behaviors.

Elimination of dispersed camping on North Manitou Island and development of additional designated campsites would likely have short- and long-term negligible to minor adverse impacts on the state-listed species adjacent to the new campsites, but would also have short- and long-term negligible to minor beneficial impacts on state-listed species in wider areas that are being impacted by repeated use.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on Michigan state-listed plant and animal species include (1) the improvements to the parking areas at the ends of Leelanau County Roads 651 and 669; (2) Glen Haven Village improvements; (3) implementation of the “Fire Management Plan”; (4) improvements to the Lake Michigan overlooks accessed from the Pierce Stocking Scenic Drive; (5) riverbank stabilization on the Platte River at the former Water Wheel and Casey’s Corner canoe liveries; (6) restoration approximating the natural topography, hydrology, and native vegetative cover of nonhistoric areas disturbed by past land uses — particularly those in critical dunes areas; and (7) minor improvements to the Dune Climb parking area. Each of these projects would involve short-term adverse impacts during construction. The long-term impacts would likely be minor to moderate beneficial (such as habitat restoration and enhancement). The

impacts of the other actions described above, together with the impacts of alternative B, would result in short- and long-term, minor to moderate adverse cumulative impacts, and minor to moderate beneficial cumulative impacts. Alternative B would likely contribute a relatively small component to these cumulative adverse impacts.

**Conclusion.** Alternative B would have short- and long-term, negligible to moderate, adverse impacts and short- and long-term negligible to moderate beneficial impacts on state-listed species. The cumulative impacts would likely be short and long term, minor to moderate adverse, and minor to moderate beneficial. There would be *no impairment* of state-listed species from this alternative (see specific definition of impairment in the “Impairment of National Lakeshore Resources” section).

### Wetlands and Water Quality

Readers are encouraged to refer back to the “Wetlands and Water Quality” discussion in the “Methods and Assumptions for Analyzing Impacts” section for additional details on the types of impacts resulting from visitor use and development.

Use of motorized boats on School, Loon, North Bar, and Bass (Leelanau County) lakes and the Crystal and Platte rivers would continue to result in resuspension of sediments and pollution of wetlands and water bodies. The bay-to-bay trail and the M-22/M-109 hike/bike trail could impact wetlands and water quality through erosion, runoff, and pollution during construction, and trampling, erosion, resuspension of sediments, and pollution during use. Assuming use of best management practices during construction, the overall impacts would likely be short and long term, minor to moderate, and adverse. Implementation of user capacity management (see discussion in chapter 2) to reduce impacts of visitor use in sensitive and yet popular areas

such as the Platte River corridor, would have short- and long-term, minor to moderate beneficial impacts.

New motorized boat use on Shell and Tucker lakes and potential activities in the high-use zone located at the mouth of the Platte River under alternative B could result in impacts on wetlands and water quality due to trampling, resuspension of sediments, erosion, and dust. Assuming practicable levels of NPS monitoring and mitigation, these impacts would likely range from minor to moderate depending on location and activity, and be adverse over both the short and long terms.

Upgrades to a few picnic areas, improvements to access areas on several inland lakes and the Crystal River, and development of a multi-loop trail and small parking area in the Bow Lakes area with potential links to a local school might impact wetlands and water quality. Impacts of these developments would be primarily due to potential erosion during construction, and erosion, dust, and pollution during use. Assuming use of best management practices, adverse short-term impacts would likely be minor to moderate, and adverse long-term impacts would be minor.

Continued NPS acquisition of lands in the Benzie Corridor would help protect wetlands and water quality below this area from impacts associated with private development, resulting in short- and long-term, negligible to minor beneficial impacts. Construction of a road and associated bike trail along the Benzie Corridor would result in short-term negligible adverse impacts on waters and water quality through sedimentation associated with erosion. Long-term effects would include negligible adverse impacts on water resources due to increased stormwater runoff associated with increased impermeable surface area.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on wetlands and water quality include (1) implementation of the “Fire Management

Plan”; (2) riverbank stabilization on the Platte River at the former Water Wheel and Casey’s Corner canoe liveries; (3) restoration approximating the natural topography, hydrology, and native vegetative cover of nonhistoric areas disturbed by past land uses — particularly those in critical dunes areas; (4) minor improvements to the Dune Climb parking area; and (5) dredging of the Platte River mouth. Although each of these projects would involve short-term adverse impacts (e.g., dredging of the Platte River resulting in short-term suspension of particulates in the water and resulting lower water quality immediately downstream (lakeside) of the dredging), the net result would likely be long-term, minor to moderate beneficial impacts (e.g., dredging the mouth of the Platte River allows boats to pass without continuously hitting the bottom, stirring up material, and reducing water quality).

The impacts of the other actions described above, together with the impacts of alternative B, would result in short- and long-term, negligible to moderate, adverse cumulative impacts, and long-term, negligible to moderate, beneficial cumulative impacts. Alternative B would likely contribute a relatively small component to these cumulative impacts.

**Conclusion.** Alternative B would have short- and long-term, negligible to moderate, adverse and short- and long-term, negligible to moderate, beneficial impacts on the on wetlands and water quality. There would be short- and long-term negligible to moderate, adverse cumulative impacts, and long-term negligible to moderate beneficial cumulative impacts. There would be *no impairment* of wetlands or water quality from this alternative (see specific definition of impairment in the “Impairment of National Lakeshore Resources” section).

## VISITOR OPPORTUNITIES AND USE

### Visitor Opportunities

Opportunities would be available for visitors to experience the fundamental resources and values of the Lakeshore and to learn about the Lakeshore’s primary interpretive themes (see chapter 1 “Fundamental Resources and Values” and “Primary Interpretive Themes” sections). Visitors would have access to information, interpretation, and educational opportunities at a variety of locations, including the visitor center in Empire, at Glen Haven, and at the visitor contact station on South Manitou Island. Interpretive and educational activities throughout the Lakeshore would be similar to those currently offered. These opportunities would have long-term, moderate beneficial impacts.

Alternative B would provide the greatest level of access to and through the Lakeshore via foot, bicycle, motor vehicle, and ferry. The existing network of state, county, and NPS roads plus a new road with bicycle lane/trail in the Benzie Corridor would provide increased access. Visitors would also have increased Lakeshore access with the addition of the M-22/M-109 hike/bike trail (initiated by others) and the bay-to-bay hiker/paddler trail, and concessioner-operated interpretive tours to near the Giant Cedars area would be considered. Seasonal ferry service would be provided for day and overnight trips to South Manitou Island, overnight trips to North Manitou Island (similar to the no-action alternative), and additional occasional day trips to North Manitou Island would be allowed. The above-noted increases in Lakeshore access would have long-term, moderate beneficial impacts.

The scenic resources of the Lakeshore would be the least natural in character of all the alternatives because of the potential level of recreation-oriented development allowed (this alternative has the most recreation zone of any alternative). However, even with this

increased development (proposed or potential), the overall character of the Lakeshore would remain relatively natural. The development of a road with bicycle lane/trail in the Benzie Corridor could result in views of the ridgeline from below or more distant points within and outside the Lakeshore being slightly less natural in character than the no-action alternative. However, the Benzie Corridor development would be carefully designed and would provide visitors with new access to panoramic views of the Lakeshore and surrounding landscape. As in the no-action alternative, visitors could continue to experience sites that reflect the area's culture and history (e.g., Glen Haven, Port Oneida, and cultural resources on North Manitou and South Manitou islands). Even with some increased development, there would be long-term, moderate, beneficial impacts on opportunities to experience the natural and cultural scenic resources of the Lakeshore.

New recreation-oriented development would include a new road with bicycle lane/trail in the Benzie Corridor, the M-22/M-109 hike/bike trail (initiated by others), the bay-to-bay hiker/paddler trail and associated primitive campgrounds, relocation of the D. H. Day group campground to the main D. H. Day campground, designation of campgrounds on North Manitou Island, picnic area upgrades at some locations, parking improvements at the ends of Peterson Road and Esch Road, facility improvements (i.e., parking, picnicking, comfort stations) at Platte River Point, improved parking areas and ramps/docks at some inland lakes, parking and boat access upgrades to the Crystal River, and a trailhead parking area and a multi-loop trail in the Bow Lakes area. Even with these changes, the scale of recreation-oriented development in the Lakeshore would be modest. This level of development would have long-term, moderate beneficial impacts on visitors.

There would continue to be a wide range of recreational activities in the Lakeshore (similar to the no-action alternative). However in this alternative, opportunities for motorized and nonmotorized recreational activities would be expanded to the greatest degree of any of the alternatives. In addition to the above-mentioned additional recreational activities there would be possible bicycle rentals on South Manitou Island, possible groomed trail skiing, and two additional inland lakes would be accessible to motorized watercraft. User capacity management would improve visitor experiences on the Platte River. All of these actions would have long-term, minor beneficial impacts on visitors. There would be a change from dispersed camping to designated camping on North Manitou Island, which for some visitors would have long-term, minor adverse impacts.

Natural sounds would continue to dominate the Lakeshore except along roadways in developed areas, where motorized boats are allowed (along rivers, at specific inland lakes, and on Lake Michigan), and when aircraft are flying over. Two more inland lakes than in the no-action alternative would allow motorized boats (and accompanying sounds). A road/bicycle trail would be developed in the Benzie Corridor; associated noise impacts (minor) would likely be similar to those of the Pierce Stocking Scenic Drive. Natural sounds would also be temporarily disrupted locally by construction activities. Because of more visitor opportunities and development in this alternative, there would be slightly more disruptions to natural sounds compared to the no-action alternative; with mitigation these impacts would be long-term, minor, and adverse.

The naturally dark night sky would continue to be predominant in the Lakeshore despite vehicular lights along roadways and lighting in developed areas. A road/bicycle trail would be developed in the Benzie Corridor; lighting would be designed to minimize impacts on the



naturally dark night sky. Because of potential increases in development in this alternative, there would be slightly more disruptions to the naturally dark night sky than in the no-action alternative; with mitigation these impacts would be long-term, minor, and adverse for those who value the dark night sky.

### Visitor Use

Alternative B reflects a broad emphasis on dispersed recreation across much of the Lakeshore. New facilities are proposed at present and other opportunities for expanded facilities could be evaluated during the life of this plan. Completion the M-22/M-109 hike/bike trail (initiated by others), the bay-to-bay hiker/paddler trail, facility improvements at road ends and inland lakes, opportunities for skiing on groomed trails, and improved access to the Giant Cedars area, the potential for day excursions to North Manitou Island, and the Benzie Corridor road/bicycle lane/trail would provide additional impetus for increased visitor use. Depending on the strategy(ies) chosen, implementation of user capacity management strategies on the Platte River might locally reduce visitor numbers.

The timing of increased visitor use is difficult to predict because it would depend on when projects are funded or carried out. The net effect of alternative B would be a long-term increase of up to 100% above the increase anticipated under the no-action alternative (up to an estimated 84,000 additional annual visits).

Visitors to the Lakeshore from outside the region would likely account for the majority of future visits, though the number of visits by local residents would be expected to account for a larger share of future visitor use than is occurring now. The largest estimated increase in visitor use levels of any alternative would have long-term and minor effects that might be concurrently viewed as beneficial or

adverse, depending on the expectations and preferences of visitors.

### Cumulative Impacts

Other past, present, and reasonably foreseeable projects that would affect visitor opportunities and use include: (1) improvements to parking areas at the ends of Leelanau County Roads 651 and 669; (2) Glen Haven Village improvements; (3) improvements to the Pierce Stocking Scenic Drive Lake Michigan overlooks 9 and 10; (4) South Manitou Lighthouse Complex exterior restoration and interior rehabilitation; and (5) Dune Climb parking area paving and other minor improvements. These actions would improve visitor opportunities by improving enjoyment, access, and/or range of available opportunities for visitors and would have an overall long-term, minor, beneficial effect on visitor opportunities and use. Developments near the Lakeshore (particularly along the access roads and in/near Glen Arbor and Empire) may continue to occur; these could result in a degradation of natural scenic quality, natural soundscapes, and night sky. These actions would have a long-term, minor, adverse cumulative effect on visitors. Combined with alternative B, these actions would have a long-term, minor, beneficial cumulative effect. Impacts of alternative B would comprise a relatively small portion of the overall cumulative effect.

### Conclusion

Increased access and visitor opportunities related to additional recreation-oriented facilities would have a long-term, minor to moderate beneficial impact on visitor opportunities and use. Implementation of user capacity management strategies would have a long-term, minor beneficial impact on visitor experiences but potentially long-term minor adverse effects on visitor use. The removal of dispersed camping on North Manitou Island would have long-term minor adverse impacts

on visitor opportunities and use. The increased visitor opportunities and facilities would have a long-term minor adverse impact on scenic resources, natural sound, and the night sky. Construction activities would have short-term minor adverse impact. The cumulative effects would be long-term, moderate, and beneficial.

## **WILDERNESS CHARACTER**

### **Natural and Undeveloped**

Under alternative B, 14,400 acres on North Manitou Island (20% of the National Lakeshore, the least of any alternative), would be proposed for wilderness designation. This is 16,503 acres (23%) less than in the no-action alternative. Assuming Congress acted to designate this area as wilderness, wilderness values therein would be protected permanently, a long-term minor beneficial impact compared to the no-action alternative. In contrast to the no-action alternative, there would be no wilderness protection on South Manitou Island or on the mainland portion of the Lakeshore, a major, long-term, adverse impact.

The wilderness would be rather small compared to the no-action alternative, but it would be contiguous. In contrast to the no-action alternative, there would be no nonconforming motor vehicle or bicycle use within wilderness. As in the no-action alternative, the presence of historic structures within wilderness would continue to locally diminish the areas' undeveloped primeval character, a localized long-term minor adverse impact.

### **Opportunities for Solitude**

Outstanding opportunities for solitude would be available within wilderness on North Manitou Island. In particular, island areas away from trails and facilities would continue to offer excellent prospects for privacy and

isolation. On days with day ferry trips to North Manitou Island (once or twice per week at most), opportunities for solitude could be reduced within a few hours' walk from the ferry dock, a long-term, minor, adverse impact. In contrast to the no-action alternative, there would be no wilderness protection on the mainland or South Manitou Island; this would reduce prospects for solitude, a long-term, major adverse impact.

### **Opportunities for Primitive, Unconfined Recreation**

Due to the addition of occasional day ferry service to North Manitou Island, opportunities would be available there for day and overnight wilderness experiences, a minor, long-term, beneficial impact. However, opportunities for primitive, unconfined recreation in wilderness would no longer be available on 16,503 acres of South Manitou Island and the mainland. The permit requirement for backcountry camping would continue. In contrast to the no-action alternative, backcountry campers would be required to stay in designated campgrounds not only on the mainland and South Manitou Island, but also on North Manitou Island. Opportunities for primitive unconfined recreation would be substantially reduced overall, a major, long-term, adverse impact.

### **Cumulative Impacts**

Over time, the Lakeshore's ongoing program to restore former nonhistoric sites to more natural conditions has substantially increased the natural, undeveloped character of the Lakeshore. The work includes removing nonnative trees and human enhancements, plus reestablishing more natural contours and native vegetation. Combined with the ongoing restoration program, alternative B would have long-term, moderate, adverse cumulative effects. Impacts of alternative B would

comprise a substantial portion of these overall cumulative effects.

## **Conclusion**

Establishment of 14,400 acres of designated wilderness on North Manitou Island would permanently protect wilderness values therein. However, about 16,503 acres on the mainland and South Manitou Island would no longer have wilderness protection, so naturalness and opportunities for solitude and primitive recreation would be substantially reduced there. Alternative B would have long-term (some permanent), minor beneficial and minor to major adverse impacts on wilderness character. Combined with other actions, alternative B would have long-term, moderate, adverse cumulative effects on wilderness character.

## **REGIONAL SOCIOECONOMICS**

Implementation of alternative B would occur against the same backdrop of economic, demographic, and social conditions described under the no-action alternative. The economic and social effects of alternative B would contribute to those conditions, but would not fundamentally alter the area's economic and demographic outlook.

### **Visitor-Related Economic Impacts**

Alternative B reflects a broad emphasis on dispersed recreation across much of the Lakeshore and an overall reduction in amount of area managed as wilderness. The net effect of alternative B would be a projected long-term increase of up to 100% above the increase anticipated for the no-action alternative (up to an estimated 84,000 additional annual visits).

Changes in visitor use within the National Lakeshore with the implementation of

alternative B could indirectly cause limited increases or reductions in visitor use at nearby outdoor recreation resources managed by the state, local governments, and other entities. Given the potential scale of such changes, the effects on future management and operations of these resources are likely to be limited.

Retail, lodging, and other tourism-related spending would accompany the increased use with expenditures projected to reach \$37.4 million per year, \$4.6 million higher than at present and \$2.3 million per year higher than for the no-action alternative. Shifts in visitor use over time might affect the demands for goods and services for local merchants and other recreation-oriented establishments. The Lakeshore would collect additional entry fees and revenues from the sales of various passes, and Eastern National would sell more merchandise at the visitor center, with portions of these receipts retained to support recreational, cultural, and educational programs in the Lakeshore.

Economic spin-offs of visitor spending include higher personal income and 30–35 more jobs than under the no-action alternative, most of the latter being seasonal. These visitor-related impacts would be long term but limited in scale relative to current employment and personal income in the two counties. Implementation of alternative B could provide additional concession/commercial service opportunities, for example, in conjunction with recreational opportunities on South Manitou Island, winter use, and the bay-to-bay hiker/paddler trail.

Under alternative B, Lakeshore visitors from within the region would be expected to be a larger share of the incremental use than under the no-action alternative, although the number of visits by nonresidents would also increase.

The state and local governments would collect additional sales tax from the increases in visitor spending.

The visitor-related economic impacts would be beneficial, but negligible in the short term and minor to moderate and beneficial over the long term.

### **Economic Impacts Related to Implementation and NPS Operations**

Alternative B would provide a sustained economic infusion to the region over the life of this plan resulting from ongoing NPS operating expenditures, and \$42.8 million in identified future project construction needs (\$36.2 million above that for the no-action alternative). The future construction budget includes an allowance of \$26.0 million for eventual construction of the road and accompanying bike lanes/trail in the Benzie Corridor. There are no assurances that such funding would be received. Identified costs for other major projects would be \$700,000 less than for the no-action alternative. Spending to address deferred maintenance would be the same as for the no-action alternative.

As under the no-action alternative, NPS maintenance staff would perform much of the work to address deferred maintenance and preservation, restoration and rehabilitation activities. Future construction spending would be higher than under the no-action alternative, supporting the local construction trades industry and associated vendors and suppliers.

Annual NPS payroll, operating, and maintenance would produce long-term effects on employment, business sales, income and other related measures. Up to 13 additional full-time equivalent employees, could be supported in conjunction with alternative B. Staffing needs would increase over time as the implementation of specific projects, programs, and management included in this alternative proceed.

A need for a modest long-term increase in budgeted funds for NPS operations is

identified in conjunction with alternative B (there are no assurances that such increases will occur). Available resources would include about \$4.4 million in base budget appropriations (\$500,000 per year above the no-action alternative), more than \$1.0 million in entry and camping fees, and various nonrecurring funding for supplemental and specific project construction. Retained revenues from entry and camping fees would likely increase with higher visitation.

Supplemental funding would be required for future land acquisition in the Benzie Corridor, the same as under the no-action alternative.

The eventual construction of a scenic road and bike lanes/trail in the Benzie Corridor would produce short-term effects on local employment, business revenues, income, taxes, and other related economic measures. Some local heavy construction firms and related suppliers and vendors would likely garner a portion of the project construction spending. The magnitudes of the effects would be indeterminate, in large part because the length of time required to complete the project — a single or multiple construction seasons — is uncertain. Based on preliminary cost estimates, it is reasonable to anticipate that the effects would be beneficial, short term, and minor to moderate. Completion of the scenic road and accompanying bike lanes/trail would likely encourage new residential development on private lands near the corridor, although topography would act to limit the level of such development.

Activities sponsored by the Lakeshore's partners would provide additional sources of economic stimulus. The timing, magnitude, and indirect economic consequences of those activities are indeterminate.

The economic effects associated with the NPS operations would be beneficial, but negligible to minor in the short term and beneficial and minor over the long term.

### Effects on Regional Population

Alternative B would have little direct impact on regional population growth. Increases in construction and long-term jobs and visitor use over the life of the plan would provide a negligible impetus for growth, relative to other factors. The increases would be insufficient to trigger additional job-related migration. Rather, it is more likely that many of the jobs would be filled by individuals already residing in the area.

Implementation of alternative B could indirectly enhance the region's attractiveness for job-related and retirement migration as a result of enhanced dispersed recreational opportunities on the mainland.

The effects on regional population growth under this alternative would be negligible to minor, both in the short and long terms. Generally, population growth would be viewed as beneficial.

### Community Services

Over time, more visitors to the Lakeshore would indirectly result in added demands on community services and facilities across the region. The limited scale, seasonal nature, and spatial dispersion of such demands across the region would be such that facility expansions and additional staffing would not be required.

Effects on community services under this alternative are indeterminate but would likely be negligible to minor over the short and long terms.

### Traffic and Emergency Services

Traffic impacts of alternative B would include higher traffic volumes on the highways and roads providing access to the Lakeshore, with minor increases in travel times, wait times at major intersections, and frequency of encountering full parking lots. Even with the

increases in traffic, estimated future traffic volumes would remain below design capacity on the major routes and not dramatically increase maintenance requirements. Increases in traffic volumes could accelerate the onset of less than desirable levels of service at the M-22/M-109 intersection in Glen Arbor, possibly triggering intersection improvements (Robert Peccia & Associates. 2001).

The eventual completion of a scenic road with bike lanes/trail in the Benzie Corridor would increase traffic on roadways in the southern portion of the Lakeshore and potentially alter traffic patterns on the public roadways adjacent to the Lakeshore. Traffic, noise, and related factors would become more noticeable to residents and their guests on properties in the vicinity of the corridor.

Impacts on the number of traffic accidents and demands on first responders would be similar to but larger than under the no-action alternative. Demands associated with this alternative would not require additional law enforcement or emergency response staffing, although the increases in the number of "call outs" could burden area first response agencies because they are staffed partially by volunteers. Emergency responders in Benzie County could see larger increases in demand with the completion of the road and bike lanes/trail in the Benzie Corridor.

The effects of implementing alternative B on traffic and emergency services across the region would be adverse but minor over the short and long terms.

### Attitudes and Lifestyles

Alternative B establishes future management direction for the Lakeshore that reflects public input and the Lakeshore's purpose, significance, and fundamental resources and values, but with added emphasis on providing recreational opportunities. That emphasis will generally appeal to those valuing interested in developing facility-based recreation or

maximizing the economic contributions associated with the Lakeshore. Those valuing solitude, wilderness, and appreciation of the current cultural and recreation opportunities might be less enthusiastic about the management direction set forth in alternative B.

Construction and completion of the Benzie Corridor scenic road and bike lane/trail would affect the lifestyles of residents and their guests in the general vicinity of the corridor. Short-term effects during construction would include noise, potentially including blasting, heavy truck traffic, and a generally increased presence of other humans in settings that had been more remote and private. The construction-related noise and traffic would diminish over the long term, but general increases in traffic, noise, and increased presence of others would continue. Most of these impacts would be viewed as adverse.

Some property owners, along with members of the broader community would view the opening of a scenic road and bike lane/trail within the Benzie Corridor positively for the visitor opportunities (scenic vistas, recreational driving, and bicycling) it would provide.

The management direction for this alternative would result in the most direct lifestyle consequences because it recasts many of the influences of the Lakeshore — for example, potentially promoting more commercial development and human use adjacent to the Lakeshore on the south, in the Glen Arbor and Empire communities, and in Leland.

### **Cumulative Impacts**

Cumulative social and economic impacts from alternative B would be of the same type, but larger in scale, as those under the no-action alternative. The effects of underlying development trends in the region include long-term, moderate population and economic growth; long-term increases in traffic on local roads; related impacts on public safety; higher spending that bolsters community and

recreation-oriented businesses in the region; and additional tax revenues to fund public services and facilities.

The incremental economic and social effects of alternative B, including those associated with increases visitor and park operating expenditures, would be negligible to minor in the short term and minor in the long term, and generally beneficial. Alternative B, combined with the impacts of other actions described above, would result in minor short- and long-term adverse cumulative effects on traffic and highway safety. Impacts of alternative B would comprise a small portion of these overall cumulative effects.

### **Conclusion**

The economic and social effects of alternative B would include negligible to minor short-term and moderate long-term economic benefits compared to the no-action alternative. Short- and long-term effects on lifestyles and attitudes are indeterminate. Long-term social consequences would include a negligible to minor contribution to long-term population growth and demands on community infrastructure and services. Overall, the cumulative social and economic effects associated with alternative B would be minor, short and long term, and indeterminate as they include effects that might be concurrently viewed as beneficial or adverse.

### **NPS OPERATIONS**

Under alternative B, the Lakeshore's maintenance and operational load would be increased by (1) managing a substantial portion of the Lakeshore as the recreation zone (with more need to monitor for use-related impacts); (2) development of a scenic road and bike lane/trail within the Benzie Corridor (with a new area to patrol and new facilities to maintain); (3) managing the area around the mouth of the Platte River as a more developed beach access area; (4) bicycle use on South

Manitou Island (with increased ranger patrol and resource monitoring needs); (5) addition of new trails and backcountry campgrounds; and possible occasional day trips by the ferry to North Manitou Island; (6) possible day use on North Manitou Island (with increased interpretive and ranger patrol needs); (7) possible concession tours to near the Giant Cedars area, and (8) a modest visitation increase over time. Some increased maintenance would also be incurred with a new M-22/M-109 hike/bike trail. Most other facility-based changes, such as minor picnic area upgrades, improving parking at the end of Esch and Peterson roads, and relocation or upgrading the Crystal River access area would decrease maintenance needs for individual areas or change the nature of maintenance needs without increasing the burden. Wilderness minimum requirement analysis would be required for 14,400 acres (all on North Manitou Island), a 16,503-acre (23%) decrease compared to the no-action alternative. Impacts of alternative B would be long term, minor beneficial and long term, moderate adverse.

### **Cumulative Impacts**

Ongoing and planned facility upgrades and restoration/rehabilitation projects would have mostly beneficial impacts because these projects would result in reduced resource management and cyclic maintenance needs. Dredging of the Platte River mouth would continue to place demands upon the NPS maintenance staff and budget, a minor adverse effect. Combined with these impacts, alternative B would have long-term minor beneficial and moderate adverse cumulative effects. Impacts of alternative B would comprise a substantial portion of these overall cumulative effects.

### **Conclusion**

Alternative B would have long-term minor beneficial and moderate adverse impacts on

NPS operations. This alternative, combined with other actions, would have both long-term minor beneficial and moderate adverse cumulative effects.

### **UNAVOIDABLE ADVERSE IMPACTS**

Some negligible to moderate impacts to soils, vegetation, wildlife, water resources, wilderness character, scenic resources, natural sounds, and night sky from recreational use and facilities would be essentially unavoidable (e.g., soil compaction, vegetation trampling, wildlife disturbances, decreased opportunities for solitude, and decreased naturalness). Increases in visitor use would have low level adverse impacts on regional socioeconomics (e.g., increased traffic).

### **IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES**

Irreversible commitments of resources are actions that result in loss of resources that cannot be reversed. Irretrievable commitments of resources are actions that result in the loss of resources but only for a limited period of time.

With the exception of consumption of fuels and raw materials for maintenance or construction activities, no actions in this alternative would result in consumptions of nonrenewable natural resources or use of renewable resources that would preclude other uses for a period of time.

### **RELATIONSHIP OF SHORT-TERM USES AND LONG-TERM PRODUCTIVITY**

The National Lakeshore would continue to be used by the public, and most areas would be protected in a natural state. The National Park Service would continue to manage the Lakeshore to maintain ecological processes and native biological communities and to provide

appropriate recreational opportunities consistent with preservation of cultural and natural resources. Actions would be taken with care to minimize adverse effects on the long-term productivity of biotic communities.

Under alternative B there would be expanded (but still relatively modest) facilities to support recreational use and some localized loss of ecological productivity.



## IMPACTS OF ALTERNATIVE C

### HISTORIC RESOURCES

*The Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995) identifies four treatment approaches that apply to a wide variety of resource types, including buildings, sites, structures, objects, districts, and landscape features and patterns. Three of those treatments are included in this plan — preservation, rehabilitation, and restoration. See page 40 for more detailed definitions. The simplest of these treatment approaches is preservation, in which measures are undertaken to stabilize the resource to ensure that it does not deteriorate further from its existing condition and then to maintain and repair historic features and materials. The second option is rehabilitation, in which the resource is made useable for some purpose while preserving those features that convey its historical, cultural, or architectural value. The third is restoration, in which the historic appearance at a particular time is accurately regained. The fourth treatment, reconstruction, is not proposed in this plan.

Although each alternative calls for preserving and protecting all historic properties, each action alternative provides a different management zone configuration based on that alternative's overall vision, and each management zone prescribes which of the three treatments could be used for historic properties. Thus, potential treatments for the National Lakeshore's various historic properties differ among the alternatives. Based on the locations and relative proportions of management zones in alternative C, 78% of historic structures would undergo preservation, rehabilitation, or restoration (experience history zone), 16% of historic structures would undergo preservation or rehabilitation (recreation zone), and 6% of historic structures would undergo preservation

(experience nature zone). This information is summarized in table 3 on page 74.

All preservation, rehabilitation, or restoration efforts would be undertaken in accordance with the standards. Any materials removed during rehabilitation or restoration efforts would be evaluated to determine their value to the Lakeshore's museum collections and/or for their comparative use in future preservation work at the sites. Implementation of the actions described above for this alternative, which would bring all historic resources up to a good condition, would result in no adverse effects on historic resources.

At Glen Haven the Glen Haven Historic District and Sleeping Bear Point Life-Saving Station would be preserved, rehabilitated, or restored (same action in all alternatives). Some buildings would be rehabilitated for visitor and/or staff use. The Sleeping Bear Inn and garage would be placed in the NPS historic leasing program to allow rehabilitation for adaptive use. All other structures would be stabilized and maintained in their current condition.

At Port Oneida historic structures and landscapes would be preserved, rehabilitated, or restored (same action in all alternatives). Structures on at least one farmstead would be restored for interpretive purposes. Some buildings in the district would be rehabilitated for visitor and/or staff use, including a visitor contact station and staff housing. At least one farmstead would be placed in the NPS historic leasing program to allow rehabilitation and adaptive use. All other structures and landscapes would be stabilized and maintained in their current condition.

On North Manitou Island the historic life-saving station and Cottage Row structures would be preserved, rehabilitated, or restored (same action as in the preferred alternative).

Preservation and/or adaptive use of the rehabilitated historic former Manitou Island Association structures for administrative and operational purposes would continue. Historic structures and landscapes elsewhere on the island would be preserved.

On South Manitou Island (same action as in the preferred alternative) the historic life-saving station, lighthouse complex, village historic structures, the schoolhouse, and farm loop tour historic structures would be preserved, rehabilitated, or restored. Historic structures and landscapes elsewhere on the island would be preserved.

Other mainland historic structures and landscapes would be managed as specified for the management zone in which they lie (see alternative map and zone descriptions).

Actions involving other than historic property treatments, such as relocating the D.H. Day group campground and improving or expanding the main D.H. Day campground, would have no effect on historic properties because they would be designed to avoid possible impacts on properties on or eligible for the national register.

All properties on or determined eligible for inclusion in the National Register of Historic Places would, at a minimum, undergo stabilization (where that action has not already occurred), or maintenance in the current condition (where some preservation treatment has already been implemented).

The actions proposed above are general. The treatments for each resource (preservation [stabilization], rehabilitation with adaptive use, restoration) have not yet been determined so impacts cannot be fully described. However, it is the National Park Service's intent that no action proposed be adverse. All actions affecting these historic structures and landscapes will be undertaken in consultation with the Michigan state historic preservation officer.

Alternative C would not directly or indirectly affect any properties outside the boundary of the National Lakeshore that are listed on or eligible for the National Register of Historic Places, or that are listed by the state.

### Cumulative Impacts

Over the years historic resources in the Lakeshore have been adversely impacted by natural processes such as weathering, vegetative encroachment, and the wear and tear associated with visitor use. Actions proposed for the South Manitou Island Lighthouse Complex would result in both the restoration of the exterior of the keeper's quarters and connecting passageways and the rehabilitation of the interior for adaptive reuse. In addition, actions proposed for Glen Haven Village include the stabilization and maintenance of historic structures or their rehabilitation for adaptive reuse. All preservation, rehabilitation, or restoration efforts would be undertaken in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995), and would result in no adverse effects on historic resources.

As described above, implementation of alternative C would result in no adverse effects on historic resources. The no adverse impacts of this alternative, in combination with both the adverse and no adverse impacts of other past, present, and reasonably foreseeable future actions, would result in a no adverse effect cumulative impact. The no adverse effects of alternative C would be a sizeable contribution to the no adverse effect cumulative impact.

### Conclusion

Alternative C would have a determination of no adverse effect under the Advisory Council on Historic Preservation "Regulations for the Protection of Historic and Cultural

Properties” (36 CFR 800). There would be *no impairment* of cultural resources from implementation of alternative C (see specific definition of impairment in the “Impairment of National Lakeshore Resources” section).

## NATURAL RESOURCES

### Soils and Geologic Resources

Readers are encouraged to refer back to the “Soils and Geologic Resources” discussion in the “Methods and Assumptions for Analyzing Impacts” section for additional details on the types of impacts resulting from visitor use and development.

The use of motorized boats on School, Loon, North Bar and Bass (Leelanau County) lakes and the Crystal and Platte rivers would continue. Although soil compaction and erosion of the dunes would be reduced in some areas by the use of sand ladders, boardwalks, and sidewalks to protect the substrate, placement and maintenance would be limited to what can be accomplished with current resources. These ongoing activities would continue to have minor to moderate (depending on location and activity), short- and long-term adverse impacts on soils and geologic resources. Implementation of user capacity management (see discussion in chapter 2) to reduce impacts of visitor use in sensitive and yet popular areas such as the Platte River corridor, would have short- and long-term, minor to moderate beneficial impacts.

Development of the bay-to-bay trail and the M-22/M-109 hike/bike trail could result in soil disturbance and erosion during construction, and subsequent erosion and compaction due to use. Assuming use of best management practices (such as using erosion avoidance and control mechanisms) during construction and later use and NPS monitoring of impacts during use to prevent soil erosion and compaction, the overall

adverse impacts would likely be short-term moderate and long-term minor.

The new farm loop and Giant Cedars area auto tours on South Manitou Island, dispersed camping on North Manitou Island, and a variety of as yet undefined but new opportunities within the high-use zones in the central and southern mainland portions of the Lakeshore would likely contribute to soil compaction and erosion in these areas. Although practicable levels of monitoring and remediation of visitor-related impacts by staff could address these impacts to some extent, the large size of the high-use areas suggests that the sum of these types of activities would likely have short- and long-term, negligible to moderate adverse impacts.

Constructing a short loop trail and small parking area at Bow Lakes; providing additional designated campsites on North Manitou Island; relocating the D. H. Day group campground to the D. H. Day main campground; upgrading or expanding the D. H. Day campground and Glen Lake picnic area and upgrading the Dune Climb facilities; and improving access (parking areas, ramps or docks) at a few inland lakes (locations to be determined), could result in soil disturbance, compaction, and erosion — all of which could be reduced by use of best management practices during location, design, and development. Other development, such as potential improvements to the parking areas and development of picnic areas and comfort stations at the ends of County Road 669 and Esch Road and the mouth of the Platte River, might result in increased visitor use and associated increases in soil erosion and compaction in those areas. The sum of these impacts on soils and geologic resources in the Lakeshore would likely be short and long term, minor to moderate, and adverse.

Continued NPS acquisition of lands on a willing-seller basis in the Benzie Corridor would have short- and long-term moderate beneficial impacts on the soils and geologic

resources in that area by protecting them from impacts associated with private development. Construction of a nonmotorized hike/bike trail along the Benzie Corridor would result in short-term minor adverse impacts on soils through soil erosion and compaction. Long-term effects would include negligible adverse impacts on soil resources due to erosion associated with increased impermeable surface area. Private development would probably continue at its current pace and have minor to moderate adverse impacts on these resources.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on soils and geologic resources include (1) improvements to the parking areas at the ends of Leelanau County Roads 651 and 669; (2) Glen Haven Village improvements; (3) improvements to the Lake Michigan overlooks accessed from the Pierce Stocking Scenic Drive; riverbank stabilization on the Platte River at the former Water Wheel and Casey's Corner canoe liveries; (4) restoration approximating the natural topography, hydrology, and native vegetative cover of nonhistoric areas disturbed by past land uses — particularly those in critical dunes areas; (5) minor improvements to the Dune Climb parking area; and (6) continued dredging of the mouth of the Platte River. Although activities 1-5 would likely result in short-term adverse impacts during the construction phase, the net result would likely be long-term, minor to moderate beneficial impacts because all projects would contribute to a reduction of the potential for soil compaction and erosion. Dredging the mouth of the Platte River results in continued addition of dredged material to the shoreline. During low-water periods deeper dredging is required and results in dredge materials with high clay content being deposited on the shoreline, resulting in armoring of the beach surface and consequent profile changes. This results in short- and long-term minor to moderate adverse impacts.

The impacts of other actions described above, in combination with the impacts of the alternative C, would result in short-term, negligible to moderate, adverse cumulative impacts, and long-term, minor to moderate beneficial cumulative impacts. Alternative C's contribution to these cumulative impacts would be minimal.

**Conclusion.** Alternative C would have short- and long-term, negligible to moderate adverse and beneficial impacts on soils and geologic resources. The cumulative impacts would likely be short term, negligible to moderate, and adverse, and long term, minor to moderate, and beneficial. There would be *no impairment* of soils or geologic resources from implementing alternative C (see specific definition of impairment in the "Impairment of National Lakeshore Resources" section).

## Vegetation and Wildlife

Readers are encouraged to refer back to the "Vegetation and Wildlife" discussion in the "Methods and Assumptions for Analyzing Impacts" section for additional details on the types of impacts resulting from visitor use and development.

The use of motorized boats on School, Loon, North Bar and Bass (Leelanau County) lakes and the Crystal and Platte rivers would continue to result in trampling of vegetation, habitat alteration, introduction and spread of invasive species, sensory-based disruption of wildlife, and the likelihood of introducing nonnative species. Impacts on vegetation and wildlife from such activities would likely continue to be short and long term, negligible to moderate, and adverse. Implementation of user capacity management (see discussion in chapter 2) to reduce impacts of visitor use in sensitive and yet popular areas such as the Platte River corridor, would have short- and long-term, minor to moderate beneficial impacts.

The bay-to-bay trail and the M-22/M-109 hike/bike trail would impact vegetation and wildlife through trampling of vegetation, habitat loss and alteration, and sensory-based disruption of wildlife. Assuming use of best management practices (such as locating trails/paths close to existing disturbances, minimization of the construction footprint, and timing of construction outside the peak breeding/nesting periods) during construction, and careful monitoring of impacts during use, the overall impacts would likely be short and long term, negligible to minor, and adverse.

Under alternative C, 32% (23,200 acres) of the National Lakeshore would be managed as wilderness (assuming that Congress acts to designate wilderness) a 7,703-acre (11%) decrease from the no-action alternative. Areas on both islands and in the central and southern portions of the mainland would be managed as wilderness. This reduction in the portion of the Lakeshore conveying wilderness protection to vegetation and wildlife, combined with a relatively large portion of the mainland portions of the Lakeshore being zoned high-use, would likely have short- and long-term, minor to moderate, adverse impacts on vegetation and wildlife within the Lakeshore.

The new farm loop and Giant Cedars area auto tours on South Manitou Island, dispersed camping on North Manitou Island, and a variety of as yet undefined but new opportunities within the high-use zones in the central and southern mainland portions of the Lakeshore, would likely result in trampling of vegetation, habitat alteration, introduction and spread of invasive species, and sensory-based disruption of wildlife. Impacts on vegetation and wildlife from such activities under alternative C would likely be short and long term, negligible to moderate, and adverse.

Constructing a short loop trail and small parking area at Bow Lakes; providing

additional designated campsites on North Manitou Island; relocating the D. H. Day group campground to the D. H. Day campground; upgrading or expanding the D. H. Day campground; and improving access (parking areas, ramps or docks) at a few inland lakes (locations to be determined), could result in habitat loss and degradation, both of which could be reduced, to some extent, by strategic location and design. These improvements might result in introduction and spread of invasive species to inland waterways. Other development, such as potential improvements to the parking areas and development of picnic areas and comfort stations at the ends of County Road 669, Esch Road, and at the mouth of the Platte River, might result in increased visitor use and associated increases in vegetation trampling, habitat alteration, and sensory-based disruption of wildlife in those areas. The sum of these impacts on vegetation and wildlife in the Lakeshore would likely be short and long term, minor to moderate, and adverse.

Continued NPS acquisition of lands within the Benzie Corridor would have short- and long-term minor beneficial impacts on the vegetation and wildlife in that area by protecting them from impacts associated with private development. Construction and use of a nonmotorized hike/bike trail along the Benzie Corridor would result in short-term (construction) and long-term (use) negligible adverse impacts on vegetation and wildlife through trampling of vegetation, habitat loss and alteration, and sensory-based disruption of wildlife behaviors. Private development would probably continue at its current pace and have minor to moderate adverse impacts on these resources.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on vegetation and wildlife include (1) the improvements to the parking areas at the ends of Leelanau County Roads 651 and 669; (2) implementation of the “Fire Management Plan”; (3) improvements to the Lake Michigan

overlooks accessed from the Pierce Stocking Scenic Drive; (4) riverbank stabilization on the Platte River at the former Water Wheel and Casey's Corner canoe liveries; and (5) restoration approximating the natural topography, hydrology, and native vegetative cover of nonhistoric areas disturbed by past land uses — particularly those in critical dunes areas. These actions could have short- and long-term negligible to minor adverse impacts (due to trampling and sensory-based disturbance during the activity) and long-term minor beneficial impacts (such as habitat protection, restoration and enhancement) on vegetation and wildlife.

The impacts of other actions described above, together with the impacts of alternative C, would result in short and long term, negligible to moderate adverse cumulative impacts, and short- and long-term negligible to moderate beneficial cumulative impacts. Alternative C would likely contribute a relatively small portion of these cumulative impacts.

**Conclusion.** Alternative C would have short- and long-term negligible to moderate adverse impacts, and short- and long-term, minor to moderate beneficial impacts. The cumulative impacts of alternative C combined with other past, present, and reasonably foreseeable actions would likely be short and long term, negligible to moderate, adverse, and short and long term, negligible to moderate, beneficial. There would be *no impairment* of vegetation or wildlife resources from implementation of alternative C (see specific definition of impairment in the "Impairment of National Lakeshore Resources" section).

### Federal Threatened and Endangered Species

Readers are encouraged to refer back to the "Federal Threatened and Endangered Species" discussion in the "Methods and Assumptions for Analyzing Impacts" section

for additional details on the types of impacts resulting from visitor use and development.

The federally listed species considered are the Michigan monkey flower, piping plover (populations and designated critical habitat), and Pitcher's thistle. The piping plover and Pitcher's thistle are found primarily in near-shore dunes; the Michigan monkey flower is restricted to one lakeside location in the Lakeshore interior. Although part of the designated critical habitat within the Lakeshore coincides with actively used recreational beach areas, NPS staff have demonstrated success in minimizing impacts on nesting piping plovers in areas with relatively high human activity (e.g., the mouth of the Platte River) through various actions (see "Mitigative Measures for the Action Alternatives" section in chapter 2). All impact analyses assume continued protection of threatened and endangered species as outlined in the Lakeshore-wide desired condition statements (see chapter 1).

Under alternative C, 32% of the National Lakeshore would be managed as wilderness (assuming that Congress acts to designate wilderness), a 7,703-acre (11%) decrease over existing conditions. This reduction in area managed as wilderness would potentially affect Pitcher's thistle and piping plover. The wilderness status of areas occupied by Michigan monkey flower would not change. Although management of wilderness would cease in some areas occupied by Pitcher's thistle, these areas would be managed as recreation zone or experience nature zone — management strategies that are very similar to existing management under which Pitcher's thistle currently does quite well in the Lakeshore. Given demonstrated persistence of this species under such management, combined with continued protection of threatened and endangered species as outlined in the Lakeshore-wide desired condition statements, this reduction in area managed as wilderness would be expected to have no more than discountable impacts to

this species. The reduction in area managed as wilderness would have insignificant effects on piping plovers and piping plover critical habitat because management of the Lake Michigan shoreline and near-shoreline areas would remain essentially the same despite the change in wilderness status, and because piping plovers successfully nest and fledge under current management.

Continuing dispersed camping on North Manitou Island, and developing the new visitor activities proposed in alternative C, such as use of the new bay-to-bay trail, provision of concession auto tours to near the Giant Cedars area on South Manitou Island, potentially expanded bicycle use, and a variety of as yet undefined but new opportunities in the high-use zones in the central and southern mainland portions of the Lakeshore, could result in trampling of Pitcher's thistle, habitat alteration, and sensory-based disruption of piping plover. These impacts could be reduced by strategic location and design such as careful selection and demarcation of trails outside of sensitive areas (e.g., away from piping plover critical habitat) and use of boardwalks.

Developing the bay-to-bay trail, providing designated campsites on North Manitou Island, relocating the D. H. Day group campground to the D. H. Day main campground and upgrading or expanding the D. H. Day campground could result in trampling and habitat alteration and degradation, all of which could be reduced, to some extent, by strategic location and design. Other development, such as potential improvements to the parking areas and development of picnic areas and comfort stations at the ends of County Road 669, Esch Road, and the mouth of the Platte River, might result in increased visitor use and associated increases in trampling and habitat alteration for both Pitcher's thistle and piping plover, and sensory-based disruption of piping plover in those areas.

Under this alternative, the National Park Service would continue to acquire lands within the Benzie Corridor, and would construct a hike/bike trail during the life of this plan. Private development within the corridor would probably continue at its current pace. These conditions and activities are not anticipated to affect listed species because neither they nor their habitats occur within the corridor.

For projects proposed in alternative C, the National Park Service would implement measures that would ensure that adverse effects on listed species do not occur. These avoidance measures might include, but are not limited to, the following:

- Safeguarding the known locations of listed species.
- Restricting human activity in piping plover breeding areas by use of a specialized fence system.
- Increasing the number of NPS/volunteer piping plover nest monitors, should conditions warrant.
- Restricting human activity in piping plover breeding areas.
- Restricting dogs from piping plover breeding areas during the breeding season.
- Flagging or fencing plants prior to any work in or adjacent to Pitcher's thistle habitat. Every effort would be made to avoid any impacts to these plants.
- Providing education about the listed species and their habitats.
- Designating alternate access points away from areas occupied by listed species.

The National Park Service staff anticipates that adverse effects could be avoided in all projects proposed under alternative C. The National Park Service cannot foresee at this time any project for which adverse effects could not be avoided. In the rare event that adverse effects could not be avoided, the project would either be discontinued or NPS staff would request formal consultation with

the U.S. Fish and Wildlife Service. As such, any impacts from implementation of alternative C would likely have only beneficial, insignificant, or discountable effects on piping plover and piping plover critical habitat, Michigan monkey flower, and Pitcher's thistle.

At the landscape level, alternative C is not likely to adversely affect listed species because the proposed management direction under this alternative would result in conditions that are beneficial to preserving habitat and would minimize adverse impacts on listed species to insignificant or discountable. As such, implementation of alternative C may affect but would not be likely to adversely affect piping plover and piping plover critical habitat, Michigan monkey flower, and Pitcher's thistle.

**Conservation Measures.** Conservation measures are activities above and beyond avoidance measures and are undertaken to reduce potential impacts on federally listed species or candidate species. Initiation of conservation measures would occur in consultation with the U. S. Fish and Wildlife Service and would be required if any of the following occurred:

- initiation of activities anticipated to have impacts to piping plovers or their designated critical habitat beyond those addressed in this document
- additional Michigan monkey flower occurrences within the Lakeshore were identified in areas where they might potentially be impacted
- initiation of activities anticipated to have impacts on Michigan monkey flower populations
- initiation of activities anticipated to have impacts on Pitcher's thistle populations beyond those addressed in this document

Renewed discussion and consultation with the U. S. Fish and Wildlife Service, should any of the above events occur, would focus on

development of specific conservation measures to reduce potential impacts on these species and/or designated critical habitat. Such conservation measures would be based on the recommendations provided by the U.S. Fish and Wildlife Service.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on federally listed species and designated critical habitat include (1) the improvements to the parking areas at the ends of Leelanau County Roads 651 and 669; (2) implementation of the "Fire Management Plan"; (3) improvements to the Lake Michigan overlooks accessed from the Pierce Stocking Scenic Drive; and (4) activities presented in table 21. Most of these actions would benefit natural resources including federally listed species and their designated critical habitats. Some past projects at the National Lakeshore, however, such as the site restoration project near Big Glen Lake, have adversely affected federally listed species, i.e., Michigan monkey flower. These resulted in formal consultation with the U.S. Fish and Wildlife Service. During implementation, actions would be taken to avoid or minimize potential adverse impacts on such species. Any adverse impacts, such as trampling and sensory-based disruption, would be insignificant or discountable. The impacts of the actions described above, together with the impacts of alternative C, may affect but would not be likely to adversely affect piping plover, piping plover critical habitat, Pitcher's thistle, and Michigan monkey flower. Alternative C would likely contribute a relatively small component to these cumulative impacts.

**Conclusion.** Any adverse impacts of alternative C on the addressed federally listed species and designated critical habitat within the Lakeshore would be no more than insignificant or discountable over both the short and long terms. Implementation of alternative C may affect but would not likely adversely affect the addressed listed species and critical habitat. Other projects, combined



with the impacts of alternative C, on federally listed species and designated critical habitat may affect but would not likely adversely affect piping plover, piping plover critical habitat, Pitcher's thistle, and Michigan monkey flower. There would be *no impairment* of federal threatened and endangered species from this alternative (see specific definition of impairment in the "Impairment of National Lakeshore Resources" section).

### Michigan State-Listed Species

Readers are encouraged to refer back to the "Michigan State-Listed Species" discussion in the "Methods and Assumptions for Analyzing Impacts" section for additional details on the types of impacts resulting from visitor use and development.

Under alternative C, 32% of the National Lakeshore would be managed as wilderness (assuming that Congress acts to designate wilderness), a 7,703-acre (11%) decrease over the no-action alternative. Areas on both islands and in the central and southern portions of the mainland would be managed as wilderness. This reduction in the portion of the Lakeshore conveying wilderness protection to vegetation and wildlife, combined with a relatively large portion of the mainland portions of the Lakeshore being zoned high use, would likely have short- and long-term, minor to moderate, adverse impacts on Michigan state-listed species within the Lakeshore.

Use of the new bay-to-bay trail, concession tours to near the Giant Cedars area on South Manitou Island; and potential activities at the end of Esch Road, in the area stretching from the Pierce Stocking Scenic Drive to Sleeping Bear Bay, and at the end of County Road 669 could impact Michigan state-listed species associated with the shoreline/dunes/near-shore habitat complex. The concession tours to near the Giant Cedars area could also impact the state-listed species associated with

that sensitive area. Although short-term impacts due to trampling, habitat alteration, and sensory-based disturbance, which would likely be moderately adverse, could be somewhat reduced by continued NPS vigilance in monitoring and actively managing such impacts, the extensive nature of the proposed high-use zones and their proximity to sensitive resources suggests that long-term adverse impacts would also range from minor to moderate.

Continued use of motorized boats on School, Bass (Leelanau County), North Bar, and Loon lakes and on the Crystal and Platte rivers would continue to have short- and long-term minor adverse effects on their associated state-listed species due to shoreline erosion, resuspension of sediments, pollution, and sensory-based disruption, and on mature forest species in areas close to these lakes. Implementation of user capacity management (see discussion in chapter 2) to reduce impacts of visitor use in sensitive and yet popular areas such as the Platte River corridor, would have short- and long-term, minor to moderate beneficial impacts.

Developing the bay-to-bay trail; providing designated campsites on North Manitou Island; relocating the D. H. Day group campground to the D. H. Day campground; upgrading or expanding the D. H. Day campground; and development within the high-use zones at the ends of County Road 669, Esch Road, and at the mouth of the Platte River could all negatively impact state-listed species associated with shoreline/dunes/near-shore habitat due to trampling, habitat alteration, and sensory-based disruption. Developments such as the M-22/M-109 hike/bike trail, a short loop trail and small parking area at Bow Lakes, and improved access (parking areas, ramps or docks) at a few inland lakes (locations to be determined) could result in habitat loss and degradation for species associated with lake/wetland/riparian habitat, which could be reduced, to some extent, by strategic location and design. Increased visitor

use and associated increases in trampling, habitat alteration, and sensory-based disruption of species in these areas could also be expected. The sum of these impacts on Michigan state-listed species in the Lakeshore would likely be short and long term, minor to moderate, and adverse.

Continued NPS acquisition of lands in the Benzie Corridor would have short- and long-term minor beneficial impacts on state-listed species near that area by protecting them from impacts associated with private development. Construction and use of a nonmotorized hike/bike trail along the Benzie Corridor could result in short-term (construction) and long-term (use) negligible adverse impacts on state-listed species occurring near the corridor through habitat loss and alteration and sensory-based disruption of wildlife behaviors. Private development would probably continue at its current pace and have negligible to minor adverse impacts on these resources.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on Michigan state-listed plant and animal species include (1) the improvements to the parking areas at the ends of Leelanau County Roads 651 and 669; (2) Glen Haven Village improvements; (3) implementation of the “Fire Management Plan”; (4) improvements to the Lake Michigan overlooks accessed from the Pierce Stocking Scenic Drive; (5) riverbank stabilization on the Platte River at the former Water Wheel and Casey’s Corner canoe liveries; (6) restoration approximating the natural topography, hydrology, and native vegetative cover of nonhistoric areas disturbed by past land uses — particularly those in critical dunes areas; and (7) minor improvements to the Dune Climb parking area. Each of these projects would involve short-term adverse impacts during construction. The long-term impacts would likely be minor to moderate beneficial, such as habitat enhancement.

The impacts of the other actions described above, together with the impacts of alternative B, would result in short- and long-term, negligible to moderate adverse cumulative impacts, and minor to moderate beneficial cumulative impacts. Alternative C would likely contribute a relatively small component to these cumulative impacts.

**Conclusion.** Alternative C would have short- and long-term, minor to moderate, adverse impacts, and short- and long-term minor to moderate beneficial impacts on state-listed species. The cumulative impacts would likely be short and long term, negligible to moderate adverse, and minor to moderate beneficial. There would be *no impairment* of state-listed species from this alternative (see specific definition of impairment in the “Impairment of National Lakeshore Resources” section).

## Wetlands and Water Quality

Readers are encouraged to refer back to the “Wetlands and Water Quality” discussion in the “Methods and Assumptions for Analyzing Impacts” section for additional details on the types of impacts resulting from visitor use and development.

Current visitor activities that would continue and might impact wetlands and water quality include continued use of motorized boats on School, Loon, North Bar and Bass (Leelanau County) lakes and the Crystal and Platte rivers. Motorboat use would continue to result in resuspension of sediments and pollution of wetlands and water bodies. Impacts on wetlands and water quality from such activities would likely continue to be short and long term, minor to moderate, and adverse. Implementation of user capacity management (see discussion in chapter 2) to reduce impacts of visitor use in sensitive and yet popular areas such as the Platte River corridor, would have short- and long-term, minor to moderate beneficial impacts.

The bay-to-bay trail and the M-22/M-109 hike/bike trail could impact wetlands and water quality through erosion, runoff, and pollution during construction, and trampling, erosion, resuspension of sediments, and pollution during use. Assuming use of best management practices during construction, and careful monitoring of impacts during use, the overall impacts would likely be short and long term, minor to moderate, and adverse.

Potential improvements at the end of Esch Road, County Road 669, and at the mouth of the Platte River could result in impacts from trampling, resuspension of sediments, erosion, and dust. Given the extensive area zoned as high use under this alternative, and assuming practicable levels of NPS monitoring and management, the sum of these impacts would likely be moderately adverse over both the short and long terms.

Upgrades to boat access at some inland lakes, upgrade of the Glen Lake picnic area and Dune Climb facilities, additional trails in the Glen Lake high-use zone, upgrades or expansion of the D. H. Day campground, and a short loop trail and small parking area in the Bow Lakes area might impact wetlands and water quality. Assuming use of best management practices during construction, impacts due to the Bow Lakes trail and parking area would likely be short term, minor to moderate, and adverse during construction, and long term, minor to moderate, and beneficial after construction. These actions would focus visitor use on less sensitive areas (e.g., designated trails). Impacts of the remaining developments would be primarily due to potential erosion during construction, and erosion, dust, and pollution during use. Assuming use of best management practices, impacts would likely be short and long term, moderate, and adverse.

Continued NPS acquisition of lands within the Benzie Corridor would help protect wetlands and water quality below this area from the impacts of private development,

resulting in short- and long-term, negligible to minor beneficial impacts. Construction and use of a nonmotorized hike/bike trail along the Benzie Corridor would result in short-term (construction) and long-term (use) negligible adverse impacts on water resources through increased stormwater runoff associated with construction activities and subsequent increased impermeable surface area. Private development would probably continue at its current pace and have negligible to minor adverse impacts on these resources.

**Cumulative Impacts.** Past, present, and anticipated projects that would contribute to impacts on wetlands and water quality include (1) implementation of the “Fire Management Plan”; (2) riverbank stabilization on the Platte River at the former Water Wheel and Casey’s Corner canoe liveries; (3) restoration approximating the natural topography, hydrology, and native vegetative cover of nonhistoric areas disturbed by past land uses — particularly those in critical dunes areas; (4) minor improvements to the Dune Climb parking area; and (5) dredging of the Platte River mouth. Although each of these projects would involve short-term adverse impacts (e.g. dredging of the Platte River resulting in short-term suspension of particulates in the water and resulting lower water quality immediately downstream (lakeside) of the dredging), the net result would likely be long-term, minor to moderate beneficial impacts (e.g. dredging the mouth of the Platte River allows boats to pass without continuously hitting the bottom, stirring up material, and reducing water quality).

The impacts of the other actions described above, together with the impacts of alternative C, would result in short- and long-term, negligible to moderate adverse cumulative impacts, and short- and long-term, negligible to moderate beneficial cumulative effects. Alternative C would likely contribute a relatively small component to these cumulative impacts.

**Conclusion.** Alternative C would have short-term, negligible to moderate, adverse; short- and long-term, moderate, adverse; short-term, negligible to minor, beneficial; and long-term negligible to moderate beneficial impacts on wetlands and water quality. The cumulative impacts would be short and long term, negligible to moderate adverse, and short and long term, negligible to moderate beneficial. There would be *no impairment* of wetlands or water quality from this alternative (see specific definition of impairment in the “Impairment of National Lakeshore Resources” section).

## VISITOR OPPORTUNITIES AND USE

### Visitor Opportunities

Opportunities would be available for visitors to experience the fundamental resources and values of the Lakeshore and to learn about the Lakeshore’s primary interpretive themes (see chapter 1 “Fundamental Resources and Values” and “Primary Interpretive Themes” sections). Visitors would have access to information, interpretation, and educational opportunities at a variety of locations, including the visitor center in Empire, at Glen Haven, and at the visitor contact station on South Manitou Island. Interpretive and educational activities would be more structured (e.g., more guided programs) in the concentrated use areas, and self-guided elsewhere, providing options at both ends of the spectrum. These opportunities would have long-term, moderate beneficial impacts.

Access to and through the Lakeshore would be on the existing network of state, county, and NPS roads. Visitors would have increased Lakeshore access with the addition of a hike/bike trail in the Benzie Corridor, the M-22/M-109 hike/bike trail (initiated by others), and the bay-to-bay hiker/paddler trail, and concessioner-operated interpretive tours to near the Giant Cedars area would be considered. Seasonal ferry service would be provided for overnight trips to North

Manitou Island and day and overnight trips to South Manitou Island (similar to the no-action alternative). The above-noted increases in Lakeshore access would have long-term, moderate beneficial impacts.

The scenic resources of the Lakeshore would reflect relatively large areas that are natural in character (this alternative has the second greatest amount of experience nature zone) and other areas with concentrated recreation-oriented development (this alternative has the greatest amount of the high-use zone). The development of a hike/bike trail in the Benzie Corridor could result in views of the Crystal Ridge being slightly less natural in character than the no-action alternative. However, the Benzie Corridor trail would provide visitors with new access to panoramic views of the Lakeshore and surrounding landscape. As in the no-action alternative, visitors could continue to experience Lakeshore sites that reflect the area’s culture and history (e.g., Glen Haven, Port Oneida, and cultural resources on North Manitou and South Manitou islands). Even with some increased development, there would be long-term, moderate, beneficial impacts on opportunities to experience the natural and cultural scenic resources of the Lakeshore.

Much of the additional recreation-oriented development would be concentrated in select areas resulting in a modest level of development, while fewer and more primitive facilities would be provided elsewhere. Additional facilities include a hike/bike trail in the Benzie Corridor; the M-22/M-109 hike/bike trail (initiated by others); the bay-to-bay hiker/paddler trail; additional trails south of Glen Haven and to Shauger Hill; the relocation of the D. H. Day group campground to the main D. H. Day campground; the addition of amenities and/or capacity at the D. H. Day campground; the addition of designated campgrounds on North Manitou Island; upgraded/expanded facilities at Little Glen Lake picnic/beach area; upgraded facilities at the Dune Climb to support continued heavy visitor use; improved parking areas and

ramps/docks at a few inland lakes; expanded facilities at the ends of County Road 669, Esch Road, and Platte River Point; and a trailhead parking area and short loop trail in the Bow Lakes area. Even with these changes, the scale of recreation-oriented development in the Lakeshore would be modest. This level of development would have long-term, moderate beneficial impacts for visitors.

There would continue to be a wide range of recreational activities in the Lakeshore (similar to the no-action alternative) however, opportunities for nonmotorized recreational activities such as hiking, biking, backpacking, paddling, cross-country skiing, and back-country camping would be facilitated and expanded. Opportunities for facility-based recreational activities would primarily be increased in the high-use zones (e.g., 669/Good Harbor Bay, south of Glen Haven to Shauger Hill, Esch Beach, and Platte River Point). User capacity management would improve visitor experiences on the Platte River. These changes to the range of recreational activities in the Lakeshore would have long-term, minor beneficial impacts.

Natural sounds would continue to dominate the Lakeshore except along roadways, in developed areas, where motorized boats are allowed (along rivers, at specific inland lakes, and on Lake Michigan), and when aircraft are flying over. There is the potential for increased visitor opportunities and facilities in the 669/Good Harbor Bay, south of Glen Haven to Shauger Hill, Esch Beach, and Platte River Point areas. A hike/bike trail would be developed in the Benzie Corridor; associated noise (minor) would likely be comparable to similar Lakeshore facilities. Natural sounds would also be temporarily disrupted locally by construction activities. Because of more visitor opportunities and development in this alternative, there would be slightly more disruptions to natural sounds compared to the no-action alternative; with mitigation these impacts would be long term, minor, and adverse.

The naturally dark night sky would continue to be predominant in the Lakeshore despite vehicular lights along roadways and lighting in developed areas. There is the potential for increased development in the 669/Good Harbor Bay, south of Glen Haven to Shauger Hill, Esch Beach, and Platte River Point areas. A hike/bike trail would be developed in the Benzie Corridor. Associated disruptions to the naturally dark night sky would likely be similar to other Lakeshore developed areas. Because of this localized increased development, compared to the no-action alternative there would be slightly more disruptions to the naturally dark night skies; with mitigation these impacts would be long term, minor, and adverse for those who value the dark night sky.

### Visitor Use

Among the alternatives in this plan, alternative C would be expected to result in the largest increase in annual recreation use of any alternative. Alternative C reflects an emphasis on concentrated use in several high use zones, several of which would be near Lake Michigan. Expansion/improvements of the D. H. Day Campground, the M-22/M-109 hike/bike trail (initiated by others), the bay-to-bay hiker/paddler trail, more guided interpretive programs, improved access to near the Giant Cedars area, the Benzie Corridor hike/bike trail, facility improvements at road ends and inland lakes, and increased interpretive opportunities on the South Manitou Island farm loop tours would provide additional impetus for increased visitor use. Depending on the strategy(ies) chosen, implementation of user capacity management strategies on the Platte River might locally reduce visitor numbers. The net effect of the management direction established under alternative C would be a long-term increase of up to 125% above the increase anticipated under the no-action alternative (up to an estimated 105,000 additional annual visits). The timing and magnitude of increased visitor

use is difficult to predict because it would depend on when projects are funded or carried out.

Visitors to the Lakeshore from outside the region would likely account for the majority of future visits, though the number of visits by local and seasonal residents would be expected to account for a large share of future visitor use. The largest increase in visitor use levels of all of the alternatives would have long-term and minor effects that might be concurrently viewed as beneficial or adverse, depending on the expectations and preferences of visitors.

### **Cumulative Impacts**

Other past, present, and reasonably foreseeable projects that would affect visitor opportunities and use include: (1) improvements to parking areas at the ends of Leelanau County Roads 651 and 669; (2) Glen Haven Village improvements; (3) improvements to the Pierce Stocking Scenic Drive Lake Michigan overlooks 9 and 10; (4) South Manitou Lighthouse Complex exterior restoration and interior rehabilitation; and (5) Dune Climb parking area paving and other minor improvements. These actions would improve visitor opportunities by improving enjoyment, access, and/or range of available opportunities for visitors and would have an overall long-term, minor, beneficial effect on visitor opportunities and use. Developments near the Lakeshore (particularly along the access roads and in/near Glen Arbor and Empire) might continue to occur; these could result in a degradation of natural scenic quality, natural soundscapes, and night sky. These actions would have a long-term, minor, adverse effect on visitors. Combined with alternative C, these actions would have a long-term, minor, beneficial cumulative effect. Impacts of alternative C would comprise a relatively small portion of the overall cumulative effect.

### **Conclusion**

Increased access and visitor opportunities related to additional recreation-oriented facilities would have a long-term, minor to moderate beneficial impact on visitor opportunities and use. Implementation of user capacity management strategies would have a long-term, minor, beneficial impact on visitor opportunities, but potentially long-term minor, adverse effects on visitor use. The increased visitor opportunities and facilities in the high-use zones would have a long-term, minor, adverse impact on scenic resources, natural sounds, and the night sky. Construction activities would have short-term, minor, adverse impacts. The cumulative effects would be long-term, moderate, and beneficial.

## **WILDERNESS CHARACTER**

### **Natural and Undeveloped**

Under alternative C, about 23,200 acres (32 % of the National Lakeshore) would be proposed for wilderness designation, a 7,703-acre (11%) decrease from the no-action alternative. Assuming Congress acted to designate the proposed areas as wilderness, wilderness values would be protected forever in designated areas within the central and south mainland portions of the Lakeshore and each island. In contrast to the no-action alternative, there would be no wilderness protection for the north portion of the mainland, the Otter Creek area, or the southeastern portion of South Manitou Island. Naturalness and opportunities for solitude and primitive recreation would be reduced in these areas, but this effect would be tempered by management as the experience nature zone. A new area of designated wilderness and associated experiences would be available on the Sleeping Bear Plateau. Impacts would be long term, minor, beneficial, and adverse.

In contrast to the no-action alternative, there would be no nonconforming motor vehicle or

bicycle use *within* wilderness because county road rights-of-way would be excluded from wilderness. However, the presence of historic structures within wilderness would continue to locally diminish the areas' undeveloped primeval character (same as the no-action alternative). Impacts would be localized, long term, minor, and beneficial and adverse.

### **Opportunities for Solitude**

Outstanding opportunities for solitude would be available due to designated wilderness in two of three portions of the mainland and on the Manitou Islands. In particular, areas away from trails and facilities would continue to offer excellent prospects for privacy and isolation. Solitude would continue to be more easily found on North Manitou Island than on South Manitou Island because the former is larger, has fewer visitors (most of whom are seeking wilderness experiences), and would continue to lack day use. Also, in contrast to the no-action alternative, about one-third of South Manitou would not be managed as wilderness. Impacts on opportunities for solitude would be long term, minor, and beneficial and adverse.

### **Opportunities for Primitive, Unconfined Recreation**

Compared to the no-action alternative, there would be reduced opportunities for day and overnight wilderness experiences on South Manitou Island. Due to the lack of day ferry service to North Manitou Island there would continue to be only overnight wilderness experience opportunities there. The back-country camping permit requirement would remain in place, as would the requirement for campers to stay in designated campgrounds (except on North Manitou Island where camping would continue to be dispersed). Permit and camping requirements would continue to diminish opportunities for primitive, unconfined recreation to some

degree. Alternative C's impact on opportunities for primitive, unconfined recreation would be long term, minor, and beneficial and adverse.

### **Cumulative Impacts**

Over time, the Lakeshore's ongoing program to restore former nonhistoric sites to more natural conditions has substantially increased the natural, undeveloped character of the Lakeshore. The work includes removing nonnative trees and human enhancements, plus reestablishing more natural contours and native vegetation. Combined with this ongoing restoration program, alternative C would have long term, minor, beneficial and adverse cumulative effects. Impacts of alternative C would comprise a substantial portion of these overall cumulative effects.

### **Conclusion**

Establishment of 23,200 acres of designated wilderness in the central and south portions of the mainland and on both islands would permanently protect wilderness values (naturalness and opportunities for solitude or primitive unconfined recreation). However, wilderness values in several areas (north portion of the mainland, Otter Creek area, and southeast portion of South Manitou Island) would no longer have wilderness protection. Impacts of alternative C on wilderness character would be long term (some permanent), minor, and adverse and beneficial. Combined with other actions, alternative C would have long-term minor, beneficial and adverse cumulative effects on wilderness character.

### **REGIONAL SOCIOECONOMICS**

Implementing alternative C would occur against the same backdrop of economic, demographic, and social conditions described under the no-action alternative. The

economic and social effects of alternative C would contribute to those conditions, but would not fundamentally alter the area's economic and demographic outlook.

### **Visitor-Related Economic Impacts**

Among the alternatives in this plan, alternative C would be expected to result in the largest increase in annual recreational use. Alternative C reflects an emphasis on concentrating use in several high-use areas in the Lakeshore. Several of these areas would be near the Lake Michigan lakeshore. The net effect of alternative C would be a long-term increase of up to 125% above the increase anticipated under the no-action alternative — up to an estimated 105,000 additional annual visits (see the “Impacts to the Alternative C — Visitor Use” section in this chapter).

Changes in the geographic distribution, timing, and activity of visitor use within the National Lakeshore from implementation of alternative C could indirectly cause increased or reduced visitor use at other nearby outdoor recreation resources. Although the potential magnitude of such changes is higher than for the preferred alternative, such changes would not likely appreciably affect future management and operations of these resources.

Retail, lodging, and other tourism-type spending would accompany the increased use with expenditures projected to reach \$38.0 million per year, \$5.2 million higher than at present, and \$2.9 million per year higher than for the no-action alternative. Demands for goods and services from local merchants and other recreation-oriented establishments might change over time in conjunction with shifts in visitor use. The National Lakeshore would collect more in entry fees and revenues from the sales of various passes, and Eastern National would sell more merchandise at the visitor center, with portions of these receipts retained to support recreational, cultural, and educational programs in the Lakeshore.

Economic spin-offs of the visitor spending include higher personal income and 35 to 45 more jobs than under the no-action alternative. Most of these added jobs would be seasonal. The visitor-related impacts would be long term but limited in scale relative to current employment and personal income in the two counties.

The state and local governments would collect additional sales tax from the increases in visitor spending.

The above visitor-related economic impacts would be beneficial, but negligible in the short term and minor and beneficial over the long term.

### **Economic Impacts Related to Implementation and NPS Operations**

Alternative C would provide a sustained economic infusion to the region over the life of this plan resulting from ongoing NPS operating expenditures and \$30.5 million in future construction spending (\$23.9 million above that for the no-action alternative). The future construction budget includes \$7.3 million for the eventual construction of the Benzie hike/bike trail. However, there would be no assurances that the construction funds for the hike/bike trail would be forthcoming. Budgeted needs to address deferred maintenance would be the same as for the no-action alternative.

As under the no-action alternative, maintenance staff would perform much of the work to address deferred maintenance and preservation, restoration and rehabilitation activities. Future construction needs would be higher than under the no-action alternative, supporting the local construction trades industry and associated vendors and suppliers.

Annual NPS payroll, operating, and maintenance would produce long-term effects on employment, business sales, income and



other related measures. A long-term increase of up to 19 full-time-equivalent employees could be supported by the management and actions included in alternative C. Staff would be added over time as specific projects, programs, and management included in this alternative were implemented.

A need for a long-term increase in budgeted funds for NPS operations is identified in conjunction with alternative C (there are no assurances that such increases will occur). Available resources would include about \$4.5 million base budget appropriations (\$600,000 per year above the no-action alternative), more than \$1.0 million in retained entry and camping fees, and various nonrecurring funding for supplemental and specific project construction. Total retained fees would be higher under alternative C than for the no-action alternative.

As with the no-action alternative, supplemental funding would be required for future land acquisition in the Benzie Corridor.

The eventual construction of a hike/bike trail in the Benzie Corridor would produce short-term effects on local employment, business revenues, income, taxes, and other related economic measures. Some local heavy construction firms and related suppliers and vendors would likely garner a portion of the project construction spending. The magnitudes of the effects are indeterminate, in large part because the length of time required to complete the project is uncertain. Based on preliminary cost estimates, it is reasonable to anticipate that the effects would be beneficial, short term, and minor.

Activities sponsored by the Lakeshore's partners would provide additional sources of economic stimulus. The timing, magnitude, and indirect economic consequences of those activities are indeterminate.

The economic effects associated with NPS operations would be beneficial, but negligible

to minor in the short term and beneficial and minor over the long term.

### **Effects on Regional Population**

Alternative C would have little direct impact on regional population growth. The increases in construction and long-term jobs and visitor use over the life of this plan would provide a minor impetus for growth, relative to other factors.

Implementation of alternative C could indirectly enhance the region's attractiveness for both job-related and retirement migration to the region as a result of enhanced developed recreational opportunities and establishment of wilderness on the mainland.

The effects of implementing alternative C on regional population growth under this alternative would be negligible to minor, both in the short term and the long term. Generally, population growth would be viewed as beneficial.

### **Community Services**

Over time, increasing visitor use at the Lakeshore under alternative C would indirectly result in added demands on community services and facilities across the region. The limited scale, seasonal nature, and spatial dispersion of such demands across the region would be such that facility expansions and additional staffing would not be required.

Effects on community services under alternative C would be indeterminate and negligible over the short and long terms.

### **Traffic and Emergency Services**

Traffic impacts of alternative C would be similar to, but greater than those under the no-action alternative. With the concentration

of high-use zoning in the vicinity of the Dunes Climb / Glen Haven / Glen lakes areas, traffic increases would be more heavily concentrated on M-22, M-109, and surrounding local roads. Even with the increases, future traffic volumes would remain substantially below design capacity and not dramatically increase maintenance requirements. Increases in traffic volumes could accelerate the onset of less than desirable levels of service at the M-22/M-109 intersection in Glen Arbor, possibly triggering intersection improvements (Robert Peccia & Associates. 2001).

The eventual completion of a hike/bike trail in the Benzie Corridor would increase traffic on public roadways in the southern portion of the Lakeshore — both vehicular and bicycle. The increases could be accompanied by limited increases in noise and related factors. Motorized vehicular traffic would not be allowed on the hike/bike trail.

Implementation of alternative C would result in greater increases in demand on law enforcement and first responders in Leelanau County as compared to the no-action alternative. Demands associated with this alternative would not require additional law enforcement or emergency response staffing, although the increases in the number of “call outs” could burden area first response agencies because they are partially staffed by volunteers.

The effects of implementing alternative C on traffic and emergency services across most of the region would be adverse, but minor over the short and long terms.

### **Attitudes and Lifestyles**

Alternative C establishes future management direction for the Lakeshore that reflects public input and the Lakeshore’s purpose, significance, and fundamental resources and values. In terms of attitudes, some individuals might be dismayed because they might feel

that the management zones and wilderness proposals do not go far enough to achieve their particular preferences. For example, the reconfiguration of wilderness to exclude county roads and sizable sections of the mainland but continue management of a substantial area as wilderness might not satisfy those who favor a maximum wilderness proposal.

The recreation, conservation, and resource management opportunities associated with alternative C would have both direct and indirect lifestyle consequences, with the direct consequences most apparent to neighbors and visitors to the Lakeshore. For example, future visitors would have access to a broader range of experiences and options, including wilderness on the mainland and enhanced access to backcountry use along the shoreline. Individuals promoting improved boating access to the Lake Michigan would be encouraged by the long-term potential to study the feasibility of providing such access. Many residents and local government officials would approve of the explicit statements and policies regarding state and county roads and other valid existing rights reflected in this plan.

Construction and completion of the Benzie hike/bike trail would affect the lifestyles of residents and their guests in the vicinity of the corridor. Short-term effects during construction would include noise, potentially blasting, truck traffic, and an increased presence of humans into settings that had been more remote and private. The construction-related noise and traffic would diminish over the long term, but some limited increase in noise and awareness of the presence of others would continue. Most of these impacts would be viewed as adverse.

Some property owners, along with members of the broader community, would view the opening of the Benzie hike/bike trail positively for the visitor opportunities (hiking, enjoying

the scenic vistas, picnicking, and bicycling) it would provide.

The management and access policies established under alternative C might have indirect consequences on attitudes and lifestyles. Such consequences could arise primarily in terms of the extent to which alternative C influences or changes recreation and resource conditions at a broader level over the long term. For example, changes in shoreline access might contribute to higher population growth in the region and attract more use at the Lakeshore and conflicts with the preferences and desires of others to discourage more use. Given the relatively small size of the community, such conflicts can become sources of long-term division or strength.

### Cumulative Impacts

Cumulative social and economic impacts from alternative C would be of the same type, but larger in scale, as those under the no-action alternative. The effects of underlying development trends in the region include long-term, moderate population and economic growth, long-term increases in traffic on local roads, related impacts on public safety, higher spending that bolsters community- and recreation-oriented businesses in the region, and additional tax revenues to fund public services and facilities. The other cumulative actions could result in some long-term negligible economic effects on visitor-related businesses, and on local traffic and safety, due to changes in visitor use levels and distribution.

The incremental economic and social effects of alternative, C including those associated with increased visitor and NPS operating expenditures, would be negligible to minor in the short term and minor in the long term, and generally beneficial. Alternative C, combined with the impacts of other actions described above, would result in minor short- and long-

term adverse cumulative effects on traffic and highway safety. Impacts of alternative B would comprise a small portion of these overall cumulative effects.

### Conclusion

The economic effects of alternative C would include negligible to minor short-term and minor to moderate long-term economic benefits, the latter due to increased visitation. Among the alternatives, alternative C offers the largest economic benefits for the region. Short- and long-term effects on lifestyles and attitudes are indeterminate; many interested parties would support this alternative, but some would be disappointed in one or more of its aspects. Long-term social consequences include a negligible to minor contribution to long-term population growth and demands on community infrastructure and services. Overall, the cumulative social and economic effects associated with alternative C would be minor, short and long term, and indeterminate as they include effects that might be concurrently viewed as beneficial or adverse.

### NPS OPERATIONS

Under alternative C, the Lakeshore's maintenance and operational load would be increased by (1) managing the busy high use zone west of Little Glen Lake (with more need for patrols and monitoring for use-related impacts); (2) developing a hike/bike trail within the Benzie Corridor (a new area to patrol and new facilities to maintain); (3) adding other new trails and backcountry campgrounds; improving and/or expanding the D. H. Day Campground; (4) managing the ends of County Road 669, Esch Road, and the Platte River mouth as more developed beach access areas; (5) upgrading the Glen Lake picnic area to support beach and picnic use; (6) possibly adding concession tours to near the Giant Cedars area; (7) providing more structured interpretive opportunities in

concentrated use areas, and (8) a modest increase in visitation over time. Some increased maintenance would also be incurred with a new M-22/M-109 hike/bike trail. Concentrating use in specific areas and most other facility-based changes, such as relocating the D. H. Day group campground to the main D. H. Day Campground and upgrades at the Dune Climb, would decrease maintenance needs for individual areas or change the nature of the maintenance needs without increasing the burden. Wilderness minimum requirement analysis would be required for 23,200 acres, a 7,703-acre (11%) reduction from the no-action alternative. Impacts of alternative C would be long term, minor beneficial and moderate adverse.

### **Cumulative Impacts**

Ongoing and planned facility upgrades and restoration/rehabilitation projects would have mostly beneficial impacts because these projects would result in reduced resource management and cyclic maintenance needs. Dredging of the Platte River mouth would continue to place demands upon the maintenance staff and budget, a minor adverse effect. Combined with these impacts, alternative C would have long-term minor beneficial and moderate adverse cumulative effects. Alternative C would comprise a substantial portion of these cumulative effects.

### **Conclusion**

Alternative C would have long-term minor beneficial and moderate adverse impacts on NPS operations. This alternative, combined with other actions, would have long-term minor beneficial and moderate adverse cumulative effects.

### **UNAVOIDABLE ADVERSE IMPACTS**

Some negligible to moderate impacts to soils, vegetation, wildlife, water resources, wilderness character, scenic resources, natural sound, and night sky caused by recreational use and facilities would be essentially unavoidable (e.g., soil compaction, vegetation trampling, wildlife disturbances, decreased opportunities for solitude, decreased naturalness). Increases in visitor use would have low level adverse impacts on regional socioeconomics (e.g., increased traffic).

### **IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES**

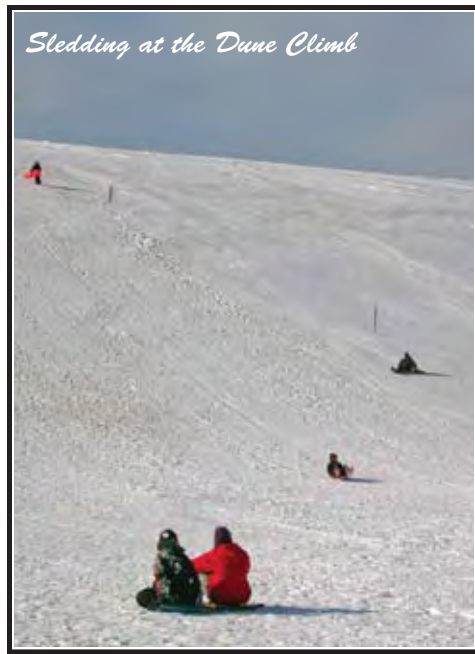
Irreversible commitments of resources are actions that result in loss of resources that cannot be reversed. Irretrievable commitments of resources are actions that result in the loss of resources but only for a limited period of time.

With the exception of consumption of fuels and raw materials for maintenance or construction activities, no actions in this alternative would result in consumption of nonrenewable natural resources or use of renewable resources that would preclude other uses for a period of time.

### **RELATIONSHIP OF SHORT-TERM USES AND LONG-TERM PRODUCTIVITY**

The National Lakeshore would continue to be used by the public, and most areas would be protected in a natural state. The National Park Service would continue to manage the Lakeshore to maintain ecological processes and native biological communities and to provide appropriate recreational opportunities consistent with the preservation of cultural and natural resources. Actions would be taken with care to minimize adverse effects on the long-term productivity of biotic communities.

Under alternative C there would be expanded (but still relatively modest) facilities to support recreational use and some localized loss of ecological productivity.





## PUBLIC INVOLVEMENT, INCLUDING SCOPING

Prior to the official start of this planning process, the National Park Service held 35 meetings with 793 people, increasing the awareness of the wilderness situation at the National Lakeshore and hearing from the public their preferences for resolution. Primarily as a result of these meetings, the National Park Service decided to begin a new general management planning process that included a *Wilderness Study*.

The public was notified of this Sleeping Bear Dunes planning effort via: (1) a *Federal Register* notice of intent, dated December 28, 2005, to prepare an environmental impact statement; (2) distribution of the first newsletter for this effort in January 2006; and (3) a press release announcing a public comment opportunity, including public scoping meetings for the general management plan.

*Newsletter 1*, issued in January 2006,

- introduced the concepts of general management plans and wilderness studies
- outlined preliminary issues and concerns for the planning effort
- provided a general timetable for development of the *General Management Plan / Wilderness Study / Environmental Impact Statement*
- provided draft purpose and significance statements
- invited the public to participate in the planning process by providing comment
- provided a comment form and website link to facilitate public comment
- invited the public to attend scoping meetings for the *General Management Plan / Wilderness Study / Environmental Impact Statement*

Scoping is an early and open process for determining the scope of a proposed action or project and for identifying issues related to the project. During scoping, NPS staff provide an overview of the project, including purpose and need and preliminary issues. The public is asked to submit comments, concerns, and suggestions relating to the project and preliminary issues.

A public comment period was open from January 30 to March 17, 2006. Public scoping meetings (open-house style) were held on February 14 and 15, 2006, in Empire and Traverse City, Michigan, respectively. A third meeting scheduled for February 16 in Benzonia, Michigan, was postponed until March 2, 2006, due to adverse weather conditions. Meetings with NPS employees were also held. The main purpose of the comment period and meetings was to introduce the planning process and gather ideas about what the plan should address. Frequently asked questions and answers were posted on the Lakeshore's website and were updated throughout the planning process. Nearly 150 people attended the three scoping meetings. More than 300 written comments were received in response to *Newsletter 1* and at the public open houses. A summary of public comments was posted on the Lakeshore's website in May 2006.

*Newsletter 2*, issued in April 2006,

- summarized public scoping comments
- answered frequently asked questions
- presented the draft foundation for planning and management — the purpose and significance statements (revised); the fundamental resources and values; the primary interpretive themes; and special mandates
- provided a planning steps/timetable update
- invited the public to participate in the planning process by providing comments



- provided a comment website link to facilitate public comment
- invited the public to attend public planning workshops

A public comment period, including three public planning workshops, was announced in *Newsletter 2* and in a press release. The comment period was open from May 22 to July 7, 2006, and the workshops were held in Traverse City, Michigan, on June 20 and 21, 2006. An NPS employee workshop was also held. The purpose of the comment period and workshops was to gather input about how to manage the National Lakeshore. In total, about 70 people participated in the public workshops, and 25 additional written comments were received via mail, email, and the NPS' PEPC (Planning, Environment, and Public Comment) system. This input was used to develop alternative management concepts and draft management zones. A summary of public and staff comments was posted on the Lakeshore's website in September 2006.

A press release explaining and clarifying the wilderness situation at the National Lakeshore was issued in July 2006.

*Newsletter 3*, issued in October 2006,

- briefly summarized the June public planning workshops
- presented draft management zones and alternative management concepts
- provided a wilderness study update
- presented draft desired conditions for the National Lakeshore
- provided a planning steps/timetable update
- invited the public to participate in the planning process by providing comments
- provided a comment form and website link to facilitate public comment

A public comment period was open from October 11 to November 10, 2006. The main purpose of the comment period was to introduce the alternative management

concepts and gather ideas about the draft management zones, the alternative management concepts, and desired future conditions. More than 200 written comments were received in response to *Newsletter 3*. A summary of public comments was posted on the Lakeshore's website in February 2007.

*Newsletter 4*, issued in April 2007,

- briefly summarized public comments on *Newsletter 3*
- presented refined management zones
- presented four preliminary alternatives based on the alternative concepts from *Newsletter 3*
- provided brief informational sections on wilderness and user capacity
- provided a planning steps/timetable update
- invited the public to participate in the planning process by providing comments
- provided a comment form and website link to facilitate public comment
- invited the public to attend public meetings

A public comment period, including three public meetings, was announced in *Newsletter 4* and in a press release. The comment period was open from March 31 to May 14, 2007. Three public meetings were held in Honor, Glen Arbor, and Traverse City, Michigan, on May 1, 2, and 3, 2007, respectively. Meetings with NPS employees were also held. The purpose of the comment period and the meetings was to gather comments on the preliminary alternatives and what should be included in the preferred alternative. About 200 people participated, and more than 400 written comments were received. A summary of public comments was posted on the Lakeshore's website in August 2007.

Using input from the public and considering the probable environmental consequences and costs of the alternatives, the planning team developed the preferred alternative. The *Draft General Management Plan / Wilderness*

*Study / Environmental Impact Statement* was then produced and distributed for public review. The mailing list for the draft document included nearly 2,400 individuals and groups.

The *Draft General Management Plan / Wilderness Study / Environmental Impact Statement* for Sleeping Bear Dunes National Lakeshore was made available for public review beginning April 7, 2008; the comment period ended on June 15, 2008. Public meetings were held at Honor, Traverse City, and Glen Arbor, Michigan, on June 3, 4, and 5, 2008, respectively, with a total of 196 people attending. A total of 292 comments were received via letters (66 total), e-mails (60 total), Web responses (129 total), and comments transcribed from the public meetings (37 total). Comments came from 20 different states. Many other meetings and a radio broadcast regarding the draft plan were attended by park staff, for example, congressional briefings and meetings with road commissions, friends groups, federal agencies, state agencies, and townships.

National Lakeshore staff conducted an extensive public involvement and outreach program throughout the planning process. By the time of printing the *Final General Management Plan / Wilderness Study / Environmental Impact Statement*, NPS staff had held more than 90 informational meetings with the general public and dozens of groups or representatives (see list below) upon their request. More than 2,500 people in total attended these meetings.

- Benzie County Commissioners
- Benzie County Kiwanis Club
- Benzie County Parks and Recreation
- Benzie County Road Commission
- Benzie Fishery Coalition
- Benzie Rotary Club
- Benzie Sunrise Rotary Club
- Cherry Capital Paddling Club
- Citizens for Access to the Lakeshore
- Citizens' Council for Sleeping Bear Dunes

- Cleveland Township
- Conservation Resource Alliance
- Crystal Lake Watershed Association
- Empire Lions Club
- Frankfort Rotary Club
- Friends of Sleeping Bear Dunes
- Glen Arbor Community Forum
- Glen Arbor Township
- Grand Traverse Band of Ottawa and Chippewa Indians
- Golden K Kiwanis Club
- Interlochen Public Radio
- Leelanau Chamber of Commerce & Businesses
- Leelanau County Commissioners
- Leelanau County Planning Commission
- Leelanau County Road Commission
- Leelanau Rotary Club
- Leelanau Scenic Route Committee
- Manitou Islands Memorial Society
- Michigan congressional delegation
- Michigan state historic preservation officer
- Michigan Department of Natural Resources
- Michigan Department of Environmental Quality
- Michigan Land Use Institute
- Manitou Island Transit
- National Parks Conservation Association
- Natural Resource Conservation Service
- Noon Tiders
- Northwestern Community College
- Platte Township
- Preserve Historic Sleeping Bear
- Republican Women of Leelanau County
- Rotary Club of Traverse City
- Traverse City Kiwanis
- U.S. Fish and Wildlife Service
- WTCM 580 Radio

Newsletters were available online, as were other documents related to this planning effort (e.g., public comment summaries, frequently asked questions, letters, and planning updates from the superintendent). *The Draft General Management Plan / Wilderness Study / Environmental Impact*

*Statement* was also available online. An interactive web forum related to the planning effort was also available. A press release was sent to media outlets announcing the web forum and encouraging the public to share their thoughts and ideas in a public way. An NPS moderator interacted with forum users, answering questions and facilitating open discussions for all to see.

The *Final General Management Plan / Wilderness Study / Environmental Impact Statement* is available online at the National Lakeshore's website ([www.nps.gov/slbe](http://www.nps.gov/slbe)).

## CONSULTATION AND COORDINATION TO DATE WITH OTHER AGENCIES, OFFICES, AND TRIBES

### FEDERAL AGENCIES

The National Park Service contacted the U.S. Fish and Wildlife Service (USFWS) in a letter dated February 16, 2006. The letter advised the U.S. Fish and Wildlife Service of the NPS planning process for this *General Management Plan / Wilderness Study / Environmental Impact Statement* and requested a current list of federally listed threatened, endangered, or candidate species within the National Lakeshore. The U.S. Fish and Wildlife Service responded in a letter dated March 21, 2006; the response letter included a list of such species found within Leelanau and Benzie counties. On March 27, 2007, National Lakeshore managers met with USFWS representatives to discuss the planning process.

In subsequent communications, Lakeshore staff sought advice from the U. S. Fish and Wildlife Service regarding how to fulfill NPS responsibilities for complying with Section 7 of the Endangered Species Act. On September 26, 2007, the two agencies agreed that a biological assessment should not be prepared in association with this *General Management Plan*. A general management plan is broad and strategic in nature (rather than a “major construction activity,” which is the usual trigger for preparation of a biological assessment). Details about many individual proposals mentioned in the *General Management Plan* alternatives, such as trail development and facility improvements, have not been yet been determined; project specifics that allow more meaningful impact assessment would be detailed in subsequent implementation plans. The National Park Service will continue to consult with the U. S. Fish and Wildlife Service in the future on a project-by-project basis concerning the need for additional Section 7 consultation. The

initial letter from the U. S. Fish and Wildlife Service is reproduced in appendix F.

The environmental consequences portion of this document (chapter 5) provides, to the extent possible, a *general* analysis of potential impacts on federally listed species and critical habitat for all alternatives, and for the preferred alternative a determination of effect is also provided. The U. S. Fish and Wildlife Service has advised the National Park Service that the EIS analysis fulfills the requirement for a biological assessment and for informal consultation under Section 7 of the Endangered Species Act.

A letter dated June 16, 2008, from the East Lansing Field Office of the U.S. Fish and Wildlife Service provided comments on the draft plan preferred alternative in relation to section 7 of the Endangered Species Act (this letter is reprinted on the following pages). This office concurred with the NPS determination that implementing the preferred alternative

may affect but not likely adversely affect Pitcher’s thistle, Michigan monkey flower, piping plover or piping plover critical habitat. Effects of the proposed alternative are considered insignificant, discountable, or beneficial. This precludes the need for further action on this project as required under section 7 of the Act.

They noted, however, that if the project plans change or elements of the preferred alternative are modified, consultation should be reinitiated.

The National Park Service contacted the U.S. Natural Resources Conservation Service regarding prime and unique farmlands in two counties in letters dated May 9, 2006. The

Natural Resources Conservation Service replied in a letter dated May 18, 2006. National Lakeshore managers met with a representative from the Natural Resources Conservation Service on May 23, 2006, to discuss prime and unique farmlands and the planning process.

A letter dated June 9, 2008, from the Chicago office of the Environmental Protection Agency provided comments on the draft plan. This office rated the draft plan preferred alternative as “LO (Lack of Objection).” (This letter is reprinted on the following pages.)

## STATE AGENCIES

The National Park Service contacted the Michigan state historic preservation officer in a letter dated February 16, 2006. The letter advised this office about the start of this planning process, asked for its involvement in the planning process, and solicited input on issues and concerns to be addressed by the plan. No written response was received. On March 27 and September 4–5, 2007, National Lakeshore managers met with representatives from the Michigan state historic preservation office to discuss the planning process and historic properties within the National Lakeshore.

A letter dated July 7, 2008, from Brian Conway, the state historic preservation officer (in the Michigan Department of History, Arts, and Libraries in Lansing, Michigan) provided comments on the draft plan (this letter is reprinted on the following pages). Mr. Conway stated that

Based on the information provided for our review, it is the opinion of the State Historic Preservation Officer (SHPO) that the preferred alternative identified in the GMP does not meet the criteria of adverse effect [36CFR section 800.5(a)(1)] and will have no adverse effect [36CFR section 800.5(b)] on

historic properties within the area of potential effects . . . .

The National Park Service contacted the Chief of the Coastal Zone Management Program (Michigan Department of Environmental Quality) in a letter dated May 9, 2006. This office responded with a letter on June 8, 2006. Lakeshore managers met with representatives from the Michigan Departments of Natural Resources and Environmental Quality on April 2, 2007, to discuss the planning process. The Michigan Coastal Zone Management Program was provided the opportunity to review and concur with the *General Management Plan / Wilderness Study / Environmental Impact Statement*.

A letter dated June 23, 2008, from the state Department of Environment Quality provided comments on the draft plan (this letter is reprinted on the following pages). This office stated

[W]e strongly support the Preferred Alternative . . . . The Preferred Alternative strikes a good balance between protecting sensitive coastal resources and providing ample opportunity for visitor access and recreation. Activities such as controlling invasive species, protecting open dune areas, restoring disturbed sites, and protecting threatened and endangered species are all consistent with the goals of the Coastal Management Program and the DEQ.

This office also noted that there were activities identified in the preferred alternative that will require state permits.

A letter dated June 9, 2008, from the state Department of Natural Resources provided comments on the draft plan (this letter is reprinted on the following pages). This office

supports the work of the NPS and their planning partners in the development of

the “Preferred Alternative,” and we endorse that recommendation. The preferred plan is the result of a planning process that demonstrated an impressive effort to engage the public and stakeholders.

## AMERICAN INDIAN TRIBES

The National Park Service contacted the following five American Indian tribal groups in a letter dated February 16, 2006: Bay Mills Indian Community, Grand Traverse Band of Ottawa and Chippewa Indians, Little River Band of Ottawa Indians, Little Traverse Bay Bands of Odawa Indians, and Sault Ste. Marie Tribe of Chippewa Indians. The NPS letter advised the tribes of the planning process, invited them to participate in planning, and inquired about the tribes’ potential interests and concerns as they relate to the planning effort. No written responses from the tribes were received. NPS staff placed follow-up phone calls to each tribal group on June 14 and July 13, 2006, to make sure the tribal groups received the letters and to ask if they had questions or wished to meet to discuss the planning effort.

On July 18, 2006, Lakeshore managers met with representatives of the Grand Traverse Band of Ottawa and Chippewa Indians to discuss the *General Management Plan / Wilderness Study / Environmental Impact Statement* and other matters of mutual interest. During that meeting, the Grand Traverse Band representatives explained that the other tribal groups had authorized them (Grand Traverse Band) to represent the other

tribal groups in the National Lakeshore’s planning process. On August 1, 2006, the National Park Service sent a letter to each of the five tribal groups summarizing the NPS understanding of this arrangement. In August 2006, the Grand Traverse Band reviewed the National Lakeshore’s draft interpretive themes and provided input to ensure that the statements appropriately reflect values and stories related to American Indian culture and affiliation with the National Lakeshore. Informal comments were received and incorporated. On March 16, 2007, the National Park Service sent a letter to the Grand Traverse Band and offered to present the preliminary alternatives and answer any questions. On April 10, National Lakeshore staff met with a representative from the Grand Traverse Band to present and discuss the preliminary alternatives. On May 14, 2007, the National Lakeshore received a comment letter from the Grand Traverse Band. The National Lakeshore provided clarification and response in a letter dated May 31, 2007, and requested a follow-up meeting to discuss the Grand Traverse Band’s comments in more detail. That meeting was held on June 7, 2007.

A letter dated June 18, 2008, from the Grand Traverse Band of Ottawa and Chippewa Indians provided comments on the draft plan (this letter is reprinted on the following pages). The tribe fundamentally supported the preferred alternative because it “provides a good mix of enjoyment opportunities to the public as well as resource protection,” although slight modifications were suggested. The tribe expressed interest in continued communication with NPS staff.

## **LIST OF AGENCIES OR ENTITIES RECEIVING A COPY OF THIS PLAN**

### **FEDERAL AGENCIES**

Advisory Council on Historic Preservation  
Federal Aviation Administration  
Isle Royale National Park  
Keweenaw National Historic Park  
Natural Resources Conservation Service  
Pictured Rocks National Lakeshore  
U.S. Army Corps of Engineers  
U.S. Bureau of Land Management  
U.S. Coast Guard  
U.S. Department of Agriculture, Forest Service  
U.S. Department of Labor – Occupational Safety and Health Administration  
U.S. Environmental Protection Agency  
U.S. Fish and Wildlife Service

### **AMERICAN INDIAN TRIBAL GOVERNMENTS**

Bay Mills Indian Community  
Grand Traverse Band of Ottawa and Chippewa Indians  
Hannahville-Potawatomi Indian Community  
Keweenaw Bay Indian Community  
Lac Vieux Desert Band of Lake Superior Chippewa Indians  
Little River Band of Ottawa Indians  
Little Traverse Bay Bands of Odawa Indians  
Nottawaseppi Huron Band of Potawatomi  
Pokagon Band of Potawatomi Indians  
Saginaw Chippewa Indian Tribe  
Sault Ste. Marie Tribe of Chippewa Indians

### **U.S. SENATORS AND REPRESENTATIVES**

Honorable Carl Levin, Senator  
Honorable Debbie Stabenow, Senator  
Honorable Dave Camp, House of Representatives  
Honorable Peter Hoeskstra, House of Representatives

Honorable David E. Bonior, House of Representatives  
Honorable Carolyn Cheeks Kilpatrick, House of Representatives  
Honorable John Conyers, Jr., House of Representatives  
Honorable Vernon J. Ehlers, House of Representatives  
Honorable Dale E. Kildee, House of Representatives  
Honorable Joe Knollenberg, House of Representatives  
Honorable Sandy Levin, House of Representatives  
Honorable Lynn N. Rivers, House of Representatives  
Honorable Mike Rogers, House of Representatives  
Honorable Nick Smith, House of Representatives  
Honorable Fred Upton, House of Representatives

### **STATE OFFICIALS, SENATORS, AND REPRESENTATIVES**

Honorable Jennifer M. Granholm, Governor  
State Representative David Palsrok  
State Senator Jason Allen  
State Senator Dan L. DeGrow  
State Senator Michelle McManus

### **STATE AGENCIES AND COMMISSIONS**

State of Michigan  
Coastal Management Program  
Cultural and Economic Development  
Department of Agriculture  
Department of Environmental Quality  
Department of History, Arts, and Libraries  
Department of Natural Resources  
Department of Transportation — Traverse City Transportation Service Center

Historian  
Historical Center  
Historic Preservation Office  
Natural Features Inventory  
Natural Resources Commission  
Water Resources Commission

## **REGIONAL, COUNTY, AND LOCAL GOVERNMENTS**

Almira Township  
Benzie Conservation District  
Benzie County Administrator  
Benzie County Clerk  
Benzie County Commissioners  
Benzie County Planning Commission  
Benzie County Sheriff's Office  
Benzie County Road Commission  
Benzie County Treasurer  
Benzie County Parks and Recreation  
Benzonia Township  
Bingham Township  
Blaine Township Hall  
Centerville Township  
Cleveland Township  
Colfax Township  
Crystal Lake Township  
Empire Township  
City of Frankfort  
Gilmore Township  
Glen Arbor Township  
Grand Traverse County  
Homestead Township  
Inland Township  
Joyfield Township  
Kasson Township  
Lake Township  
Leelanau Conservation District  
Leelanau County Administrator  
Leelanau County Clerk  
Leelanau County Commissioners  
Leelanau County Road Commission  
Leelanau County Sheriff's Department  
Leelanau County Planning Commission  
Leelanau County Treasurer  
Leelanau Township  
Manistee County Commission  
Metroparks of the Toledo Area

Northwest Michigan Council of Governments  
Northwest Michigan Regional Planning  
Platte Township  
Solon Township  
Spring Township  
Suttons Bay Township  
Village of Benzonia  
Village of Beulah  
Village of Elberta  
Village of Empire  
Village of Northport  
Weldon Township

## **ORGANIZATIONS, BUSINESSES, AND UNIVERSITIES**

AAA Michigan  
Advocates for Safe Drinking Water and Lakes  
Air Foundation  
Arts Council of Greater Grand Rapids  
Bay Area Transit Authority  
Benzie Area Historical Society  
Benzie Audubon Club  
Benzie County Chamber of Commerce  
Benzie Fishery Coalition  
Benzie Soil and Water Conservancy  
Campaign for America's Wilderness  
Cedar Rod & Gun Club  
Center for Biological Diversity  
Cherry Capitol Paddle America Club  
Citizen's Council of the Sleeping Bear Dunes  
Area  
Citizens for Access to the Lakeshore  
Citizens for Positive Planning  
Conservation Resource Alliance  
Crystal Lake Watershed Association  
Crystal Mountain  
Eastern National  
Empire Area Museum  
Empire Lions Club  
Frankfort-Elberta Chamber of Commerce  
Friends of Sleeping Bear Dunes  
Friends of the Crystal River  
George Wright Society  
Glen Arbor Art Association  
Glen Lake Chamber of Commerce  
Grand Traverse Audubon Club  
Grand Traverse Bay Watershed Initiative



Grand Traverse Conservancy  
Grand Traverse Convention and Visitors  
Bureau  
Grand Traverse Hiking Club  
Grand Valley State University  
Great Lakes Natural Resource Center  
Green Party  
Izaak Walton League  
Kalamazoo Nature Center  
Land Information Access Association  
Leelanau Chamber of Commerce  
Leelanau Conservancy  
Leelanau Democratic Party  
Leelanau Historical Society  
Leelanau Scenic Heritage Route  
Leelanau-Kohahna Foundation  
Manitou Islands Memorial Society  
Michigan Association of Builders  
Michigan Association of Realtors  
Michigan Audubon Society  
Michigan Chamber of Commerce  
Michigan Council of Hostelling International  
Michigan Environmental Council  
Michigan Historical Council  
Michigan Hotel, Motel, and Resort  
Association  
Michigan Land Use Institute  
Michigan Mountain Biking Association  
Michigan State University  
Michigan Technological University  
Michigan Travel Bureau  
Michigan United Conservancy  
MSU Cooperative Extension Service  
MSU Extension  
National Parks and Conservation Association  
Natural Resources Defense Council  
Northern Michigan Environmental Action  
Council  
Northwestern University  
Preserve Historic Sleeping Bear  
Public Employees for Environmental  
Responsibility  
Save Leelanau Farmland!  
Shielding Tree Nature Center  
Sierra Club  
Student Conservation Association  
The Biodiversity Project  
The Homestead  
The Nature Conservancy

The Wilderness Society  
Traverse City Chamber of Commerce  
Wayne State University  
West Michigan Environmental Action  
Council  
Western Land Exchange Project  
University of Arkansas  
University of Michigan  
University of Nebraska

## **LIBRARIES**

Alpena County Library  
Benzie Shores District Library  
Beulah Public Library  
Glen Lake Community Library  
Leelanau Township Library  
Leland Township Library  
Library of Michigan  
Suttons Bay Area Public Library  
Traverse City District Library

## **SCHOOL DISTRICTS**

Glen Lake School District  
Leelanau School  
Traverse Bay Area – Intermediate School  
District

## **HOMEOWNER'S ASSOCIATIONS**

Crystal Lake Association  
Glen Lake Association  
Homestead  
Little Platte Lake Association  
Little Traverse Lake Association  
Platte Lake Improvement Association  
Platte River Homeowner's Association

## **CONCESSIONERS AND IN-PARK BUSINESSES**

Blough Firewood  
Camp Leelanau-Kohahna  
Commission for the Blind

Crystal River Outfitters  
Manitou Island Transit  
Riverside Canoe Livery  
Trading Post

## **NEWSPAPERS AND MAGAZINES**

Albion Pleiad  
Ann Arbor News  
Antrim County News  
Benzie Record Patriot  
Booth Newspapers  
Cassopolis Vigilant/Edwardsburg Argus  
Central Michigan Life  
Chelsea Standard  
Chicago Sun-Times  
Compass Newspaper  
County Press  
Crains Detroit Business  
Crawford County Avalanche  
Daily Mining Report  
Daily News  
Daily Press  
Daily Reporter  
Daily Tribune  
Dearborn Press & Guide  
Detroit Free Press  
Detroit News  
Dowagiac Daily News  
Exponent  
Ferris State Torch  
Flint Journal  
Gazette  
George Weeks, Columnist  
Gladwin County Record  
Glen Arbor Sun  
Grand Haven Tribune  
Grand Rapids Press  
Grand Traverse Herald  
Grand Traverse News  
Grand Valley Lanthorn  
Herald-Palladium  
Holland Sentinel  
Houghton Lake Resorter  
Ironwood Daily Globe  
Kalamazoo Gazette  
Kalkaskian  
Lansing State Journal

Leelanau Enterprise  
Ludington Daily News  
Mackinac Town Crier  
Macomb Daily  
Manchester Enterprise  
Marlette Leader  
Metro Times  
Michigan Chronicle  
Midland Daily News  
Mining Journal  
Monroe Evening News  
Monroe Guardian  
Montmorency County Tribune  
News-Herald  
News-Sentinel  
Niles Daily Start  
Northern Express  
Northwoods Call  
Oakland Press  
Observer Eccentric  
Oceana's Herald-Journal  
Penasee Globe  
Pioneer Times  
P R Newswire  
Romeo Observer  
Saline Reporter  
Spinal Column Newsweekly  
State News  
Straitsland Resorter  
Student Movement – Andrews University  
Sturgis Journal  
The South End, Wayne State University  
The Technical, Kettering University  
Times Herald  
Town Meeting  
Travel & Outdoor  
Travel & Outdoor Features  
Traverse City Record Eagle  
Traverse—The Magazine  
View  
Voice News  
Ypsilanti Courier

## **RADIO AND TELEVISION STATIONS**

BNZ Radio  
Voice News  
Cadillac Evening News

CHAPTER 6: CONSULTATION AND COORDINATION

Community Calendar, TV

Evening News

Interlochen Public Radio

The Outdoor Network

WBKP

WFUM-Michigan Television – U of M

WGTU/WGTQ 29/8

WGVU

WILX

WJBK FOX-2

WKAR

WLNS NewsCenter 6

WLUC-TV 6

WNEM

WOOD TV 8

WOTV

WPBM-WTON TV 7 & 4

WTCM News

WWTV-WWUP 9 & 10

WZPX TV-43

WZZM TV-13

## COMMENTS ON, CHANGES TO, AND RESPONSES TO COMMENTS ON THE DRAFT PLAN

### COMMENTS ON THE DRAFT PLAN

The *Draft General Management Plan / Wilderness Study / Environmental Impact Statement* was made available for public review in mid April, 2008. The public comment period ended on June 15, 2008. A postcard announcing that the document would be available was sent to approximately 2,500 people. Following response to the postcard, the document was sent to about 700 individuals, organizations, agencies, and tribes. The draft document was also posted on the Web and distributed at meetings. Nearly 300 comments on the draft plan were received.

### KEY CHANGES TO THE PREFERRED ALTERNATIVE

In response to comments on the draft plan, the following key changes were made.

#### 1. *Changes in Inland Lake Boating*

The original text (pg. 54, second column of the draft plan, first full bullet on Inland Lake Use and Access) said

- Inland Lake Use and Access — Motorized boats would be allowed on School and Loon lakes. Motorized boats would no longer be allowed on Bass (Leelanau County) and North Bar lakes. Access for nonmotorized boats would be improved at a few inland lakes (locations to be determined).

The decision was made to no longer allow motorboats only on North Bar Lake (to improve visitor experiences for nonmotorized uses such as canoeing, kayaking, fishing, and swimming). Boats with electric motors would be allowed in the experience nature zone on

Bass Lake (Leelanau County), Tucker Lake, and Otter Lake to increase the range of visitor opportunities that are compatible with the intent of this zone.

Therefore, the revised text in this final plan (the bullet on Inland Lake Use and Access) now reads:

- Inland Lake Use and Access — Motorized boats would be allowed on School and Loon lakes. Motorized boats would no longer be allowed on North Bar Lake. Electric motors would be allowed in the experience nature zone on Bass Lake (Leelanau County), Tucker Lake, and Otter Lake. Access for boats would be improved at a few inland lakes (locations to be determined).

Changes were made in the appropriate places throughout the document (e.g., environmental consequences chapter) to reflect these changes.

#### 2. *Minor Change in Wilderness Proposal*

Based on public comment, the decision was made to exclude the Cottonwood Trail area from the wilderness proposed on the Sleeping Bear Plateau. The Cottonwood Trail area is one of three trails into the namesake dunes, and it is used by school and other groups of up to 100 people, which is not consistent with wilderness values.

Accordingly, the wilderness proposal for the preferred alternative was reduced to 32,100 acres or 45% of the National Lakeshore.

### 3. *Benzie Corridor Language*

Based on public comment, the word “purchase” was replaced with “acquire” for the language about lands in the Benzie Corridor (as shown below) to clarify that donation, easements, etc. would also be considered. (This same change was made in the no-action alternative and in alternatives B and C).

The National Park Service would continue to acquire lands within the Benzie Corridor on a willing-seller basis (subject to available funding) for future development of a scenic road and/or a bike/hike trail (determined and evaluated via a future study).

- question, with reasonable basis, the accuracy of information in the environmental impact statement
- question, with reasonable basis, the adequacy of the environmental analysis
- suggest different viable alternatives
- cause changes or revisions in the proposal

Comments in favor of or against the preferred or other alternatives, or comments that only agree or disagree with NPS policy, are not considered substantive.

Although the planning team is obligated only to respond to substantive comments, it has also responded to selected nonsubstantive comments for various reasons (e.g., politics, numbers of people responding, and the need to clarify the agency position).

### 4. *Table 3*

The Shalda Cabin in the preferred alternative was changed from the experience nature zone to the recreation zone (to be consistent with the 7th bullet under recreation zone in appendix D). The Kraitz Cabin was removed from table 3 completely because it has not yet been determined eligible for the national register. The “Lyle Schmidt Barn (1)” was changed to the “Lyle Schmidt Farm (3)” to reflect the actual number of structures there. Accordingly, corresponding figures in the table and in other locations throughout the document were updated.

Letters, Web comments, e-mails, and meeting transcripts are a part of the project administrative record.

On the following pages, first the comments from organizations and individuals and NPS responses are presented. These are organized by topic, such as access, Benzie Corridor, etc. Following that are reproductions of comment letters from agencies and organizations, with substantive comments bracketed and NPS responses provided.

## RESPONSES TO COMMENTS ON THE DRAFT PLAN

Letters and Web comments from federal and state agencies and from tribes are reprinted in full, along with NPS responses to substantive comments. Other substantive comments (from organizations and individuals) are paraphrased, and NPS responses are provided. Comments are substantive if they do the following:

### Access

**COMMENT:** Make existing NPS facilities more accessible to visitors with mobility impairments.

**RESPONSE:** In all development planning, the National Lakeshore considers ways to provide opportunities for visitors with limited mobility. Developments proposed in the near future at Glen Haven include improved parking, picnicking, and beach access facilities, and these facilities will be

accessible to those with disabilities. The National Park Service strives to maintain a balance between development and resource protection. Accessible picnic areas are found at the Platte River picnic area, along the Pierce Stocking Scenic Drive, and at the County Road 669 and 651 road ends. The Platte River campground is fully accessible, and the more rustic D.H. Day campground is accessible with assistance. Please refer to the “Accessibility to the National Lakeshore” subheading under the “Desired Conditions and Strategies” heading in chapter 1.

**COMMENT:** Share information regarding improvements to Tiesma Road and associated lakeshore access.

**RESPONSE:** The *General Management Plan* alternatives include no specific plans or proposals to improve Tiesma Road or associated access; however, the preferred alternative calls for Tiesma Road to remain open and allows for improvements to be made.

### **Benzie Corridor**

**COMMENT:** The National Lakeshore’s establishing legislation (Public Law 91-479) allows for a scenic road along the Benzie Corridor, but not for a hike/bike trail.

**RESPONSE:** Congressional action would be needed to allow for either removal of the Benzie Corridor (as in alternative A) or development of a hike/bike trail alone (alternative C). Congressional action may be needed to implement the preferred alternative if a scenic road is not included in the ultimate decision.

**COMMENT:** The National Park Service should consider multiple means of acquisition within the Benzie Corridor other than purchase in fee simple, such as donations and easements. The National

Park Service should also consider partnerships as a means of providing public access within or to the corridor.

**RESPONSE:** In the preferred and no-action alternatives, and alternatives B and C, the term “purchase” has been changed to “acquire” in the final plan, to clarify that acquisition of less-than-fee interest (e.g., easements), as well as other means of acquisition, such as donation, would be considered by the National Park Service. Property within the Benzie Corridor would be acquired only from willing sellers.

### **Boundary Adjustments**

**COMMENT:** North Fox Island and South Fox Island should be added to the National Lakeshore.

**RESPONSE:** As part of the GMP process, the planning team assessed the Fox Islands as a potential addition to the National Lakeshore boundary (see appendix B) and concluded that these islands do not meet NPS criteria for boundary adjustments.

### **Historic Resources**

**COMMENT:** Historic properties within designated wilderness will end up receiving less preservation treatment than those outside wilderness. Historic properties located in management zones other than the experience history zone will not be adequately preserved.

**RESPONSE:** All alternatives in the *Draft General Management Plan / Wilderness Study* specify preservation of all historic properties regardless of management zone or proposed wilderness.

NPS management policies for wilderness preservation and management are outlined in chapter 6 of *NPS Management Policies 2006*. Section 6.3.8, “Cultural Resources,” states that “cultural resources that have

been included within wilderness will be protected and maintained according to the pertinent laws and policies governing cultural resources using management methods that are consistent with the preservation of wilderness character and values. These laws include the Antiquities Act and the Historic Sites, Buildings and Antiquities Act, as well as subsequent historic preservation legislation, including the National Historic Preservation Act, the Archaeological Resources Protection Act, and the Native American Graves Protection and Repatriation Act.”

Historic properties within proposed wilderness at the National Lakeshore are to be maintained in keeping with wilderness principles that limit the use of wheeled vehicles and motorized equipment to only those instances where they are the minimum tool necessary to accomplish the desired preservation goal. The National Lakeshore staff has already been successfully preserving historic structures in proposed wilderness for many years, and will continue to do so. The minimum tool requirement occasionally makes preservation maintenance less convenient, but this does not mean the properties receive a lesser degree of preservation treatment. See the “Resource Management and Research” subheading under the “Implications of Managing Lands Proposed for Wilderness” heading in chapter 3.

As outlined in the introduction to the “Management Zones” heading of chapter 2, in every management zone the National Lakeshore intends to preserve and protect natural and cultural resources to the greatest extent possible given available funds. The experience history zone does not confer a higher priority for preservation treatment of structures compared to other zones. It does, however, contain some of the highest priority

resources — those identified as fundamental resources.

**COMMENT:** Three structures in the Glen Haven Village Historic District need to be reevaluated for their eligibility for the national register.

**RESPONSE:** There are three structures in Glen Haven (Wickland House, Dean House, and Rude Garage) that have been reviewed and determined ineligible for the National Register of Historic Places (that is, they are nonhistoric). The Michigan state historic preservation officer has written to the National Lakeshore suggesting that these structures be reevaluated before any actions on them are undertaken. The National Lakeshore staff plans to do so.

**COMMENT:** The “Prominent Historical Resources Base Map” in chapter 4 has omissions, including the Newhall cottage and shed, the Lake Manitou privy and bathhouse, and Beuham orchard on North Manitou Island; the Minger Cabin near School Lake; the D.H. Day cultural landscape; certain archeological sites; and the Empire Air Base housing.

**RESPONSE:** The map of historic resources was not intended to be an exhaustive depiction of all such resources — simply the most prominent ones. As such, there are several historic resources not shown on the map. As for the specific historic structures and landscapes listed in the comment, although the National Lakeshore continues to preserve them in the interim, formal determinations of eligibility have yet to be made. Archeological sites are not generally shown on NPS maps due to their sensitivity, fragile nature, and the potential for vandalism or looting.

**COMMENT:** The footnote in “Table 3: Range of Treatment for Historic Properties under the Alternatives,” indicates that the list in the table shows buildings, but does not include landscape features such as fence rows, cemeteries, sidewalks, etc. They should be included because the footnote also says that all landscapes are preserved.

**RESPONSE:** All historic features, from fence rows to buildings, are to be preserved. The intent of table 3 was to respond to this concern by comparing the range of possible treatments for the buildings across the alternatives. The range of treatments for landscapes associated with the buildings is the same as shown for the buildings. All cultural landscape features are to be preserved.

**COMMENT:** In chapter 2, table 3, the number in parentheses in some cases does not match the actual number of structures that exists in a district.

**RESPONSE:** The table 3 numbers for Lyle Schmidt Farm have been corrected in the final plan. The table reflects structures that have been determined eligible for the national register. There are other potentially eligible resources for which formal determinations of eligibility have yet to be made; these are not shown.

**COMMENT:** Why isn’t the “Historic Properties Management Plan” mentioned under the chapter 1 heading “Relationship of the General Management Plan to Other Planning Efforts”?

**RESPONSE:** The “Draft Historic Properties Management Plan” was placed on hold in 1999. Following completion of the *General Management Plan*, it may be appropriate to resume it. The “Relationship of the General Management Plan to Other Planning Efforts” discussion addresses only planning efforts that have been completed or are currently underway.

**COMMENT:** It is not appropriate to specify, by management zone, a range of treatment for historic structures.

**RESPONSE:** NPS *Management Policies 2006* indicate that it is, in fact, appropriate to specify particular treatments or ranges of treatments for historic properties by management zone: “Delineation of management zones will illustrate where there are differences in intended resource conditions, visitor experiences, and management activities” (section 2.3.1.2). “Decisions regarding which treatments will best ensure the preservation and public enjoyment of particular cultural resources will be reached through the planning and compliance process . . .” (section 5.3.5). “The relative importance and relationship of all values will be weighed to identify potential conflicts between and among resource preservation goals, park management and operation goals, and park user goals. Conflicts will be considered and resolved through the planning process . . .” (section 5.3.5).

## Management Zones

**COMMENT:** There’s an error in the maps for the action alternatives. The orange recreation zone strip around the islands and mainland should be the darker orange (for water), not the lighter (for land).

**RESPONSE:** In the final plan, the colors have been corrected to match the legend as suggested. For graphic simplicity, the thin strip of active Lake Michigan beach area, which is part of this recreation zone, has not been shown separately.

## Natural Resources

**COMMENT:** Applying the recreation zone to all Lake Michigan beaches in the National Lakeshore threatens fragile beach landscapes, endangered species, and habitats adjacent to them.



**RESPONSE:** The recreation zoning of Lake Michigan beaches reflects the NPS intent to continue to allow recreational motorboat access within the 0.25 mile of Lake Michigan waters within the National Lakeshore boundary. The recreation zone would be applied to active Lake Michigan beach areas, which are essentially bare sand areas that are washed by waves, but not the adjacent foredune. By their very nature, active beaches lack stabilizing vegetation and are not vulnerable to formation of lasting informal trails. With the exception of steep bluff slopes, these are the same resilient sand areas commonly used by visitors for sunbathing, sand play, and beach strolling. The National Lakeshore has a demonstrated history of protecting nesting piping plovers and their critical habitat in these areas in consultation with the U.S. Fish and Wildlife Service.

**COMMENT:** Dredging of the Platte River (discussed in chapter 5 under the "Cumulative Impacts" heading) should be stopped altogether because the impacts of dredging are not consistent with the purpose of the National Lakeshore.

**RESPONSE:** The question of whether dredging of the Platte River mouth (for recreational motorboat access) should be continued is closely related to the question of whether a new boat ramp should be developed within the high use zone near the mouth of the Platte River. The purpose of the dredging is to provide recreational boating and fishing access to Lake Michigan in September during the salmon run. As stated in the preferred alternative, a separate environmental impact statement would be needed to determine whether there may be alternatives for providing this access in a way that lessens impacts to resources and visitors' experiences. Such a study would consider a number of alternatives, and the environmental, safety, visitor opportunity, and other impacts of

implementing those alternatives. Cessation of dredging would likely be a component of one or more of these alternatives. The National Park Service will not make a decision on this topic until such a study, conducted with opportunities for public input, is completed.

**COMMENT:** The preferred alternative's proposal to improve the Glen Lake picnic area (to facilitate beach and picnic use) would have natural resource impacts. Examples include impacts to nesting geese, siting a well and septic system, and compliance with state environmental and other regulations.

**RESPONSE:** The impacts of improving the Glen Lake picnic area have been considered broadly in chapter 5 of this *General Management Plan / Wilderness Study / Environmental Impact Statement*. Specific design details for improvements would be developed subsequent to this *General Management Plan*. Potential impacts on wildlife and other natural and cultural resources would be considered in more detail during the design phase. Facility improvements would comply with state and other applicable regulations.

**COMMENT:** There would be serious impacts associated with a boat launch on Platte Bay, including impacts to Pitcher's thistle and piping plover.

**RESPONSE:** Potential impacts from development of a boat launch facility on Platte Bay would be thoroughly analyzed in an environmental impact statement prior to any such project. This analysis would include consultation with other agencies as appropriate, including the U.S. Fish and Wildlife Service regarding potential impacts to threatened and endangered species and critical habitat.

**COMMENT:** The preferred alternative's proposal for improvements to Esch Beach

parking would have undesirable impacts. Examples include potential changes to the area's character, natural resource impacts, and increased use.

**RESPONSE:** Currently, parking at Esch Beach takes place on road shoulders within the county road right-of-way. This parking results in congestion, resource damage, safety concerns, and difficult access to the beach for visitors and emergency vehicles. Improvements to Esch Beach parking have yet to be designed, but would be developed in consultation with the county and would address these issues while minimizing resource impacts. Slight changes to the area's character may result, but mitigation measures would be taken to minimize such changes. Improvements would be designed to better accommodate existing levels of frequently recurring use, not peak use. The facilities would not create more demand, but would help address current demand. However, the National Park Service does not control county road rights-of-way, so parking could occur along road shoulders even after improvements are made. Increased use may occur regardless of NPS actions.

## Planning Foundation

**COMMENT:** Suggestions were made either to include cultural resources in the National Lakeshore's purpose statement, or to list the NPS Organic Act (which mentions preservation of historic resources) in or directly under the purpose statement in the plan. It was also suggested that not including cultural resources in the National Lakeshore's purpose statement jeopardizes the National Lakeshore's ability to compete for funding to preserve cultural resources.

**RESPONSE:** A park unit's purpose statement, simply stated, is the reason a specific park was designated by Congress. The purpose of Sleeping Bear Dunes National Lakeshore was clearly specified by

Congress in the 1970 legislation that established the National Lakeshore; that purpose does not include cultural resources.

A park unit's purpose statement does not replace or lessen the impact of the National Park Service's mission. Rather, it focuses the agency's management role at a particular park unit. (The focus of management is different at Carlsbad Caverns National Park than at Gettysburg National Military Park, for example.) A park's purpose statement also does not permit the National Park Service to ignore the requirements of federal legislation, such as the NPS Organic Act, National Historic Preservation Act, the Archeological Resources Protection Act, or the Native American Graves Protection and Repatriation Act. The National Lakeshore's cultural resources are protected by these laws, and by the *General Management Plan's* specifically stated intent to preserve them.

Adding cultural resources to the National Lakeshore's purpose would offer no additional protection or funding for cultural resources beyond what is currently provided. The National Lakeshore has competed successfully for cultural resource preservation funding despite the fact that neither the enabling legislation for the National Lakeshore nor the existing *General Management Plan* list cultural resources as part of the National Lakeshore's purpose. There is no reason to expect this to change.

The NPS Organic Act is prominently stated in the "Servicewide Laws and Policies" heading of chapter 1. In addition, the relationship between the National Lakeshore's purpose and the NPS Organic Act has been clarified in the introductory paragraph of the "Purpose" section earlier in chapter 1.

**COMMENT:** The planning team created the definition of “fundamental resources and values.” The term and the list of fundamental resources and values were not vetted with the public.

**RESPONSE:** The planning team used the National Park Service's agency-wide definition of fundamental resources and values. The *NPS General Management Planning Dynamic Sourcebook* defines fundamental resources and values as “features, systems, processes, experiences, stories, scenes, sounds, smells, or other attributes determined to warrant primary consideration during planning and management because they are critical to achieving the park’s purpose and maintaining its significance.”

*Newsletter #2* (published in May 2006) presented the draft foundation for planning and management, which included the definition of fundamental resources and values and a list of fundamental resources and values for Sleeping Bear Dunes National Lakeshore. The public was encouraged to read and comment on this newsletter. *Newsletters #3* and *#4* also made reference to fundamental National Lakeshore resources and these newsletters were made available for public review. After reviewing all of the public comments received in response to the newsletters, the planning team found no compelling reason to modify the list of resources (natural, cultural, and recreational) identified as fundamental.

**COMMENT:** The National Lakeshore's list of fundamental resources and values should be expanded to include more of the National Lakeshores resources, particularly its cultural resources.

**RESPONSE:** The following excerpt from the *NPS General Management Planning Dynamic Sourcebook* (2008) explains why the National Lakeshore’s list of

fundamental resources and values is not more comprehensive:

Park managers are continually challenged to set priorities and allocate limited funding and staffing to adequately protect what is most important about a park while at the same time complying with the full array of legislative mandates, laws, and policies that cover all park resources and values. . . . In identifying the fundamental resources and values deserving primary consideration during planning and management, restraint is critical. The resulting list is useful only if it focuses on those relatively few things that are so important that they should be the preeminent considerations in all park planning and decision making. The list of resources and values should not be interpreted as everything that is important about the park, or even everything that is nationally significant. It should be a relatively short list of resources or values considered to be critical to achieving the park's purpose and maintaining its significance. Identifying fundamental resources and values helps ensure that planning is focused on what is truly most significant about the park. It creates a tool that park managers and staffs can use to focus planning and management on highly significant resources and values and ensure that all the resources and values warranting preeminent consideration are adequately protected.

Although a few people suggested that ALL cultural resources should be shown as fundamental, this would defeat the purpose outlined above. If all resources are fundamental, it would be very difficult for a manager to prioritize during times of scarce funding.

## Planning Process, Law, and Policy

**COMMENT:** All four action alternatives place the Lake Michigan beaches in the recreation zone; why isn't there more diversity in terms of zoning these beaches?

**RESPONSE:** Many areas within the National Lakeshore are zoned identically across all action alternatives. In this case, the recreation zoning of Lake Michigan beaches reflects the NPS intent to continue to allow recreational motorboat access within the 0.25 mile of Lake Michigan waters within the National Lakeshore boundary. The recreation zone would be applied to active Lake Michigan beach areas, which are essentially bare sand areas that are washed by waves, but not the adjacent foredune. Because boat access from the water to the beaches is not causing any appreciable environmental impacts, and it would be extremely difficult to enforce a "no-beaching" rule, extending the recreational zoning established for the waters of Lake Michigan to the beaches themselves, allows this use to continue.

**COMMENT:** An asset management plan (mentioned in the "Implementation of the General Management Plan" discussion in chapter 2) provides a vehicle for NPS management to reverse decisions made in the *General Management Plan*, especially with regard to preservation of historic structures.

**RESPONSE:** Asset management plans follow the direction given in general management plans; they do not reverse it.

The National Park Service defines assets as physical structures or groupings of structures, land features, or other tangible properties having a specific service or function. Examples include roads, trails, buildings, and utility systems.

The NPS asset management program is designed to address several key questions:

- What assets does the park own?
- What is the condition of each asset?
- What is the current replacement value of each asset?
- What is required to properly sustain the assets over time?
- What assets are the highest priorities relative to the park mission, and where should a park focus resources?

Properly caring for assets throughout their useful life cycle saves resources in the long run. Asset management practices help parks clearly prioritize, reduce, and manage deferred maintenance; improve the overall condition of assets; better predict and justify future budget requests; anticipate maintenance needs; plan accordingly; and fix problems before they become expensive emergencies.

**COMMENT:** The Port Oneida Rural Historic District needs its own management plan within the preferred GMP alternative.

**RESPONSE:** Ideally, Port Oneida would have a comprehensive management plan, one of many such plans needed for the National Lakeshore. Such a plan would be consistent with the management direction in the approved *General Management Plan*. Some decisions have been made regarding Port Oneida already. For example, the *Port Oneida Rural Historic District Environmental Assessment* was completed, and a "Finding of No Significant Impact" was signed in June 2008. However, this environmental assessment only described and analyzed alternative locations for a visitor contact station and employee housing, alternative means of improving visitor access, and ways to interpret Port Oneida resources (see the chapter 1 heading "Relationship of the General Management Plan to Other Planning Efforts"). A cultural landscape management plan / environmental assessment for Port Oneida is also underway.

**COMMENT:** The plan should include “safe, off road parking at M-22 and the Platte River” because such had been proposed by the National Park Service in the past and the funds were appropriated by Congress to do so.

**RESPONSE:** The 1979 *General Management Plan* stated that the long-range goal for this area was to provide one canoe livery (operated under a concession contract), with picnic facilities and a central parking area IF the private properties at that intersection became available for acquisition. However, the National Park Service did not acquire all the properties. The 1992 *Platte River Management Plan* referenced the 1979 plan and called for “appropriate parking and safe access for visitors” desiring to use a canoe livery. The National Park Service subsequently addressed this in the 1990s by constructing a 42-car parking area at the Platte River picnic area and a pedestrian bridge for visitors to access Riverside Canoe Livery services. During the peak season (generally July and August), a congestion problem remains because the livery’s customers and employees park along county roads, including Birch Trail across the busy highway from the livery.

The 1999 Senate Report 105-227 contained language regarding appropriations toward mitigating a safety hazard associated with parking and access to the canoe livery, consistent with the *Platte River Management Plan*. The language in the report regarding the safety hazard was adopted into the Conference Report, but was not included in the appropriations bill. A fundamental rule of federal appropriations is that restrictions on lump sum appropriations that appear only in the legislative history of an appropriations act (such as the Conference Report) do not bind the agency on its spending of lump-sum appropriated funds. Because the provision for the parking lot does not appear in any appropriations act for the Department of

the Interior, the National Park Service is not required to use its discretionary funds to build a parking lot.

Parking for National Lakeshore visitors is currently available. Parking congestion during the roughly two months of peak use at the junction of M-22 and the Platte River is a direct result of customers and employees of the canoe livery. The National Park Service is not categorically opposed to the construction of a parking lot for use by visitors who use the canoe livery services. To build a parking lot, there must be a legal mechanism, such as a concession contract, that would enable this use of National Lakeshore lands.

**COMMENT:** Motorized boats must be allowed on Loon Lake because inland lakes are under the state of Michigan's legal jurisdiction.

**RESPONSE:** Motorized boats are allowed on Loon Lake in every alternative.

## Visitor Opportunities

**COMMENT:** Provide more bicycle opportunities in the National Lakeshore for both mountain bikes and road bikes. Provide a mountain bike area (such as Burnham Woods). Use a park trail near Otter Creek as a connector to county roads, creating a bicycle route from the Platte River campground to Empire. Add bike trails and bike concessions on the islands.

**RESPONSE:** Placing Burnham Woods in the recreation zone in the preferred alternative allows consideration of future use of this area by mountain bikes, pending planning and environmental analysis. The hiking trail south of Otter Creek Road (South Aral Road) is in an area zoned experience nature and proposed for wilderness in the preferred alternative. Allowing bicycles on this hiking trail west of Otter Lake would

negatively affect wilderness values. The M-22/M-109 hike/bike trail referred to in the preferred alternative would provide the desired connection between county roads. Currently, bicyclists can make the connection by accessing M-22 between Trails End and Esch Road. Most of North Manitou Island is proposed as wilderness, there are no county roads, and bicycling would not be allowed. Bicycles are permitted on county roads, including those on South Manitou Island, but there are no plans to develop a bicycle trail or concession operation on South Manitou Island.

**COMMENT:** The National Park Service should provide additional equestrian trails in the National Lakeshore.

**RESPONSE:** Equestrian use is currently allowed within the National Lakeshore on the Alligator Hill trail system and along state and county road rights-of-way. All of the *General Management Plan / Wilderness Study's* management zones (especially the recreation zone and experience nature zone) would allow for future consideration of additional horse trails, although none are specifically proposed in the preferred alternative. Wilderness proposal/designation does not preclude horse trails. Any future trail proposals would be subject to analysis of environmental impacts, per the National Environmental Policy Act of 1969.

**COMMENT:** The National Park Service's pet policy at the National Lakeshore should be changed.

**RESPONSE:** The pet policy is not a component of the *General Management Plan / Wilderness Study*; however, it is addressed in the "Superintendent's Compendium," which is a list of designations, closures, permit requirements, and other restrictions imposed under the discretionary authority of the park superintendent, as provided for in Title 36 of the *Code of Federal*

*Regulations*. The "Superintendent's Compendium" can be accessed via the National Lakeshore's website ([www.nps.gov/slbe](http://www.nps.gov/slbe)).

**COMMENT:** Designate a portion of the Lake Michigan beach as a "clothing optional" area.

**RESPONSE:** Michigan Penal Code 750.335a prohibits indecent exposure, which includes public nudity. It would therefore be inappropriate for the National Lakeshore to designate a "clothing optional" area.

**COMMENT:** Recreational hunting has no place at the National Lakeshore.

**RESPONSE:** The law that established the National Lakeshore in 1970 (Public Law 91-479) specifically permits hunting within the National Lakeshore (see "Special Mandates" discussion of chapter 1).

**COMMENT:** Noise impacts were not considered in the document. Noise levels (especially from trucks and motorcycles) are increasing, and this is affecting wildlife and recreational enjoyment. Are there any noise level regulations in the National Lakeshore?

**RESPONSE:** Impacts related to noise are analyzed for each of the alternatives in "Chapter 5: Environmental Consequences" under the "Visitor Opportunities and Use" heading, "Visitor Opportunities" subheading (reference natural sounds) and the "Natural Resources" heading, "Vegetation and Wildlife" subheading (reference sensory-based disturbance).

Most roads in the National Lakeshore are rights-of-way that are controlled by the Leelanau County and Benzie County road commissions; however, NPS regulations still apply. Title 36 of the *Code of Federal Regulations* (section 2.12) prohibits noise

exceeding 60 decibels, or making a noise that is unreasonable considering the nature and purpose of the actor's conduct, location, time of day or night, purpose for which the park was established, impact on park users, and other factors that would govern the conduct of a reasonably prudent person under the circumstances. Park rangers have the authority to enforce this regulation and do so as needed.

**COMMENT:** Consider allowing electric motors on all lakes.

**RESPONSE:** The preferred alternative has been revised to allow electric motors on Bass Lake (Leelanau County), Tucker Lake, and Otter Lake. A few lakes remain completely nonmotorized.

**COMMENT:** Provide visitor center services in the North district/Port Oneida area or Leland.

**RESPONSE:** Visitor services will be provided in Port Oneida (see "Port Oneida Rural Historic District Environmental Assessment" subheading of the "Relationship of the General Management Plan to Other Planning Efforts" heading in chapter 1 of this document).

## Wilderness

**COMMENT:** How and when did portions of the National Lakeshore come to be managed "so as to maintain their presently existing wilderness character"?

**RESPONSE:** Information about the legislative direction for wilderness studies and wilderness management at Sleeping Bear Dunes National Lakeshore is provided in chapter 1 under the "Purpose and Need for the Wilderness Study," discussion and in "Chapter 3: Wilderness Study and Proposal."

**COMMENT:** Some areas should not be included in the preferred alternative's wilderness proposal because they are routinely used by large school groups and guided tours.

**RESPONSE:** The preferred alternative's wilderness proposal was revised to remove the Cottonwood Trail to allow continued use by large groups without compromising solitude within designated wilderness. The Cottonwood Trail provides an opportunity for large groups to experience one of the National Lakeshore's fundamental resources, the namesake Sleeping Bear Dunes. Other areas either duplicate this opportunity or are not routinely needed by rangers for large group tours.

**COMMENT:** Networks of small roads used by motorized vehicles (including off-road vehicles and snowmobiles) contribute to trail damage, litter, and a decreased nature experience, and they seem incompatible with wilderness.

**RESPONSE:** For clarification, in the preferred alternative, all developed county road rights-of-way are excluded from wilderness. Off-road vehicles, including snowmobiles, are allowed only on county road rights-of-way and the shoulders of state highways. The National Lakeshore works with the county road commissions to minimize resource and visitor impacts associated with county roads. In developing the wilderness proposals associated with the various alternatives, the planning team considered what effect keeping the roads open and out of wilderness would have on the wilderness values and character of adjacent lands. Because some of the area proposed as wilderness in 1981 would be broken into small parcels surrounded by roads, the preferred alternative proposes about 600 fewer acres for wilderness (the area south of Trails End Road and east of Lasso/Peterson roads, and the area between Peterson and Tiesma roads) than the 1981 recommendation.

Chapter 5 considers impacts on wilderness character.

**COMMENT:** Congress would not be able to designate wilderness in the Bass Lake and Otter Lake areas (Benzie County) because these areas have county roads, docks, picnic tables, and restroom facilities.

**RESPONSE:** Neither Otter and Bass Lakes (Benzie County) nor the Trails End developed area is proposed for wilderness in any action alternative. In the no-action alternative, the lakes themselves are in proposed wilderness but the roads and facilities are not. In the preferred alternative, the proposed wilderness would be located west of these lakes. (See Preferred Alternative map).

### Other

**COMMENT:** The impact analysis of the management zoning for the M-22/M-109 hike/bike trail should include condemnation of adjacent private property; landform constraints on siting the hike/bike trail; and impacts to safety, property values, and vegetative buffers.

**RESPONSE:** A “Trailway Plan and Environmental Assessment” is being prepared to analyze a range of alternatives within Leelanau County for providing a nonmotorized hike/bike trail that is separate from the road surface. That plan, scheduled for release in the near future, is separate from this GMP/WS planning process, and will examine likely impacts of the hike/bike trail in more detail.

It is anticipated that the trail would be located entirely on either federal land within the National Lakeshore, on state highway rights-of-way, or (in a few cases) on county road rights-of-way. The trail would be sited within the state highway right of way in areas where private land abuts the highway corridor.

Planning for the trail in Benzie County has not been initiated. However, the *Draft General Management Plan / Wilderness Study* includes management zoning that would accommodate the hike/bike trail in both Benzie and Leelanau counties.

Placement of the high use zone in the GMP/WS alternatives in no way implies acquisition of private lands for the hike/bike trail. This point has been clarified in “Appendix D: Development of the Preferred Alternative.” The National Park Service does not control state or county road rights-of-way within the National Lakeshore. The National Park Service also recognizes private inholdings and other valid existing rights, and the management zones shown on the alternative maps are not intended to imply otherwise.

**COMMENT:** Consideration of a Lake Michigan boat access in the high use zone near Platte Point should be made more assertively in the preferred alternative.

**RESPONSE:** A decision on whether a new boat ramp should be developed within the high use zone near the mouth of the Platte River is likely to be complicated and controversial. As stated in the preferred alternative, a separate environmental impact statement would be needed to determine whether any such facility would be appropriate in this area. Such a study would consider a number of alternatives (including a no-action alternative) and the environmental, safety, visitor opportunity, and other impacts of implementing those alternatives. The National Park Service will not make a decision on this topic until such a study, conducted with opportunities for public input, is completed.

**COMMENT:** A Lake Michigan boat access in the high use zone near Platte Point would have undesirable environmental impacts.



**RESPONSE:** See the response immediately above.

**COMMENT:** Over-building the parking area at Esch Beach could result in more use and watershed problems.

**RESPONSE:** The preferred alternative places the Esch Beach parking area out of proposed wilderness and in the recreation zone, and proposes improvements at this site. If the scale of the developments eventually proposed have the potential for significant impacts, these would have to be assessed in a planning document with the input of the public. Please also see the comment and response about Esch Beach under the “Natural Resources” topic.

**COMMENT:** National Lakeshore use of sustainable technologies (wind and solar

power, alternative fuels transportation, etc.) should be part of the preferred alternative.

**RESPONSE:** Sustainability of NPS operations and facilities is a National Lakeshore-wide goal. The GMP/WS alternatives do not differ with regard to this goal. This topic is addressed in the chapter 1 “Desired Conditions and Strategies” heading, under the “Facilities and Services” subheading.

**COMMENT:** The National Park Service should collaborate with nearby counties on “The Grand Vision,” a regional traffic and land use study.

**RESPONSE:** The National Park Service has been participating in “The Grand Vision” effort, attending meetings and workshops and providing input.



United States Department of the Interior

FISH AND WILDLIFE SERVICE  
East Lansing Field Office (ES)  
2651 Coolidge Road, Suite 101  
East Lansing, Michigan 48823-6316

IN REPLY REFER TO:

June 16, 2008

Ms. Dusty Shultz, Superintendent  
National Park Service  
Sleeping Bear Dunes National Lakeshore  
9922 Front Street (Hwy M-72)  
Empire, Michigan 49630

Subject: Request for consultation under section 7 of the Endangered Species Act  
for the General Management Plan for Sleeping Bear Dunes National  
Lakeshore, Leelanau and Benzie Counties, Michigan.

Dear Ms. Shultz:

We have received your April 8, 2008 letter and Draft General Management Plan (GMP)/Wilderness Study/Environmental Impact Statement (EIS) requesting consultation under section 7 of the Endangered Species Act of 1973, as amended, for the Sleeping Bear Dunes National Lakeshore (SBDNL). Leelanau and Benzie Counties, Michigan. According to your letter, the GMP provides an overall decision-making framework for long-term management direction for the next twenty years. Your preferred alternative, described on pages 52 to 55 in the GMP, values the Lakeshore primarily for preservation of natural resources and for opportunities for visitor enjoyment of natural, cultural and recreational resources. It also includes a proposal to designate 32,200 acres as wilderness. The preferred alternative was considered the proposed action for purposes of this consultation.

Your EIS addresses potential effects of the proposed action on the Pitcher's thistle (*Cirsium pitcheri*), Michigan monkey flower (*Mimulus glabratus* var. *Michiganiensis*), piping plover (*Charadrius melodus*) and piping plover critical habitat. We concur that these are the only federally listed threatened or endangered species or critical habitat that are currently known to occur within the action area. The potential range of the Indiana bat (*Myotis sodalis*) may extend into portions of Leelanau and Benzie Counties, but there are no known records of this species within the Lakeshore. As a result, you dismissed Indiana bat from further analysis in your EIS.

## COMMENTS

## RESPONSES

Ms. Dusty Schultz

2

Pitcher's thistle, piping plover and piping plover critical habitat occur in association with near-shore dunes and beach areas at various locations within the Lakeshore, including sites on North Manitou Island. Michigan monkey flower, in contrast, is restricted in distribution to one lakeside location within the Lakeshore interior. Your analysis assumes continued protection of threatened and endangered species within the Lakeshore, as outlined in the desired condition statements in the GMP.

For projects proposed under the preferred alternative, the GMP indicates you will implement measures to ensure there will be no adverse effects on listed species. These include:

- Safeguarding the known locations of listed species
- Restricting human activity in piping plover breeding areas by use of specialized fencing
- Increasing the number of NPS/volunteer piping plover nest monitors, should conditions warrant
- Restricting human activity in piping plover breeding areas
- Restricting dogs from piping plover breeding areas during the breeding season
- Flagging or fencing plants prior to any work in or adjacent to Pitcher's thistle habitat
- Providing education about the listed species and their habitat
- Designating alternative access points away from areas occupied by listed species.

Given these measures, you have indicated that NPS cannot foresee at any time, any project proposed in the GMP for which adverse effects could not be avoided. In the event adverse effects cannot be avoided you have indicated that you will discontinue the project or request formal consultation with our office. In addition, you have indicated the preferred alternative includes a 3% increase in areas managed as wilderness. The increase in wilderness area may benefit listed species within the Lakeshore, although you have indicated the benefit may not be significant due to the current management practices already underway at the Lakeshore.

Based on information provided in the EIS, including the measures described above, we concur with your determination that the proposed preferred alternative may affect but not likely adversely affect Pitcher's thistle, Michigan monkey flower, piping plover or piping plover critical habitat. Effects of the proposed alternative are considered insignificant, discountable or beneficial.

This precludes the need for further action on this project as required under section 7 of the Act. If, however, project plans change, elements of the preferred alternative are modified, or new information becomes available that indicates listed or proposed species may be affected by any actions proposed under the preferred alternative, you should reinitiate consultation with this office.

## COMMENTS

Ms. Dusty Schultz

Comments on the EIS

We have also reviewed the GMP/Wilderness Study/EIS and offer these comments.

1. Table 21, Page 172. We suggest you consider adding piping plover critical habitat to the "species potentially affected" column. As we have consulted on restoration activities and the potential effect on piping plover and piping plover critical habitat, we suggest you also add these to the "potential impacts" column. You may wish to consider these additions in Chapter 5: Environmental Consequences.

Cumulative Impacts, Page 206. Clarification and additions may be needed here. Some past projects at the Lakeshore, such as the site restoration project near Glen Lake, have adversely affected federally listed species, i.e. Michigan monkey flower. These resulted in formal consultation with our office. The Cumulative Impacts section suggests past projects have had only beneficial effects.

We appreciate the opportunity to cooperate with the Sleeping Bear Dunes National Lakeshore in conserving endangered species. If further assistance is needed or you have any questions, please contact Jack Dingledine at (517) 351-6320.

Sincerely,



Craig Czarnecki  
Field Supervisor

## RESPONSES

1. Table 21 was revised as suggested. The "Cumulative Impacts" sections related to federal threatened and endangered species have been revised to reflect past projects that have adversely affected the Michigan monkey flower.

## COMMENTS

## RESPONSES



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 5  
77 WEST JACKSON BOULEVARD  
CHICAGO, IL 60604-3590

RECEIVED  
BY *[Signature]* DATE 6/2/08

JUN 09 2008

REPLY TO THE ATTENTION OF:

E-19J

Mr. Nick Chevance  
Regional Environmental Coordinator  
National Park Service  
Midwest Region  
601 Riverfront Drive  
Omaha, Nebraska 68102-4226

**Re: Draft Environmental Impact Statement / Draft General Management Plan/Draft  
Wilderness Study for Sleeping Bear Dunes National Lakeshore, Benzie and  
Leelanau Counties, Michigan, CEQ#: 20080134**

Dear Mr. Chevance:

In accordance with Section 309 of the Clean Air Act and the National Environmental Policy Act (NEPA), the U.S. Environmental Protection Agency (EPA) has reviewed the Draft General Management Plan (GMP), Wilderness Study and Environmental Impact Statement (EIS), issued by the National Park Service, for the project listed above.

Sleeping Bear Dunes National Lakeshore consists of a mainland portion plus North Manitou and South Manitou islands and is in the northwestern portion of Michigan's Lower Peninsula. The park is 71,291 acres total.

Five alternatives are presented in the DEIS. There is a no-action alternative that primarily reflects current conditions and activities at the park. There are four action alternatives (preferred, A, B, and C) representing different ways to manage the site. Four Management Zones have been designated in the Draft GMP. They are as follows: High Use, Experience History, Recreation, and Experience Nature.

The no-action alternative does not contain any Management Zones. The other four alternatives were closely aligned in the Management Zones of High Use and Experience History, except alternative A, which only designated 1% of the park to High Use. The preferred alternative is zoned for 25% Recreation and 57% Experience Nature. Alternative A is zoned for 19% Recreation and 74% Experience Nature. Alternative B is zoned for 56% Recreation and 35% Experience Nature. Alternative C is zoned for 25% Recreation and 66% Experience Nature.

The wilderness study designates the following percentages of wilderness for each action alternative: 46% for the preferred alternative (32,200 acres), 47% for alternative A (33,600 acres), 20% for alternative B (14,400 acres), and 32% for alternative C (23,200 acres). The no-

## COMMENTS

## RESPONSES

action alternative has 43% of the park designated has wilderness (30,903 acres).

U.S. EPA rates the DEIS preferred alternative as LO (Lack of Objection). The preferred alternative represents a large portion of the park being managed as the Experienced Natural Management Zone, while still providing many recreational opportunities. We have included a Stormwater Green Sheet for your consideration during planning activities and project design. We also want to inform you that we recently became aware that using certain types of plastic mesh as an erosion barrier may prove fatal to snakes and birds. If these materials are used at Sleeping Bear Dunes National Lakeshore, please consider alternate materials or methods.

If you have any questions please contact Julie Guenther at (312) 886-3172 or email her at guenther.julia@epa.gov.

Sincerely,



Kenneth A. Westlake  
NEPA Implementation  
Office of Enforcement and Compliance Assurance

Enclosures: Summary of Ratings Definition and Followup Action  
Stormwater Green Sheet

Cc: Superintendent Dusty Schultz  
Sleeping Bear Dunes National Lakeshore  
9922 Front St  
Empire, Michigan 49630-9797



## COMMENTS

## RESPONSES

**\*SUMMARY OF RATING DEFINITIONS AND FOLLOW UP ACTION\*****Environmental Impact of the Action****LO-Lack of Objections**

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

**EC-Environmental Concerns**

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impacts. EPA would like to work with the lead agency to reduce these impacts.

**EO-Environmental Objections**

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantive changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

**EU-Environmentally Unsatisfactory**

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

**Adequacy of the Impact Statement****Category 1-Adequate**

The EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collecting is necessary, but the reviewer may suggest the addition of clarifying language or information.

**Category 2-Insufficient Information**

The draft EIS does not contain sufficient information for the EPA to fully assess the environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

**Category 3-Inadequate**

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

<sup>1</sup>from EPA Manual 1640 Policy and Procedures for the Review of the Federal Actions Impacting the Environment

## COMMENTS

## RESPONSES

## NEPA Stormwater Green Sheet

**Stormwater section of NEPA documents should discuss/include (at a minimum):**

- ✓ Compliance with NPDES construction and post-construction requirements (project larger than one acre has to comply by writing a pollution prevention plan)
- ✓ Compliance with local ordinances
- ✓ Compliance with the Energy Independence and Security Act of 2007

"Energy Independence and Security Act of 2007" Title IV ("Energy Savings in Building and Industry"), Subtitle C ("High Performance Federal Buildings"). Here is the entire provision:

**SEC. 438. STORM WATER RUNOFF REQUIREMENTS FOR FEDERAL DEVELOPMENT PROJECTS**

*The sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.*

This provision is quite significant. It will require Federal sites to achieve/maintain the predevelopment hydrology to the "maximum extent technically feasible". Sites will need to include things like rain gardens and permeable pavements in order to do this.

**Stormwater measures beyond the bare minimum:**

- ✓ Mimic natural hydrology. Does the project decrease the recharge of the upper aquifer system?
- ✓ Sensitive areas should be given treatment beyond the bare minimum
- ✓ Keep native vegetation during construction and replant ASAP
- ✓ What types of salt/chemicals are being used for deicing? Latest BMP's used for deicing?  
[http://www.upperdesplainsriver.org/bbb\\_roadsalt.htm](http://www.upperdesplainsriver.org/bbb_roadsalt.htm)
- ✓ Sprawl is bad! Smart growth is good! Are there ways that the development can be implemented in a more compact area? [www.epa.gov/ehpages/pollutmgrowth.html](http://www.epa.gov/ehpages/pollutmgrowth.html) -select "pollution prevention programs" and "sustainability" for more info.
- ✓ Rain gardens, and permeable parking surfaces. Rain gardens and permeable parking surfaces increase the amount of water filtering into the ground and recharge aquifers, prevent community flooding and drainage problems, help protect waterbodies from pollutants carried by urban stormwater, and provide valuable wildlife habitat in an urban setting.
- ✓ Commitment to creating a Sustainable Buildings Implementation Plan (per Executive Order 13423) prior to construction.
- ✓ Green roofs, created wetlands, vegetated swales, native plant landscapes, and rain barrels
- ✓ Websites that can help with Stormwater Pollution Prevention and Sustainable Design:
  - Menu of stormwater BMP's: <http://efpub1.epa.gov/npdes/stormwater/menubmps/>
  - Medium and small-sized model stormwater pollution prevention guides for construction sites: [www.epa.gov/npdes/swppguide](http://www.epa.gov/npdes/swppguide)
  - Green infrastructure practices (e.g. rain gardens): <http://www.epa.gov/npdes/greeninfrastructure/>
  - Some standards, including standards for individual sites: <http://www.sustainablecities.org/>
  - Standards for neighborhoods (LEED for Neighborhood Development): <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=148>
  - Center for Watershed Protection: [www.cwpp.org](http://www.cwpp.org)
  - Low Impact Development Center: [www.lowimpactdevelopment.org](http://www.lowimpactdevelopment.org)
  - Green Alley Handbook: <http://egov.cityofchicago.org/city/webportal/home.do -at top of page City Departments, choose Transportation, under CDOT Programs choose Green Alleys, choose Green Alleys again and scroll down for the Green Alley Handbook>
  - Menu of Stormwater Best Management Practices (compost-based fact sheets, etc.): <http://cfpub.epa.gov/npdes/stormwater/menubmps/index.cfm>



## COMMENTS

## RESPONSES



**The Grand Traverse Band of  
Ottawa and Chippewa Indians**

2605 N. West Bay Shore Drive • Peshawbestown, MI 49682 • (231) 534-7750

June 18, 2008

Ms. Dusty Shultz, Superintendent  
Sleeping Bear Dunes National Lakeshore  
9922 Front Street  
Empire, MI 49630-9417

Received by

JUN 24 2008

SLBE Mailroom

Re: Sleeping Bear Dunes National Lakeshore Draft Management Plan/Wilderness  
Study/Environmental Impact Statement April 2008 Comments

Dear Ms. Shultz,

The Grand Traverse Band of Ottawa and Chippewa Indians (GTB) are the cultural and political descendants of the Ottawa and Chippewa Bands who have resided in the upper Great Lakes Region for countless generations are, to a great extent, pleased with the effort SLBE has made regarding the Park Management Plan, Wilderness Study, and Environmental Impact Study required by the National Environmental Policy Act of 1969 (NEPA). We understand that consultation with Tribal governments is not only an obligation of Federal Trust Responsibility and a requirement of NEPA; it is a process in which GTB is familiar with, and successfully engages with the implementation of the management plans and practices required by other Federal agencies in Northern Michigan.

After significant review and deliberation among staff of our Natural Resources Department (NRD) we would like to offer the following comments and would hope that you consider incorporating slight adjustments to your Preferred Alternative as we suggest:

Management Zone Comments:

In general we support the configuration and extend of your various management zone designations, where there appears to be a balance of natural resource and recreational opportunities.

- **High Use Zone (HUZ)** – It is the fundamental view of GTB NRD that “high use” zones should be limited in scope and extent and include only the main thoroughfares through the Park (M-22 and M-109); Pease Stocking Drive; the Dune Climb and Empire Bluffs parking areas; and the Platte River Ranger Station, campground and associated access road to Platte River Point. Additionally, after consultation with NRD staff and members of the Tribe’s Natural Resources and Environment Committee, it was agreed that small boat access to Lake Michigan is important. We would suggest that the road ends at County Road 669 and Esch Road be modified and maintained to allow

1. These road ends are maintained by the county road commissions, and currently accommodate launching of small watercraft.

GRAND TRAVERSE      CHARLEVOIX      LEEANAU      BENZIE      MANISTEE      ANTRIM

## COMMENTS

Ms. Dusty Shultz, Superintendent  
June 18, 2008  
Page 2 of 4

1. <sup>1</sup> launching of small trailerable fishing watercraft if possible. Though our philosophy remains that promoting high use within certain areas of the National Lakeshore is undesirable, we feel that if planned and implemented carefully the addition of such access, high use could be minimized while offering access for both tribal and non-tribal subsistence fishers. Given the aforementioned recommended change, the Preferred Alternative reflects our desired future condition in terms of HUZ's.
- **Experience History Zone (EHZ)** – Though the Historic Properties are not of particular interest to the Grand Traverse Band primarily stemming from the fact that homesteading of properties ultimately led to the reduction, modification and/or elimination of lands traditionally used for tribal cultural, traditional and subsistence purposes. To the Tribe this is relatively recent history. However given that the Grand Traverse Band respects the registration of Historic places and does not object to their preservation, however we would offer that the concept of preserving landscapes “as they would have been while in operation” be carried further to included that such landscapes could possibly benefit not only the visiting public as well as local wildlife and the environment. Working farms producing crops such as alfalfa, rye, clover, summer or winter rape and other grass or oil-seed bearing species would not only give the appearance of a working farm, but also provide forage for many native wildlife species and potentially provide a source of biofuels. We would be interested in discussing this further once the GMP is under implementation.
3. Additionally, we understand the premise of the Purpose and Significance Statements as reflecting the enabling legislation of the Park and that the EHZ carries that concept forward, however we would offer the following: We continue to feel strongly that some reference should be made to the preservation and/or potential restoration of tribal cultural resources within the Park including, but not limiting to, components such as Native American burial and ceremonial sites; natural resources utilized by Native Americans; and reference to the Department of Interior’s Trust Responsibility to Indian Tribes. Given the aforementioned recommended considerations, the Preferred Alternative reflects our desired future condition in terms of EHZ’s.
- **Recreation Zone (RZ) and Experience Nature Zone (ENZ)** – Our views on these elements remain consistent with our letter sent on May 4, 2007. It appears to us that there are really only very subtle differences between the “recreation” and “experience nature” zones. The only substantive difference appears to be the occurrence of Wilderness. Generally it appears that the recreation zone would offer accommodation to slightly higher visitation levels, but it is not clear to what degree this refers. Realistically, the opportunity for solitude are likely indiscernible between the RZ and ENZ. It is unclear what is meant by the reference to “developments” under Facilities and Commercial Services. Clarification would be helpful. Fundamentally, the tribe supports
5. In Table 1: Management Zones (chapter 2), “developments” refers to infrastructure intentionally developed by humans. As such, NPS development ranges from primitive maintained trails, to roads and

## RESPONSES

2. The experience history and recreation zones would allow for agricultural crops to be considered in accordance with historic preservation principles, and after an analysis of potential impacts. Such crops may incidentally benefit wildlife and the natural environment.
3. These concerns are addressed in chapter 1, under the “Desired Conditions and Strategies” heading, “Relations with American Indian Tribes” subheading, and in chapter 4 under the “Impact Topics Considered but Not Analyzed in Detail” heading, “Indian Trust Resources” subheading. A strategy related to American Indians has been added to the chapter 1 “Natural Resources (General) and Diversity” subheading of the “Desired Conditions and Strategies” heading.
4. Although some differences between the recreation zone and experience nature zone may seem subtle, many are not. For example, the recreation zone permits motorized use, while the experience nature zone does not. Also, the recreation zone permits major operational facilities such as roads, parking areas, docks and boat launches, and formal picnic areas, while the experience nature zone permits only very modest improvements such as trails or signs. These distinctions are true regardless of wilderness status. Table 1 in chapter 2 provides a side-by-side comparison of the four management zones.
5. In Table 1: Management Zones (chapter 2), “developments” refers to infrastructure intentionally developed by humans. As such, NPS development ranges from primitive maintained trails, to roads and

(continued on next page)



## COMMENTS

Ms. Dusty Shultz, Superintendent  
June 18, 2008  
Page 3 of 4

5. the ENZ philosophy in that the resources within them should be enjoyed and protected from development, but we would offer that resource "enhancement" be added as allowable under the ENZ and include "resource improvement" in addition to reduce resource impacts as it relates to resource modification. Given the aforementioned recommended considerations, the Preferred Alternative reflects our desired future condition in terms of Recreation and Experience Nature Zones.

6. **Wilderness** – We remain unclear as to the costs and benefits related to designating areas as Wilderness. We also continue to struggle with the concept of wilderness in region largely defined by recreational values mixed with strong local and regional desires to maintain access to such areas. We understand that access via County owned roads would remain the same as they are not classified as wilderness, but it remains unclear whether these roads would remain open and classified under a Recreation Zone if any were relinquished by the County to the Park in the future. Particularly given the fact that the Wilderness designation as defined in the 1981 recommendation would remain in effect "until Congress acts on a new recommendation" effectively leaving some important road right-of-ways in Wilderness given relinquishment from the owning Counties, clarification would be helpful.

We understand that a wide variety of recreational uses and management actions are allowed within Wilderness, and we support this provided it includes resource enhancement/improvement in addition to restoration. Often enhancement or improvement of resources is necessary for restoring native communities of flora and fauna. In some cases, restoration may mean returning an already existing population of individuals to its historic or natural levels. In short we feel it is important to consider the possibility of improving natural resources within SLBE rather than getting caught up in semantics. We would like to discuss this further and come to a mutual understanding of this issue.

7. Finally, we continue to seek clarification as to whether some of the prohibitions within Wilderness areas may conflict with certain tribal ceremonies and rituals (eg. sweatlodges). We would invite further discussions related to this issue. Given the aforementioned recommendation the Preferred Alternative reflects our desired future condition in terms of Wilderness.

#### Grand Traverse Band Preferred Alternative:

Fundamentally, the Grand Traverse Band would support the Sleeping Bear Dunes National Lakeshore Preferred Alternative as it appears to provide a good mix of enjoyment opportunities to the public as well as resource protection. Based on the description of the ENZ and Uses and Management in Wilderness it is evident that management actions may be taken to preserve and potentially "enhance" resources and we would support this vision. Yet, as mentioned above we would prefer to

## RESPONSES

5. (continued) parking lots, to boat ramps or docks, to administrative offices and museums. Protecting and preserving natural resources is the top priority in the experience nature zone. Natural resources would be modified only to provide for safe visitor access or to reduce resource impacts, such as from exotic species or past developments. These sorts of "resource improvements" are allowed in all of the zones to the extent described in the "Desired Future Conditions and Strategies" heading in chapter 1 and the management zone table in chapter 2. The terms "resource enhancement" and "resource improvement" can have many meanings. NPS staff will work closely with affiliated tribes to evaluate any specific proposals.

6. Costs for each of the alternatives are included in each alternative description (chapter 2) and in appendix C. Environmental impacts have been evaluated in chapter 5. The areas proposed as wilderness are intended to provide a specific type of recreational value, and the existing roads provide access to those areas. The preferred alternative includes a new wilderness proposal in which county roads would remain out of wilderness, in the recreation zone, even if they were abandoned by the county(ies) within the life span of this plan. The recreation zone specifically allows for their continued use for vehicle travel. However, if a new wilderness proposal is not advanced, and acted upon by Congress as a result of this process, any abandonment of the rights-of-way for the county roads in the 1981 "Wilderness Recommendation" would indeed result in their closure. The counties have given no indication that they plan to abandon these rights-of-way.

7. Tribal ceremonies and rituals, (e.g., sweatlodges) are not precluded in wilderness. NPS staff will continue to work closely with affiliated tribes to address these and other issues.

## COMMENTS

Ms. Dusty Shultz, Superintendent  
June 18, 2008  
Page 4 of 4


discuss and clarify this issue further in addition to discussing the costs and benefits of wilderness designations in general.

In summary, we support the Preferred Alternative with the following changes and considerations:

- ☐ Add and maintain small fishing boat access at County Road ends 669 and Esch Road.
- ☐ Consider developing wildlife plantings around farms under Historic Preservation.
- ☐ Add "enhancement" and "resource improvement" to the definition of ENZ.
- ☐ Ensure improved roads remain open regardless of whether ownership is retained by the Counties.

In closing, we appreciate the opportunity for involvement in the revision process of the General Management Plan and look forward to further participation in the upcoming process components as well as the overall management of natural resources within the National Lakeshore. I would encourage a meeting with my staff to discuss your next steps in selecting the Preferred Alternative in defining the future vision of the Sleeping Bear Dunes National Lakeshore, and also encourage future discussions of issues identified above in regards to future management actions related to GMP implementation. Please contact Suzanne McSawby at 231-534-7104 with any questions and to identify the timing of a consultation meeting.

Sincerely,

  
Robert Kewaygoshkum  
Tribal Chairman

  
Suzanne McSawby  
Natural Resources Department Manager

## RESPONSES

## COMMENTS



JENNIFER M. GRANHOLM  
GOVERNOR

STATE OF MICHIGAN  
DEPARTMENT OF ENVIRONMENTAL QUALITY  
LANSING



STEVEN E. CHESTER  
DIRECTOR

June 23, 2008

Received by

JUN 26 2008

Ms. Dusty Shultz, Superintendent  
Sleeping Bear Dunes National Lakeshore  
9922 Front Street  
Empire, Michigan 49630-9797

SLBE Mailroom

Dear Ms. Shultz:

On behalf of the Coastal Management Program in the Department of Environmental Quality (DEQ), I am pleased to provide comments on the Draft General Management Plan, Wilderness Study, and Environmental Impact Statement.

It appears that all of the proposed Alternatives, other than the No-Action Alternative, would bring additional resources and significantly increase federal investments in the Lakeshore for improvements. However, we strongly support the Preferred Alternative identified in the Draft Management Plan. The Preferred Alternative strikes a good balance between protecting sensitive coastal resources and providing ample opportunity for visitor access and recreation. Activities such as controlling invasive species, protecting open dune areas, restoring disturbed sites, and protecting threatened and endangered species are all consistent with the goals of the Coastal Management Program and the DEQ.

We also support the emphasis placed on protecting cultural and historic resources within the context of the management zone in which they are located. We are pleased to see that the Preferred Alternative would preserve, rehabilitate, and restore important historic structures at some of the more popular destinations such as Glen Haven, Port Oneida, and North and South Manitou Islands.

1. There are activities identified in the Preferred Alternative that will require state permits under the Michigan Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. The National Park Service (NPS) has a long history of stewardship of coastal resources and cooperation with the state of Michigan on development proposals. The staff of the DEQ looks forward to working with you on implementing improvements at the Park.

The Coastal Management Program also greatly appreciates the strong emphasis that the NPS placed on encouraging public input on the planning process. The consultation process was extensive and it is apparent the Park Service was open and responsive to comments that were submitted.

CONSTITUTION HALL • 525 WEST ALLEGAN STREET • P.O. BOX 30457 • LANSING, MICHIGAN 48909-7657  
www.michigan.gov • (517) 335-2419

## RESPONSES

1. The National Park Service will continue to work closely with the state of Michigan during implementation of the preferred alternative. This includes obtaining required state permits once development proposals are in the design phase.

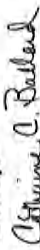
## RESPONSES

## COMMENTS

Ms. Dusty Shultz  
Page Two  
June 23, 2008

The Coastal Management Program greatly appreciates the significant commitment of federal resources the NPS brings to Michigan's shoreline. We view the Sleeping Bear Dunes National Lakeshore as one of the most significant coastal resources in the state, and we look forward to working with you as you implement the selected alternative.

Sincerely,



Catherine Cunningham Ballard, Chief  
Michigan Coastal Management Program  
Environmental Science and Services Division  
(517) 335-3456

cc: Mr. Michael Duwe, NPS  
Mr. Frank Ruswick, DEQ  
Mr. Ken DeBeausaert, DEQ  
Ms. Liz Brown, DEQ  
Ms. Amy Butler, DEQ  
Mr. Christopher Antieau, DEQ



## COMMENTS

## RESPONSES


  
 JENNIFER GRANHOLM  
GOVERNOR

STATE OF MICHIGAN  
DEPARTMENT OF HISTORY, ARTS AND LIBRARIES  
LANSING

DR. WILLIAM ANDERSON  
DIRECTOR

June 30, 2008

DUSTY SCHULTZ  
NATIONAL PARK SERVICE  
SLEEPING BEAR DUNES NATIONAL LAKESHORE  
9922 FRONT STREET HWY M-72  
EMPIRE MI 49630-9797

Received by  
JUL 07 2008  
SLBE Mailroom

RE: ER96-12 Sleeping Bear Dunes National Lakeshore Draft General Management  
Plan/Wilderness Study/EIS, Leelanau County (NPS)

Dear Ms. Schultz:

Under the authority of Section 106 of the National Historic Preservation Act of 1966, as amended, we have reviewed the above-cited Draft General Management Plan/Wilderness Study/EIS (GMP) for Sleeping Bear Dunes National Lakeshore. Based on the information provided for our review, it is the opinion of the State Historic Preservation Officer (SHPO) that the preferred alternative identified in the GMP does not meet the criteria of adverse effect [36 CFR § 800.5(a)(1)] and will have no adverse effect [36 CFR § 800.5(b)] on historic properties within the area of potential effects for the above-cited undertaking.

The views of the public are essential to informed decision making in the Section 106 process. Federal Agency Officials or their delegated authorities must plan to involve the public in a manner that reflects the nature and complexity of the undertaking, its effects on historic properties and other provisions per 36 CFR § 800.2(d). We remind you that Federal Agency Officials or their delegated authorities are required to consult with the appropriate Indian tribe and/or Tribal Historic Preservation Officer (THPO) when the undertaking may occur on or affect any historic properties on tribal lands. In all cases, whether the project occurs on tribal lands or not, Federal Agency Officials or their delegated authorities are also required to make a reasonable and good faith effort to identify any Indian tribes or Native Hawaiian organizations that might attach religious and cultural significance to historic properties in the area of potential effects and invite them to be consulting parties per 36 CFR § 800.2(c).

This letter evidences the NPS's compliance with 36 CFR § 800.4 "Identification of historic properties" and 36 CFR § 800.5 "Assessment of adverse effects", and the fulfillment of the NPS's responsibility to notify the SHPO, as a consulting party in the Section 106 process, under 36 CFR § 800.5(c) "Consulting party review".

The State Historic Preservation Office is not the office of record for this undertaking. You are therefore asked to maintain a copy of this letter with your environmental review record for this undertaking. If the scope of work changes in any way, or if artifacts or bones are discovered, please notify this office immediately.

If you have any questions, please contact Martha MacFarlane Fees, Environmental Review Coordinator, at (517) 335-2721 or by email at [ER@nichigan.gov](mailto:ER@nichigan.gov). Please reference our project number in all communication with this office regarding this undertaking. Thank you for this opportunity to review and comment, and for your cooperation.

Sincerely,




Brian D. Conway  
State Historic Preservation Officer

BDC:DLA:ROC:REM:hgs

STATE HISTORIC PRESERVATION OFFICE, MICHIGAN HISTORICAL CENTER  
702 WEST WALAMAZOO STREET • P.O. BOX 30740 • LANSING, MICHIGAN 48909-8240  
(517) 373-1620  
[www.michigan.gov/nhs](http://www.michigan.gov/nhs)


## COMMENTS

## RESPONSES



JENNIFER M. GRANHOLM  
GOVERNOR


STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
LANSING



REBECCA A. HUMPHRIES  
DIRECTOR

June 11, 2008

Ms. Dusty Shultz, Superintendent  
U. S. Department of the Interior  
National Park Service  
Sleeping Bear Dunes National Lakeshore  
9922 Front Street (Hwy. M-72)  
Empire, MI 49630-9797

Received by   
JUN 25 2008  
GLBE Mailroom

**SUBJECT:** Comments on the Sleeping Bear Dunes National Lakeshore General Management Plan/Wilderness Study/Environmental Impact Statement for a National Lakeshore

Dear Ms. Shultz:


The Michigan Department of Natural Resources (DNR) is pleased to have the opportunity to review these plans and comment on them. Your presentation on May 22, 2008 helped to bring into focus the multitude of considerations covered in your planning process and your general management plan, and I thank you for providing us with that opportunity.

All of the DNR resource divisions have reviewed the plan and their comments have been consolidated into the attached Summary. This Summary shows that the DNR supports the recommended "Preferred Alternative" as outlined in your plan.

If you have any questions regarding the attached summary, please contact Mr. Paul Curtis, the DNR Parks and Recreation Division's Park Management Plan Administrator, who coordinated the review of this document and summarized the DNR's comments. Mr. Curtis can be reached at 517-335-4832 or [curtis@michigan.gov](mailto:curtis@michigan.gov) via e-mail.

Thanks again for the opportunity to meet with you and comment on this plan.

Sincerely,

  
Mindy Koch  
Resource Management Deputy  
517-373-0046

cc: Director Rebecca A. Humphries, DNR  
Mr. Ronald A. Olson, DNR  
Mr. Douglas Reeves, DNR  
Mr. Kelley Smith, DNR  
Ms. Lynne Boyd, DNR  
Mr. Paul Curtis, DNR

NATURAL RESOURCES COMMISSION  
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*Great Lakes, Great Times, Great Outdoors!*



COMMENTS

RESPONSES

6.10.2008  
**Sleeping Bear Dunes National Lakeshore**  
Department of Natural Resources (DNR) Summary on the Draft General Management Plan (GMP), Wilderness Study and Environmental Impact Statement

Comments were provided by the DNR's:

- Parks and Recreation Division (PRD)
- Forest, Mineral, and Fire Management Division (FMFMD)
- Fisheries Division (FD)
- Wildlife Division (WD)
- Law Enforcement Division (LED)
- Northern Lower Peninsula Ecoregion Team (NLP)

Coordinated response prepared by:

- Paul N. Curtis, PRD Park Management Plan Administrator

Recommendation:

The Michigan Department of Natural Resources (DNR) supports the "Preferred Alternative" proposed by the National Park Service (NPS) for the Sleeping Bear Dunes National Lakeshore. The General Management Plan and Wilderness Study were reviewed by all resource divisions of the DNR, as well as the DNR's Northern Lower Peninsula Ecoregion Team.

Following are general comments on the overall plan and process, as well as comments specific to each main section of the General Management Plan.

General Comments:

Our overall impression is that this plan represents a very thorough development of an assessment of natural/cultural resources and opportunities for recreation and education. We appreciate that State listed endangered and threatened species, and special concern species, were addressed in the plan, as were cultural resources of significance at the local level.

We support the work of the NPS and their planning partners in the development of the "Preferred Alternative," and we endorse that recommendation. The preferred plan is the result of a planning process that demonstrated an impressive effort to engage the public and stakeholders. The document is well organized and succinct in its recommendations. The creation of the four zones is both creative and informative to any casual visitor and should serve the NPS well in its future management of the Sleeping Bear Dunes National Lakeshore.

## COMMENTS

The DNR manages properties and programs in close proximity to the Sleeping Bear Dunes National Lakeshore, and there has been a history of cooperation between the two agencies on regional land management issues, including, but not limited to:

- Management of deer populations on both the mainland and the offshore islands of South and North Manitou.
- Operation of the weir on the Platte River, which is on DNR property within the national lakeshore boundary.
- Cooperative work on threatened and endangered species, such as the piping plover.
- Cooperation with training and law enforcement issues.

The DNR looks forward to continued cooperative management opportunities, specifically as relates to these and to forest health, regional recreation and wildfire management and assistance. Under the text of 'Ecosystem Management' (pg. 16) the plan does advocate regional cooperation with surrounding landowners on regional land management issues, but we feel that it should be strengthened to include in the listed strategies the following:

1.
  - Manage for forest health to include not only invasive species but also insects and diseases. Forest pests and diseases such as emerald ash borer, beech bark disease, oak wilt and others have the potential to regionally impact forests.
2. Acknowledge that impacts of proposed recreation changes (e.g. elimination of motorboat use on Bass Lake, a new trail, or removal of a campground) may have an impact on other regional providers of recreation, and discuss what those impacts might be.
3. More specific language regarding the benefits of interagency cooperation on fire management and assistance (e.g. for prevention, mitigation of threat, readiness, detection, suppression of wildfires (if needed), and use of fire to meet management objectives in and adjacent to their areas of responsibility)

### General Management Plan

#### Summary:

- The explanation of why you did all three documents at once is good ('Purpose' statements). Not only because of the similar processes involved, but more importantly because it makes sense for the GMP to guide the recommendation for designation of the Wilderness area.
- This will be the only part this document that some people read. Inclusion of maps/graphics (a location map and maps of the GMP alternatives incorporated into the text of the "Summary") would help convey the message more effectively. (Maps of these were provided in a pocket in

## RESPONSES

1. In chapter 1, under the "Desired Conditions and Strategies" heading the strategy regarding control of invasive nonnative species ("Ecosystem Management" subheading) and the strategy about fire management ("Natural Resources [General] and Diversity" subheading) have been revised.
2. Chapter 5 (Environmental Consequences) sections on regional socio-economics have been revised to address these impacts as suggested.
3. In chapter 1, under the "Desired Conditions and Strategies" heading the strategy regarding control of invasive nonnative species ("Ecosystem Management" subheading) and the strategy about fire management ("Natural Resources [General] and Diversity" subheading) have been revised.

## COMMENTS

- the back of the document, but no reference was made to them or their location in the text.)
- Grammar question...the management zones are identified as "high use zone" (for example). As a specific title, shouldn't it be capitalized? (this occurs throughout document)
  - Reference is made in the discussion of the Preferred Alternative for selected areas to be zoned 'high use' or 'recreation' to allow for possible future recreation opportunities...we could not find where these might be in this section or in the full discussion starting on page 52. If it merits mention, it seems it should merit some discussion of where and why.
  - 'Next Steps' is good information on what to expect.
  - Overall content well thought-out and understandable. (The style used for naming/page numbering in the "Contents," however, is distracting and hard to read.)

Chapter 1 – Introduction:

- Good overviews of both the park and the planning process
- 'Purpose and Needs' statements do a good job of outlining the GMP and Wilderness Study
- Like the focus given for 'Primary Interpretive Themes' (pg.12) and the reference to the 1836 Treaty (pg.14)

Chapter 2 – Alternatives:

- Evaluation of the 'No-Action Alternative' and comparison of it to the others would be easier if the proposed management zones were applied to it. That would give readers of the plans a way to see how the park is currently managed in the context of zones.
- "Implementation Funding" is a great way to start this chapter with the statement that "...this plan does not guarantee future NPS funding." It is good to have that stated clearly and perhaps often.
- "Management Zones" brief definitions are good.
- We'll be interested in how the park implements the monitoring of criteria and indicators of "user capacity" impacts as described in the "User Capacity (Carrying Capacity)" Section.
- Discussion of alternatives...No-Action, Preferred, and 'A,' 'B' and 'C'... wide range of proposed plan impacts.

5.

- 'Lake Michigan Boat Access' (pg.54) discusses ramps/docks at the Platte River mouth. This was the source of a DNR effort in the mid-1970's to respond to the new and exploding salmon fishery in Lake Michigan and particularly Platte Bay. A proposal to develop a safe harbor at the river mouth was rejected with much public input against any proposed changes to one of the few remaining "natural" river mouths.

3

## RESPONSES

4. The management zones described in chapter 2 were developed through this planning effort and are prescriptive rather than descriptive. In other words, they do not necessarily reflect existing management. Thus, it would be inaccurate and misleading to apply these zones to the map of the no-action alternative.

5. This element of the preferred alternative, like most, is dependent upon funding. The National Park Service will work closely with the Michigan Department of Natural Resources to seek funding for such a study. Cessation of dredging would likely be a component of one or more of the alternatives in this separate study.

## COMMENTS

## RESPONSES

<p>5. <sup>↑</sup> Additionally, we feel that the language regarding Lake Michigan Boat Access should be strengthened regarding the discussion of a 'separate study.' There is no timeline offered for the study. We think that a needed addition to the plan is that it should specify that an Environmental Impact Study be conducted within the lifetime of the General Management Plan. The study should look at alternatives for boat access as well as the current impacts of on-going dredging to accommodate existing use.</p> <p>6. - 'Inland Lake Use and Access' (pg. 54) recommends removal of motorized boats on Bass Lake and North Bar Lake. These lakes are low in fish productivity and a non-motorized experience is appropriate here, as well as at other inland lakes as proposed. Effecting this change may shift current use to other lakes in the area, including those managed by the DNR or local units.</p> <p>- Did not see any mention of equestrian use in any of the discussions of recreation activities or trails, though it currently is an activity at Alligator Hill?</p> <p>- Alternates 'A' and 'B' omit cultural resource opportunities in the middle of South Manitou Island (determined eligible for National Register)</p> <p><u>Chapter 3 – Wilderness Study:</u></p> <ul style="list-style-type: none"> <li>No comment</li> </ul> <p><u>Chapter 4 – Affected Environment:</u></p> <ul style="list-style-type: none"> <li>Economic Contributions of Sleeping Bear Dunes National Lakeshore (pg.145) ... how were these determined? it would be good to cite the source of this.</li> </ul> <p><u>Chapter 5 – Environmental Consequences:</u></p> <ul style="list-style-type: none"> <li>No comment</li> </ul> <p><u>Chapter 6 – Consultation and Coordination:</u></p> <ul style="list-style-type: none"> <li>Extensive effort demonstrated to interact with the public throughout the planning process.</li> </ul>	<p>6. Chapter 5 (Environmental Consequences) sections on regional socioeconomics have been revised to address these impacts as suggested.</p> <p>7. The information source has been added to the referenced section as suggested.</p>
---	---



## COMMENTS

## RESPONSES

1. A park unit's purpose statement, simply stated, is the reason a specific park was designated by Congress. The purpose of Sleeping Bear Dunes National Lakeshore was clearly specified by Congress in the 1970 legislation that established the National Lakeshore; that purpose does not include cultural resources.

A park unit's purpose statement does not replace or lessen the impact of the National Park Service's mission. Rather, it focuses the agency's management role at a particular park unit. A park's purpose statement also does not permit the National Park Service to ignore the requirements of federal legislation, such as the NPS Organic Act, National Historic Preservation Act, the Archeological Resources Protection Act, or the Native American Graves Protection and Repatriation Act. The National Lakeshore's cultural resources are protected by these laws, and by the *General Management Plan's* specifically stated intent to preserve them.

**PEPC**  
Planning, Environment and Public Comment

Home | Park | Projects/Study | Reports | Tools | Admin | Logout

National Park Service  
U.S. Department of the Interior

SLBE > General Management Plan/Wilderness Study (14851) > Public Documents > Sleeping Bear Dunes National Lakeshore Draft General Management Plan/Wilderness Study/Environmental Impact Statement - April 2008 > Correspondence

**Correspondence (95)**

**Author Information**

**Keep Private:** No

**Name:** carolyn damsira

**Organization:** Michigan Council for Arts and Cultural Affairs

**Organization Type:** S - State Government

**Address:** PO Box 30705  
Lansing, MI 48909-8206  
USA

**E-mail:**

**Correspondence Information**

**Status:** Reviewed **Park Correspondence Log:**

**Date Sent:** 06/11/2008 **Date Received:** 06/11/2008

**Number of Signatures:** 1 **Form Letter:** No

**Contains Request(s):** No **Type:** Web Form

**Notes:**

**Correspondence Text**

1. We must insure that preservation of cultural resources is included in the purpose of the Lakeshore statement as Congress intended for every unit of the National Park System. This park's unique cultural resource are a gem of the state and the nation replicated nowhere else. These resources contribute to the quality and diversity of park offerings and contribute to the economic health of the area. They are as important as the dunes, the water and wildlife for drawing visitors to the area. As a program manager for the state's art agency, I help fund cultural projects across the state. Preserving cultural resources are an investment in the future of Michigan, they are why many of the state's residents choose to live here and why visitors come. Human history is natural history, and to ignore this aspect of the lakeshore is to neglect a fundamental part of why this park was chosen to be part of the NPS.  
Carolyn Damsira

**Status** **Assigned Code(s)** **Code**

Coded FO1010 Code



## **Appendixes, Selected References, Preparers and Consultants, and Index**



## APPENDIX A: LEGISLATION

84 STAT.] PUBLIC LAW 91-479—OCT. 21, 1970

1075

Public Law 91-479

## AN ACT

To establish in the State of Michigan the Sleeping Bear Dunes National Lakeshore, and for other purposes.

October 21, 1970  
[H. R. 18776]

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That (a) the Congress finds that certain outstanding natural features, including forests, beaches, dune formations, and ancient glacial phenomena, exist along the mainland shore of Lake Michigan and on certain nearby islands in Benzie and Leelanau Counties, Michigan, and that such features ought to be preserved in their natural setting and protected from developments and uses which would destroy the scenic beauty and natural character of the area. In order to accomplish this purpose for the benefit, inspiration, education, recreation, and enjoyment of the public, the Secretary of the Interior (hereinafter referred to as the "Secretary") is authorized to take appropriate action, as herein provided, to establish in the State of Michigan the Sleeping Bear Dunes National Lakeshore. In carrying out the provisions of this Act, the Secretary shall administer and protect the Sleeping Bear Dunes National Lakeshore in a manner which provides for recreational opportunities consistent with the maximum protection of the natural environment within the area.

Sleeping Bear  
Dunes National  
Lakeshore, Mich.

(b) In preserving the lakeshore and stabilizing its development, substantial reliance shall be placed on cooperation between Federal, State, and local governments to apply sound principles of land use planning and zoning. In developing the lakeshore, full recognition shall be given to protecting the private properties for the enjoyment of the owners.

SEC. 2. (a) The Sleeping Bear Dunes National Lakeshore (hereinafter referred to as the "lakeshore") shall comprise the land and water area generally depicted on the map entitled "A Proposed Sleeping Bear Dunes National Lakeshore Boundary Map", numbered NL-SBD-91,000 and dated May 1969, which shall be on file and available for public inspection in the offices of the National Park Service of the Department of the Interior.

(b) As soon as practicable after the date of enactment of this Act and following the acquisition by the Secretary of those lands owned by the State of Michigan within the boundaries of the area designated for inclusion in the lakeshore (excepting not to exceed three hundred acres in the Platte Bay area) and of such additional lands, if any, as are necessary to provide an area which in his opinion is efficiently administrable for the purposes of this Act, he shall establish the Sleeping Bear Dunes National Lakeshore by publication of notice thereof in the Federal Register.

Publication in  
Federal Register,

SEC. 3. (a) Within thirty days, or as soon as possible thereafter, after the effective date of this Act, the Secretary shall publish in the Federal Register a map or other description of the lakeshore delineating areas constituting the following categories:

Description,  
publication in Fed-  
eral Register.

Category I, public use and development areas.

Category II, environmental conservation areas.

Category III, private use and development areas.

(b) Lands and interests therein designated as category I may be acquired by the Secretary in accordance with section 8 of this Act.

(c) Within one hundred and fifty days after the effective date of this Act, the Secretary shall publish in the Federal Register an additional map or other description of those lands, if any, designated as within categories II and III for acquisition by him in fee in accordance with section 8 of this Act.

Additional map,  
publication in  
Federal Register,



Land acquisition,  
limitation.

(d) Except as provided in subsection (f) of this section, the Secretary may, after the publication provided for in subsection (c), acquire only such interests in lands designated as category II, other than those to be acquired in fee simple, as he deems appropriate to insure the continued conservation and preservation of the environmental quality of the lakeshore.

(e) Except as provided in subsection (f) of this section, the Secretary may, after the publication provided for in subsection (c), acquire only such interests in lands designated as category III, other than those lands to be acquired in fee simple, as he deems appropriate to protect lands designated for acquisition.

Real property,  
use and develop-  
ment restrictions,  
notification.

(f) Not later than one hundred and fifty days after the effective date of this Act, the Secretary shall notify owners of real property in categories II and III, other than property designated by him for fee acquisition, of the minimum restrictions on use and development of such property under which such property can be retained in a manner compatible with the purpose for which the lakeshore was established. If the owner of any real property in categories II and III agrees to the use and development of his property in accordance with such restrictions, the Secretary may not acquire, without the consent of such owner, such property or interests therein for so long as the property affected is used in accordance with such restrictions, unless he determines that such property is needed for public use development. The foregoing limitations on acquisition shall also apply to any owners of real property to whom the Secretary did not, within the time set forth, give such a notice, except that if any property owner has not, within ninety days of the notice agreed to use the property in accordance with the notice, then the Secretary may acquire, without limitation, fee or lesser interests in property by any of the methods set forth in section 8 of this Act: *Provided*, That nothing contained in subsections (d) and (e), and in this subsection, which limits the acquisition of the fee simple title to property within the lakeshore, shall prevent the Secretary from acquiring, without the consent of the owner, the fee simple title whenever in the Secretary's judgment the estimated cost of acquiring the lesser interest would be a substantial percentage of the estimated cost of acquiring the fee simple title.

Advisory com-  
mission.

SEC. 4. (a) There is hereby established a Sleeping Bear Dunes National Lakeshore Advisory Commission. The Commission shall cease to exist ten years after the establishment of the lakeshore pursuant to section 2 of this Act.

Membership.

(b) The Commission shall be composed of ten members, each appointed for a term of two years by the Secretary, as follows:

(1) Four members to be appointed from recommendations made by the counties in which the lakeshore is situated, two members to represent each such county;

(2) Four members to be appointed from recommendations made by the Governor of the State of Michigan; and

(3) Two members to be designated by the Secretary.

(c) The Secretary shall designate one member to be Chairman. Any vacancy in the Commission shall be filled in the same manner in which the original appointment was made.

(d) A member of the Commission shall serve without compensation as such. The Secretary is authorized to pay the expenses reasonably incurred by the Commission in carrying out its responsibilities under this Act on vouchers signed by the Chairman.

(e) The Secretary or his designee shall consult with the Commission with respect to matters relating to the development of the lakeshore and with respect to the provisions of sections 9, 12, and 13 of this Act.

SEC. 5. In administering the lakeshore the Secretary shall permit

Hunting and  
fishing, regu-  
lations.

hunting and fishing on lands and waters under his jurisdiction in accordance with the laws of the State of Michigan and the United States applicable thereto. The Secretary, after consultation with the appropriate agency of the State of Michigan, may designate zones and establish periods where and when no hunting shall be permitted for reasons of public safety, administration, or public use and enjoyment and issue regulations, consistent with this section, as he may determine necessary to carry out the purposes of this section.

SEC. 6. (a) The administration, protection, and development of the lakeshore shall be exercised by the Secretary, subject to the provisions of this Act and of the Act of August 25, 1916 (39 Stat. 535; 16 U.S.C. 1 et seq.), as amended and supplemented, relating to the areas administered and supervised by the Secretary through the National Park Service; except that authority otherwise available to the Secretary for the conservation and management of natural resources may be utilized to the extent he finds such authority will further the purposes of this Act.

Administration.

(b) In the administration, protection, and development of the area, the Secretary shall prepare and implement a land and water use management plan, which shall include specific provisions for—

Land and water use plan.

(1) development of facilities to provide the benefits of public recreation;

(2) protection of scenic, scientific, and historic features contributing to public enjoyment; and

(3) such protection, management, and utilization of renewable natural resources as in the judgment of the Secretary is consistent with, and will further the purpose of, public recreation and protection of scenic, scientific, and historic features contributing to public enjoyment.

(c) Within four years from the date of enactment of this Act, the Secretary of the Interior shall review the area within the Sleeping Bear Dunes National Lakeshore and shall report to the President, in accordance with subsections 3(c) and 3(d) of the Wilderness Act (78 Stat. 890; 16 U.S.C. 1132 (c) and (d)), his recommendation as to the suitability or nonsuitability of any area within the lakeshore for preservation as wilderness, and any designation of any such area as a wilderness shall be accomplished in accordance with said subsections of the Wilderness Act.

Area review; report to President.

(d) In developing the lakeshore the Secretary shall provide public use areas in such places and manner as he determines will not diminish the value or enjoyment for the owner or occupant of any improved property located thereon.

SEC. 7. Nothing in this Act shall be construed as prohibiting any governmental jurisdiction in the State of Michigan from assessing taxes upon any interest in real estate retained under the provisions of section 10 of this Act to the owner of such interest.

Tax assessments.

SEC. 8. (a) The Secretary is authorized to acquire by donation, purchase with donated or appropriated funds, transfer funds, transfer from any Federal agency, or exchange lands and interests therein for the purposes of this Act. When an individual tract of land is only partly within the area designated, the Secretary may acquire the entire tract by any of the above methods to avoid the payment of severance costs. Land so acquired outside the designated area may be exchanged by the Secretary for non-Federal lands within such area, and any portion of the land not utilized for such exchanges may be disposed of in accordance with the provisions of the Federal Property and Administrative Services Act of 1949 (63 Stat. 377), as amended (40 U.S.C. 471 et seq.).

Land acquisition or exchange.



(b) In exercising his authority to acquire property under this Act, the Secretary shall give immediate and careful consideration to any offer made by an individual owning property within the lakeshore to sell such property to the Secretary. An individual owning property within the lakeshore may notify the Secretary that the continued ownership by such individual of that property would result in hardship to him, and the Secretary shall immediately consider such evidence and shall within one year following the submission of such notice, subject to the availability of funds, purchase such property offered for a price which does not exceed its fair market value.

Federal property, transfer.

(c) Any property or interests therein, owned by the State of Michigan or any political subdivisions thereof, may be acquired only by donation. Notwithstanding any other provision of law, any property owned by the United States on the date of enactment of this Act located within such area may, with the concurrence of the agency having custody thereof, be transferred without consideration to the administrative jurisdiction of the Secretary for use by him in carrying out the provisions of this Act.

Acquisition by condemnation.

(d) With respect to that property which the Secretary is authorized to acquire by condemnation under the terms of this Act, the Secretary shall initiate no condemnation proceedings until after he has made every reasonable effort to acquire such property by negotiation and purchase. The certificate of the determination by the Secretary or his designated representative that there has been compliance with the provisions of this subsection and of subsection (b) of this section shall be prima facie evidence of such compliance.

(e) Nothing in this Act shall be construed to prohibit the use of condemnation as a means of acquiring a clear and marketable title, free of any and all encumbrances.

Zoning bylaws.

SEC. 9. (a) The Secretary shall, at the request of any township or county in or adjacent to the lakeshore affected by this Act, assist and consult with the appropriate officers and employees of such township or county in establishing zoning bylaws for the purpose of this Act. Such assistance may include payments to the county or township for technical aid.

(b) No improved property within the area designated for inclusion in the lakeshore shall be acquired by the Secretary by condemnation so long as the affected county or township has in force and applicable thereto a duly adopted, valid zoning bylaw approved by the Secretary in accordance with the provisions of subsection (d) of this section and the use of improved property is in compliance therewith. In the event that the affected county or township does not have in effect and applicable to any improved property a duly adopted, valid zoning bylaw so approved, the Secretary shall be prohibited from acquiring such property by condemnation, if the owner thereof notifies the Secretary in writing of such owner's agreement to use his property in a manner consistent with the applicable standard set forth in subsection (d) of this section, and such prohibition against condemnation shall remain in effect for so long as such property is so used.

(c) If the Secretary determines that any such property referred to in subsection (b) of this section covered by any such bylaw is being used in a way which is not in substantial compliance with such bylaw, or that any such property referred to in subsection (b) with respect to which an agreement has been made is being used in a manner which is not substantially consistent with such applicable standards, he shall so notify the owner of any such property in writing. Such notice shall contain a detailed statement as to why the Secretary believes that such use is not in substantial compliance with such zoning bylaw or why such use is not substantially consistent with such applicable standards, as the case may be. Any such owner shall have sixty days following the

receipt by him of that written notification within which to discontinue the use referred to in such notification. Discontinuance of such use within such sixty-day period shall have the effect of prohibiting the Secretary from acquiring such property by condemnation by reason of such use. In any case in which such use is not discontinued within such sixty-day period, the Secretary may, in his discretion, acquire such property by condemnation.

(d) Any zoning bylaw or amendment thereto submitted to the Secretary for approval for the purposes of this Act shall be approved by him if such bylaw or amendment contains provisions which—

Bylaws, conditions for approval.

(1) contribute to the effect of prohibiting the commercial and industrial use (other than a use for a commercial purpose as authorized under section 13 of this Act) of all property within the boundaries of such area which is situated within the county or township adopting such bylaw or amendment;

(2) are consistent with the objectives and purposes of this Act so that, to the extent possible under Michigan law, the scenic and scientific values of the lakeshore area will be protected;

(3) are designed to preserve the lakeshore character of the area by appropriate restrictions upon the burning of cover, cutting of timber (except tracts managed for sustained yield), removal of sand or gravel, and dumping, storage, or piling of refuse and other unsightly objects or other uses which would detract from the natural or traditional lakeshore scene;

(4) provide that no construction, reconstruction, moving, alteration, or enlargement of any property, including improved property as defined in this Act, within the lakeshore area shall be permitted, if such construction, reconstruction, moving, alteration, or enlargement would afford less than a fifty-foot setback from all streets measured at a right angle with the street line, and a twenty-five-foot distance from all contiguous properties. Any owner or zoning authority may request the Secretary of the Interior to determine whether a proposed move, alteration, construction, reconstruction, or enlargement of any such property would subject such property to acquisition by condemnation, and the Secretary, within sixty days of the receipt of such request, shall advise the owner or zoning authority in writing whether the intended use will subject the property to acquisition by condemnation; and

(5) have the effect of providing that the Secretary shall receive notice of any variance granted under, and of any exception made to the application of, such bylaw or amendment.

(e) The approval of any bylaw or amendment pursuant to subsection (d) shall not be withdrawn or revoked by the Secretary for so long as such bylaw or amendment remains in effect as approved. Any such bylaw or amendment so approved shall not be retroactive in its application.

SEC. 10. (a) Any owner or owners of improved property situated within the area designated for inclusion in the lakeshore on the date of its acquisition by the Secretary may, as a condition of such acquisition, retain, for a term of not to exceed twenty-five years, or for a term ending at the death of such owner or owners, the right of use and occupancy of such property for any residential purpose which is not incompatible with the purposes of this Act or which does not impair the usefulness and attractiveness of the area designated for inclusion. The Secretary shall pay to the owner the value of the property on the date of such acquisition, less the value on such date of the right retained by the owner. Where any such owner retains a right of use and occupancy as herein provided, such right during its existence may be conveyed or leased for noncommercial residential purposes in accordance with the provisions of this section.

Property owners, retention of use.



(b) Any deed or other instrument used to transfer title to property, with respect to which a right of use and occupancy is retained under this section, shall provide that such property shall not be used for any purpose which is incompatible with purposes of this Act, or which impairs the usefulness and attractiveness of such area and if it should be so used, the Secretary shall have authority to terminate such right. In the event the Secretary exercises his power of termination under this subsection he shall pay to the owner of the right terminated an amount equal to the value of that portion of such right which remained unexpired on the date of such termination.

"Improved  
property."

SEC. 11. As used in this Act, the term "improved property" means a detached, one-family dwelling, construction of which was begun before December 31, 1964, together with so much of the land on which the dwelling is situated, such land being in the same ownership as the dwelling, as the Secretary shall designate to be reasonably necessary for the enjoyment of the dwelling for the sole purpose of noncommercial residential use, together with any structures accessory to the dwelling which are situated on the lands so designated. The amount of the land so designated shall in every case be at least three acres in area, or all of such lesser acreage as may be held in the same ownership as the dwelling, and in making such designation the Secretary shall take into account the manner of noncommercial residential use in which the dwelling and land have customarily been enjoyed: *Provided, however,* That the Secretary may exclude from the land so designated any beach or waters on Lake Michigan, together with so much of the land adjoining any such beach or waters, as the Secretary may deem necessary for public access thereto. If the Secretary makes such exclusion, an appropriate buffer zone shall be provided between any residence and the public access or beach.

Scenic roads.

SEC. 12. In order to facilitate visitor travel, provide scenic overlooks for public enjoyment and interpretation of the national lakeshore and related features, and in order to enhance recreational opportunities, the Secretary is authorized to construct and administer as a part of the national lakeshore scenic roads of parkway standards generally lying within the parkway zone designated on the map specified in section 2(a) of this Act. Such scenic roads shall include necessary connections, bridges, and other structural utilities. Notwithstanding any other provision of this Act, the Secretary may procure for this purpose land, or interest therein, by donation, purchase with appropriated or donated funds, or otherwise: *Provided,* That land and interest so procured shall not exceed one hundred and fifty acres per mile of scenic road, except that tracts may be procured in their entirety in order to avoid severances. Property so acquired in excess of the acreage limitation provided in this section may be exchanged by the Secretary for any land of approximately equal value authorized for acquisition by this Act.

Commercial  
property.

SEC. 13. In any case not otherwise provided for in this Act, the Secretary shall be prohibited from condemning any commercial property used for commercial purposes in existence on December 31, 1964, so long as, in his opinion, the use thereof would further the purpose of this Act, and such use does not impair the usefulness and attractiveness of the area designated for inclusion in the lakeshore. The following uses, among others, shall be considered to be uses compatible with the purposes of this Act: Commercial farms, orchards, motels, rental cottages, camps, craft and art studios, marinas, medical, legal, architectural, and other such professional offices, and tree farms.

SEC. 14. The Secretary shall furnish to any interested person requesting the same a certificate indicating, with respect to any property

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which the Secretary has been prohibited from acquiring by condemnation in accordance with provisions of this Act, that such authority is prohibited and the reasons therefor.

SEC. 15. There are authorized to be appropriated not more than \$19,800,000 for the acquisition of lands and interests in lands and not more than \$18,769,000 (June 1970 prices) for development, plus or minus such amounts, if any, as may be justified by reason of ordinary fluctuations in construction costs as indicated by engineering cost indices applicable to the type of construction involved herein.

Appropriation.

Approved October 21, 1970.

96 STAT. 1720

PUBLIC LAW 97-361—OCT. 22, 1982

Public Law 97-361  
97th Congress

An Act

Oct. 22, 1982  
[H.R. 3787]

To amend sections 10 and 11 of the Act of October 21, 1970 (Public Law 91-479; 16 U.S.C. 460x), entitled "An Act to establish in the State of Michigan the Sleeping Bear Dunes National Lakeshore, and for other purposes".

Sleeping Bear  
Dunes National  
Lakeshore,  
Mich.

16 USC 460x-9.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That section 10 of the Act entitled "An Act to establish in the State of Michigan the Sleeping Bear Dunes National Lakeshore, and for other purposes", approved October 21, 1970 (16 U.S.C. 460x-x14), is amended by striking out subsection (b) and inserting in lieu thereof the following new subsections:

"(b) Any person who is—

"(1) an owner of improved property described in section 11(a)(2) which is situated within the area designated for inclusion in the lakeshore on the date of its acquisition by the Secretary; or

*Post*, p. 1721.

"(2) an occupier of improved property described in section 11(a)(2) which is situated within the area designated for inclusion in the lakeshore on the date of its acquisition by the Secretary, in situations where the fee ownership of such improved property has been heretofore acquired by the United States (whether by donation, purchase, condemnation, exchange or otherwise);

may retain, for a term not to exceed twenty-five years from January 1, 1973, or for a term ending on the death of such owner or occupier, the right of use or occupancy of such property for any residential purpose which is not incompatible with the purposes of this Act or which does not impair the usefulness and attractiveness of the area designated for inclusion. Such owner or occupier must notify the Secretary of any intention to exercise such option within 60 days after receipt of the notice referred to in section 11(c)(3). In situations where the United States has not heretofore acquired fee title to the improved property, the Secretary shall pay to the owner the value of the property on the date of such acquisition, less the value on such date of the right retained by the owner. In situations where the United States has heretofore acquired fee title to the improved property, the occupier may notify the Secretary that such occupier elects to retain continued use and occupancy of such property pursuant to this section, in which event the occupier shall pay to the Secretary the value of the additional right retained, which value shall be based upon the value of the property at the time of its acquisition by the Secretary.

*Post*, p. 1721.

"(c) Any deed or other instrument used to transfer title to property, with respect to which a right of use and occupancy is retained under this section, and any instrument evidencing any right of use and occupancy retained by any occupier under this section, shall provide that such property shall not be used for any purpose which is incompatible with purposes of this Act, or which impairs the usefulness and attractiveness of such area, and if it should be so



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96 STAT. 1721

used, that the Secretary may terminate such right. In the event the Secretary exercises his power of termination under this subsection he shall pay to the owner of the right terminated an amount equal to the value of that portion of such right which remained unexpired on the date of such termination.

“(d)(1) Any owner or occupier of improved property who retains a right of use and occupancy under subsection (b) may convey or lease such right during its existence to a member of such owner or occupier’s immediate family for noncommercial residential purposes which are not incompatible with the purposes of this Act and which do not impair the usefulness and attractiveness of the area designated for inclusion.

Right of use and occupancy.

“(2) Any owner or occupier of improved property who has retained a right of use and occupancy under subsection (b) may terminate such right at any time, and the Secretary shall pay, within 120 days after the date of such termination, to the owner of the right terminated an amount equal to the value of that portion of such right which remained unexpired on the date of such termination.

Termination.

“(3) As used in this Act, the term ‘member of the immediate family’ means spouse, brother, sister, or child, including persons bearing such relationships through adoption, and step-child.”.

“Member of the immediate family.”

SEC. 2. Section 11 of the Act amended by the first section of this Act is amended to read as follows:

“SEC. 11. (a) As used in this Act, the term ‘improved property’ means a detached, one-family dwelling, construction of which—

“Improved property.”  
16 USC 460x-10.

“(1) was begun before December 31, 1964, or

“(2) for the purposes of section 10(b) or 10(d), was begun on or after December 31, 1964, and before October 21, 1970, and has been openly and continuously used, at least during the summer months of each year when similar dwellings in the area are used, as a residential dwelling since such construction was completed, and with respect to the portion of such period after any acquisition of such property by the United States, by the owner, or a member of the immediate family of the owner, of such dwelling on the date of such acquisition,

Ante, p. 1720.

together with so much of the land on which the dwelling is situated, such land being in the same ownership as the dwelling, as the Secretary shall designate to be reasonably necessary for the enjoyment of the dwelling for the sole purpose of noncommercial residential use, together with any structures accessory to the dwelling which are situated on the lands so designated. The amount of land so designated shall in every case be at least three acres in area, or all of such lesser acreage as may be held in the same ownership as the dwelling, and in making such designation the Secretary shall take into account the manner of noncommercial residential use in which the dwelling and land have customarily been enjoyed.

“(b) The Secretary may exclude from the land designated under subsection (a) any beach or waters on Lake Michigan, together with so much of the land adjoining any such beach or waters as the Secretary may deem necessary for public access thereto. If the Secretary makes such exclusion, an appropriate buffer zone shall be provided between any residence and the public access or beach.

Beach or waters, exclusion.

“(c)(1) The Secretary may exclude from the category of ‘improved property’ under this Act any property described in subsection (a)(2) which the Secretary determines is in an area required for public use or development in the immediate future. In making any such determination the Secretary shall take into account the proximity of such

Improved property, exclusion.



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Right of use and  
occupancy,  
termination.

property to any other improved property, the development or public use of the lakeshore and the related timetable therefor, and the anticipated availability in the immediate future of funds related to such development or public use.

“(2)(A) With respect to any improved property, as defined in subsection (a)(2), with respect to which the occupier has retained a right of use and occupancy under section 10(b), the Secretary may terminate such right 90 days after notifying in writing the occupier, if the Secretary determines that such improved property is needed for public use or development under this Act. In making any such determination the Secretary shall take into account the proximity of such property to any other improved property, the development or public use requirements of the lakeshore and related timetable therefor, and the current availability of funds for the proposed public use or development.

“(B) The Secretary shall pay to the owner of the right terminated an amount equal to the value of that portion of such right which remained unexpired on the date of such termination.

“(3)(A) The Secretary must, within 60 days after the date of enactment of this subsection, notify in writing any owner or occupier of property described in subsection (a)(2) that an option to retain rights with respect to such property exists under section 10(b), whether such property shall be subject to any action by the Secretary under paragraph (1) of this subsection, the nature of such proposed action, the reasons for such proposed action, and the contemplated timetable therefor.

“(B) With respect to any proposed action to be taken under paragraph (2) of this subsection, if the Secretary determines within 60 days after the date of enactment of this subsection, after taking into account timetable and funding projections, that, consistent with the General Management Plan dated October 1979, public use or development is anticipated before 1998 for an area containing any improved property described in subsection (a)(2), the Secretary shall include notice of such determination in any notification under subparagraph (A) of this paragraph. Any failure of the Secretary to so notify an occupier pursuant to this subparagraph shall not preclude the Secretary from taking action under paragraph (2) at some future date.”

16 USC 460x-11.

SEC. 3. Section 12 of the Act amended by the first two sections of this Act is amended—

(1) by inserting “(a)” immediately before “In order to facilitate”;

(2) by inserting “Benzie County and within” after “within” in the first sentence thereof; and

(3) by adding the following at the end thereof:

Land exchange.

“(b) Except as provided in subsection (c), any lands in Leelanau County acquired by the Secretary under this section before the date of enactment of this subsection which are within the parkway zone depicted on the map specified in section 2(a) but which are not within, or contiguous to, the lakeshore zone as depicted on such map may be exchanged by the Secretary for other lands of approximately equal value in the lakeshore. If the Secretary is unable to effect such an exchange, such lands may be offered for sale to the person who owned such lands immediately before their acquisition by the Secretary. If such previous owner declines such offer, the Secretary may sell such lands to any buyer. Proceeds from any sale under this

PUBLIC LAW 97-361—OCT. 22, 1982

96 STAT. 1723

subsection shall be credited to the account established under section 17 of this Act.

"(c) The Secretary is authorized to obtain and administer, according to the provisions of this section, as a part of the lakeshore as Resource Preservation Areas certain interests in the following lands:

Administration.

"(1) Approximately 600 acres designated as 'Miller Hill' on the map numbered 634-91,001, dated September 1982.

Miller Hill.

"(2) Approximately 975 acres as designated as 'Bow Lakes' on the map numbered 634-91-002, dated September 1982.

Bow Lakes.

"(d)(1) The Secretary may obtain fee title under subsection (e) to lands described in subsection (c)(1), or easements or other restrictive agreements for the preservation of scenic values in such lands.

"(2) The Secretary may obtain fee title under subsection (e) to lands described in subsection (c)(2), or public access easements or other restrictive agreements consistent with use of such lands for educational purposes and for research and interpretation of natural features.

"(e)(1) Except as provided under paragraph (4), the Secretary may obtain fee title or other lesser interests to lands described in subsection (c) only—

"(A) by gift, donation, or bequest;

"(B) by purchase from a willing seller under paragraph (2); or

"(C) as an exercise of a right of first refusal under paragraph

(3).

"(2) The Secretary may negotiate with willing sellers for the transfer of fee title to other lesser interests to lands described in subsection (c). If the Secretary and such willing seller are unable to agree to a fair purchase price, that question may, by mutual consent be submitted to the appropriate United States District Court for adjudication.

"(3) If the owner of any lands described in subsection (c) intends to transfer any interest in such lands except by gift, donation, or bequest, such owner must notify the Secretary of such intention. The Secretary shall have 90 days after notification in which to exercise a right of first refusal to match any bona fide offer to obtain such interest under the same terms and conditions as are contained in such offer. If the Secretary has not exercised such right within 90 days, the owner may transfer such interest.

"(4) Condemnation may be used with respect to any lands described in subsection (c) only—

Condemnation.

"(A) to clear title if necessary for any transfer to the Secretary under this subsection; or

"(B) to purchase fee title or such lesser interest as may be sufficient to prevent significant damage to the scenic, soil, or water resources of the lakeshore. Action under this subparagraph shall be used only after attempts to negotiate a solution to the problem have failed. If the Secretary determines that such attempts have failed, the Secretary shall notify in writing the owner of the property involved of the proposed action to be taken under this subparagraph and the Secretary shall seek an injunction to prevent such resource damage. The Secretary may at any time, and if an injunction is granted under this subparagraph the Secretary shall within 30 days after the date of such injunction, send in writing to the owner of the property the Secretary's best and final offer for the purchase of such property. If the owner does not accept such offer, the Secretary may file for condemnation. The Secretary must notify the Committee

Notification to congressional committees.



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on Energy and Natural Resources of the United States Senate and the Committee on Interior and Insular Affairs of the United States House of Representatives of any action taken under this subparagraph.

“(f)(1) The Secretary shall enter into discussions with appropriate local government officials to develop mutually agreeable zoning restrictions for the protection of scenic resources with respect to the lands described in subsection (c)(1).

“(2) The Secretary shall enter into discussions with appropriate State and local officials responsible for the administration of the Goemaere-Anderson Wetland Protection Act (Michigan, P.A. 203, 1979) to ensure the protection of natural resources with respect to the lands described in subsection (c)(2).

“(g) If the owner of the area designated as ‘The Kettle’ in the General Management Plan dated October 1, 1979, and comprising 240 acres, agrees to donate fee title or a scenic easement to, or other less than fee interest in, such area, the lands in such area may be included as a part of the lakeshore upon publication in the Federal Register by the Secretary of a revised map of the lakeshore which includes such lands.

“(h) The Secretary may, upon request in writing by any owner or occupier of lands in the lakeshore, provide services, such as road maintenance, subject to reimbursement.”

16 USC 460x-14.

SEC. 4. Section 15 of the Act amended by the first three sections of this Act is amended by striking out “\$57,753,000” and inserting in lieu thereof “\$66,153,000”.

SEC. 5. The Act amended by the first four sections of this Act is further amended by adding at the end the following new sections:

Presidential  
recommendations  
to Congress.  
16 USC 460x-15.

“SEC. 16. In accordance with section 3(c) of the Wilderness Act (78 Stat. 890, 892; 16 U.S.C. 1132(c)), the President shall, no later than June 1, 1983, advise the United States Senate and House of Representatives of his recommendations with respect to the suitability or nonsuitability as wilderness of any area within the lakeshore. Subject to existing private rights, the areas described in the report prepared by the National Park Service entitled ‘Wilderness Recommendation; Sleeping Bear Dunes National Lakeshore’ dated January, 1981, and recommended for wilderness (approximately 7,128 acres) and for potential wilderness additions (approximately 23,775 acres) shall, until Congress determines otherwise, be administered by the Secretary so as to maintain their presently existing wilderness character and potential for inclusion in the National Wilderness Preservation System.”

Administration.

SEC. 6. No authority under this Act or any amendment made by this Act to enter into contracts or to make payments shall be effective except to the extent and in such amounts as provided in advance in appropriations Acts.

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SEC. 7. For purposes of section 7(a)(3) of the Land and Water Conservation Fund Act of 1965 (16 U.S.C. 4601-9(a)(3)), the statutory ceilings on appropriations established by the amendments made by this Act shall be deemed to be statutory ceilings contained in a provision of law enacted prior to the convening of the Ninety-fifth Congress.

Statutory  
ceilings.  
16 USC 460x-14  
note.

Approved October 22, 1982.

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LEGISLATIVE HISTORY—H.R. 3787:

HOUSE REPORT No. 97-882 (Comm. on Interior and Insular Affairs).  
CONGRESSIONAL RECORD, Vol. 128 (1982):

Sept. 29, considered and passed House.

Oct. 1, considered and passed Senate, amended; House concurred in Senate amendments.

PUBLIC LAW 108-229—MAY 28, 2004

118 STAT. 645

Public Law 108-229  
108th Congress

An Act

To provide for expansion of Sleeping Bear Dunes National Lakeshore.

May 28, 2004  
[H.R. 408]

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

Michigan.  
16 USC 460x-7  
note.

**SECTION 1. EXPANSION OF SLEEPING BEAR DUNES NATIONAL LAKE-SHORE.**

(a) **IN GENERAL.**—When title to the land described in subsection (b) has vested in the United States in fee simple, the boundary of Sleeping Bear Dunes National Lakeshore is revised to include such land in that park.

(b) **LAND DESCRIBED.**—The land referred to in subsection (a) consists of approximately 104.45 acres of unimproved lands generally depicted on National Park Service map number 634/80078, entitled “Bayberry Mills, Inc. Crystal River, MI Proposed Expansion Unit to Sleeping Bear Dunes National Lakeshore”. The Secretary of the Interior shall keep such map on file and available for public inspection in the appropriate offices of the National Park Service.

(c) **PURCHASE OF LANDS AUTHORIZED.**—The Secretary of the Interior may acquire the land described in subsection (b), only by purchase from a willing seller.

**SEC. 2. LIMITATION ON ACQUISITION BY EXCHANGE OR CONVEYANCE.**

The Secretary of the Interior may not acquire any of the land described in subsection (b) of section 1 through any exchange or conveyance of lands that are within the boundary of the Sleeping Bear Dunes National Lakeshore as of the date of the enactment of this Act.

Approved May 28, 2004.

**LEGISLATIVE HISTORY—H.R. 408:**

HOUSE REPORTS: No. 108-292 (Comm. on Resources).

SENATE REPORTS: No. 108-240 (Comm. on Energy and Natural Resources).

**CONGRESSIONAL RECORD:**

Vol. 149 (2003): Oct. 8, considered and passed House.

Vol. 150 (2004): May 19, considered and passed Senate.

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## APPENDIX B: ANALYSIS OF BOUNDARY ADJUSTMENTS

As one of the provisions of Public Law 95-625, the National Parks and Recreation Act of 1978, Congress directed that the National Park Service consider, as part of a planning process, what modifications of external boundaries might be necessary to carry out park unit purposes.

*NPS Management Policies 2006* (section 3.5 Boundary Adjustments) state that the National Park Service will conduct studies of potential boundary adjustments and may make boundary revisions for the following reasons:

- 1) Protect significant resources and values, or to enhance opportunities for public enjoyment related to park purposes;
- 2) Address operational and management issues, such as the need for access or the need for boundaries to correspond to logical boundary delineations such as topographic or other natural features or roads; **OR**
- 3) Otherwise protect park resources that are critical to fulfilling park purposes.

Additionally, all recommendations for boundary changes must meet the following two criteria:

- 4) The added lands will be feasible to administer considering their size, configuration, and ownership; costs; the views of and impacts on local communities and surrounding jurisdictions; and other factors such as the presence of hazardous substances or exotic species;
- 5) Other alternatives for management and resource protection are not adequate.

The following areas were assessed as potential additions to the Lakeshore based on public comments received and internal scoping.

### NORTH AND SOUTH FOX ISLANDS

North Fox and South Fox islands are located in Lake Michigan, approximately 17 and 24 miles northeast, respectively, of North Manitou Island. The Fox Islands are part of Leelanau County, Michigan. North Fox is the smaller of the two islands at about 832 acres. The north island has been owned and managed by the state of Michigan since the year 2000. South Fox Island is about 3,400 acres in size. Since 2001, about two-thirds of South Fox Island has been privately owned. The other third is owned and managed by the state, including a lighthouse on the southern tip of the island. There is no regular ferry service to South Fox Island, and it has no docks, fuel, or sheltered harbor. The state manages a special deer hunt on the island, and hunters can access the area using the seasonal service offered by the Manitou Island Transit ferry.

The Fox Islands contain resources and values related to the Lakeshore's purpose (dunes and beaches, for example). However, the resources and values at the islands are not critical to accomplishing the Lakeshore's purpose, nor are the islands required for operational or management needs for the Lakeshore. If the islands were incorporated into the Lakeshore boundaries, they would be difficult and costly for the National Park Service to administer due to their distance from Lakeshore headquarters (more than 50 miles) and from the docks in Leland, Michigan (more than 30 miles). Adequacy of other alternatives for the islands' management and resource protection, such as continued management by the state and/or a long-term lease of lighthouse facilities by a nonprofit organization, depends upon the level of funding, as would be the case for NPS management. Dune areas on the Fox Islands are identified by the state of Michigan as "critical dunes areas," affording them special

protection under the Sand Dune Protection and Management Act of 1976, as amended. Because the Fox Islands do not meet NPS criteria for boundary adjustments, the islands are not considered for inclusion in the National Lakeshore boundary in this *General Management Plan*.

## POINT BETSIE LIGHTHOUSE

Point Betsie Lighthouse, built in 1858, is located on the Lake Michigan shore in Benzie County, south of Sleeping Bear Dunes National Lakeshore and north of Frankfort, Michigan. The lighthouse, which is listed on the National Register of Historic Places, is owned by Benzie County. In 2004 the lighthouse property was transferred by the Bureau of Land Management from U.S. Government management to ownership by Benzie County, with the Coast Guard retaining rights to operate the light and ownership of the modern house behind the lighthouse and the grounds on which that guest house sits. According to an operating agreement between Benzie County and the Friends of Point Betsie Lighthouse, Inc. (“Friends”), the capital assets will continue to be owned by Benzie County and operated by the Friends. The Friends are responsible for fundraising to accomplish this, along with the county who will apply for various state and federal grants.

The Point Betsie Lighthouse and its surrounding property do not contain resources and values related to the Lakeshore’s purpose. Including the lighthouse property within the National Lakeshore would not address NPS operational and management needs, nor are the resources and values at the lighthouse critical to fulfilling the National Lakeshore’s purpose. If the Point Betsie Lighthouse were incorporated into the Lakeshore boundaries, additional operational funding would be required for maintaining and administering this resource. The cooperative agreement between Benzie

County (owner) and the Friends of Point Betsie Lighthouse is an adequate alternative to NPS management and resource protection. For these reasons, the lighthouse is not considered for inclusion in the National Lakeshore boundary in this *General Management Plan*.

## NORTH MANITOU SHOAL LIGHT

The North Manitou Shoal Light (“the Crib”) is located offshore from Leland, Michigan. The light tower, which is still in service, marks the end of North Manitou Shoal, a shallow area of the Manitou Passage. The light is listed on the National Register of Historic Places and consists of a square, two-story, white steel building set on a massive concrete crib. The light is owned and managed by the U.S. Coast Guard.

The North Manitou Shoal Light does not contain resources and values related to the Lakeshore’s purpose. Furthermore, including the lighthouse property within the National Lakeshore would not address NPS operational and management needs, and the resources and values at the lighthouse are not critical to fulfilling the National Lakeshore’s purpose. If the North Manitou Shoal Light were incorporated into the Lakeshore boundaries, additional operational funding would be required for maintaining and managing the light. Because the lighthouse is still active, continued ownership and management by the U.S. Coast Guard is an appropriate alternative. For these reasons, the North Manitou Shoal Light is not considered for inclusion in the National Lakeshore boundary in this *General Management Plan*.

## ADDITIONAL LAKE MICHIGAN BEACH AND SHORELINE

During public scoping for this *General Management Plan*, a few members of the public suggested that the National Park

Service should acquire more beach or shoreline along Lake Michigan. The only specific suggestion along these lines was to acquire beach land located between Old Indian Trail (near the south end of the National Lakeshore) and Point Betsie, about 3 miles away. This area, which is bordered by Crystal Lake to the south and east, is largely forest land, but includes a dune area adjacent to the shoreline around Point Betsie. The area is in private ownership, and land uses include a golf course and numerous private residences.

This area does contain resources and values related to the Lakeshore's purpose (e.g., beaches and dune formations). However, including more beach lands within the National Lakeshore would not address NPS operational and management needs, and the resources and values in this area are not critical to fulfilling the National Lakeshore's purpose. In addition, many of the natural resources in this area have been severely altered and fragmented. The dune area that includes and surrounds Point Betsie is identified by the state as a "critical dune area," affording it special protection under the Sand Dune Protection and Management Act of 1976, as amended. The area between the south end of Sleeping Bear Dunes and Point Betsie would not be feasible to acquire due to very high real estate prices for Lake Michigan frontage.

## FISHTOWN

Fishtown is located on the docks along the Carp River where it empties into Lake Michigan in Leland, Michigan, north of Sleeping Bear Dunes National Lakeshore.

This 1-acre cluster of small wooden structures is listed on the National Register of Historic Places and is privately owned. Some of Fishtown's buildings were built in the late 1800s, when lumbering and iron smelting were dominant industries in northern Leelanau County. The fishing era began around 1900 and flourished over the next three decades, when most of Fishtown's fishing shanties, icehouses, and smokehouses were constructed. Most of the structures now house retail businesses, but fishing activities continue there today as well.

Fishtown has been purchased by the non-profit Fishtown Preservation Society to ensure that its historic integrity is preserved for public enjoyment. Their plan is to maintain and preserve Fishtown's historic structures, boats, and equipment, and to continue to lease the buildings to retail businesses, including commercial fishing operations, in order to continue public access there.

Fishtown does not contain resources and values related to the Lakeshore's purpose. Including the Fishtown property within the National Lakeshore would not address NPS operational and management needs, and the resources and values at the lighthouse are not critical to fulfilling the National Lakeshore's purpose. If Fishtown were incorporated into the Lakeshore boundaries, additional operational funding would be required for maintaining and administering this resource. Acquisition and management by the Fishtown Preservation Society is an adequate alternative to NPS management and resource protection. For these reasons, Fishtown is not considered for inclusion in the National Lakeshore boundary in this *General Management Plan*.



## APPENDIX C: COST SUMMARY OF ALTERNATIVES

	No Action	Preferred Alternative	Alternative A	Alternative B	Alternative C
<b>One-Time Capital Costs</b>					
<b>Facility (Construction)(1)</b>	\$3,200,000	\$14,100,000	\$11,000,000	\$40,100,000	\$27,800,000
<b>Non-Facility (2)</b>	\$3,400,000	\$3,400,000	\$3,400,000	\$2,700,000	\$2,700,000
<b>Deferred Maintenance (3)</b>	\$15,400,000	\$15,400,000	\$15,400,000	\$15,400,000	\$15,400,000
<b>TOTAL ALTERNATIVE COSTS (1)(2)(3)</b>	\$22,000,000	\$32,900,000	\$29,800,000	\$58,200,000	\$45,900,000
<b>Annual Operating Costs (in 2007 dollars)</b>					
<b>ONPS (4)</b>	\$3,900,000	\$4,400,000	\$4,200,000	\$4,400,000	\$4,500,000
<b>Staff- FTE (5)</b>	66	79	77	79	85

The presentation of costs in a general management plan is applied to the types and general intensities of development in a comparative format. The following applies to costs presented in this general management plan:

- The costs are presented as estimates and are not appropriate for budgeting purposes.
- The cost estimates were developed in 2007; they are very general and intended for alternative comparison purposes only.
- The cost estimates were developed using industry standards to the extent available and they represent the total costs of projects. However, due to cost estimating uncertainty, actual costs could be as much as 30% lower or 50% higher than noted.
- Actual costs will be determined at a later date and will take into consideration the design of facilities, identification of detailed resource protection needs, and changing visitor expectations.
- Initial construction was assumed to occur in year one *except* for construction of a Benzie Corridor scenic road (alternative B) and construction of a Benzie Corridor hike/bike trail (alternative C); these were assumed to occur in year 25. For the preferred alternative, Benzie Corridor construction costs (for a scenic road and/or hike/bike trail) were *not*

included because, similar to the no-action alternative, construction is not anticipated to occur within the life of the plan.

- Approval of the general management plan does not guarantee funding or staffing for proposed actions.
- Project funding will not come all at once; it will likely take many years to secure and may be provided by partners, donations, or other nonfederal sources.
- Some proposals may not be funded within the life of this *General Management Plan* and full implementation may occur many years into the future.

### NOTES

- (1) Facility (construction) costs include costs for new facilities that are proposed in the action alternatives. For the no-action alternative, construction costs include only projects that are already planned and funded.
- (2) Non-facility costs include natural and cultural resources management activities and visitor use projects.
- (3) Deferred maintenance costs are those needed to improve Lakeshore assets (structures and facilities) to a good condition based on NPS standards and calculating tools.
- (4) Annual operating costs (ONPS) are the total annual costs for maintenance and operations

associated with each alternative. Included are all costs related to Lakeshore maintenance (e.g., utilities, materials, supplies, and leasing) and visitor services, law enforcement, resource management, and administration operations (including staff salaries and benefits). These costs are based on the current budget.

- (5) Total full-time equivalents (FTE) are the number of staff required to maintain Lakeshore assets at a good level and provide

acceptable visitor services, protection of resources, and other operational support. Full-time equivalent staff would likely be NPS employees. However, Lakeshore managers would explore opportunities to work with partners, volunteers, and other federal agencies to assist in the effective and efficient management of the Lakeshore. Those hours might be in addition to or instead of NPS employees.

## APPENDIX D: DEVELOPMENT OF THE PREFERRED ALTERNATIVE

### INITIAL PLANNING STEPS

Work on the *Sleeping Bear Dunes National Lakeshore General Management Plan / Wilderness Study / Environmental Impact Statement* began in late 2005. The planning team consisted of Sleeping Bear Dunes National Lakeshore staff, the NPS Midwest Region Chief of Planning and Compliance, and technical specialists from the National Park Service's Denver Service Center.

Early steps in the planning process included the following (see chapter 1 for details):

- Reaffirm the Lakeshore's purpose and significance.
- Identify the Lakeshore's fundamental resources and values.
- Consider legislative mandates.
- Recognize planning issues.
- Identify desired conditions.

The planning team conducted field trips and gathered and studied information on National Lakeshore resources, visitor uses and values, and planning issues. The team also solicited input from the public. (See chapter 6 for a summary of public involvement.) With help from the public, the planning team developed four alternative concepts (including no action) for managing the Lakeshore. These concepts were presented to the public in a newsletter, and then comments from the public were gathered and reviewed.

Based on public input and further consideration, the planning team developed the four alternative concepts into four full preliminary alternatives. These draft alternatives were then presented in another newsletter and at public meetings, and once again public comments were collected and reviewed. Possible consequences of the preliminary alternatives were considered and additional field investigations were conducted.

### DEVELOPING THE PREFERRED ALTERNATIVE

The next major step was to develop a preferred alternative. After reviewing the public comments on the preliminary alternatives, the planning team used an evaluation process called "Choosing by Advantages" to evaluate the four preliminary alternatives (no action, alternative A, alternative B, and alternative C). In using this process, the planning team asks, "What and how large are the advantages of each alternative?", "How important are these advantages?", and finally "Are these advantages worth their associated costs?" The Choosing by Advantages process does not "weigh" evaluation criteria in advance so that certain criteria are automatically more important than others. Rather, the process focuses on the differences between alternatives and determining how important those differences (advantages) are.

After addressing the Choosing by Advantages questions in detail, the team used the resulting information to develop the preferred alternative. Alternative A provided the overall best value (greatest total advantage for the cost expended). Thus, to build the preferred alternative, the team started with alternative A, then studied the Choosing by Advantages results to see where elements of other alternatives could be incorporated (or substituted for elements of alternative A) to add advantages without adding too much additional cost.

The draft preferred alternative was presented in the *Draft General Management Plan / Wilderness Study / Environmental Impact Statement*. Based on comments on the draft plan, changes were made to the preferred alternative; these are listed on page 295.

## **RATIONALE FOR AND SUPPLEMENTARY INFORMATION ABOUT THE PREFERRED ALTERNATIVE**

This section provides more information about and rationale for the preferred alternative.

### **High Use Zone**

The M-22 and M-109 road corridors were zoned high use in the preferred alternative to acknowledge continued vehicular use of these state transportation routes<sup>3</sup>. Along these corridors, the width of the high use zone is 300 feet (each side) from the highway centerline, on NPS-owned lands only, to allow for a possible future M-22/M-109 hike/bike trail. Within this high use zone, wherever it turns out that land is not needed for the bike trail, the width of the high use zone would revert back to the M-22 or M-109 right-of-way, and lands would revert to adjacent management zoning. The high-use zoning does not imply the acquisition of private lands for the hike/bike trail development.

The area around Lake Michigan Road (in Benzie County, near the Platte River) was zoned high use to recognize the relatively high level of use and activity that occurs along the road, at Platte Point, and in and around the Platte River campground and picnic area. This high use zone extends to the northeast towards Tiesma Road to allow for a new Lake Michigan boat ramp or dock in this area, although a new boat ramp or dock is not proposed by the National Park Service. (A separate study would be needed to determine whether any such facility would be appropriate in this area. If such a study indicated that a

new boat ramp or dock is not appropriate here, the high use zone beyond the Lake Michigan Road area would revert to the experience nature zone and Tiesma Road would revert to the recreation zone). NPS-owned Tiesma Road would remain open in any event.

Other popular National Lakeshore areas that were zoned high use to allow for high levels of visitor use and interpretive activities include the Pierce Stocking Scenic Drive and the Dune Climb. The Lakeshore's maintenance facility area, located just south of Empire, was also zoned high use.

### **Experience History Zone**

Areas of the National Lakeshore containing cultural resources that are fundamental to the Lakeshore's significance (see chapter 1) were zoned experience history. These areas are Glen Haven (including the area around the Sleeping Bear Point Life-Saving Museum), Port Oneida Rural Historic District, and the U.S. Life-Saving Service Station/villages and lighthouse on the Manitou Islands. In addition, on South Manitou Island the NPS-owned portion of the farm loop tour and adjacent fields and the schoolhouse were zoned experience history. The primary management emphasis in these areas is to preserve historic structures and landscapes and provide visitors the opportunity to enjoy and learn about them.

### **Recreation Zone**

Areas zoned recreation in the preferred alternative include the following:

- Lake Michigan beach areas and the 0.25-mile-wide strip of Lake Michigan within the National Lakeshore boundary — to allow continued access by watercraft (except for personal watercraft, or jet skis).

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<sup>3</sup> State owned road rights-of-way are not controlled by the National Park Service. Showing state-owned road rights-of-way within the high use management zone is not intended to suggest otherwise, but rather to indicate continued use under management by the state.

- County-owned road corridors — to recognize continued vehicular and other use of these routes for recreational and other purposes.<sup>4</sup>
- School Lake and Loon Lake —to permit continued motorboat and other recreational uses.
- The Platte River — to permit moderate levels of recreational use, including use of motorboats.
- To allow for a possible M-22/M-109 hike/bike trail developed at the initiative of Lakeshore partners, the area between Peterson Road and north of Platte River campground; the area southeast of the Lakeshore’s Empire maintenance area and west of M-22; the area south of Glen Haven and north of the Dune Climb (west of M-109); plus corridors or two-tracks east of the Pierce Stocking Scenic Drive and north of Alligator Hill. If these areas are not needed for the bike trail, they would revert back to the experience nature zone (except for county roads and the D. H. Day group campground, which would retain the recreation zone).
- Various trailhead areas — to allow for trailhead parking.
- Various farmsteads, farm fields, and other historic elements that are either adjacent to M-22 or where there is minimal conflict with the adjacent experience nature zone — to allow for preservation as “scene setters” or possible adaptive reuse/rehabilitation by partners or the National Park Service. Examples include the Boekeloo cabin and immediate landscape, the Ken-Tuck-U-Inn and immediate landscape, Tweddle School, the Tweddle farmstead, the Bufka farmstead and surrounding open fields, and the Eitzen and Kropp farmsteads.
- The wooded area (“Burnham Woods”) south of the Glen Lakes and east of M-22 — to allow consideration for a possible future designated mountain bike trail system.
- The area east of Glen Haven — to maintain the rustic character of the D. H. Day campground and surroundings, and to permit moderate use levels in this area.
- The Benzie Corridor — to allow for a future scenic road per the Lakeshore’s enabling legislation, and/or a hike/bike trail. About 10% of the 1,100-acre Benzie Corridor has been purchased by the National Park Service from willing sellers over the past quarter century, so development of a scenic road or hike/bike trail is likely decades off into the future. Based on public input received to date and preliminary impact analyses, NPS managers concluded that (a) the Benzie Corridor should remain within the Lakeshore’s legislated boundary, and (b) future managers should have the flexibility to study and decide, based on the circumstances, public input, and other best available information at the time, whether a scenic road or hike/bike trail (or both) should be built within the Benzie Corridor<sup>5</sup>.

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4. County-owned road rights-of-way are not controlled by the National Park Service. Showing county-owned road rights-of-way within the recreation management zone is not intended to suggest otherwise, but rather to indicate continued use under management by the counties.

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5. The NPS vision of the scenic road at the time of this writing is as follows. The road would provide an identifiable southern entrance to the National Lakeshore. It would include an interchange on US-31. From there it would continue in a generally northwesterly direction along the Crystal Ridge to an intersection with M-22. The road would provide scenic variety and offer outstanding scenic views of Lake Michigan, Empire Bluffs, Platte Lake, and Crystal Lake. Complementary facilities along the scenic road would likely include an entrance station, scenic overlooks, picnic areas, restrooms, and hiking and biking trails. The road would likely be similar to Pierce Stocking Scenic Drive, only with two-way traffic. It would be closed to commercial traffic.

## **Experience Nature Zone**

The remainder of the National Lakeshore was zoned experience nature, in keeping with the purpose of the National Lakeshore: to “preserve outstanding natural features, including forests, beaches, dune formations, and ancient glacial phenomena in their natural setting, and protect them from developments and uses that would destroy the scenic beauty and natural character of the area, for the benefit, inspiration, education, recreation, and enjoyment of the public.”

## **Wilderness Proposal**

Based on public input, preliminary impact analyses, and the Choosing by Advantages evaluation, the planning team started with alternative A’s wilderness proposal and modified it as follows:

- south portion of the Lakeshore — added a wilderness exclusion around Empire Bluffs Trail to facilitate trail maintenance and to ensure that hang gliding could continue there; added a wilderness exclusion around the Treat farmstead to facilitate maintenance of open farm fields
- central portion of the Lakeshore — added a wilderness exclusion for the Cottonwood Trail to provide an opportunity for large groups to experience the namesake Sleeping Bear Dunes
- north portion of the Lakeshore — added a wilderness exclusion around the Bufka farm to facilitate maintenance or rehabilitation of the farmstead and surrounding farm fields
- South Manitou Island — added a wilderness exclusion for the farm loop tour route, including the schoolhouse, to allow continuation of the interpretive tours and to facilitate maintenance, rehabilitation, or restoration of the structures, farmsteads, and surrounding fields.
- North Manitou Island — added a wilderness exclusion for all of Cottage Row to facilitate maintenance, rehabilitation, or restoration of these structures and immediate surroundings.

## **Other Elements of the Preferred Alternative**

- Parking at Platte River Point (near the mouth of the Platte River) could be improved to enhance vehicular circulation and reduce congestion.
- The Esch Beach road end would be improved to address resource impacts and safety concerns associated with parking and improve vehicular circulation there.
- Access would be improved at some inland lakes to facilitate boat use and address natural resource impacts (trampling, erosion, etc.)
- The Crystal River access area would be upgraded or relocated and a small parking area would be provided to address natural resource impacts (trampling, erosion of gravel into the river, etc.)
- Motorboats would no longer be allowed on North Bar Lake to improve visitor experiences for nonmotorized uses (canoeing, kayaking, fishing, and swimming). Electric motors would be allowed in the experience nature zone on Bass Lake (Leelanau County), Tucker Lake, and Otter Lake to increase the range of visitor opportunities that are compatible with the intent of this zone.
- Little Glen Lake picnic area would be improved to facilitate beach use. For example, the sand area along the beach would be expanded and flush toilets might be constructed.
- Valley View campground, which is not very popular with visitors, would be abandoned and the area returned to more natural conditions. A replacement campground for hikers and paddlers

would be provided in a more attractive location closer to the Lake Michigan shoreline as a part of the bay-to-bay trail proposal.

- On South Manitou Island, provided there is demand and the service is economically feasible, concession auto tours to near the Giant Cedars would be allowed to the end of the county-owned road; from there, tours would continue on foot for a short distance to the trees. User capacity management strategies (e.g., education, supervision by tour leaders, fences, and/or boardwalks) would be implemented as needed to prevent visitor use-related impacts to the cedar trees and surrounding vegetative community.
- Day ferry trips to North Manitou Island (once or twice a week, not daily) would be allowed provided there is demand and the service is economically feasible. The intent is to allow a different segment of visitors to experience this island.
- On North Manitou Island, designated camping would be required within certain problem areas to confine and address natural resource impacts. In areas where use has not resulted in problems, dispersed camping would continue.
- At Bow Lakes, a small parking area and a loop hiking trail would be provided to facilitate visitor use on NPS-owned lands.

## APPENDIX E: WILD AND SCENIC RIVERS

Section 5(d) of the National Wild and Scenic Rivers Act (16 USC 1271-1287) requires that “In all planning for the use and development of water and related land resources, consideration shall be given by all Federal agencies involved to potential national wild, scenic and recreational river areas.” It further requires that “the Secretary of the Interior shall make specific studies and investigations to determine which additional wild, scenic and recreational river areas . . . shall be evaluated in planning reports by all Federal agencies as potential alternative uses of water and related land resources involved.”

The National Park Service has compiled and maintains a Nationwide Rivers Inventory (NRI), which is a register of river segments that potentially qualify as national wild, scenic or recreational river areas. The inventory is a listing of more than 3,400 free-flowing river segments in the United States that are believed to possess one or more “outstandingly remarkable” natural or cultural values judged to be of more than local or regional significance. The original inventory, completed in 1982, was conducted by the U.S. Department of the Interior with the cooperation of state and local agencies. To be listed, river segments had to meet the following three basic criteria:

- be free flowing (and generally 25 miles or longer)
- be relatively undeveloped (both river and corridor)
- possess outstanding natural and/or cultural values

In 1990, National Lakeshore staff inventoried and evaluated rivers and river segments that may have had potential for inclusion into the national wild and scenic rivers system. Five streams were inventoried: Platte River, Otter Creek, Shalda Creek, Crystal River, and Good Harbor Creek. Only the Platte River was

identified by the Lakeshore staff for possible study and inclusion at that time.

A major update to the Nationwide Rivers Inventory was initiated in 1993. To be eligible for listing on the updated inventory, river segments had to meet the following two criteria:

- be free flowing (no mileage requirement)
- have at least one “outstandingly remarkable” value

The Crystal River and the Platte River were included on the 1993 update. The entire 3-mile segment of the Crystal River within the National Lakeshore was included, with the following description: “Sinuous river channel following beach ridges. Large wetlands associated with interdunal wetlands. Remnant beaches contain rich diversity of species. Popular canoeing stream.” The entire segment of the Platte River within the National Lakeshore (4 miles) was included, with the following description: “Sinuous river channel following remnant beach ridges. Major archeological resources relative to mid-woodland period Indian encampments. Popular canoeing destination. Important salmon and trout resource.”

In 2005, NPS staff completed acquisition of the 104 acres of land identified in the Lakeshore boundary expansion authorized by Public Law (PL) 108-229. These lands include 6,300 feet of river frontage along the Crystal River, approximately 0.6 miles along both banks. The land contains important wetland, riparian, and upland habitat for a variety of species within mixed northern forests. It also provides a natural backdrop for recreational river users and exceptional vistas for visitors who are hiking, biking or driving on nearby trails and roads.



## APPENDIXES

The National Park Service recommends that this additional 0.6-mile reach of the Crystal River be added to the 3 miles already on the

Nationwide Rivers Inventory when it is next updated.

## APPENDIX F: INITIAL CONSULTATION LETTERS

Mr. Dusty Shultz

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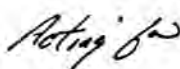
We have provided the approximate location of each species within or adjacent the Lakeshore. If you require more precise information on species locations, please contact our office. In addition to the species listed above, the breeding range of the federally endangered Indiana bat (*Myotis sodalis*) occurs within the southern half and western coastal counties of the Lower Peninsula, including Benzie and Leelanau Counties. Although this species has not been confirmed within the Lakeshore, it may occur in any area of suitable habitat. Suitable Indiana bat habitat typically consists of highly variable forested landscapes in riparian, bottomland, and upland areas which provide roosting trees with crevices or exfoliating bark.

Critical habitat for the endangered piping plover was designated in May, 2001. Michigan Units MI-14, MI-15 and MI-16 occur within the boundaries of the Lakeshore. Maps depicting these units are attached. As a reminder, species for which critical habitat has been designated require a determination of effect for the species as well as for the critical habitat. In determining the effect of the action on critical habitat, we recommend you refer to the Federal Register notice regarding designation (66 Fed. Reg. 22938, May 7, 2001).

If the project requires modification, or new information becomes available that suggests species listed or proposed for listing may be present and/or affected, you should initiate consultation with us as required by section 7 of the Endangered Species Act. Since threatened and endangered species data changes continuously, we recommend you contact this office for an updated Federal list of the species occurring in the project area every six months during the remaining planning and building period.

We have no additional comments on the proposed action at this time. We would be happy to review and comment on the Draft EIS when it is available. Please contact me or Mr. Jack Dingledine at 517-351-6320 if you have questions.

Sincerely,

  
 Craig A. Czarnecki  
Field Supervisor

Enclosures

cc: MDNR, Wildlife Division, Lansing, MI (Attn: Lori Sargent)

g: admin/archives/mar06/NPSMgmtPlanEISListReq.jvd.doc



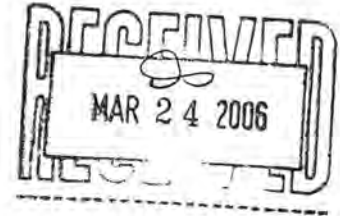
## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

East Lansing Field Office (ES)  
2651 Coolidge Road, Suite 101  
East Lansing, Michigan 48823-6316

IN REPLY REFER TO:

March 21, 2006



Dusty Shultz, Superintendent  
National Park Service  
Sleeping Bear Dunes National Lakeshore  
9922 Front Street (Hwy M-72)  
Empire, Michigan 49630

# 2408

Subject: Request for Information on Federally Listed Threatened and Endangered Species  
for the General Management Plan/Wilderness Study/Environmental Impact  
Statement for Sleeping Bear Dunes National Lakeshore, Michigan.

Dear Ms. Shultz:

We appreciate receiving your February 16, 2006 letter regarding your intent to prepare an Environmental Impact Statement (EIS) in support of a General Management Plan/Wilderness Study for Sleeping Bear Dunes National Lakeshore, Leelanau/Benzie Counties, Michigan. According to your letter, the National Park Service (NPS) intends to prepare a General Management Plan that will provide an overall decision-making framework for long-term management direction for the next twenty years, while the Wilderness Study will identify and recommend areas of possible inclusion into the National Wilderness Preserve System.

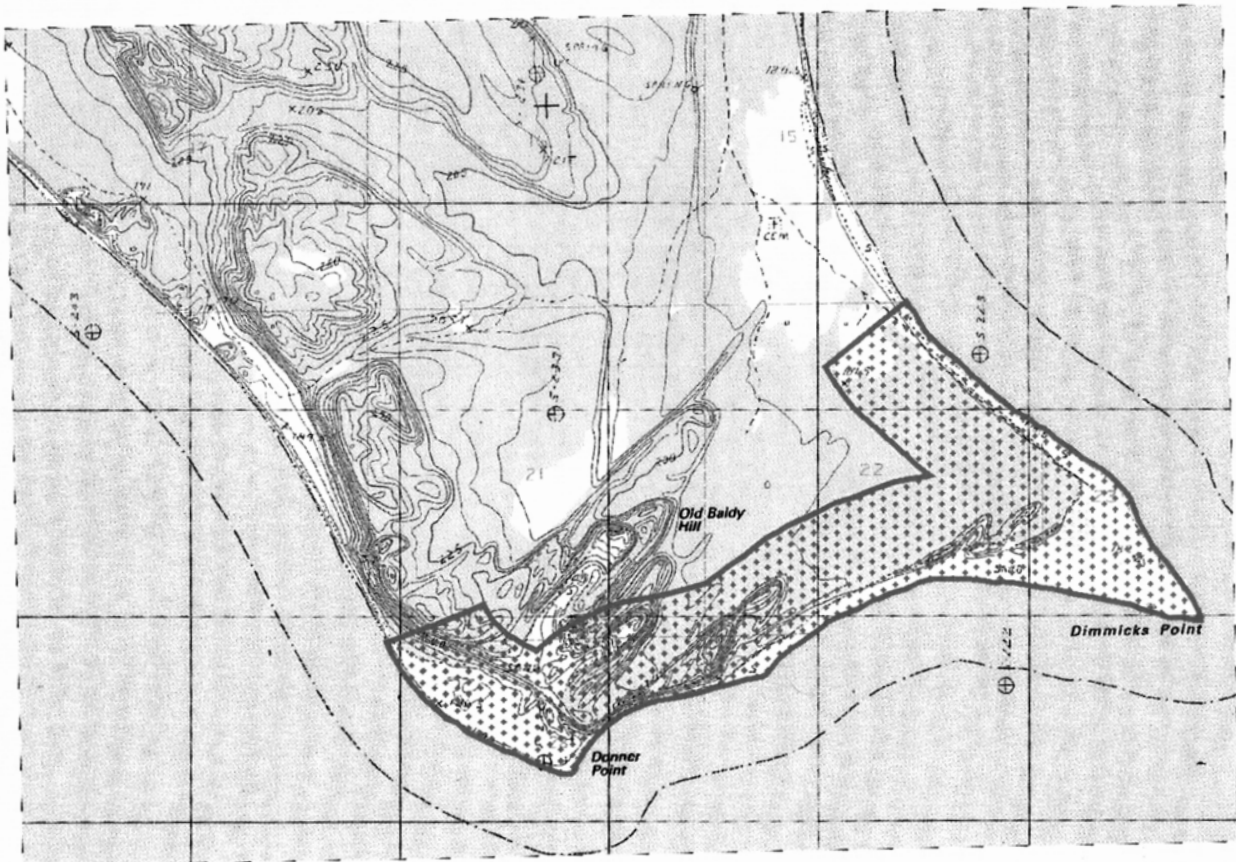
You have requested a current list of all federally endangered, threatened, or proposed species, or designated or proposed critical habitat, in the action area. According to our files, the following species are known to occur within or adjacent the Lakeshore in Leelanau and Benzie Counties.

Species	Current Status	Approximate Location
Bald Eagle ( <i>Haliaeetus leucocephalus</i> )	T	T32NR14W, T30NR15W, T30NR12W, T29NR13W, T27NR14W, T27NR15W
Piping Plover ( <i>Charadrius melodus</i> )	E	T31NR14W, T29NR14W, T27NR15W, T27NR16W
Michigan Monkey-Flower ( <i>Mimulus glaberratus</i> var. <i>michiganensis</i> )	E	T29NR13W, T28NR14W, T27NR14W,
Pitcher's thistle ( <i>Cirsium pitcheri</i> )	T	T32NR15W, T31NR14W, T30NR15W, T31NR12W, T29NR12W, T30NR13W, T29NR14W, T29NR15W, T28NR15W, T27NR15W, T27NR16W




## Piping Plover CH Unit MI-14

North Manitou  
Leelanau Co.



### Legend

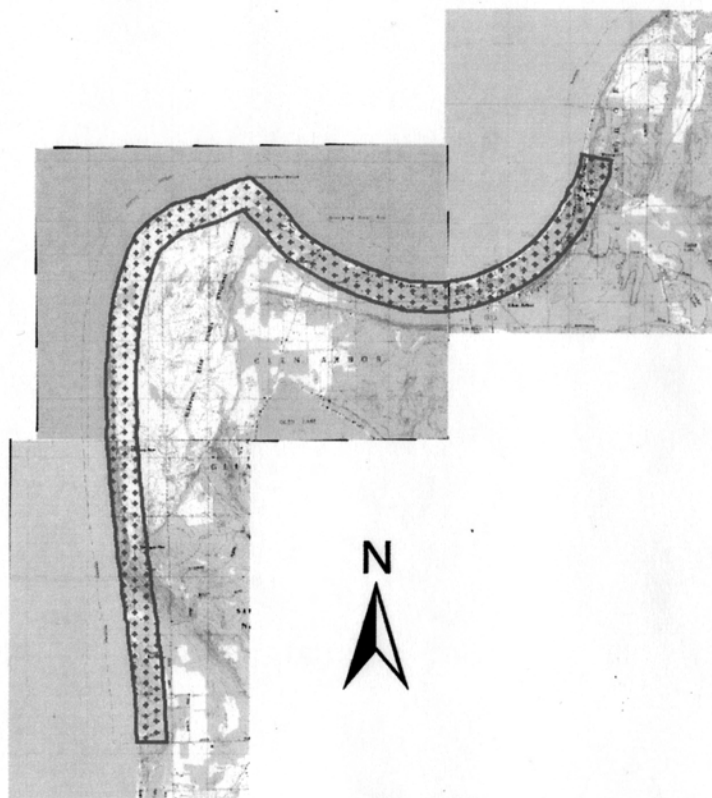
 Mi\_14\_PP critical habitat




0 0.25 0.5 1 1.5 2 Kilometers

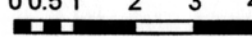
# **Piping Plover CH Unit MI-15**

**Crystal Run to Empire Beach**  
**Leelanau Co.**



## **Legend**

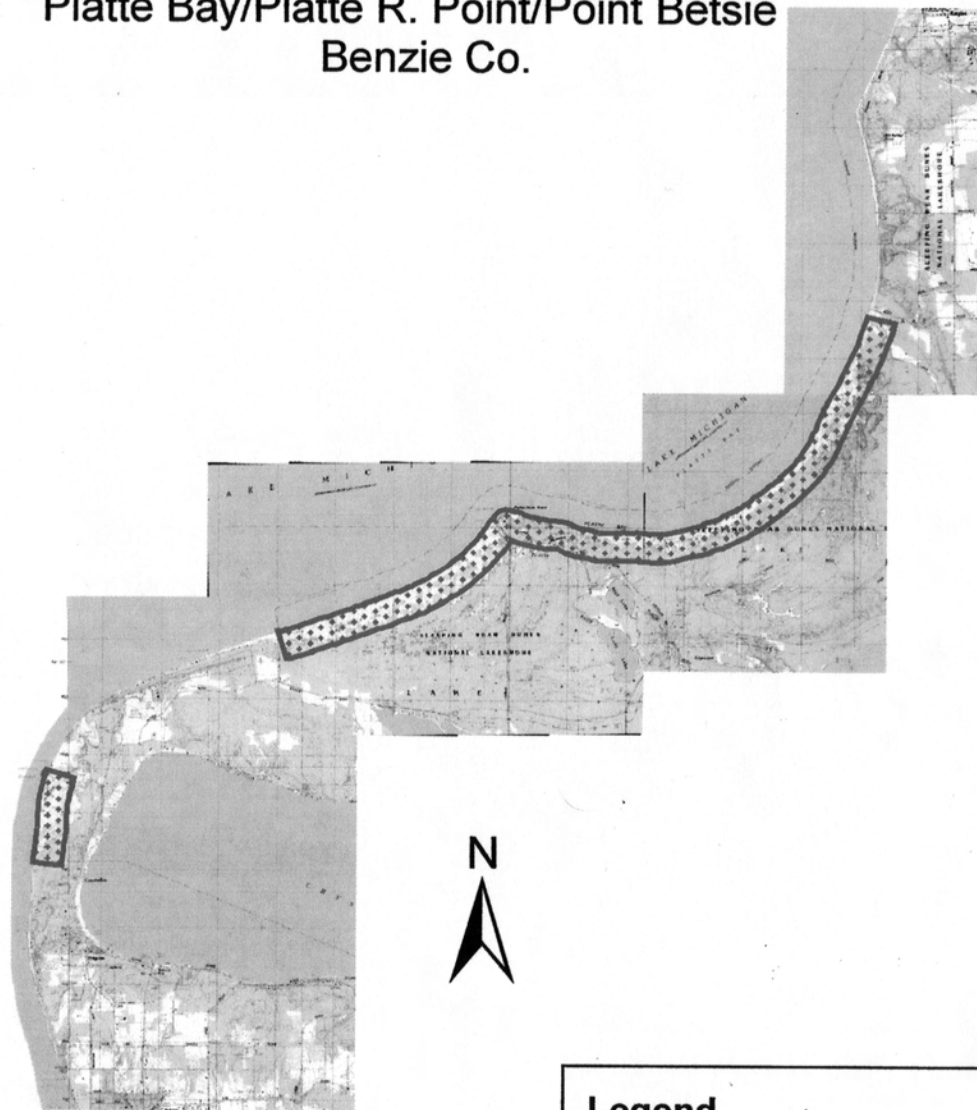
 Mi\_15\_500m\_buff\_finall\_3\_proj.shp

0 0.5 1 2 3 4  
 Kilometers


# **Piping Plover CH Unit MI-16**

## **Platte Bay/Platte R. Point/Point Betsie**

### **Benzie Co.**



### **Legend**

 Mi\_16\_PP critical habitat

0 0.5 1 2 3 4  
Kilometers

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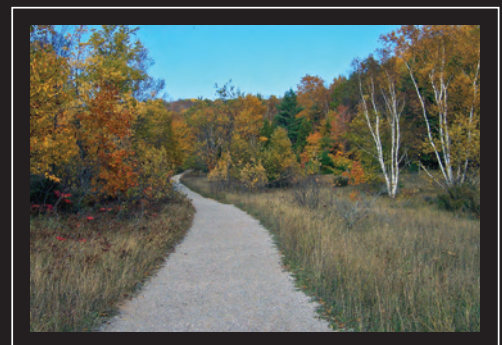
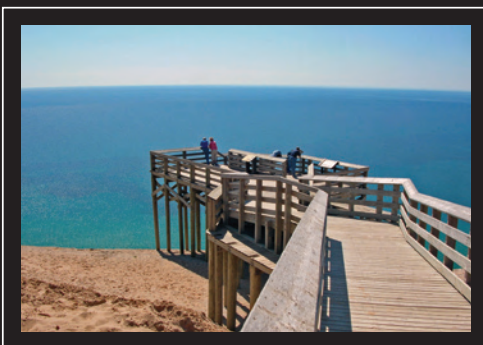
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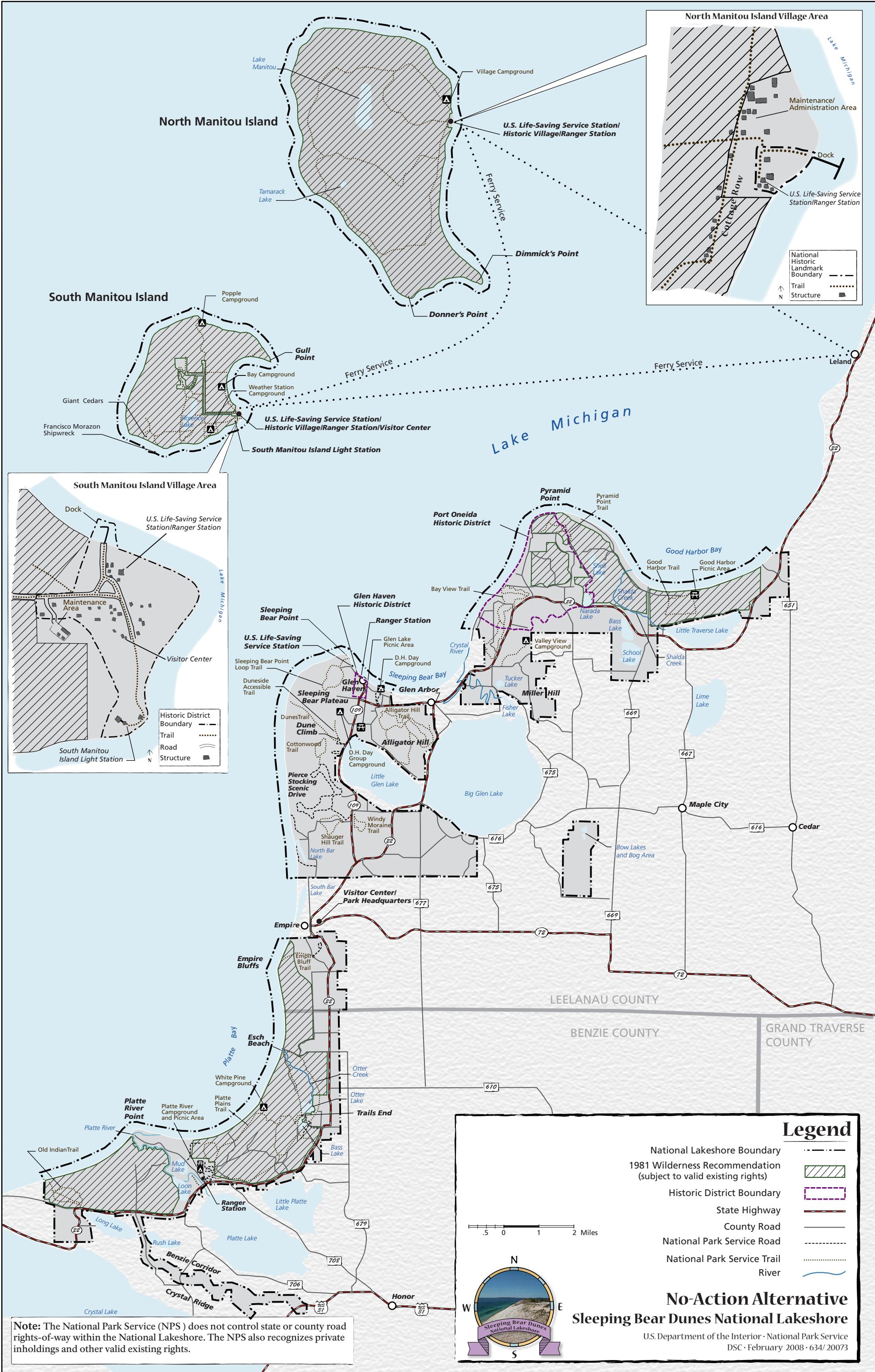
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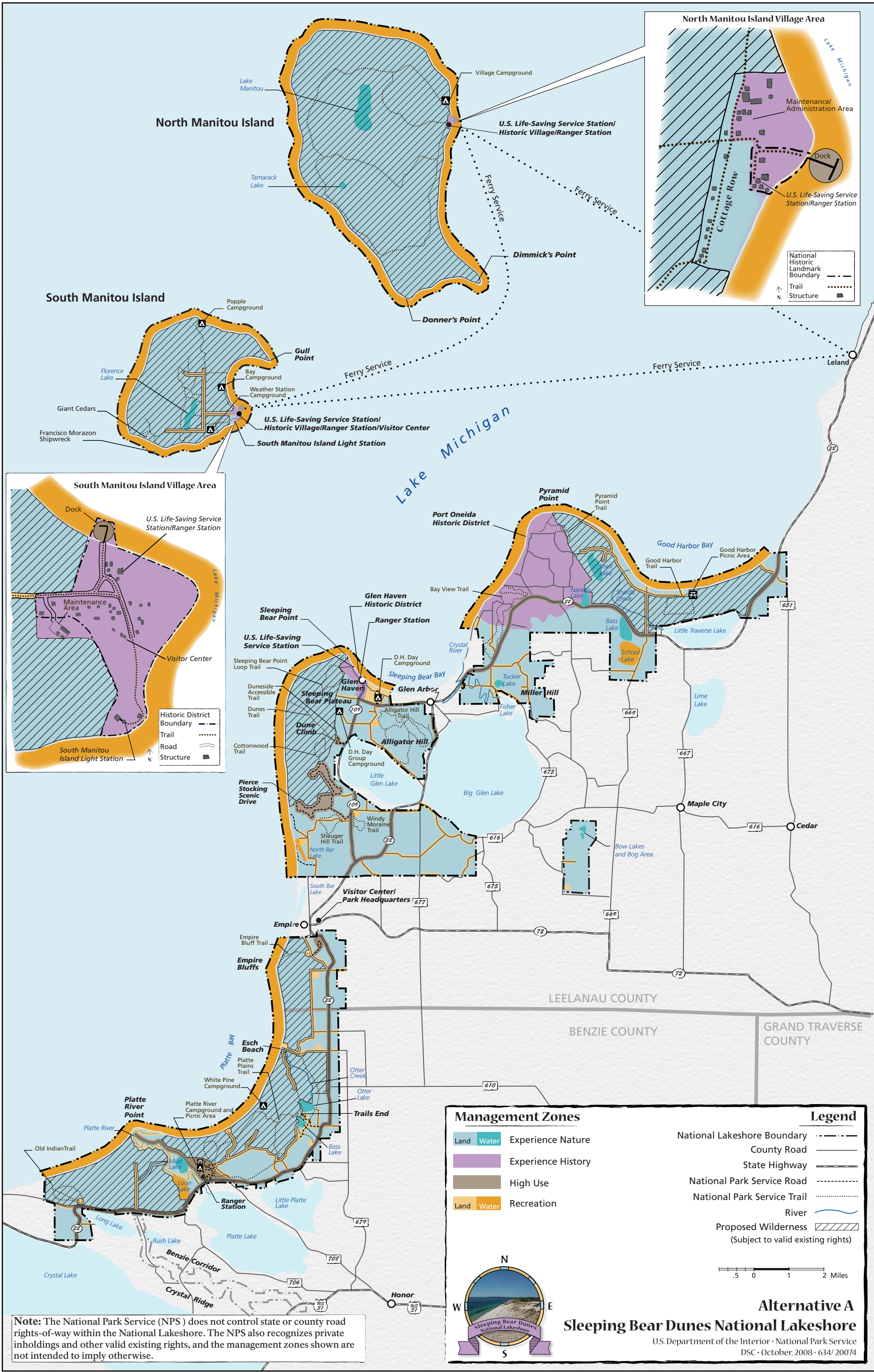
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Sleeping Bear Dunes National Lakeshore









**Note:** The National Park Service (NPS) does not control state or county road rights-of-way within the National Lakeshore. The NPS also recognizes private inholdings and other valid existing rights, and the management zones shown are not intended to imply otherwise.

### Management Zones

- Land Water Experience Nature
- Experience History
- High Use
- Land Water Recreation

### Legend

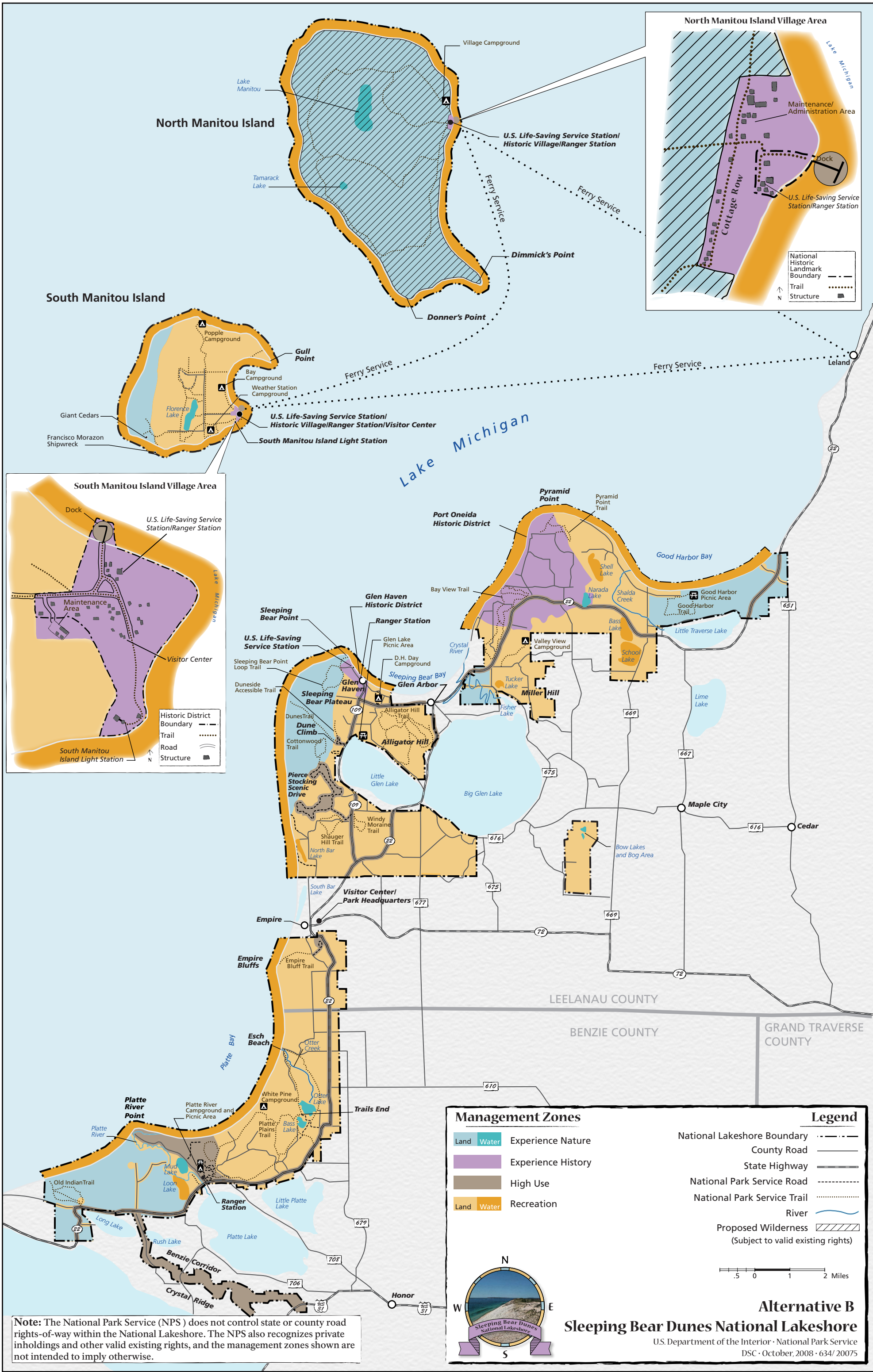
- National Lakeshore Boundary
- County Road
- State Highway
- National Park Service Road
- National Park Service Trail
- River
- Proposed Wilderness (Subject to valid existing rights)



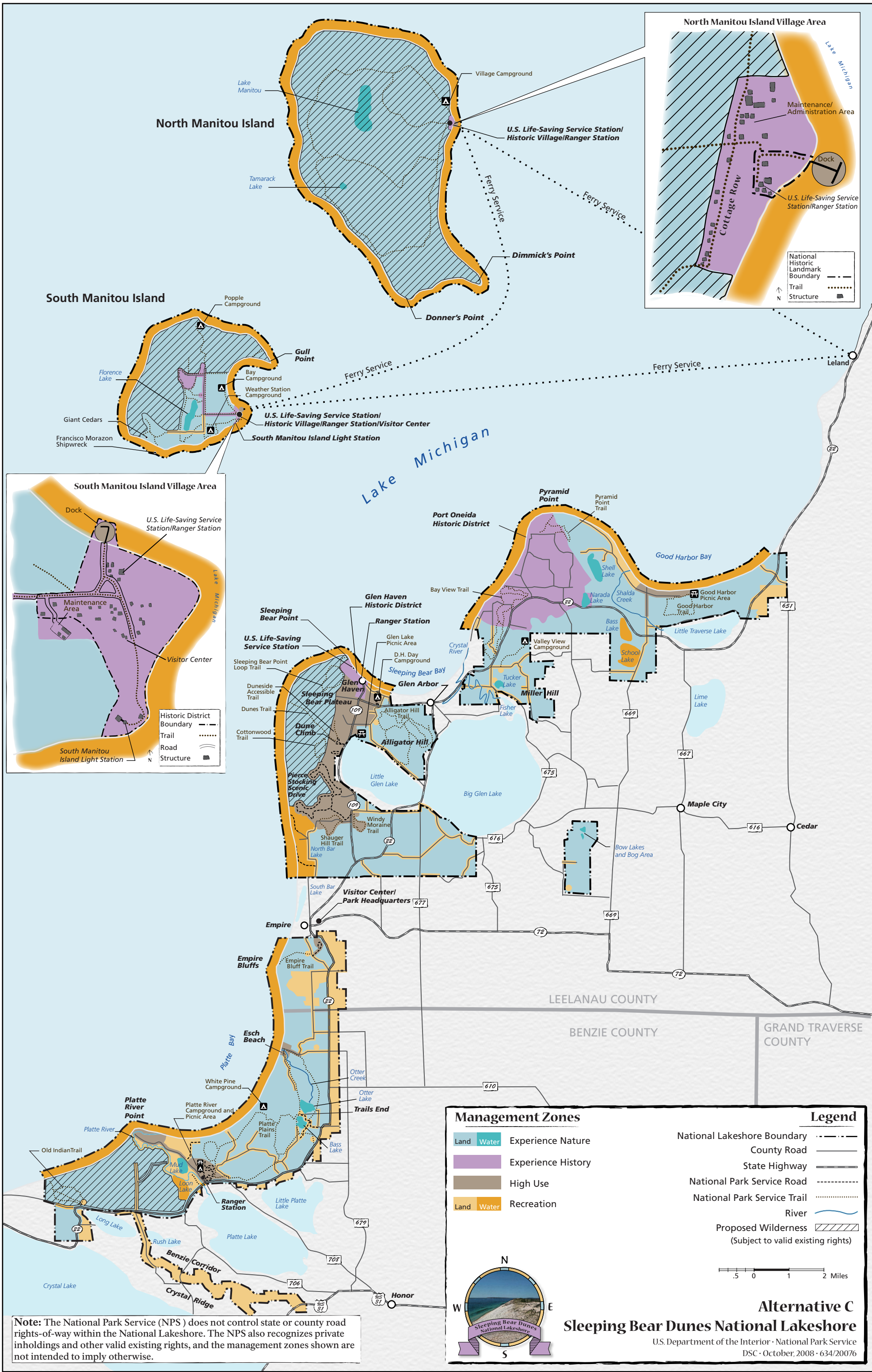
## Alternative A Sleeping Bear Dunes National Lakeshore

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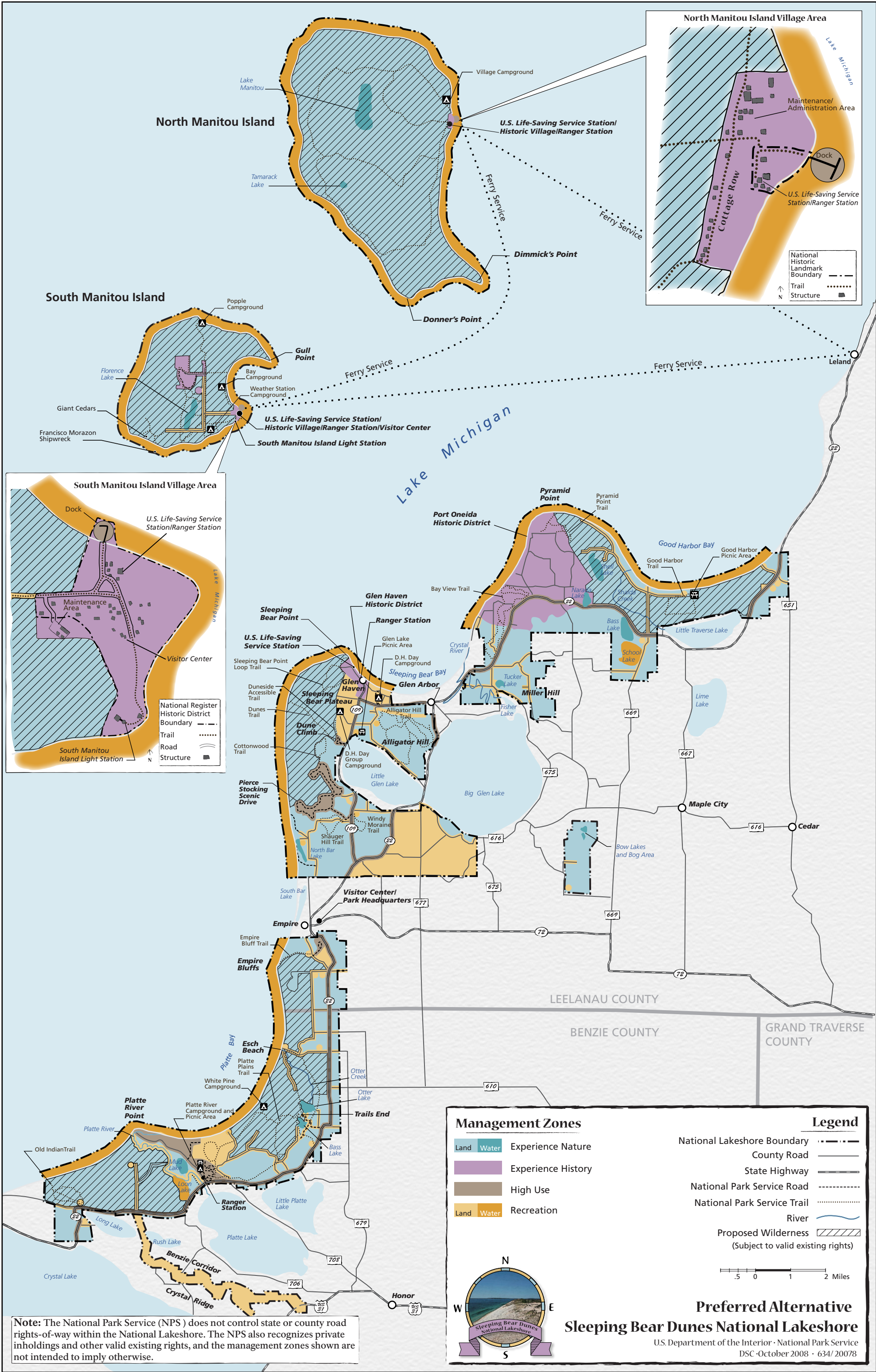












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