



Ice Age Complex

DRAFT GENERAL MANAGEMENT PLAN | ENVIRONMENTAL IMPACT STATEMENT

AT CROSS PLAINS

ICE AGE COMPLEX AT CROSS PLAINS, WISCONSIN

DRAFT GENERAL MANAGEMENT PLAN/ENVIRONMENTAL IMPACT STATEMENT

THE ICE AGE COMPLEX AT CROSS PLAINS, WISCONSIN comprises land within a unit of the Ice Age National Scientific Reserve and includes the interpretive site for the Ice Age National Scenic Trail. Within the Complex are lands owned and managed by the National Park Service, the Wisconsin Department of Natural Resources, Dane County Parks, and the U.S. Fish and Wildlife Service. This general management plan is needed to establish a consistent vision for the Ice Age Complex that is shared by all of these partners.

This document establishes a framework to assist in making decisions about the Complex. It examines five alternatives for managing this site over the next 15 to 20 years, identifying desired conditions and analyzing the impacts of implementing each alternative. **Alternative 1: No Action, Continuation of Current Management** looks into the future of current management and provides a basis for comparison to other alternatives. **Alternative 2: Ecological Restoration Emphasis** would restore vegetative conditions to those present prior to European settlement, supporting interpretation of the post-glacial period. **Alternative 3: Interpretation and Education Emphasis** would focus on interpreting how the glacial landscape evolved over time, and ecological resources would be managed to reveal the glacial landscape. **Alternative 4: Outdoor Recreation Emphasis** would offer visitors a variety of low-impact recreational experiences supporting, and compatible with, the preservation and interpretation of glacial significance. **Alternative 5: Preferred Alternative** would provide interpretation of the landscape since glacial retreat and appropriate low-impact outdoor recreation opportunities.

The potential environmental impacts of all alternatives have been identified and assessed. The following impact topics are addressed in this GMP/EIS: soil resources, water quality, soundscapes, vegetation and wildlife, socioeconomics, and visitor use and experience.

The key impacts of **Alternative 1** would be short and long-term, minor to moderate, adverse impacts on soils from agricultural use on some lands and unauthorized trails on others, but beneficial impacts to soils which are converted from farmland to prairie. There would be negligible to minor benefits to visitor experience under current management and negligible impacts in all other areas.

The key impacts of **Alternative 2** would be short and long term, mild to moderate, adverse impacts on soils from compaction from visitor use, but beneficial impacts to soils which are converted from farmland to prairie. There would be temporary adverse impacts to the soundscape from construction activities and a moderate beneficial impact on vegetation and wildlife from ecological restoration. There would be negligible to minor benefit to visitor experience under this alternative.



The key impacts of **Alternative 3** would be minor to moderate adverse impacts to soils from building and trail construction as well as compaction due to trail use, but also beneficial impacts to soils as they are converted from farmland to prairie. There would be minor to moderate adverse impacts to the soundscape from construction and increased visitation and a negligible to moderate beneficial impact on vegetation and wildlife. There would be minor benefit to visitor experience from indoor exhibits and interpretive programs.

The key impacts of **Alternative 4** would be minor to moderate adverse impacts to soils from construction and trail use under this alternative, but also beneficial impacts to soils as they are converted from farmland to prairie. There would be minor beneficial impact on vegetation and wildlife. This alternative would have a minor to moderate benefit to visitor experience by offering broad outdoor experience and extensive exhibits.

The key impacts of **Alternative 5** would be minor to moderate adverse impacts on soils construction and trail use but also beneficial impacts to soils as they are converted from farmland to prairie. There would be minor beneficial impact on vegetation and wildlife under this alternative. This alternative would have a moderate benefit to visitor experience through broad outdoor experience and interpretive programming.

This *Draft General Management Plan/ Environmental Impact Statement* has been distributed to other agencies and interested organizations and individuals for review and comment. The public comment period for the document lasts 60 days. For more information, contact Superintendent, Ice Age National Scenic Trail, 700 Rayovac Drive, Suite 100, Madison, Wisconsin 53711.

How to comment on this document

Comments on this draft general management plan / environmental impact statement are welcome and will be accepted during the 60-day public review and comment period. During the comment period, comments may be submitted using the several methods noted below.

We prefer that readers submit comments online (through the park planning website identified below) so the comments become incorporated in the NPS Planning, Environment, and Public Comment System. An electronic public comment form is provided through this website.

Please submit comments

online at: <http://www.planning.nps.gov>

or by mail: Ice Age Complex
at Cross Plains
Draft GMP/EIS
National Park Service
Attn: Christina Miller
12795 W. Alameda Parkway
P.O. Box 25287
Denver, CO 80225

or hand delivery: at public meetings to be announced in the media following the release of this draft general management plan / environmental impact statement.

Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware your entire comment — including your personal identifying information — may be publicly available at any time. While you may ask us in your comment to withhold personal identifying information from public review, we cannot guarantee that we will be able to do so.



SUMMARY

BACKGROUND

A mere 20,000 years ago, two-thirds of what is today the state of Wisconsin lay under the grip of colossal ice sheets. The climate warmed and the ice sheets began to melt back. They left in their wake an impressive landscape of fascinating glacial landforms: moraines, drumlins, kames, kettles, eskers, outwash plains, meltwater channels, driftless (unglaci-ated) topography, glacial lake beds and islands, and more. These Wisconsin Ice Age remnants are considered among the world's finest examples of how continental glaciation sculpts our planet. Located just west of Madison near the village of Cross Plains is a 1,500-acre area that contains an outstanding collection of glacial landforms, including a gorge carved by meltwater and expansive views of both driftless and glaciated terrain. These acres comprise a park called, for the purpose of this planning effort, the "Ice Age Complex at Cross Plains" (henceforth "Ice Age Complex" or "complex") (see figure ES-1). This site, however, has a rich history of different legal designations.

The lands and landscape of the Ice Age Complex have been deemed nationally significant under two related, but distinct, federal designations. The elements recognized in both designations are parts of the singular concept advanced by Wisconsin citizens in the late 1950s and early 1960s to protect and showcase Wisconsin's heritage from continental glaciation. Congress authorized the concept in two parts, at two different times, and through two different legislative vehicles.

In 1964 Congress enacted legislation (Public Law [PL] 88-655; 78 Stat. 1087; 16 United States Code [USC] 469d, *et seq.*) directing the Secretary of the Interior to cooperate with the governor of Wisconsin in studying and subsequently designating an Ice Age National Scientific Reserve ("Ice Age Reserve"). The purpose of the Ice Age Reserve is "to assure protection, preservation, and interpretation of the nationally significant values of Wisconsin continental

glaciation, including moraines, eskers, kames, kettleholes, drumlins, swamps, lakes, and other reminders of the ice age." The continental glaciers last advanced and retreated over the state some 30,000 to 10,000 years ago.

Congress envisioned the Ice Age Reserve as a network of distinct areas, each exhibiting an outstanding example of one type of landscape or landform resulting from continental glaciation. The legislation's intention is that the reserve would be owned and managed by the state of Wisconsin, with the assistance and collaboration of the Secretary of the Interior (acting through the National Park Service). Several of the outstanding sites selected were already Wisconsin state parks. The legislation made reference to the Ice Age National Scenic Trail but made no provisions for it.

When the study was completed, nine sites were identified to be protected and managed by the Wisconsin Department of Natural Resources (WDNR) as units of the Ice Age Reserve (see figure ES-2). On May 29, 1971, the Secretary of the Interior published an order in the *Federal Register* that formally brought the Ice Age Reserve into existence.

As noted in Black (1974), "The Cross Plains area was selected for inclusion in the Reserve in part because it contains a typical portion of the Johnstown Moraine on the uplands and a typical proglacial stream in Black Earth Creek Valley, and is close to a center of population. More importantly, it is the only place . . . where the terminal moraine rests directly on well exposed, weathered dolomite bedrock and where small marginal proglacial lakes, a marginal drainage way, and a subglacial drainage way may all be seen in a small area. The various glacial features associated with the moraine in the vicinity of Cross Plains are more varied and yet as definitive as one could hope to see, all preserved in a neat little package. The area is one of increasing urbanization, and preservation of parts of the front and its associated phenomena can only be assured in the Reserve."

SUMMARY

FIGURE ES-1: MAP OF ICE AGE COMPLEX AT CROSS PLAINS

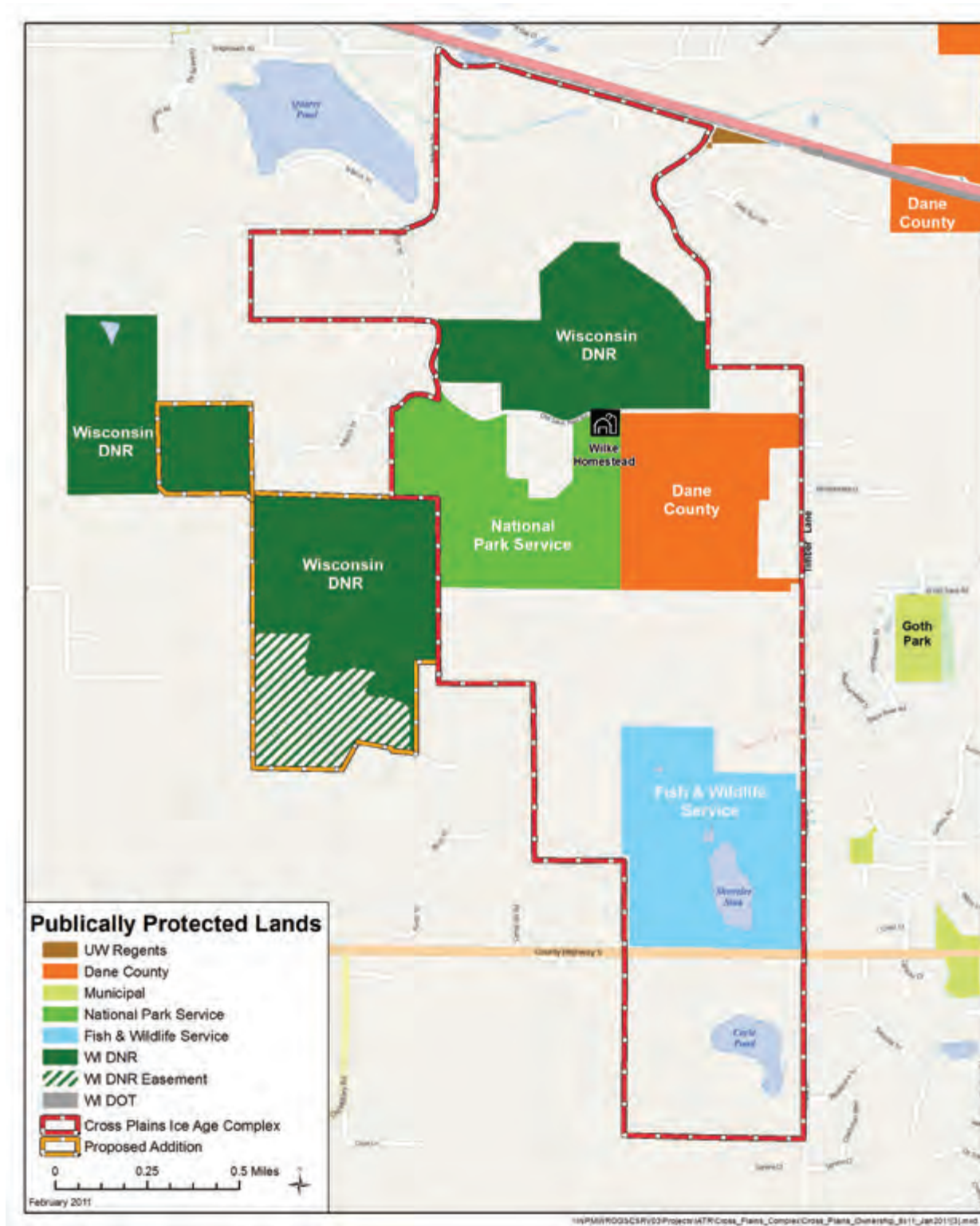


FIGURE ES-2: ICE AGE NATIONAL SCIENTIFIC RESERVE AND ITS NINE UNITS



SUMMARY

The Wisconsin Department of Natural Resources purchased 100 acres of the Cross Plains unit of the Ice Age Reserve in September 1975, and an additional 60 acres were subsequently purchased. The Cross Plains unit is also designated as Cross Plains State Park by Wisconsin Administrative Rule.

Congress again recognized the national significance of Wisconsin's glacial landscapes when, on October 3, 1980, it amended the *National Trails System Act* to authorize and establish the Ice Age National Scenic Trail as a component of the National Trails System (PL 96-370; 94 Stat. 1360; 16 USC 1244(a)(10)). The Ice Age National Scenic Trail meanders through Wisconsin for approximately 1,200 miles from Potawatomi State Park in Door County to Interstate State Park in Polk County, generally following the terminal moraine and other glacial landscape features and connecting six of the nine units of the Ice Age Reserve. The Secretary of the Interior was assigned administrative responsibility for the Ice Age National Scenic Trail.

The Secretary of the Interior delegated overall administrative responsibility for the Ice Age National Scenic Trail to the National Park Service. The Park Service, in cooperation with the Wisconsin Department of Natural Resources and other parties, completed a *Comprehensive Plan for Management and Use of the Ice Age National Scenic Trail* in September 1983. The National Park Service is responsible at the federal level for carrying out the provisions of the *National Trails System Act* as they relate to the Ice Age National Scenic Trail. The National Park Service carries out or facilitates trail planning, environmental compliance, trail development and management, public and private partner involvement, and land protection activities. The National Park Service assists partners by coordinating, guiding, and assisting their efforts to acquire, develop, operate, protect, and maintain the Ice Age National Scenic Trail in accordance with the comprehensive plan and supplemental trail corridor plans and

trailway protection strategies (land protection plans). The comprehensive plan identifies the Wisconsin Department of Natural Resources and the nonprofit Ice Age Trail Alliance as cooperators in the long-term effort to develop and manage the Ice Age National Scenic Trail. The Park Service serves as the primary liaison with other federal agencies in matters relating to the Ice Age National Scenic Trail. In carrying out this role, the Park Service reviews and comments on federal or federally assisted/permitted projects and activities (such as highway, utility, and other development proposals) that may affect trail segments.

The Wisconsin Department of Natural Resources is the state agency responsible for providing and maintaining outdoor recreation resources of statewide significance, including state parks and trails, in Wisconsin. Thus, the basis for the Wisconsin Department of Natural Resources' participation in developing and managing the Ice Age Reserve and Ice Age National Scenic Trail is the statewide significance of the reserve and trail and the inclusion of state parks, forests, trails, and recreation areas in the reserve and along the route of the trail. The state legislature formalized this role in 1987 by passing legislation that designates the Ice Age National Scenic Trail as a State Scenic Trail. The legislation assigned the responsibility to the Wisconsin Department of Natural Resources for coordinating the involvement of state agencies in the trail project and cooperating with the National Park Service and private interests in planning, acquiring, developing, and maintaining the Ice Age National Scenic Trail. The Wisconsin Department of Natural Resources has been the primary NPS partner in administering federal financial assistance for acquiring lands for the Ice Age National Scenic Trail.

The *National Trails System Act* authorizes the establishment of interpretive sites along national scenic trails. Congress appropriated funds, in fiscal year (FY) 2001, for the acquisition of specific lands, owned by James and Jane Wilkie, for an Ice Age National Scenic

Trail Interpretive Site. The lands specified for the interpretive site happen to lie within the boundaries of the Cross Plains unit of the Ice Age Reserve. The National Park Service purchased the lands in 2002, subject to a life estate, and took full possession in early 2008.

The Wilkie farmstead includes a stone house, the original two-story portion of which dates back to the 1850s, just a few years after statehood in 1848. The one-story addition, built with stone from the same quarry as the original house, dates to 1952 when the Wilkies purchased the farm. There is also a structurally sound wood barn, modern garage, shed used as a chicken coop, and Quonset for equipment storage. These structures are referred to elsewhere in this document as the “farmstead” or individually as the “stone house,” “barn,” and so forth. The structures were evaluated for eligibility to be listed on the National Register of Historic Places, but it was determined they were not historically significant.

The lands that comprise the Ice Age Complex are managed at both a state and federal level. That is, the Ice Age Reserve is owned and managed by the state of Wisconsin, and the Ice Age National Scenic Trail Interpretive Site is owned and managed by the National Park Service. Additionally, the Ice Age Complex also includes Shoveler Sink Waterfowl Production Area, which is owned and managed by the U.S. Fish and Wildlife Service. The involvement of both federal and state governments, as well as Dane County Parks, makes this plan to preserve and interpret the Ice Age Complex a true partnership effort.

PURPOSE OF THE PLAN

The final general management plan would provide a framework to assist NPS and WDNR managers in making decisions today and in the future. The alternatives proposed in this document describe general paths the National Park Service and Department of Natural Resources would follow in managing the Ice Age Complex over the next 15 to 20 years.

This draft general management plan / environmental impact statement

- identifies desired conditions in different parts of the Ice Age Complex

- identifies any necessary developments and support facilities to achieve the vision and desired conditions

- ensures 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 document addresses the three purposes listed above, but it does not

- describe how particular programs or projects would be implemented or prioritized; these decisions are deferred to detailed implementation planning

- provide specific details and answers to all the issues facing the Ice Age Complex

- provide funding commitments for implementation of the plan

NEED FOR THE PLAN

The general management plan is needed in order to establish a consistent vision for the Ice Age Complex that is shared by all partners in this project. Those partners are the National Park Service, Wisconsin Department of Natural Resources, U.S. Fish and Wildlife Service, Ice Age Trail Alliance, local government agencies, and the general public. Although the Department of Natural Resources’ 1998 feasibility study provided a rough outline for how the Ice Age Complex could be managed, the final general management plan would be the first plan designed to provide comprehensive management guidance for the complex.

SUMMARY

The Ice Age National Scenic Trail is guided by a 1983 comprehensive management plan, and the Ice Age Reserve is guided by a 1968 comprehensive management plan. Neither of these older overarching plans, however, articulates the shared vision between the National Park Service, Department of Natural Resources, and the public on how to best achieve the specific purpose of the Ice Age Complex and protect its resources for future generations.

Currently, the Ice Age Complex is essentially undeveloped for visitor use. Given its location just outside the fast-growing suburbs of Madison, Wisconsin, and the interest in Ice Age geology in the region, there is potential for significant visitation at the complex. There is also potential for damage to the glacial features at the site without long-term planning for their protection. Thus, this general management plan is needed because

the management plans for related areas (national scenic trail and scientific reserve) are outdated

there must be a consistent and shared vision for the complex

there is potential for both significant visitation and resource damage

THE FIVE ALTERNATIVES

This draft general management plan / environmental impact statement examines five alternatives for managing the Ice Age Complex. In all of the alternatives, NPS managers will continue to strive to protect, maintain, and monitor key resources. Each alternative proposes a different approach to managing resources, serving visitors, and providing interpretive and recreational opportunities.

Alternative 1: No Action, Continuation of Current Management

This alternative describes how the Ice Age Complex would look in the future if no *new*

actions were taken. The description for the no-action alternative was used as a baseline against which to assess the benefits, costs, and impacts of action alternatives 2, 3, 4, and 5.

The Ice Age Complex is undeveloped for visitor use and minimally maintained. Both the Wisconsin Department of Natural Resources and U.S. Fish and Wildlife Service manage vegetation on lands that each agency owns and on land owned by the National Park Service. Staff members for the Ice Age National Scenic Trail have stabilized facilities to prevent their deterioration. There are currently no improvements (such as parking or constructed trails) on either WDNR- or NPS-owned lands to facilitate visitor experience. The Shoveler Sink Waterfowl Production Area, managed by the U.S. Fish and Wildlife Service, is open to visitors for hunting, fishing, and other wildlife-dependent activities, but the production area has no visitor facilities other than two small unsurfaced parking lots. Privately owned lands in the complex consist of agricultural fields, along with several homes and their outbuildings.

The segment of the Ice Age National Scenic Trail would still be built (by the Ice Age Trail Alliance) within the identified corridor under this alternative, but other trails would not be constructed.

Boundary Expansion. The boundary of the Ice Age Complex would not be expanded.

Estimated Costs and Staffing. A staff of six full-time equivalents would be required to implement this alternative and administer the Ice Age National Scenic Trail across the state. The annual operating costs (in 2010 dollars) would be approximately \$560,000, including costs for resource management, employee salaries and benefits, and leasing office space. The total one-time costs would be approximately \$1.24 million (in 2010 dollars) for stabilizing the Wilkie property and purchasing seed to reestablish natural vegetation conditions. The one-time costs would not include the cost of land protection, such as acquisition or easements.

Alternative 2: Ecological Restoration Emphasis

The ecosystem throughout most of the site would be restored to vegetative conditions that were present prior to European settlement (circa 1830). The restoration would support interpretation of how natural conditions in the complex would have evolved after the glacial period under minimal human influence. Vegetation would be managed at key points to reveal glacial landscapes, but the focus would be on ecosystem management. Visitors would enjoy a sense of perceived remoteness and quiet, primarily by hiking on trails. The management concept in alternative 2 would be implemented by

- restoring presettlement vegetation by applying natural processes wherever possible

- removing the buildings at the core of the site that belonged to the Wilkie family and providing parking and trail access at this location, as well as outdoor exhibits and primitive restrooms

- providing a minimally developed trail to and along the rim of Cross Plains gorge

- interpreting the site with wayside and outdoor exhibits

- managing the complex from an off-site location — there would be no permanent staff stationed at the site, and visitor interaction with park staff would be rare

Boundary Expansion. The boundary of the Ice Age Complex would not be expanded.

Estimated Costs and Staffing. A staff of eight full-time equivalents would be required to implement this alternative, together with administering the Ice Age National Scenic Trail across the state. The work required to administer the Ice Age National Scenic Trail overlaps significantly with the work required

to manage the Ice Age Complex; therefore, staffing estimates for this alternative cover both of these functions. The annual operating costs (in 2010 dollars) would be approximately \$760,000 to pay for resource management, employee salaries and benefits, and leasing office space. The total one-time costs would be approximately \$1.94 million (in 2010 dollars) for removing the Wilkie structures, constructing trails, and purchasing seed to reestablish natural vegetation conditions over more acreage than the no-action alternative. The one-time costs would not include the cost of land protection (such as acquisition or easements).

Alternative 3: Interpretation and Education Emphasis

The glacial landscape would be interpreted to focus on how the Ice Age Complex has evolved over time since the retreat of the last glacier. Throughout most of the complex, ecological resources would be managed to reveal the glacial landscape. Visitors would have an opportunity to experience a wide variety of resources, both ecological and geological, as well as remnants of human use of the site. The visitor experience would involve sheltered and indoor settings at the core of the property and hiking throughout most other areas of the site. Trails would be placed to tell stories of the formation of the glacial landscape and, to a lesser extent, about the ecological resources, such as the oak savanna. Under this alternative, the Ice Age Complex would serve as the headquarters for the Ice Age National Scenic Trail. This management concept would be implemented by

- renovating the house and/or barn at the core of the site for reuse to accommodate visitor orientation, while interpreting human use and settlement patterns; space in these facilities would also be renovated for use as staff offices

- constructing a new facility at the core of the site to accommodate maintenance needs

SUMMARY

requesting the village of Cross Plains to manage traffic along Old Sauk Pass between Cleveland Road and North Birch Trail to reduce hazards to pedestrians

providing a trail to and along the gorge with overlooks, surfaced at least in part to accommodate people with disabilities, as well as controlled partial access along the floor of the gorge

preserving and enhancing key views through vegetation management (for example, by selective thinning and pruning)

expanding the complex boundary westward to include WDNR-owned land and enhance opportunities to interpret a wider expanse of driftless area terrain

Boundary Expansion. Alternative 3 proposes to expand the boundary of the Ice Age Complex, as well as the boundary of Cross Plains State Park. The boundary would be expanded to include a 228-acre WDNR-protected parcel. The Department of Natural Resources owns part of the parcel in full, and part of it is privately owned and protected by an easement. The parcel is recommended for incorporation into the complex's boundary in order to include and protect significant resources and values and to enhance opportunities for public enjoyment related to park purpose. The parcel would offer visitors an expansive view of the Driftless Area, a rare sight along the Ice Age National Scenic Trail.

Estimated Costs and Staffing. A staff of 10.5 full-time equivalents would be required to implement this alternative and administer the Ice Age National Scenic Trail across the state. The work required to administer the Ice Age National Scenic Trail would overlap significantly with the work required to manage the Ice Age Complex; therefore, staffing estimates for alternative 3 would cover both of these functions. The annual operating costs

(in 2010 dollars) would be approximately \$1.01 million, including costs for resource management, employee salaries and benefits, and maintenance and operations. The total one-time costs would be approximately \$4.74 million (in 2010 dollars) and would go toward renovating the Wilkie property, designing and installing exhibits, constructing trails and a maintenance facility, and purchasing seed to reestablish natural vegetation conditions. The one-time costs would not include the cost of land protection, such as acquisition or easements.

Alternative 4: Outdoor Recreation Emphasis

Visitors would be offered a variety of low-impact outdoor recreational experiences in support of, and compatible with, preserving and interpreting the glacial significance of the complex and restoring and managing the ecosystem. Visitors would be able to experience resources in diverse ways and would enjoy a broad range of interpretive programming in indoor and outdoor settings. Under this alternative, the Ice Age Complex would serve as the headquarters for the Ice Age National Scenic Trail. This management concept would be implemented by

developing the core of the complex to

renovate the Wilkie house and barn primarily for use as staff offices

selectively site and construct a new visitor center with orientation services (such as exhibits and film)

selectively site and construct a new maintenance facility, unless future land acquisitions would allow for this development away from the core of visitor activity

provide outdoor gathering spaces such as an amphitheater and picnic shelter

requesting the village of Cross Plains to limit access to Old Sauk Pass between Cleveland Road and North Birch Trail (same as proposed under alternative 3)

providing a trail to and along the gorge with overlooks that would be surfaced, at least in part, to accommodate people with disabilities. If feasible a pedestrian bridge spanning the gorge would be built to provide visitors a unique perspective on its formation

providing extensive, varied trails, including a hardened bicycle/pedestrian trail across the site

offering primitive camping in the western section of the complex

expanding the complex's boundary westward to enhance opportunities for recreation, especially for a primitive camping experience near the Ice Age National Scenic Trail

Boundary Expansion. The boundary of the Ice Age Complex would be expanded to include the same 228-acre WDNR-protected parcel (mentioned under alternative 3). This parcel would be necessary to enhance opportunities for public enjoyment related to park purpose. There is no appropriate area for camping along the Ice Age National Scenic Trail corridor within the current complex boundary, so the parcel would be managed for an expanded recreational experience to allow for primitive camping for hikers on the Ice Age National Scenic Trail, which would traverse this area. This addition would be feasible to manage for the same reasons cited under alternative 3.

Estimated Costs and Staffing. A staff of 14 full-time equivalents would be required to implement this alternative and administer the Ice Age National Scenic Trail across the state. The annual operating costs (in 2010 dollars) would be approximately \$1.26 million, including costs for resource management, employee salaries and benefits,

and maintenance and operations. The total one-time costs of approximately \$8.8 million (in 2010 dollars) would be spent on renovating the Wilkie property; designing and installing exhibits; constructing trails, a maintenance facility, and a new visitor center; and purchasing seed to reestablish natural vegetation conditions. The one-time costs do not include the cost of land protection (acquisition or easements).

Alternative 5: Preferred Alternative

This alternative would provide visitors with interpretation of the evolution of the complex from the last glacial retreat and opportunities to enjoy appropriate low-impact outdoor recreation. Ecological resources would largely be managed to reveal the glacial landscape. The most sensitive ecological areas would be carefully protected, and visitor access would be highly controlled in these areas. Visitors would experience a wide variety of indoor and outdoor interpretive programming. Under this alternative, the Ice Age Complex would serve as the headquarters for the Ice Age National Scenic Trail.

The management concept for alternative 5 would be implemented by developing the core of the site (the former Wilkie property) to accommodate offices for Ice Age National Scenic Trail staff (who would support administrative and maintenance functions) and provide for a visitor center, including a sheltered picnic area. The elements involved in developing the site include

producing a building complex that would be highly sustainable (the overall goal of this development); certified under the U.S. Green Building Council's Leadership in Energy and Environmental Design rating system at a gold level; have a minimal carbon footprint; and employ systems to carefully control surface water runoff and avoid impacting the quality of Black Earth Creek.

SUMMARY

retaining parts of the existing house and barn to the extent that is practical given the need for a cost-effective, environmentally sustainable visitor center, office space, and space to support maintenance functions. Ultimately, the design of the core area for public and operational use would reflect public feedback as well as cost and environmental factors.

Until the visitor center, office, and maintenance facility complex described above can be funded and constructed, the existing buildings in the core area may be minimally modified, as necessary, to make them useful on an interim basis as a visitor contact station and for maintenance and storage purposes.

The management concept for alternative 5 would also be implemented by

- requesting the village of Cross Plains to manage traffic along Old Sauk Pass between Cleveland Road and North Birch Trail to reduce hazards to pedestrians (same as alternatives 3 and 4)

- providing a trail leading to and along the gorge with overlooks surfaced at least in part to accommodate people with disabilities. Vegetation in the gorge would be restored and volunteer trails removed.

Additionally, the management concept for alternative 5 would be implemented by

- providing an extensive, varied hiking trail network throughout the complex

- providing a management area in a narrow strip along U.S. Highway 14 to accommodate a bicycle path (in the planning stages) to connect Middleton to Cross Plains. This alternative does not envision the National Park Service or the Wisconsin Department of Natural Resources building the bicycle path;

- rather, the agencies would accommodate local efforts to build the path

- offering primitive camping equipped with a privy in the western part of the complex

- establishing a wildlife corridor of unbroken habitat between the former Wilkie property and Shoveler Sink. The area of this corridor is defined as “landscape interpretation” because of the abundance of opportunity to view glacial features here. While the landscape interpretation management area generally allows for agricultural fields, the intent of landscape interpretation in this particular corridor is to return the land to a type of native vegetation (such as short prairie grasses rather than tall prairie grasses) that would not obscure the view of glacial features

- providing picnic tables next to parking areas along U.S. Highway 14 and along Mineral Point Road

Boundary Expansion. Alternative 5 proposes to expand the complex boundary westward to incorporate two expansion areas (parcels). The one parcel would be the same 228-acre WDNR-protected parcel (mentioned above under alternatives 3 and 4), and the other would be a 40-acre parcel protected and owned by the Department of Natural Resources. Both parcels would be necessary to enhance opportunities for public enjoyment related to park purpose under this alternative. Both parcels would be managed for an expanded recreational experience to allow for primitive camping for hikers on the Ice Age National Scenic Trail, which would traverse this area, and for hiking on other trails.

Estimated Costs and Staffing. A staff of 14 full-time equivalents would be required to implement this alternative and administer the Ice Age National Scenic Trail across the state. The annual operating costs (in 2010 dollars)

would be approximately \$1.26 million, including costs for resource management, employee salaries and benefits, and maintenance and operations. The total one-time costs of approximately \$7.09 million (in 2010 dollars) would be spent on renovating the Wilkie property and new construction within the core area, designing and installing exhibits, constructing trails, and purchasing seed to reestablish natural vegetation conditions. The one-time costs would not include the cost of land protection, such as acquisition or easements.

IMPACTS FROM IMPLEMENTATION OF THE ALTERNATIVES

Soil Resources

Alternative 1: No Action, Continuation of Current Management. It is expected that alternative 1 would have some beneficial impacts on soils due to conversion of farm land to prairie. Some soils would be removed from cultivation and converted to their presettlement condition (mostly prairie). The ability to farm the prime soils today would be curtailed, and the soils would be retained for the future because the deep roots of prairie grasses are very effective at holding soil.

The present land use in the Ice Age Complex would continue to be a mix of row crop agriculture (corn and soybeans), forest land, and oak savanna. When agricultural fields are plowed, soil surface is disturbed, and there is wind erosion of silt particles and organic particles off those surfaces. There is also water erosion from the fields. There is similar land use throughout Dane County. The impacts of agriculture on erosion would be minor to moderate, depending on numerous factors, such as the amount of tillage and use of grass strips to limit erosion in critical spots.

The intensity of impacts on soils caused by trail construction would be limited to minor

ground disturbance within the narrow tread corridor. The potential impacts on soils from constructing and using the trail would be mitigated to a negligible level with proper layout of the trail on the landscape (for example, on slopes less than 10%), erosion control techniques, planking or bridges, and trail monitoring.

The Ice Age National Scenic Trail would still be built under this alternative but other trails would not. Over time, unauthorized trails (such as paths created by visitors), would proliferate. There is currently minimal impact from erosion and compaction in forest and oak savanna areas under present use, with the exception of the Cross Plains gorge and the moraine between the Cross Plains gorge and Cleveland Road. There is currently minor impact on the trail on the moraine and impact would remain minor if usage is limited to hiking. If there is no enforcement of restrictions on the use of this trail, and if use by horseback riders were to increase, there would be a moderate impact due to compaction. There is compaction at small parking areas off Mineral Point Road and Timber Lane, but this land has already been disturbed, and there would be minimal further compaction.

The steep walls of Cross Plains gorge attract visitors, and human activity has the potential to damage both forest duff cover and soils, which could lead to substantial erosion problems. While the steep walls of Black Earth Creek valley are also susceptible to erosion if vegetation is disturbed, under present use, the slopes are not visited as much as those of the Cross Plains gorge. As time passes, however, this site could become better known, and residential development might increase in the area. If increased use were not accompanied by measures to protect these areas, such as a designed and delineated trail, damage to the steep walls could be expected. There could potentially be moderate to major erosion impacts if uncontrolled human activity in the vicinity of Cross Plains gorge and Black Earth Creek valley increased.

Alternative 2: Ecological Restoration Emphasis.

Alternative 2 would have the same beneficial impacts on soils as expressed in the first paragraph under alternative 1.

This alternative would contribute to increased trail usage, compared to alternative 1 (no action), and would therefore likely have a minor impact on soils from compaction. There would be moderate impact on soils from compaction in parking areas, but these would not be large areas and would likely be in the same places as in alternative 1. Paving the parking lots would contribute to increased runoff and would require proper management.

The installation of trails near, but not in, Cross Plains gorge would minimize impact on the walls of the gorge. Erosion impacts in the gorge itself would be negligible because the public would be directed (with trail design and signage) to stay off the walls of the gorge. Because the complex would be managed from an off-site location, there would be little ability to enforce this direction. If the public does not comply with the direction to stay off the gorge walls, there could be moderate adverse impacts on soil and the forest duff covering the wall until the park has the capacity to stop this from happening, given the minimal off-site staff.

Alternative 3: Interpretation and Education Emphasis. Alternative 3 would have the same beneficial impacts on soils as expressed in the first paragraph under alternative 1.

The construction of buildings and a surfaced trail to Cross Plains gorge could potentially have a temporary moderate adverse impact on soils from erosion and compaction in areas subject to construction. Once construction is completed, there would still be some potential for minor compaction from visitor use, but the minor impacts would be confined to areas around buildings and parking lots. The on-site interpretation and maintenance facilities would potentially focus some visitor foot traffic to the interpretation building and away

from the steep walls of Cross Plains gorge and steep slopes at the edge of Black Earth Creek valley. This would reduce the potential for soil compaction and erosion from uncontrolled human activity, resulting in minor to moderate beneficial impacts on those areas.

Alternative 4: Outdoor Recreation Emphasis.

Alternative 4 would have the same beneficial impacts on soils as expressed in the first paragraph under alternative 1.

The construction of buildings and a surfaced trail to Cross Plains gorge, as well as a bridge across the gorge, could potentially have a temporary moderate adverse impact on soils from erosion and compaction in areas subject to construction. There would be additional trails across the site that would create moderate compaction in the vicinity of the trail. Once the landscape is stabilized following construction, compaction from visitor foot traffic would be confined to the areas around buildings and parking lots, which could potentially result in minor adverse impacts. The addition of a bicycle trail from the visitor center to a parking lot north of Black Earth Creek would increase visitor activity in a sensitive area, resulting in an adverse moderate impact on the steep slopes facing the creek, especially along the trail. The on-site interpretation and maintenance facilities would potentially focus some visitor foot traffic to the interpretation building and away from the steep walls of Cross Plains gorge and steep slopes at the edge of Black Earth Creek valley. This would reduce the potential for soil compaction and erosion from uncontrolled human activity, resulting in minor to moderate beneficial impacts on those areas.

Alternative 5: Preferred Alternative. Alternative 5 would have the same beneficial impacts on soils as expressed in the first paragraph under alternative 1.

The construction of buildings and a surfaced trail to Cross Plains gorge could potentially have a moderate adverse impact on soils from

erosion and compaction during construction. There would be additional trails across the site that would create moderate compaction in the vicinity of the trail. Once the landscape is stabilized following construction, compaction from visitor foot traffic would be confined to the areas around buildings and parking lots, which could potentially result in minor adverse impacts. The on-site interpretation and maintenance facilities would potentially focus some visitor foot traffic to the interpretation building and away from the steep walls of Cross Plains gorge and steep slopes at the edge of Black Earth Creek valley. This would reduce the potential for soil compaction and erosion from uncontrolled human activity, resulting in minor to moderate beneficial impacts on those areas.

Water Quality

Alternative 1: No Action, Continuation of Current Management. At this time, the small basin that collects surface water that flows into Coyle Pond is partly used for row crops. Whatever tillage techniques are used, the application of herbicides and fertilizer has the potential to contaminate groundwater by passing through the limestone beneath the sinkhole. At this time land around Shoveler Sink is not in intensive agriculture, and chemicals are not being applied to the fields, so there is currently negligible adverse impact from agricultural runoff.

Alternative 2: Ecological Restoration Emphasis. The small basin that collects surface water flowing into the Coyle Pond would be put back into presettlement vegetation under this alternative, and any adverse impact on groundwater would be negligible. In fact, over time, agricultural chemicals would not enter the groundwater system through the sink, so this would likely have a beneficial effect on groundwater quality, but the amount of this effect cannot be quantified.

Alternative 3: Interpretation and Education Emphasis;
Alternative 4: Outdoor Recreation Emphasis;

and Alternative 5: Preferred Alternative. These alternatives envision an indoor facility with modern amenities (such as indoor plumbing) for visitors, so there would be a need for a new well and septic system near the core area of the property. These would be built to appropriate codes and would therefore have a negligible impact on groundwater.

Soundscapes

Alternative 1: No Action, Continuation of Current Management. Due to minimal development of visitor amenities, this alternative would be expected to have the lowest level of visitation out of the five alternatives and therefore the least visitor-created noise. It seems likely that, overall, there would be negligible impacts on the soundscape.

Alternative 2: Ecological Restoration Emphasis. This alternative would increase trail usage over the no-action alternative, which could potentially result in more visitor-generated noise. In the short term, there would be noise generated from the removal of the structures at the core of the property, but those moderate adverse impacts on the soundscape would be temporary. Over the long term, most of the complex would be managed to allow visitors “a direct sensory experience of natural resources” (refer to table 2 in chapter 2 for the natural experience management area description for desired visitor experience), indicating negligible impacts on the soundscape.

Alternative 3: Interpretation and Education Emphasis. Alternative 3 would result in a considerable increase in visitation compared to the no-action alternative, which could lead to more visitor-generated noise. In the short term, there would be noise generated from the renovation of the structures at the core of the property, but these moderate adverse impacts on the soundscape would be temporary. Over the long term, most of the complex would be managed for landscape interpretation, under which the management prescription (refer to table 2 in chapter 2) for visitor experience

SUMMARY

would concentrate on offering views of the results of glaciation, instead of offering direct sensory experience of natural resources as the natural experience management area would, indicating the potential for minor adverse soundscape impacts.

Alternative 4: Outdoor Recreation Emphasis.

Alternative 4 could result in a considerable increase in visitation, which would lead to considerably more visitor-generated noise. There would be noise generated from the construction of structures at the core of the property, but these moderate adverse impacts on the soundscape would be temporary. The bike path across the complex could generate more visitors and more noise per visitor than the hiking trails under the other alternatives. Most of the complex would be managed for landscape interpretation or for an expanded recreational experience, under which the management prescription for visitor experience would concentrate on offering views of the results of glaciation and the opportunity for low-impact recreation. However, there would also be a large natural experience area at the corner of two of the major roads on the edge of the complex. Overall, adverse impacts on the soundscape would be minor.

Alternative 5: Preferred Alternative. Impacts on the soundscape would be very similar to alternative 4, albeit slightly less because there would not be a bike path across the complex under this alternative. Overall, adverse impacts on the soundscape would be negligible to minor.

Vegetation and Wildlife

Alternative 1: No Action, Continuation of Current Management. There would be no comprehensive plan to guide management of the complex, so vegetation and wildlife habitat would not be consistently managed. Restoration goals (such as for the oak savanna or prairie) and activities (such as prescribed burning or mechanical invasive removal)

would be decided on a case-by-case basis as funding and/or volunteer labor allows. Since there would be few defined trails, there would be a risk of vegetation trampling throughout the site from the creation of social trails. However, since the site would not be advertised, there would be no facilities to accommodate visitors, and user capacity management would allow park managers a number of strategies to mitigate this risk; thus, adverse vegetation impacts from trampling would be negligible. It seems likely that, considering the site as a whole, there would be negligible impacts on vegetation and wildlife.

Alternative 2: Ecological Restoration Emphasis.

Most of the complex would be managed for natural experience, in which “Natural resources are managed to approximate presettlement (circa 1830) conditions. To the extent possible, natural ecological processes sustain the integrity of these resources.” This management prescription would have a moderate beneficial impact on vegetation and wildlife.

Alternative 3: Interpretation and Education

Emphasis. There would still be a significant area managed for natural experience, although most of the complex would be managed for landscape interpretation, under which the management prescription for resource conditions would include managing natural resources to reveal glacial features. Since there would be a range of ways to reveal glacial features through natural resource management (for example, planting short row crops or short prairie grasses), impacts on vegetation and wildlife would range from negligible to moderately beneficial.

Alternative 4: Outdoor Recreation Emphasis and Alternative 5: Preferred Alternative. Under these two alternatives, management prescriptions would be fairly evenly divided between landscape interpretation and expanded recreational experience (which share the same desired resource condition) and natural experience. Additionally, under alternative 5,

a wildlife corridor of unbroken habitat would be established in the southern half of the complex. This combination of management prescriptions would entail a minor beneficial impact on vegetation and wildlife.

Socioeconomics

All Alternatives. Typically, the addition of parklands to a community increases the value of land adjacent to the park. Because of this, all of the alternatives would be likely to produce beneficial economic impacts. Similarly, all alternatives would have adverse impacts on the local tax base if lands were federally owned because those lands would be exempt from property tax, and the payments in lieu of tax program historically has not fully compensated for this loss. However, these adverse impacts might be smaller than for similar areas of the National Park Service because the land would also be owned by the Department of Natural Resources, which does offset local property tax losses, so this potential tax loss could be mitigated.

Alternative 1: No Action, Continuation of Current Management and Alternative 2: Ecological Restoration Emphasis. These two alternatives would only provide an outdoor experience in which activities for visitors would be limited to hiking and other low-impact activities on a minimal trail system and rare interpretive tours. The visitation level under these alternatives could be compared to the most sparsely visited parks (10,000 visitors per year or less) in the national park system. These parks, on average, contribute about \$350,000 value-added annually to their communities. Without knowing what type of housing would have been built if neither of these alternatives were implemented, it is impossible to know what the tax receipts would have been. If net property tax receipts from residential development (after the costs of improving infrastructure to accommodate these residences, such as schools and roads are taken into account) were to exceed \$350,000 annually, then the economic impacts of the

no-action alternative and alternative 2 would be adverse. If, on the other hand, net property taxes were less than the estimated \$350,000 that visitation economic benefits would bring, the impacts of these two alternatives would be beneficial.

Alternative 3: Interpretation and Education Emphasis. This alternative would not only offer an outdoor experience, but also a place to stop and rest indoors, view some exhibits, and talk with park staff. Visitors would also benefit from regular interpretive programming provided by rangers. These elements would attract more visitors to the complex, but overall, the estimated visitation would still be relatively low. Visitation under this alternative could be compared to parks with low visitation (50,000–100,000 visitors per year) in the national park system. These parks, on average, contribute about \$2.5 million value-added annually to their communities. It is not possible to know what the tax receipts would have been if this alternative were not implemented. If net property tax receipts from residential development (after the costs of improving infrastructure to accommodate these residences such as schools and roads are taken into account) were to exceed \$2.5 million annually, then the economic impacts of alternative 3 would be adverse. If, on the other hand, net property taxes were less than the estimated \$2.5 million that visitation economic benefits would bring, then the impacts of this alternative would be beneficial.

Alternative 4: Outdoor Recreation Emphasis and Alternative 5: Preferred Alternative. These alternatives would offer a broader outdoor experience in a variety of ways, such as more trails, limited primitive camping, picnic areas, and for alternative 4, a bridge across the gorge and a bike path. The two alternatives would also offer a place to stop and rest indoors; view extensive exhibits, including a film; and talk with park staff. There would be space to accommodate visitors who come in a group, such as school groups. Visitors would also benefit from regular interpretive programming

SUMMARY

provided by rangers. These elements would attract more visitors to the complex, and overall, the estimated visitation would fall in the moderate range for visitation (150,000–200,000 visitors per year) in the national park system. These parks, on average, contribute about \$5 million value-added annually to their communities. It is not possible to know what the tax receipts would be if these alternatives were not implemented. If net property tax receipts from residential development (after taking into account the costs of improving infrastructure, such as schools and roads, to accommodate the new residences) were to exceed \$5 million annually, then the economic impacts of these alternatives would be adverse. If, on the other hand, net property taxes were less than the estimated \$5 million that visitation economic benefits would bring, then the impacts of these alternatives would be beneficial.

Visitor Use and Experience

Alternative 1: No Action, Continuation of Current Management and Alternative 2: Ecological Restoration Emphasis. These alternatives would only provide an outdoor experience in which activities for visitors would be limited to hiking and other low-impact activities on a minimal trail system and rare interpretive tours. While the activities would offer some beneficial experience for visitors over the current conditions, the benefits would likely range from negligible to minor.

Alternative 3: Interpretation and Education Emphasis This alternative would not only offer an outdoor experience, but also a place to stop and rest indoors, view some exhibits (not extensive given space limitations), and talk with park staff. Visitors would also benefit from regular interpretive programming provided by rangers. For visitors interested in the human history of the site, the ability to view and interpret the Wilkie house and barn would provide a pleasant variety of experience. However, visitors who might want to view a film in a theater or arrive in groups and gather in one indoor spot might be

disappointed by the indoor space limitations. Overall, this alternative would offer beneficial visitor experience at a minor level.

Alternative 4: Outdoor Recreation Emphasis.

This alternative would offer a broad outdoor experience in a variety of ways (more trails, limited outdoor camping, picnic areas, a bridge across the gorge, and a bike path). It would also offer a place to stop and rest indoors; view extensive exhibits, including a film; and talk with park staff. There would be space to accommodate visitors who come in group, such as school groups. Visitors would also benefit from regular interpretive programming provided by rangers. However, visitors seeking solitude and a quiet nature immersion experience might be disappointed to have to travel far from the core of the site to find this. Overall, this alternative would have a minor to moderate beneficial impact on visitor experience.

Alternative 5: Preferred Alternative. This alternative would offer a broad outdoor experience in a variety of ways (more trails, including a half-day-long loop trail; limited outdoor camping; and picnic areas). It would also offer a place to stop and rest indoors; view extensive exhibits, including a film; and talk with park staff. There would be space to accommodate visitors who come in group, such as school groups. Visitors would also benefit from regular interpretive programming provided by rangers. Various attractions (such as a bike path traversing the site and a pedestrian bridge across the gorge) are not proposed in this alternative (as they are in alternative 4) because those amenities were not widely supported by the public when they commented on the preliminary alternatives. Therefore, it seems like not many benefits to visitor experience were lost with the removal of those elements. Because the sensitive resources management area was enlarged, visitors seeking solitude and a quiet nature immersion experience would not have to travel far from the core of the site to find this. Overall, this alternative would have a moderate beneficial impact on visitor experience.

NEXT STEPS AND IMPLEMENTATION OF THE GENERAL MANAGEMENT PLAN

There is a 60-day public review and comment period on this draft general management plan / environmental impact statement. After the comment period, the NPS planning team will evaluate comments from other federal agencies, tribes, organizations, businesses, and individuals regarding this document and incorporate appropriate changes into a final general management plan / environmental impact statement. The final document will include letters from government agencies, any substantive comments on the draft document, and NPS responses to those comments.

There will be a 30-day no-action period following distribution of the final general management plan / environmental impact statement. A “record of decision” may be prepared that would document the NPS selected alternative, which would become the new general management plan for the Ice Age Complex to be implemented over 15 to 20 years. Once a record of decision is signed by the NPS regional director, the plan would then be implemented as funding and staffing allows.

Please Note

IT IS IMPORTANT TO NOTE that not all of the actions in the selected alternative would necessarily be implemented immediately.

The implementation of the approved plan, no matter which alternative might be selected, would depend on future NPS, state, and partner funding levels; staff to implement the plan; servicewide priorities; and on partnership time and effort. Full implementation of the plan could be many years in the future.

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Purpose of and Need for the Plan



Chapter One

INTRODUCTION AND PURPOSE AND NEED FOR A GENERAL MANAGEMENT PLAN

INTRODUCTION

THIS CHAPTER BEGINS by providing background on the Ice Age Complex at Cross Plains (henceforth, “Ice Age Complex” or “complex”) to explain what and where it is and why the National Park Service (NPS) and the Wisconsin Department of Natural Resources (WDNR) are proposing a plan for preserving and interpreting it. This chapter also explains the process used to develop this draft general management plan / environmental impact statement (GMP/EIS), as well as the purpose of and need for a general management plan and the actions proposed herein.

DESCRIPTION OF THE ICE AGE COMPLEX

A mere 20,000 years ago, two-thirds of what is today the state of Wisconsin lay under the grip of colossal ice sheets. The climate warmed and the ice sheets began to melt back. In their wake they left an impressive landscape of fascinating glacial landforms: moraines, drumlins, kames, kettles, eskers, outwash plains, meltwater channels, driftless (unglaciaded) topography, glacial lake beds and islands, and more. These Wisconsin Ice Age remnants are considered among the world’s finest examples of how continental glaciation sculpts our planet.

Located just west of Madison near the village of Cross Plains is a 1,500-acre area that contains an outstanding collection of glacial landforms, including a gorge carved by meltwater and expansive views of both driftless and glaciaded terrain. These acres comprise a park called, for the purpose of this planning effort, the “Ice Age Complex at Cross Plains” (henceforth “Ice Age Complex” or “complex”) (see figure 1). This site, however, has a rich history of different legal designations.



*Gorge carved
by glacial
meltwater.*



The lands and landscape of the Ice Age Complex have been deemed nationally significant under two related, but distinct, federal designations. The elements recognized in both designations are parts of the singular concept advanced by Wisconsin citizens in the late 1950s and early 1960s to protect and showcase Wisconsin's heritage from continental glaciation. Congress authorized the concept in two parts, at two different times, and through two different legislative vehicles.

In 1964 Congress enacted legislation (Public Law [PL] 88-655; 78 Stat. 1087; 16 United States Code [USC] 469d, *et seq.*) directing the Secretary of the Interior to cooperate with the governor of Wisconsin in studying and subsequently designating an Ice Age National Scientific Reserve ("Ice Age Reserve" or "reserve"). The purpose of the Ice Age Reserve is "to assure protection, preservation, and interpretation of the nationally significant values of Wisconsin continental glaciation, including moraines, eskers, kames, kettleholes, drumlins, swamps, lakes, and other reminders of the ice age." The continental glaciers last advanced and retreated over the state some 30,000 to 10,000 years ago.

Congress envisioned the Ice Age Reserve as a network of distinct areas, each exhibiting an outstanding example of one type of landscape or landform resulting from continental glaciation. The legislation's intention is that the reserve would be owned and managed by the state of Wisconsin, with the assistance and collaboration of the Secretary of the Interior (acting through the National Park Service). Several of the outstanding sites selected were already Wisconsin state parks. The legislation made reference to the Ice Age National Scenic Trail but made no provisions for it.

When the study was completed, nine sites were identified to be protected and managed by the Wisconsin Department of Natural Resources (WDNR) as units of the Ice Age Reserve (see figure 2). On May 29, 1971, the Secretary of the Interior published an order in the *Federal Register* that formally brought the Ice Age Reserve into existence.



FIGURE 1: ICE AGE COMPLEX AT CROSS PLAINS

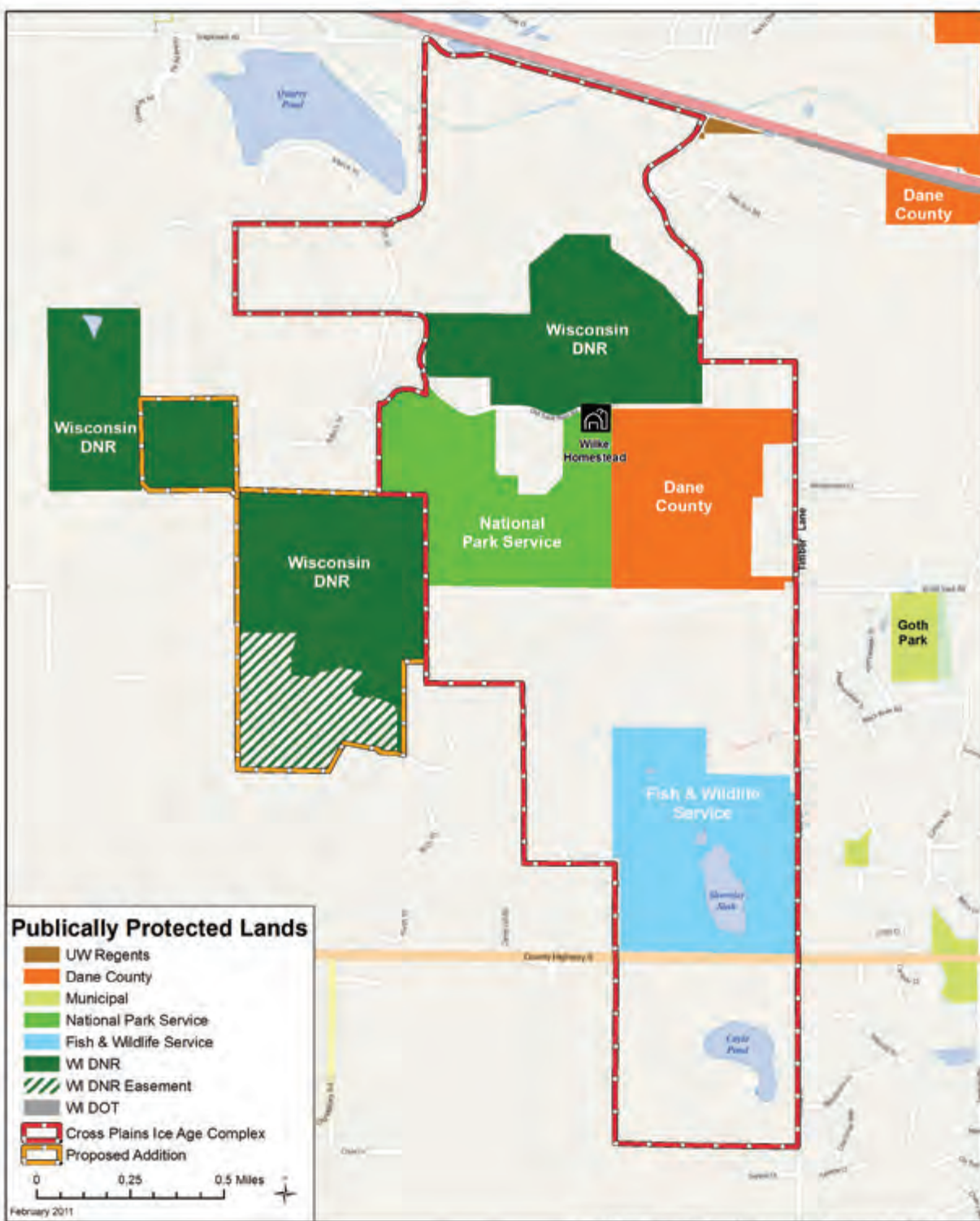


FIGURE 2: ICE AGE NATIONAL SCIENTIFIC RESERVE AND ITS NINE UNITS



As noted in Black (1974), “The Cross Plains area was selected for inclusion in the Reserve in part because it contains a typical portion of the Johnstown Moraine on the uplands and a typical proglacial stream in Black Earth Creek Valley, and is close to a center of population. More importantly it is the only place . . . where the terminal moraine rests directly on well exposed, weathered dolomite bedrock and where small marginal proglacial lakes, a marginal drainage way, and a subglacial drainage way may all be seen in a small area. The various glacial features associated with the moraine in the vicinity of Cross Plains are more varied and yet as definitive as one could hope to see, all preserved in a neat little package. The area is one of increasing urbanization, and preservation of parts of the front and its associated phenomena can only be assured in the Reserve.”

The Wisconsin Department of Natural Resources purchased 100 acres of the Cross Plains unit of the Ice Age Reserve in September 1975, and an additional 60 acres were subsequently purchased. The Cross Plains unit is also designated as Cross Plains State Park by Wisconsin Administrative Rule.

Congress again recognized the national significance of Wisconsin’s glacial landscapes when, on October 3, 1980, it amended the *National Trails System Act* to authorize and establish the Ice Age National Scenic Trail as a component of the National Trails System (PL 96-370; 94 Stat. 1360; 16 USC 1244(a)(10)). The Ice Age National Scenic Trail meanders through Wisconsin for approximately 1,200 miles from Potawatomi State Park in Door County to Interstate State Park in Polk County, generally following the terminal moraine and other glacial landscape features and connecting six of the nine units of the Ice Age Reserve. The Secretary of the Interior was assigned administrative responsibility for the Ice Age National Scenic Trail.

The Secretary of the Interior delegated overall administrative responsibility for the Ice Age National Scenic Trail to the National Park Service. The Park Service, in cooperation with the Wisconsin Department of Natural Resources and other parties, completed a *Comprehensive Plan for Management and Use of the Ice Age National Scenic Trail* in September 1983. The National Park Service is responsible at the federal level for carrying out the provisions of the *National Trails System Act* as they relate to the Ice Age National Scenic Trail. The National Park Service carries out or facilitates trail planning, environmental compliance, trail development and management, public and private partner involvement, and land protection activities. The Park Service assists partners by coordinating, guiding, and assisting their efforts to acquire, develop, operate, protect, and maintain the Ice Age National Scenic Trail in accordance with the comprehensive plan and supplemental trail corridor plans and railway protection strategies (land protection plans). The comprehensive plan identifies the Wisconsin Department of Natural Resources and the nonprofit Ice Age Trail Alliance as cooperators in the long-term effort to develop and manage the Ice Age National Scenic Trail. The Park Service serves as the primary liaison with other federal agencies in matters relating to the Ice Age National Scenic Trail. In carrying out this role, the Park Service reviews and comments on federal or federally assisted/permitted projects and activities (such as highway, utility, and other development proposals) that may affect trail segments.

The Wisconsin Department of Natural Resources is the state agency responsible for providing and maintaining outdoor recreation resources of statewide significance, including state parks and trails, in Wisconsin. Thus, the basis for the Wisconsin Department of Natural Resources’ participation in developing and managing the Ice Age Reserve and Ice Age National Scenic Trail is the statewide significance of the reserve and trail and the inclusion of

state parks, forests, trails, and recreation areas in the reserve and along the route of the trail. The state legislature formalized this role in 1987 by passing legislation that designates the Ice Age National Scenic Trail as a State Scenic Trail. The legislation also assigns the responsibility to the Wisconsin Department of Natural Resources for coordinating the involvement of state agencies in the trail project and cooperating with the National Park Service and private interests in planning, acquiring, developing, and maintaining the Ice Age National Scenic Trail. The Wisconsin Department of Natural Resources has been the primary NPS partner in administering federal financial assistance for acquiring lands for the Ice Age National Scenic Trail.

The *National Trails System Act* authorizes the establishment of interpretive sites along national scenic trails. In fiscal year (FY) 2001 Congress appropriated funds for the acquisition of specific lands, owned by James and Jane Wilkie, for an Ice Age National Scenic Trail Interpretive Site. The lands specified for the interpretive site happen to lie within the boundaries of the Cross Plains unit of the Ice Age Reserve. The National Park Service purchased the lands in 2002, subject to a life estate, and took full possession in early 2008.

The Wilkie farmstead includes a stone house, the original two-story portion of which dates back to the 1850s, just a few years after statehood in 1848. The one-story addition, built with stone from the same quarry as the original house, dates to 1952 when the Wilkies purchased the farm. There is also a structurally sound wood barn, modern garage, shed used as a chicken coop, and Quonset for equipment storage. These structures are referred to elsewhere in this document as the “farmstead” or individually as the “stone house,” “barn,” and so forth. The structures were evaluated for eligibility to be listed on the National Register of Historic Places, but it was determined they were not historically significant.

The lands that comprise the Ice Age Complex are managed at both a state and federal level. That is, the Ice Age Reserve is owned and managed by the state of Wisconsin, and the Ice Age National Scenic Trail Interpretive Site is owned and managed by the National Park Service. Additionally, the Ice Age Complex also includes Shoveler Sink Waterfowl Production Area, which is owned and managed by the U.S. Fish and Wildlife Service (USFWS). The involvement of both federal and state governments, as well as Dane County Parks, makes this plan to preserve and interpret the Ice Age Complex a true partnership effort.

OVERVIEW OF THE PLANNING PROCESS

Q *Why have the National Park Service and Department of Natural Resources developed this general management plan?*

A The *National Parks and Recreation Act of 1978* (Public Law [PL] 95-625) and the Redwood Amendment of 1978 (PL 95-250 Sec. 101(6)(b)) require the preparation and timely revision of general management plans for each unit of the national park system. NPS management policies require each general management plan to “set forth a management concept for the park [and] establish a role for the unit within the context of regional trends and plans for conservation, recreation, transportation, economic development, and other regional issues.” As part of the planning process, Congress specifically directed (at 16 United States Code [USC] 1a-7b) the National Park Service to address

measures for the preservation of the area’s resources

indications of types and general intensities of development (including visitor circulation and transportation patterns, systems, and modes) associated with public enjoyment and use of the area, including general locations, timing of implementation, and anticipated costs

identification of an implementation commitment for visitor carrying capacities [now called user capacity] for all areas of the unit

indications of potential modifications to the external boundaries of the unit and the reasons therefore

Q What is considered in developing general management plans?

A The purpose of the National Park Service, as stated in the *Organic Act of 1916* (which brought the service into existence that year), is “to conserve the scenery and the natural and historic objects and the wild life therein [within the national parks] 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.” These words comprise a mission statement for the entire system of national parks. The laws that established the Ice Age Reserve and the Ice Age National Scenic Trail include purpose statements that build on this mission statement. The Wisconsin Department of Natural Resources’ 1998 feasibility study (supporting expansion of the Cross Plains unit of the reserve) stated that the proposed long-range goal for the expanded reserve unit was “to preserve the geologic, natural, cultural, and scenic qualities of the Cross Plains Reserve unit and provide interpretive, educational, and low-impact recreational opportunities.” This general management plan translates the NPS mission, combined with the more directive purpose statements of the Ice Age Reserve, Ice Age National Scenic Trail, and the Cross Plains unit of the reserve into guidance for the managers of the Ice Age Complex for the next 15 to 20 years.

Q How are requirements of the National Environmental Policy Act integrated into the general management plan?

A This draft general management plan / environmental impact statement was

developed according to the process outlined by the *National Environmental Policy Act* (NEPA), a law passed in 1969 to impose analysis and public review requirements on federal decision makers. This plan follows the NEPA process by proposing a range of reasonable alternatives for managing the Ice Age Complex, evaluating the environmental impacts of the alternatives, and inviting public review of the alternatives and impact analysis.

NPS Director’s Order 12: *Conservation Planning, Environmental Impact Analysis, and Decisionmaking* and its accompanying handbook lay the groundwork for how the National Park Services complies with the *National Environmental Policy Act*. Director’s Order 12 and handbook set forth a planning process for incorporating scientific and technical information and establishing a solid administrative record for NPS projects.

Q How did public involvement inform this plan?

A Public feedback was invited at three specific points in the NEPA process.

1. *Scoping.* A newsletter was sent out, the website was launched, and public meetings were held in summer 2008 to gather general feedback on the scope of this plan. Questions were asked of the public about what they value about the Ice Age Complex and what problems, concerns, or opportunities they see. The responses to these questions were used to formulate preliminary alternatives.
2. *Preliminary Alternatives.* A second newsletter was sent out, and public meetings were held in summer 2009 to invite feedback on four potential ways that the Ice Age Complex could be managed. Public responses during this stage of the plan’s development influenced the results of the value analysis, during which the preferred alternative (alternative 5) was developed.

3. *Draft Plan.* Comments on this draft general management plan / environmental impact statement are now welcome. NPS responses to substantive public comments on this draft document will be included with the final general management plan / environmental impact statement.

More explanation of public involvement in this plan is included in “Chapter 5: Consultation and Coordination.”

PURPOSE OF THE PLAN

The final general management plan will provide a framework to assist NPS and WDNR managers in making decisions today and in the future. The alternatives proposed in this plan describe general paths that the National Park Service and Department of Natural Resources would follow in managing the Ice Age Complex over the next 15 to 20 years. This draft general management plan / environmental impact statement

identifies desired conditions in different parts of the Ice Age Complex

identifies any necessary developments and support facilities to achieve the vision and desired conditions

ensures 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

The document addresses the three purposes listed above, but it does not

describe how particular programs or projects would be implemented or prioritized; these decisions are deferred to detailed implementation planning

provide specific details and answers to all the issues facing the Ice Age Complex

provide funding commitments for implementation of the plan

NEED FOR THE PLAN

A general management plan is needed in order to establish a consistent vision for the Ice Age Complex that is shared by all partners in this project. Those partners are the National Park Service, Wisconsin Department of Natural Resources, U.S. Fish and Wildlife Service, Ice Age Trail Alliance, local government agencies, and the general public. Although the Department of Natural Resources’ 1998 feasibility study (mentioned above) provided a rough outline for how the Ice Age Complex could be managed, this general management plan is the first plan designed to provide comprehensive management guidance for the complex. The Ice Age National Scenic Trail is guided by a 1983 comprehensive management plan, and the Ice Age Reserve is guided by a 1968 comprehensive management plan, but neither of these older overarching plans articulate the shared vision between the National Park Service, Department of Natural Resources, and the public on how to best achieve the specific purpose of the complex and protect its resources for future generations.

Currently, the Ice Age Complex is essentially undeveloped for visitor use. Given its location just outside the fast-growing suburbs of Madison, Wisconsin, and the interest in Ice Age geology in the region, there is potential for significant visitation at the complex. There is also potential for damage to the glacial features at the site without long-term planning for their protection. Thus, this general management plan is needed because

the management plans for related areas (Ice Age National Scenic Trail and Ice Age National Scientific Reserve) are outdated

there must be a consistent and shared vision for the complex

there is potential for both significant visitation and resource damage

There are three purposes of the Ice Age Complex; those are to

ensure protection, preservation, and interpretation of the nationally significant values of continental glaciation in Wisconsin, including moraines, eskers, kames, kettleholes, drumlins, swamps, lakes, and other reminders of the Wisconsin Ice Age

establish a superlative segment of the Ice Age National Scenic Trail and provide information and interpretation about the trail to the public at a significant site along its route

provide outdoor recreational and educational opportunities in support of and compatible with the conservation and enjoyment of the nationally significant scenic, historic, natural, and cultural resources within the complex

FOUNDATION STATEMENT

Each park in the national park system must develop a formal core mission statement that provides basic guidance for making decisions about that park. The foundation statement is the formal core mission statement. The core elements of the foundation statement are (1) statements of purpose and significance; (2) descriptions of fundamental and important resources and values; (3) discussion of primary interpretive themes; and (4) summaries of legal and policy requirements and special mandates for the site. The foundation statement helps ensure that park managers and stakeholders understand these important core elements of the park.

Statements of Park Purpose

Purpose statements are the specific reasons for establishing a park. They are grounded in a thorough analysis of the park's enabling legislation and legislative history, but they go beyond simply restating the law to document shared assumptions about what the law means in terms specific to the park. Legislative mandates, from which the purpose statements for the Ice Age Complex were derived, include the 1964 law establishing the Ice Age National Scientific Reserve (because the Ice Age Complex is also the Cross Plains unit of the reserve, as determined by a 1998 WDNR Feasibility Study) and the *National Trails System Act*, as amended in 1980 to include the Ice Age National Scenic Trail (because part of the Ice Age Complex is also the interpretive site for the Ice Age National Scenic Trail) (appendix A contains copies of the legislation).

Statements of Park Significance

Significance statements describe why (within a national, regional, and systemwide context) the park's resources and values are important enough to warrant national park designation. The significance statements are directly linked to the park's purpose, are substantiated by data or consensus, and reflect the most current scientific or scholarly inquiry and cultural perceptions.

These are the three statements of park significance for the Ice Age Complex.

1. Nowhere are the marks of continental glaciation upon the land more impressive than along the Ice Age National Scenic Trail and in the Ice Age National Scientific Reserve units in Wisconsin. The meandering landscape that exhibits the marks of the glacier's farthest advance is a showplace of moraines, kames, drumlins, erratics, kettle lakes, potholes, eskers, marshes, meltwater channels, gorges, ice-walled

lake plains, outwash plains, and glacial lake beds. While many of these marks of the glacier’s advance can be viewed in the Ice Age Complex at Cross Plains, others are present in other units of the reserve.

2. The Ice Age National Scenic Trail’s path of glacial features provides outstanding opportunities for recreation, education, inspiration, solitude, and enjoyment.
3. The Ice Age Complex at Cross Plains unit is the primary site for interpreting the Ice Age National Scenic Trail. Opportunities for the public to experience and understand the marks of the glacier’s farthest advance are highlighted in the areas where the Ice Age National Scenic Trail crosses the reserve units, as it does in Cross Plains.

Fundamental and Other Important Resources and Values

The preeminent responsibility of park managers is ensuring the conservation and public enjoyment of qualities that are critical to achieving the park’s purpose and maintaining its significance. These qualities are called the park’s “fundamental resources and values.” Parks often have other resources and values that, while not fundamental to the parks purpose or significance, are nevertheless determined to be particularly important considerations for general management planning. These resources and values are called the park’s “other important resources and values.”

The *fundamental resources and values* for the Ice Age Complex include

geological features that tell the glacial story of the site, such as meltwater channels and proglacial lake basins (including, but not exclusive to, the Cross Plains gorge); the terminal

moraine; erratics; bedrock geology; driftless area features; and related natural biological resources, including vegetation created by the microclimate in the gorge

a continuous route for the Ice Age National Scenic Trail through the complex to provide footpath access and interpretive opportunities along its route

the opportunity for people, particularly those in the adjacent urban area, to experience immersion into a large natural landscape, providing outdoor recreation and education both compatible with and supporting conservation of natural resources within the complex

expansive views that provide a visual display of the contrast between the unglaciated driftless area and lands shaped by continental glaciation

The *other important resources and values* for the Ice Age Complex include the

Native American migration route that traverses the site

high concentration of open-grown white and burr oak representative of the oak savanna that has disappeared from more than 99.9% of its former range, presenting opportunities for restoration and management

Primary Interpretive Themes

Primary interpretive themes describe what needs to be interpreted in order to provide people with opportunities to understand and appreciate the park’s purpose and significance. These themes are primarily derived from and reflect park significance, although they also offer perspectives on fundamental and important resources and values. There are five primary interpretive themes identified for the Ice Age Complex.

First Primary Interpretive Theme

The Landscape — this landscape and its features uniquely illustrate the contrast between unglaciated and glaciated landscapes, which demonstrates the dramatic earth-shaping power of glaciers.

The subtheme derived from the first primary theme will focus on the process of glaciation and will compare and contrast unglaciated and glaciated landscapes.

Second Primary Interpretive Theme

People and the Land — the landscapes, both unglaciated and glaciated, have affected human migration, settlement patterns, land use, and values of the land for thousands of years. These landscapes have influenced locations of transportation corridors and agriculture and resource extraction and have inspired land stewardship and contemporary land ethics.

The subtheme derived from the second primary theme will focus on how the landscape affected human interaction with the land throughout time.

Third Primary Interpretive Theme

Ice Age National Scenic Trail — the trail offers an opportunity to connect with the past while immersed in nature. The Ice Age National Scenic Trail and other long-distance trails provide for extended outdoor experiences of discovery. The third primary theme focuses on the trail itself.

Interpretation derived from this theme would encourage visitors to use the trail to find their own connections with the past and nature and will relate the Ice Age National Scenic Trail to other long-distance trails.

Fourth Primary Interpretive Theme

Environmental Conditions — our glacial past provides opportunities to better understand changing current environmental conditions that affect the way we live today and might live tomorrow.

The subthemes derived from the fourth primary theme will invite reflection on current environmental conditions in comparison with those of ancient times. While global climate change will be a strong subtheme, this primary theme is expressed more broadly in order to be inclusive of discussions on other environmental conditions for which the site offers learning opportunities. For example, the erosive effect of glacial meltwaters on the land can be compared at the site to the erosive effect of surface water runoff from developed landscapes today.

Fifth Primary Interpretive Theme

Managing the Ecosystem — while natural ecosystems are dynamic, where communities migrate and change, human intervention can disrupt the natural balance. Reintroduction of natural processes is necessary to restore this balance.

Subthemes derived from the fifth primary theme will focus on the site's plant and animal communities, their current condition, and their need for management — not only to return a sustainable natural balance but also to enable visitors to better view and understand the glacial landscape.



Legal and Policy Requirements

Federal Laws, Policies, and Executive Orders.

The development of this general management plan / environmental impact statement has proceeded within a complex legal framework. This section identifies what must be done within the NPS-owned land at the Ice Age Complex to comply with federal laws and policies of the National Park Service. Many management directives are specified in laws and policies and are therefore not subject to alternative approaches. For example, there are federal laws and policies about managing environmental quality (such as the *Clean Air Act*, *Endangered Species Act*, and Executive Order 11990, “Protection of Wetlands”); laws governing the preservation of cultural resource (such as the *National Historic Preservation 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, for instance, that it is appropriate to protect endangered species, control exotic species, protect archeological sites, conserve artifacts, or provide for handicap access. Laws and policies have already decided those and many other things.

Laws, Policies, and Orders Applicable Solely or Primarily to the National Park Service. Some laws, policies, and orders are applicable solely or primarily to the National Park Service. Examples include the *Organic Act of 1916*, which created the National Park Service; *General Authorities Act of 1970*; *National Parks and Recreation Act of 1978*; *Redwood Amendment of 1978* (signed March 27, 1978), relating to the management of the national park system; and the *National Parks Omnibus Management Act* (1998).

The NPS *Organic Act of 1916* (16 USC 1) provides the fundamental management direction for all units of the national park system. The act states that the service thus established shall

promote 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 the said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

The National Park Service also has established policies that are identified and explained in a guidance manual entitled NPS Management Policies 2006, which can be found at <http://www.nps.gov/policy>.

In addition to determining the environmental consequences of implementing the preferred alternative and other alternatives, NPS *Management Policies 2006* (section 1.4) requires analysis of potential effects to determine whether or not proposed actions would impair a park’s resources and values.

The fundamental purpose of the national park system, established by the *Organic Act* and reaffirmed by the *General Authorities Act*, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values.



To truly understand the implications of an alternative for NPS-owned and managed property at the Ice Age Complex, it is important to combine NPS and other federal laws, mandates, and policies (listed in table 1), with the management actions and zoning described in each alternative (presented in chapter 2).

Table 1 lists some of the most pertinent NPS mandates and policies related to managing the Ice Age Complex, other federal laws and executive orders, and the associated desired conditions needed to comply with those policies, laws, and mandates. The alternatives in this general management plan address the desired future conditions that are not mandated by law and policy and must be determined through a planning process.



TABLE 1: NPS MANDATES AND POLICIES

CULTURAL RESOURCES MANAGEMENT	
ARCHEOLOGICAL RESOURCES	
Desired Conditions	NPS and Other Federal Sources
<p>Archeological sites are identified and inventoried, and their significance is determined and documented.</p> <p>Archeological sites are protected in an undisturbed condition, unless it is determined through formal processes that disturbance or natural deterioration is unavoidable. When disturbance or deterioration is unavoidable, the site is professionally documented and excavated in consultation with the Wisconsin State Historic Preservation Office, and the resulting artifacts, materials, and records are curated and conserved. Some archeological sites that can be adequately protected may be interpreted to the visitor.</p>	<p>National Park Service</p> <p><i>NPS Management Policies 2006</i></p> <p><i>NPS Director's Order 28: Cultural Resource Management Guideline</i></p> <p><i>NPS Director's Order 28A: Archeology</i></p> <p><i>The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation</i></p> <p>Programmatic Memorandum of Agreement among the National Park Service, Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers (2008)</p> <p>Other Federal</p> <p><i>National Historic Preservation Act</i></p> <p><i>Archeological Resources Protection Act</i></p> <p><i>Native American Graves Protection and Repatriation Act</i></p> <p>Executive Order 13007, "Indian Sacred Sites"</p>
HISTORIC AND PREHISTORIC STRUCTURES	
Desired Conditions	NPS and Other Federal Sources
<p>Historic structures are inventoried, and their significance and integrity are evaluated under the criteria of the National Register of Historic Places. The qualities that contribute to the listing or eligibility for listing of historic structures in the national register are protected in accordance with the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (unless it is determined through a formal process that disturbance or natural deterioration is unavoidable).</p> <p>(Note: the only structures on land currently owned by the National Park Service have been evaluated and determined not eligible for the national register. This statement of desired conditions would apply to any other structures on land acquired by the Park Service.)</p>	<p>National Park Service</p> <p><i>NPS Management Policies 2006</i></p> <p><i>NPS Director's Order 28: Cultural Resource Management Guideline</i></p> <p><i>The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings</i></p> <p><i>NPS List of Classified Structures</i></p> <p>Programmatic Memorandum of Agreement among the National Park Service, Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers (2008)</p> <p>Other Federal</p> <p><i>National Historic Preservation Act</i></p> <p><i>Archeological Resources Protection Act</i></p> <p><i>Native American Graves Protection and Repatriation Act</i></p>
CULTURAL LANDSCAPES	
Desired Conditions	NPS and Other Federal Sources
<p>Cultural landscape inventories are conducted to identify landscapes potentially eligible for listing on the National Register of Historic Places and to assist in future management decisions for landscapes and associated resources, both cultural and natural. The content of a cultural landscape report provides the basis for making sound decisions about management, treatment, and use. The management of cultural landscapes focuses on preserving the landscape's physical attributes, biotic systems, and use when that use contributes to its historical significance.</p>	<p>National Park Service</p> <p><i>NPS Management Policies 2006</i></p> <p><i>NPS Director's Order 28: Cultural Resource Management Guideline</i></p> <p><i>The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation</i></p> <p><i>NPS List of Classified Structures</i></p>

TABLE 1: NPS MANDATES AND POLICIES (CONTINUED)

CULTURAL RESOURCES MANAGEMENT	
Desired Conditions	NPS and Other Federal Sources
(Note: the only identified cultural landscape on land currently owned by the Park Service has been evaluated and determined not eligible for the national register. This statement of desired conditions would apply to any other structures on land acquired by the park service.)	National Park Service Programmatic Memorandum of Agreement among the National Park Service, Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers (2008)
	Other Federal <i>National Historic Preservation Act</i> <i>Archeological Resources Protection Act</i> <i>Native American Graves Protection and Repatriation Act</i> Executive Order 13007, "Indian Sacred Sites"
MUSEUM COLLECTIONS	
Desired Conditions	NPS and Other Federal Sources
All museum collections (prehistoric and historic objects, artifacts, works of art, archival documents, and natural history specimens) are identified and inventoried, catalogued, documented, preserved, and protected, and a provision is made for their access to and use for exhibits, research, and interpretation, according to NPS standards. The qualities that contribute to the significance of collections are protected in accordance with established standards.	National Park Service <i>NPS Management Policies 2006</i> <i>Director's Order 24: Museum Collections Management</i> <i>The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation</i> <i>NPS Museum Handbook, Parts I-III</i> Other Federal <i>National Historic Preservation Act</i> <i>Archeological Resources Protection Act</i>
NATURAL RESOURCES MANAGEMENT	
SOILS	
Desired Conditions	NPS and Other Federal Sources
The National Park Service actively seeks to understand and preserve soil resources and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of soil or its contamination of other resources. Natural soil resources and processes function in as natural a condition as possible, except where special considerations are allowable under policy.	National Park Service <i>NPS Management Policies 2006</i>
When soil excavation is an unavoidable part of an approved facility development project, the National Park Service would minimize soil excavation, erosion, and offsite soil migration during and after the development activity.	National Park Service <i>NPS Management Policies 2006</i>

TABLE 1: NPS MANDATES AND POLICIES (CONTINUED)

WATER RESOURCES	
Desired Conditions	NPS and Other Federal Sources
Surface water and groundwater are protected, and water quality meets or is better than (exceeds) all applicable water quality standards.	National Park Service NPS <i>Management Policies 2006</i> Other Federal Clean Water Act Executive Order 11514, "Protection and Enhancement of Environmental Quality"
NPS programs and facilities and NPS permitted programs and facilities are maintained and operated to avoid pollution of surface water and groundwater.	National Park Service NPS <i>Management Policies 2006</i> Other Federal Clean Water Act Rivers and Harbors Act Executive Order 12088, "Federal Compliance with Pollution Control Standards"
NATIVE VEGETATION AND ANIMALS	
Desired Conditions	NPS and Other Federal Sources
The National Park Service strives to maintain, as part of the natural ecosystem, native plants and animals in the Ice Age Complex. Populations of native plant and animal species function in as natural condition as possible, except where special considerations are warranted. Populations of native species that have been severely reduced or extirpated from the complex are restored, where feasible, and sustainable.	National Park Service NPS <i>Management Policies 2006</i>
The management of exotic plant and animal species, including eradication, is conducted wherever such species threaten resources or public health and when control is prudent and feasible.	National Park Service NPS <i>Management Policies 2006</i> Other Federal Executive Order 13112, "Invasive Species"
THREATENED, ENDANGERED, AND SPECIAL STATUS SPECIES	
Desired Conditions	NPS and Other Federal Sources
Federally and state-listed threatened and endangered species and their habitats are protected and sustained.	National Park Service NPS <i>Management Policies 2006</i> Other Federal Endangered Species Act
NATURAL SOUNDSCAPES	
Desired Conditions	NPS and Other Federal Sources
The natural soundscape of the Ice Age Complex is preserved to the greatest extent possible.	National Park Service NPS <i>Management Policies 2006</i>
Where soundscapes have been degraded by unnatural sounds (noise), they are restored to a natural condition wherever possible.	National Park Service NPS <i>Management Policies 2006</i>

TABLE 1: NPS MANDATES AND POLICIES (CONTINUED)

VISITOR USE AND EXPERIENCE	
VISITOR USE AND EXPERIENCE	
Desired Conditions	NPS and Other Federal Sources
<p>Natural and cultural resources are conserved for the enjoyment of future generations. Visitors have opportunities for forms of enjoyment that are uniquely suited and appropriate to the resources found in the Ice Age Complex. No activities occur that would cause derogation of the values and purposes for which the park was established.</p> <p>Visitors have opportunities to understand and appreciate the significance of the complex and its resources and to develop a personal stewardship ethic.</p> <p>For all management areas, units, or other logical management divisions in the complex, the types and levels of visitor use are consistent with the desired resource and visitor experience conditions prescribed for those areas.</p>	<p>National Park Service</p> <p><i>NPS Organic Act of 1916</i></p> <p><i>National Parks and Recreation Act (PL 95-625)</i></p> <p><i>NPS Management Policies 2006</i></p>
<p>To the extent feasible, programs, services, and facilities are accessible to and usable by all people, including those with disabilities.</p>	<p>National Park Service</p> <p><i>NPS Director's Order 42: Accessibility for Visitors with Disabilities in NPS Programs, Facilities, and Services</i></p> <p>Other Federal</p> <p><i>Americans with Disabilities Act</i></p> <p><i>Architectural Barriers Act</i></p>

Laws and Policies of the State of Wisconsin.

Other laws and policies are part of the Department of Natural Resource's legal and policy framework. Cross Plains State Park is designated as a state park under Chapter 27, Wisconsin Statutes. This designation allows for a broad range of recreation, education, and vegetative management activities to occur within park boundaries in accordance with the park's vision and goals. The statutory authority to acquire and manage land within Cross Plains State Park is described in sections 23.09, 23.11, 23.14, and 27.01, Wisconsin Statutes.

Wisconsin state parks are managed to ensure preservation of their scenic value, historical value, and the natural wonders they contain. The mission and goals of the state park system, as outlined in the 2008 Wisconsin State Park System Strategic Plan, are described below.

Wisconsin State Park System Mission —

Protect and enhance the natural and cultural resources of our Wisconsin State Park System properties while providing high quality recreational and educational opportunities and programs.

Wisconsin State Park System Goals —

Expand the quality and quantity of sustainable, nature-based outdoor recreation opportunities and facilities available to Wisconsin State Park System visitors to

actively manage, restore, enhance, and protect the natural, cultural, and scenic heritage of the Wisconsin State Park System

provide innovative, interpretive opportunities and programs that foster knowledge, appreciation, and stewardship of the state's natural and cultural resources and promote participation in nature-based outdoor recreation

strengthen the Wisconsin State Park System facilities development program to better provide for customer comfort and safety

motivate and enable a dedicated and customer-focused workforce

achieve financial strength and stability for the Wisconsin State Park System

attract new Wisconsin State Park System customers through innovative marketing strategies and retain current customers through exceptional service

improve operational effectiveness, planning, and decision making by managing and using accurate and reliable information

a sense of ownership and support management of the complex

an interest in participating in specific activities at the complex, such as hunting, dog walking, horseback riding, snowmobiling, and mountain biking

SCOPE OF THE GENERAL MANAGEMENT PLAN

Issues and Concerns Addressed in this Plan

This draft general management plan / environmental impact statement addresses issues raised internally by the partners developing this plan and externally by the public. The issues deal with how resources should be managed, what types of visitor experiences should be encouraged or accommodated, and how the complex should be managed. Further, the issues expressed

the need to keep the complex area natural and protected from encroaching suburban development, including protecting more land beyond that which is currently publically owned

the need to offer formal educational opportunities to tell the stories of the unique resources

the need to offer varied opportunities (camping, hiking, and other low-impact activities) for the public to access the complex

the need to address the future of the Wilkie structures at the core of the complex

the need to engage local residents and partner with other groups to instill

Issues and Concerns Not Addressed in this Plan

This document does not address the need to control the deer population. While this is a serious issue that must be addressed, it is beyond the scope of this plan. It will be addressed in a deer management plan to be developed jointly by public land managing agencies within the complex; those agencies are the National Park Service, Wisconsin Department of Natural Resources, and U.S. Fish and Wildlife Service. The deer management plan will propose alternative ways of managing deer in the complex and determine the appropriate means after thorough scientific and public review.

Impact Topics

An important part of planning is seeking to understand the consequences of making one decision over another. To this end, a general management plan is accompanied by an environmental impact statement. An environmental impact statement identifies the anticipated beneficial and adverse impacts from possible actions on resources, visitors, and neighbors. Impacts are organized by topic, such as “impacts on the visitor experience” or “impacts on vegetation and soils.” Impact topics serve to focus the environmental analysis and ensure the relevance of impact evaluation. The impact topics included for analysis in this document are presented below, and the impact analyses for the topics are contained in “Chapter 4: Environmental Consequences.” The topics were identified based on federal laws and other legal requirements, Council on Environmental Quality (CEQ) guidelines, NPS management policies, staff subject-matter expertise,

and issues and concerns expressed by the public early in the planning process (see previous section).

This section also includes a discussion of impact topics that are commonly addressed but that are not addressed in this plan for the reasons given.

Impact Topics Considered and Analyzed in Detail.

Soil resources — There are prime fertile soils in the Ice Age Complex, ranging from glacial till covered with a silt-loam loess cap to the east and unglaciated silt loams to the west. Development in the complex, as envisioned in the alternatives, would cause immediate soil disturbance during construction and an increase in impervious surfaces, resulting in more runoff and soil erosion. Current agricultural land would also be taken out of production under some of the alternatives. Therefore, this impact topic was retained for consideration.

Water quality — The region surrounding the Ice Age Complex contains one of the Midwest's most important trout fishing streams, the Black Earth Creek. Within the complex, the glacier originally impounded four proglacial lakes. Today, the southernmost proglacial lake has been divided in two by County Trunk S (Mineral Point Road) and consists of two water-filled basins (Coyle Pond and Shoveler Sink). The other proglacial lakes are dry and filled with agricultural crops. There are a few intermittent streams that bisect the complex. One follows a deep ravine on the south side of the former Wilkie property before emptying onto the former McNutt property at the western edge of the proposed site. There is at least one spring north of Old Sauk Pass that has been partially developed to include a stock tank. This spring drains northward toward Black Earth Creek. In the center of the Ice Age Complex, south of Old Sauk Pass, water runoff travels north to a depression where it enters and flows through the Cross Plains gorge, eventually reaching

Black Earth Creek. An increase in impervious surfaces from development in the complex, as envisioned in the alternatives, would result in more surface water runoff and impacts on stream and lake water quality. Additionally, an increase in visitor use would mean a need for more well-water supply, as well as a need for waste removal, such as a septic system. All of these changes to the land and land use would result in some level of impacts on water quality. Therefore, this impact topic was retained for consideration.

Soundscapes — A soundscape is human perception of the acoustical environment. Acoustic resources include natural sounds (wind, water, wildlife, vegetation, and so forth) and cultural and historic sounds (such as battle reenactments, tribal ceremonies, and quiet reverence). Some of the activities proposed under the alternatives in this plan would change the soundscape at the Ice Age Complex, so this impact topic was retained for consideration.

Vegetation and wildlife — The *Organic Act of 1916* and *NPS Management Policies 2006* both require the National Park Service to protect and conserve native plants and vegetative communities that could be affected by visitors, managers, and external sources. There are no federally listed threatened or endangered plant species in the complex, but there is one plant (heart-leaved skullcap) that has been identified as rare by the Wisconsin Department of Natural Resources. Additionally, there are some exotic (nonnative) and invasive species of vegetation that are present in the complex. The potential impacts from actions proposed in the alternatives, especially the difference in how management areas would be applied, would affect both native and exotic invasive vegetation.

There are also no federally listed threatened or endangered wildlife species (or critical habitat for these species) in the Ice Age Complex, but there are four bird species (Henslow's sparrow, hooded warbler, western meadowlark, and yellow-billed cuckoo) that

have been identified as rare by the Wisconsin Department of Natural Resources. Wildlife would be affected by actions proposed in the alternatives, including the difference in levels of development and predicted visitation, as well as how management areas would be applied; therefore, vegetation and wildlife were retained as impact topics for consideration.

Socioeconomic environment — The *National Environmental Policy Act* requires an examination of social and economic impacts caused by federal actions as part of a complete analysis of the potential impacts on the “Human Environment.” Dane County is the affected area for this socioeconomic analysis, with a focus on the local municipalities and towns surrounding the complex: Cross Plains, Middleton, Verona, and Madison. Changes in land use, as well as impacts on gateway communities, could result from actions in the alternatives. Therefore, this impact topic was retained for consideration.

Visitor experience — One of the fundamental purposes of the National Park Service is providing for visitor enjoyment and understanding. Many actions proposed in this plan could affect patterns of visitor use and the type and quality of visitor experiences. Visitor access, orientation, and interpretation are elements of the visitor experience. Some actions in this plan could impact the visitor experience. Therefore, this topic has been analyzed.

Impacts Topics Considered but not Analyzed in Detail.

Geologic resources — Geologic resources formed by glaciation are fundamental to the purposes of the Ice Age Complex. Because of their importance to this site, these resources are described at length in the affected environment chapter of this plan (chapter 3). However, because the alternatives would result in no foreseeable impacts on geologic resources, they are not described in the environmental consequences chapter of this plan (chapter 4). Geologic resource impacts

typically considered in land use planning (such as impacts on the fossil record, museum quality minerals, and caves) were eliminated for all of the alternatives. Fossils are not an issue for this plan because fossils are poorly preserved in the sandstone and dolomite at the Ice Age Complex.

There are no museum-quality samples of minerals or rock at this site.

Impact on caves is strictly regulated by the federal *Cave Resources Protection Act* and section 4.8.1.2 of the *NPS Management Policies 2006*. Although karst topography exists on the complex, as well as a sinkhole that might be connected to a cave system, there is no actual cave or human access to any cave at the complex. There would be no foreseeable impacts on major geologic features, such as the end moraine, former lakebed surfaces, and the subglacial channel (Cross Plains gorge), from any of the proposed alternatives other than related impacts associated with contamination of surface water (considered separately under water quality).

Threatened and endangered species — There are no federally listed threatened or endangered species or critical habitat for these species in the Ice Age Complex; therefore, this impact topic was not analyzed in this document. The potential impacts on other sensitive wildlife and vegetation are discussed in the “*Vegetation and Wildlife*” section of chapter 4.

Wetlands and floodplains — There is one small (roughly 100 acres) wetland area in the southeast corner of the Ice Age Complex, in the area around Shoveler Sink and Coyle Pond. There are also two small (together, about 100 acres) floodplains in the southeast portion of the site (again, around Shoveler Sink) and the northwest portion of the site in the area of Black Earth Creek. Construction near wetlands and floodplains might affect how they function. There are two elements proposed in the alternatives that could affect wetlands and floodplains; those elements are building a picnic area near Black Earth

Creek and building a trail in this same area. The extent of these impacts, however, is too speculative to state at this point. Both of these projects would be subject to implementation plans, which would fully analyze their environmental impacts. Otherwise, none of the activities in the proposed alternatives in this plan would impact the functioning of wetlands or floodplains. Therefore, this impact topic was not analyzed in detail.

Cultural resources — The *National Environmental Policy Act* requires that any federal undertaking be examined for its potential to affect cultural resources. Cultural resources are aspects of a cultural system that are valued by or significantly representative of a culture or that contain significant information about a culture. A cultural resource may be a tangible entity or a cultural practice. Cultural resources are characterized as archeological resources, cultural landscapes, historic structures, museum collections, and ethnographic resources for NPS management purposes. The following describes the various types of cultural resources:

- **Archeological Resources.** According to NPS Director's Order 28: Cultural Resource Management Guideline, archeological resources are the physical evidences of past human activity. Archeological resources may represent both prehistoric and historic time periods, and they are found above and below ground and under water. Native American occupation of southern Wisconsin began around the end of the Pleistocene epoch, when groups of hunter gatherers moved into the area after the retreat of the last glacial advance. Archeologists have established a basic broad chronology of cultural traditions in the region as follows:

Paleoindian Tradition, ca. 12,000–8,000 Before Present (B.P.)

Archaic Tradition, ca. 8,000–2,500 B.P.

Woodland Tradition, ca. 2,500–700 B.P.

Mississippian/Oneota Tradition,
ca. 800–350 B.P. Early Historic,
350–150 B.P. Late Historic,
150 B.P.- Modern Era.

These traditions are distinguished by differences in settlement and subsistence patterns, changes in styles and design of stone tools, the appearance of ceramic technology, and the construction and design of earthen mounds. Early Paleoindian sites are generally limited to surface finds of fluted points. The general absence of Early Archaic sites may be connected to the Altithermal Climatic episode. During the Late Archaic Tradition seasonal movements from wintering sites within rock shelters and interior valleys to summer encampments along rivers became established as a way of life. The Woodland Tradition is marked by the appearance of ceramics. The Mississippian/Oneota Tradition is characterized by the development of villages that contained increasingly larger populations dependent on agriculture.

Throughout the Historic Period, southern Wisconsin was continually occupied by various Native American nations including the Sauk, Ho-Chunk (formerly Winnebago), Ioway, Illini, and Potawatomi. The first Euro-American settlers reached the Cross Plains area in the 1830s. At that time, the village of White Crow, a Ho-Chunk chief, was located in what is now the Village of Cross Plains near Black Earth Creek. The town received its name from two military roads—one from Galena to Fort Winnebago, and the other from Prairie du Chien to Green Bay — crossing on a plain or piece of prairie land, about the middle of the town, and hence the name “Cross Plains.” Subsequently, the Madison-Mineral Point stage road



was important shipping route and contributed to the town's growth along with the Chicago-Milwaukee-St. Paul railroad.

A number of sites have been reported in the vicinity of the Ice Age Complex at Cross Plains. These sites represent a range of cultural traditions including Late Archaic (campsite/village), Woodland (mounds, burial sites), and Euro-American (cabin/homestead, farmstead, cemetery, historic debris scatter). Additional sites of unknown pre-historic affiliation have been recorded including rock shelters, campsites/villages, isolated finds, quarries, workshop sites, and lithic scatter. These sites appear to be located primarily along watercourses, particularly Black Earth Creek, and the bluffs adjacent to them. A significant number of sites, many associated with the Ho-Chunk village of White Crow, are found in Cross Plains along Black Earth Creek approximately 1.75 miles NW of the complex's proposed northern boundary.

Very few archeological investigations have taken place within the Ice Age Complex at Cross Plains to date. During the development of the two parking areas at the US Fish and Wildlife Service's Shoveler's Sink property, archeological surveys were completed and no significant resources were identified. A site described as a 'military well' has been reported in the land owned by the Wisconsin DNR west of the NPS-owned property within the Complex.

Archeological surveys and/or monitoring would precede any ground disturbance of unsurveyed lands. Archeological resources eligible for or listed in the national register would be avoided during construction activities.

If previously unknown archeological resources were discovered during construction, all work in the immediate vicinity of the discovery would be halted until the resources are identified and documented. If the resources cannot be preserved in their original location, an appropriate mitigation strategy would be developed in consultation with the state historic preservation officer and, as necessary, American Indian tribes. In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during construction, provisions outlined in the *Native American Graves Protection and Repatriation Act of 1990* (25 USC 3001) would be followed. If non-Indian human remains were discovered, standard reporting procedures to the proper authorities would be followed, as would all applicable federal, state, and local laws. Therefore, archeological resources is dismissed as an impact topic.

- **Cultural Landscapes.** According to NPS Director's Order 28: *Cultural Resource Management Guideline*, a cultural landscape is "a reflection of human adaptation and use of natural resources and is 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. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions." As noted below under "Historic Structures," the Wisconsin state historic preservation officer has determined that the structures on the Wilkie farmstead, as well as the farmstead's associated landscape, are not eligible for listing in the national register. A Native American

migration route that traverses the complex has not been evaluated as a cultural landscape, but there would be negligible, if any, ground disturbance under the proposed alternatives within the pathway of this route, and the topography and views and vistas of the pathway would be unaffected. Therefore, cultural landscapes was dismissed as an impact topic.

- **Historic Structures.** According to NPS Director's Order 28: *Cultural Resource Management Guideline*, a historic structure is a constructed work, consciously created to serve some human activity that is either listed in or eligible to be listed in the National Register of Historic Places. Historic structures are usually immovable, although some have been relocated, and others are mobile by design. Historic structures include buildings and monuments, dams, millraces and canals, nautical vessels, bridges, tunnels and roads, railroad locomotives, rolling stock and track, stockades and fences, defensive works, temple mounds and kivas, ruins of all structural types, and outdoor sculpture.

The only existing structures on Ice Age Complex lands are on the Wilkie farmstead (residence, bank barn with an attached silo, garage, hog-chicken house, Quonset hut, silage crib, well house, and windmill foundation). The Wisconsin state historic preservation officer has determined that the Wilkie farmstead structures and associated landscape are not eligible for listing in the national register. Therefore, historic structures was dismissed as an impact topic.

- **Museum Collections.** According to NPS Director's Order 28: *Cultural Resource Management Guideline*, museum collections are prehistoric and historic objects, artifacts, works of art, archival material, and natural-history specimens collected according to a rational scheme and maintained so they can be preserved, studied, and interpreted for public benefit. There are currently no museum collections for the complex. The site development plan for the NPS-owned area at the core of the complex would provide for appropriate collections storage, if needed. Any museum collections would be acquired, accessioned and cataloged, preserved, protected, and made available for access and use according to NPS standards and guidelines. Therefore, museum collections was dismissed as an impact topic.
- **Ethnographic Resources.** According to NPS Director's Order 28: *Cultural Resource Management Guideline*, ethnographic resources are 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 resources are associated with cultural practices, beliefs, the sense of purpose, or existence of a living community that is rooted in that community's history or is important in maintaining its cultural identity and development as an ethnically distinctive people.

During scoping the tribes traditionally associated with Ice Age Complex lands were apprised by letter of the GMP planning process; those tribes are

Sac and Fox Nation of Oklahoma

Sac and Fox Nation of Missouri in Kansas and Nebraska

Bad River Band of Lake Superior Tribe of Chippewa

Oneida Tribe of Indians in Wisconsin

Red Cliff Band of Lake Superior Chippewa

St. Croix Chippewa Indians of Wisconsin

Forest County Potawatomi Community of Wisconsin

Sokaogon Chippewa Community, Mole Lake Band

Lac du Flambeau Band of Lake Superior Chippewa

Lac Courte Oreilles Band of Lake Superior Chippewa

Sac and Fox Tribe of the Mississippi in Iowa

Stockbridge Munsee Community of Wisconsin

Ho-Chunk Nation

Menominee Indian Tribe of Wisconsin

The tribes were requested to respond with any issues or concerns and were notified of upcoming public meetings. Each of the planning newsletters were also mailed to the tribes. No concerns were expressed during the scoping process, and no requests for meetings were received.

As noted above under “Cultural Landscapes,” there would be negligible, if any, ground disturbance to the Native America migration route that traverses the complex, and the topography and views and vistas of the pathway would be unaffected; thus, ethnographic resources was dismissed as an impact topic.

A copy of this draft general management plan / environmental impact statement was sent to each tribe for review and comment. The National Park Service would continue to recognize the past and present existence of peoples in the region and the traces of their use as an important part of the cultural environment, and if subsequent issues or concerns were identified, appropriate consultations would be undertaken.

There would be no impacts on archeological resources, cultural landscapes, historic structures, museum collections, and ethnographic resources from actions under the proposed alternatives; therefore, these impact topics were dismissed from analysis.

Park operations — The Ice Age Complex is currently undeveloped for visitor use. Currently, park operations are limited to vegetation management, Ice Age Trail construction as land and/or access are acquired, and minimal signage installation. Each action alternative has been designed with the support infrastructure necessary to implement the vision of the alternative. Thus, each alternative would have adequate park operations support, and this impact topic was not analyzed further.

Environmental justice — Executive Order 12898 requires that each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, “disproportionately high and adverse human health or environmental effects” of its programs, policies, and

activities on minority populations and low-income populations. None of the proposed alternatives would result in disproportionately high or adverse human health or environmental effects on minority populations and low-income populations; thus, this impact topic was not analyzed in this document.

Air quality, carbon footprint, natural or depletable resources, energy requirements, and conservation potential — Proposed activities in the alternatives that would cause air pollution tend to contribute to carbon loading, energy use, and through the use of fossil fuels, to depletion of natural resources. Therefore, these impact topics were considered together in this analysis.

The city of Madison and Dane County generally meet federal air quality standards, and during most days, outdoor air quality is ranked as “good.” At times, however, levels of fine particulate matter do not meet federal standards. Emissions of the criteria pollutants (measured by the *Clean Air Act*) that could result from actions proposed in the alternatives would come from tailpipe emissions from visitor and staff vehicles and construction equipment. Emissions of carbon dioxide would be associated with vehicle traffic (emissions in the immediate area) and the power needs of onsite buildings (emissions at the site of power generation from carbon-based fuels). Whenever feasible, the National Park Service strives to maximize the use of renewable resources and energy and therefore minimize the use of depletable resources. However, it is not possible with today’s technologies to cost-effectively avoid all use of depletable resources in building and operating facilities. Some of the alternatives proposed in this plan include a varying level of construction and would impact natural or depletable resources and energy to a varying extent. While the alternatives in this plan would contribute to these impacts to some extent, their incremental contributions to air quality (locally) and to carbon footprint and resources and energy depletion (globally) would be extremely small. These impact topics were not analyzed in detail.

RELATIONSHIP OF OTHER PLANNING EFFORTS TO THIS GENERAL MANAGEMENT PLAN

There are two local planning efforts underway that could affect or be affected by this plan. The managers of the Ice Age Complex are coordinating with the teams developing the plans described below.

U.S. Highway 14 Access Study

The Wisconsin Department of Transportation (WDOT) is currently studying the best way to improve access to U.S. Highway 14, which forms the northern boundary of the complex. As of this writing, the idea in WDOT’s draft plan is to move one access point east and build a frontage road parallel to U.S. Highway 14 on the south side of the highway. There would need to be further consultation with the Wisconsin Department of Transportation in order to ensure adequate access to the site, while minimizing adverse impacts from highway developments.

Bike Path Along U.S. Highway 14

There have been local efforts in recent years to build a bike path along the section of U.S. Highway 14 that forms the northern boundary of the Ice Age Complex in order to connect bike paths in the city of Middleton to the village of Cross Plains. The preferred alternative in this draft document is zoned to accommodate this bike path.

Village of Cross Plains Comprehensive Plan

Another plan that could influence the future of the Ice Age Complex is the recently completed *Village of Cross Plains Comprehensive Plan* (VCP 2008). This plan zoned the land in the Ice Age Complex in three ways: agricultural/rural; woodlands/open space; and on lots that currently have private homes, single family/exurban. This zoning is consistent with the alternatives proposed in this draft general management plan / environmental impact statement.

NEXT STEPS IN THE PLANNING PROCESS

Following distribution of this draft general management plan / environmental impact statement, there will be a 60-day public review and comment period (see page iv at the beginning of this document for instructions on how to comment), after which the NPS planning team will evaluate comments from other federal agencies, organizations, businesses, and individuals regarding this draft plan. Appropriate changes will be incorporated into the final general management plan / environmental impact statement. That final document will also include letters from governmental agencies and tribes (if applicable); any 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” may be prepared that would document the NPS selection of an alternative for implementation. Once it is signed, the plan would then be implemented as funding and staffing allows.

IMPLEMENTATION OF THE PLAN

The approval of this plan does not guarantee that the funding and staffing needed to implement the plan would be forthcoming. The implementation of the approved plan would depend on future funding, and it could also be affected by factors such as changes in NPS staffing, visitor use patterns, and unanticipated environmental changes. NPS funding levels and servicewide priorities, partnership funds, time, and effort would also influence the plan’s implementation.

Full implementation could be many years in the future. Once the general management plan has been approved, additional feasibility studies and more detailed planning, environmental documentation, and consultations would be completed, as appropriate, before certain actions in the selected alternative could be carried out.

Future program and implementation plans, describing specific actions that managers intend to undertake and accomplish in the park, would tier from the desired conditions and long-term goals set forth in this draft general management plan / environmental impact statement.

WISCONSIN STATE PROPERTY DESIGNATION

The general management plan will be for the development and management of Cross Plains State Park and Ice Age National Scientific Reserve. Under the preferred alternative, the state’s acreage goal is 1,701 acres. This is the total acreage inside the proposed boundary for publically protected land. Currently, the following are the public ownership acres within the site:

State ownership (2011): 294 acres

NPS ownership (2011): 157 acres

USFWS ownership (2010): 160 acres

Dane County ownership (2010): 131 acres

State Statutory Authority: The authority to acquire and manage land for the Cross Plains State Park and Ice Age National Scientific Reserve is described in sections 23.09, 23.11, 23.14, and 27.01, Wis. Stats.



Floating maple leaves

Alternatives



Chapter Two

ALTERNATIVES, INCLUDING THE PREFERRED ALTERNATIVE



THIS CHAPTER BEGINS by explaining how the range of alternatives was formulated, how the environmentally preferred alternative was identified, how the preferred alternative was determined, the role that boundary assessment played in the planning process, and how user-capacity standards and indicators were developed. Most of this chapter is dedicated to describing the management areas and the alternative futures for the Ice Age Complex. This chapter concludes with tables that summarize the key differences between the alternatives and the environmental impacts that could result from implementing any of the alternatives.

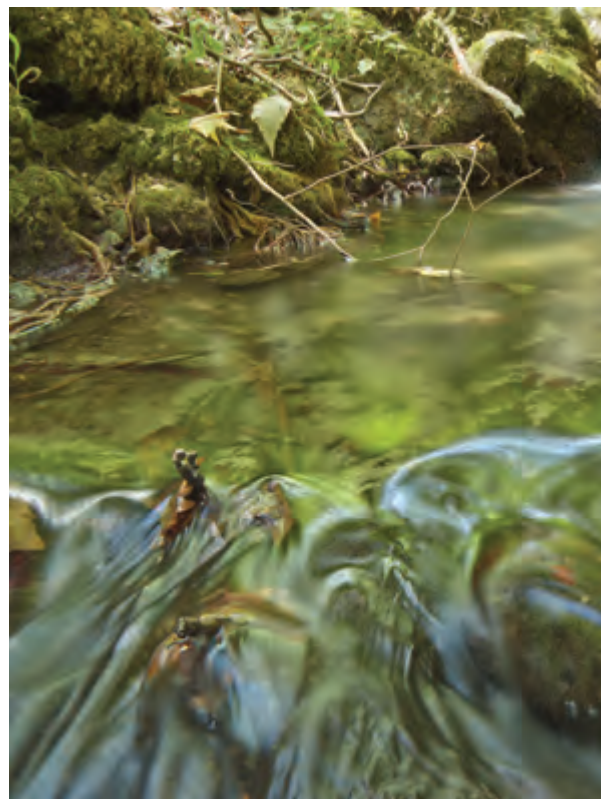
FORMULATION OF THE ALTERNATIVES

Many aspects of the desired future condition of the Ice Age Complex are defined in the laws establishing the Ice Age National Scientific Reserve and the Ice Age National Scenic Trail, as well as in the foundation statement for the complex described earlier in chapter 1. Within these parameters, the National Park Service and the Wisconsin Department of Natural Resources solicited input from the public regarding issues and desired conditions for the complex.

Taking public input into account, the planning team developed a set of five management areas and four preliminary alternative futures for the complex. A fifth alternative, the preferred alternative, was later developed after a detailed value analysis was completed. The analysis considered public feedback on the four preliminary alternatives, as well as specific costs and benefits.



Fresh glacial trout stream.



This draft general management plan / environmental impact statement provides a framework within which managers of the Ice Age Complex would make decisions to guide the management of the complex for the next 15 to 20 years. It is important to allow flexibility for necessary future management actions, so the alternatives in this plan focus on *what* resource conditions would be provided and *what* visitor experiences would be offered, not on *how* these conditions and experiences would be achieved. There is more than one way to manage park resources, address planning issues, achieve the purpose, maintain significance, and preserve the fundamental resources and values. Mindful of the need for flexibility, this planning process considered a range of alternatives, beginning with a “no-action” alternative under which the current management of the complex would continue as is. The no-action alternative is followed by a range of potential management alternatives called “action” alternatives.

The action alternatives indicate how site management would change in different ways by applying management areas (descriptions of distinct sets of resource conditions and visitor experiences) to maps of the complex to define management intent for resource conditions and visitor experiences for each location. The application and configuration of the management areas vary by alternative, depending on the intent of the alternative concept. It may help to think of the management areas as the colors an artist will use to paint a picture. The alternatives in this document are the different pictures that could be painted with the colors (management areas) available. Each of the alternatives has an overall management concept and a description of how different areas of the site could be managed (management areas and related actions). The concept for each alternative gives the artist (or in this case, the planning team) the idea for what the picture (alternative) is going to look like.

IDENTIFICATION OF THE PREFERRED ALTERNATIVE AND ENVIRONMENTALLY PREFERRED ALTERNATIVE

The CEQ regulations for implementing the *National Environmental Protection Act* require that a preferred alternative be identified in an environmental impact statement. These same regulations also require that an environmentally preferred alternative be identified, which is often, but not always, the same as the preferred alternative. The environmentally preferred alternative is decided by applying the six criteria described in the section titled “Environmentally Preferred Alternative” toward the end of this chapter. The preferred alternative is decided through a value analysis process called “Choosing by Advantages” (CBA). The CBA process is a tool for determining the specific advantages each alternative would provide toward meeting specific park objectives, and the advantages represent the benefits that would be gained under each alternative. The advantages for each alternative are compared to the expected costs of each alternative to determine the cost-benefit ratio of each alternative. The alternative that provides the most benefit per dollar, with the least adverse environmental impacts, is the best value alternative and the one that is labeled “preferred” in this plan. The application of Choosing by Advantages in this planning process is described at the end of this chapter under the section titled “Preferred Alternative.”

CONSIDERATION OF BOUNDARY ADJUSTMENT(S)

The roughly 1,600-acre boundary of the Ice Age Complex (refer to figure 1 in chapter 1) is the same as the boundary of the Cross Plains unit of the Ice Age Reserve (approved by the Wisconsin Natural Resources Board in 1999). When this unit of the reserve was

originally delineated after passage of the 1964 law establishing the Ice Age Reserve across the state, the boundary was much smaller and only north of Old Sauk Pass. At that time, the small Cross Plains unit of the Ice Age Reserve was designated as Cross Plains State Park. Since that time, the unit's boundary has been expanded, the Ice Age National Scenic Trail's route in Dane County has been planned, and other state property has been acquired next to the state park boundary for the Ice Age National Scenic Trail. During the process to develop this draft general management plan / environmental impact statement, it became apparent that the project goals for Ice Age National Scenic Trail lands are parallel with this project. The plan recommends that all of the state-owned land in the current boundary of the Cross Plains unit, as well as the State Ice Age Trail Areas, be redesignated as Cross Plains State Park lands. Similarly, all lands in the Cross Plains unit boundary that come into WDNR ownership in the future would also be designated as part of Cross Plains State Park lands. This designation would provide a consistent recreational use policy for the Ice Age National Scenic Trail as it passes through the Ice Age Complex and other recreational uses.

Currently, about one-third of the land within the complex's boundary is publically owned and managed; the remainder of the land is privately owned. It is the goal of the partners in this planning process to have the ability to manage all of the lands within this boundary by acquiring either the lands or interests in the lands (such as easements) through cooperative negotiation processes with willing sellers. Any acquisition would only be from willing sellers with whom the project partners would discuss the best mechanism for protection. In acquiring interests in real property, both the National Park Service and Department of Natural Resources are required by state and/or federal laws to pay "just compensation," which is the estimated market value of a property or interest therein based on an appraisal prepared by a certified general licensed appraiser.

As part of the planning process, the National Park Service identified and evaluated boundary adjustments that might be necessary or desirable to carry out park purposes. Section 3.5 of *NPS Management Policies 2006* states that the National Park Service may recommend potential boundary adjustments (for one or more of the following reasons) to

- include and protect significant resources and values or to enhance opportunities for public enjoyment related to park purpose

- address operational and management issues

- protect resources critical to fulfilling the park's purpose

The NPS policies further instruct that any recommendations to expand a park unit's boundaries be preceded by a determination that (1) the added lands would be feasible to administer considering size, configuration, ownership, cost, and other factors; and (2) other alternatives for management and resource protection are not adequate.

The Department of Natural Resources established objectives to identify when boundary expansion is needed; those objectives are to

- provide additional space for future recreational use and possible facility development

- provide more easily recognizable boundaries and facilitate better public use of the public lands

- provide expanded habitat protection within the ecological zone in which the park is located

During the course of the planning process, two parcels were identified as potential additions to the Ice Age Complex under alternatives 3, 4, and 5 (identified as parcels A and B in figure 3). These parcels meet the WDNR criteria. The application of the NPS criteria noted above is described in this chapter under each of these alternative descriptions.

USER CAPACITY

“User capacity” is the type and level of use that could be accommodated while sustaining the quality of a park’s resources and visitor opportunities consistent with the park’s purposes. The management of user capacity involves establishing desired conditions and then monitoring, evaluating, and taking actions to ensure that the park’s values are protected. Any use on public lands comes with some level of impact that must be accepted — it is the responsibility of a park’s managers to decide what level of impact is acceptable and what management actions are needed to keep impacts within acceptable limits.

The process to manage user capacity is summarized by five major steps; those steps are to

- establish desired conditions for resources and visitor experiences (through management areas)

- identify indicators (impacts, such as soil loss or vegetation damage, to monitor to determine whether desired conditions are being met)

- identify standards (limits of acceptable change) for the indicators

- monitor indicators to determine if there are disturbing trends or if standards are being exceeded

- take management action to maintain or restore desired conditions

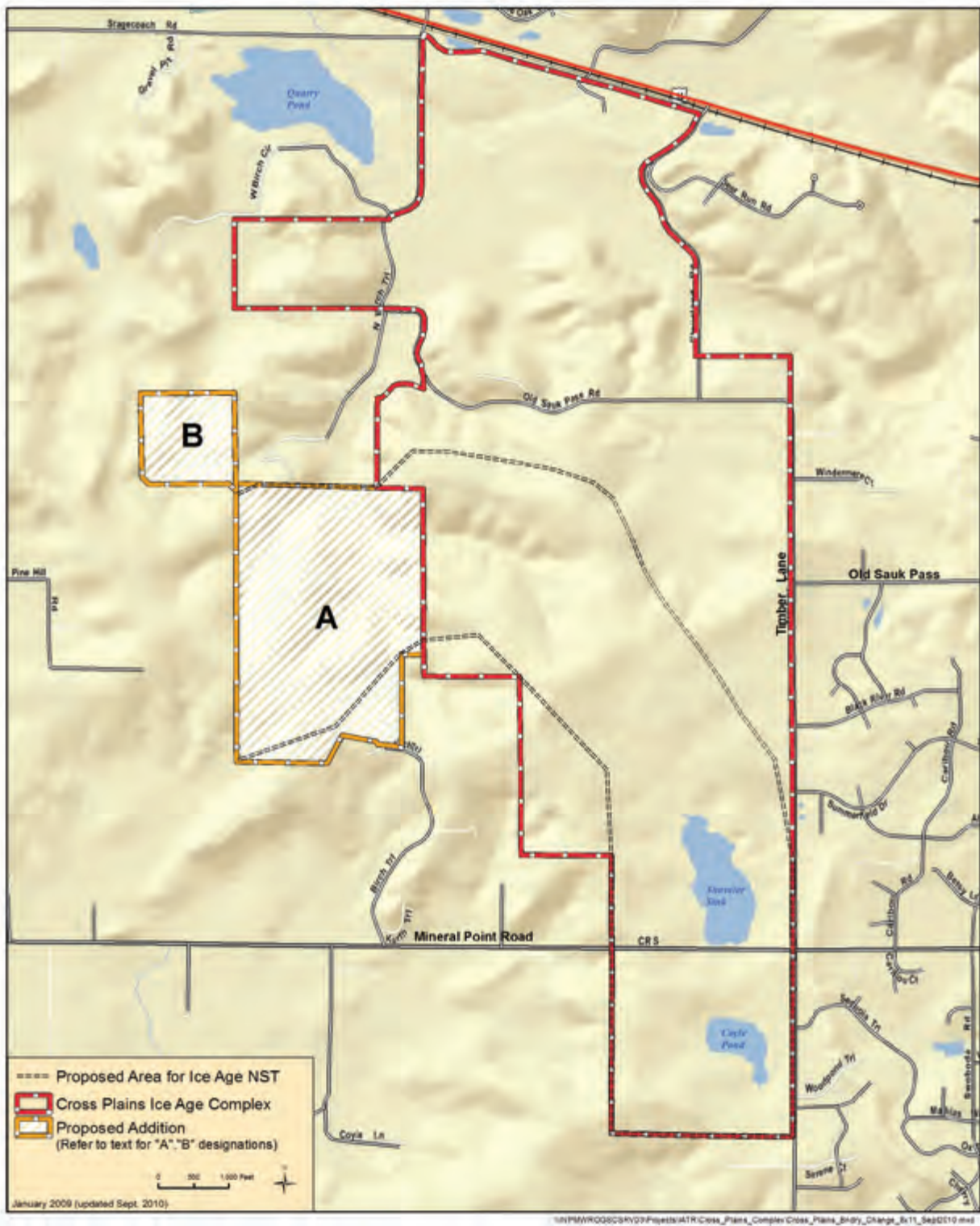
The user-capacity standards and indicators for the Ice Age Complex that were developed as part of this planning process are described below in the section titled “Indicators and Standards.”

THE PROPOSED ALTERNATIVES

The first four alternatives (no action plus alternatives 2, 3 and 4) were presented to the public in fall 2009 as preliminary alternatives. Public feedback on those alternatives was taken into account in developing the preferred alternative (alternative 5) in winter 2009/2010. Alternative 5 was also developed after analyzing the costs and benefits of the four preliminary alternatives. The alternatives that were considered but dismissed are also described in this chapter.



FIGURE 3: EXPANDED BOUNDARY CHANGES AND INCLUSION OF PARCELS A AND B



Management Areas

As mentioned above, the different ways site management would change under the action alternatives is shown by applying management areas to maps of the complex to define the intent for resource conditions and visitor experiences for each location. While the configuration of the management areas varies by alternative, the management areas themselves are the same across all alternatives. Five management areas were identified for this plan. Table 2 describes each management area in terms of the desired resource condition, the desired visitor experience, and appropriate facilities.

The Alternatives Considered

Five alternatives were considered and fully analyzed in this planning process.



Elements Common to All Alternatives. There are five elements that apply to all five alternatives.

1. Different types of trails would be built in the Ice Age Complex. A segment of the Ice Age National Scenic Trail would be built within the identified corridor in a sustainable fashion guided by trail handbook standards (see the impacts on soil resources in chapter 4). The handbook standards would also guide development of other trails, except for those described as “accessible,” which would be built to accessibility standards. While the management areas in this general management plan / environmental impact statement provide general guidance for trail location, a trails development plan would examine and analyze specific locations for trails.
2. Visitors would be allowed to walk their dogs (on leash) in most areas of the complex, with the exception of the sensitive resources management area identified in alternative 5 (preferred alternative). Dog walking was one of five specific activities for which interest was expressed by some members of the public during the course of this plan’s development. The other four activities were horseback riding, snowmobiling, mountain biking, and hunting. Because these activities could cause impacts on park resources, the appropriateness of these types of activities on publically owned land in the complex was evaluated as part of the planning process according to the criteria outlined in *NPS Management Policies 2006* (chapter 8). As stated in these policies, the National Park Service “will only allow uses that (1) are appropriate to the purpose for which the park was established, and (2) can be sustained without causing unacceptable impacts.” Evaluating the activities against these criteria, the planning team determined that one

TABLE 2: FIVE MANAGEMENT AREAS FOR THE ICE AGE COMPLEX

	Park Operations and Visitor Orientation	Sensitive Resources	Natural Experience	Landscape Interpretation	Expanded Recreational Experience
Desired Resource Condition	Park operations and visitor orientation are maintained in good condition but can be highly modified, as needed, to accommodate and withstand high levels of use by visitors and staff.	Natural resources that are a direct result of glaciation are intact. Natural resources that may not be a direct result of glaciation are managed, as necessary, to reveal glacial features. Resources particularly sensitive to user-created impacts or conditions or that pose a risk to visitor safety are located here. There are no agricultural fields in this management area.	Natural resources are managed to approximate presettlement (circa 1830) conditions. To the extent possible, natural ecological processes sustain the integrity of these resources.	Natural resources that are a direct result of glaciation are intact. Natural resources that may not be a direct result of glaciation are managed, as necessary, to reveal glacial features (while vegetation would be native wherever feasible, land cover would need to meet glacial feature-revealing criteria such as height requirements). Structures or manipulated landscapes (such as agricultural fields) do not prevent visitors from being able to recognize glacial and driftless features from key viewpoints.	Natural resources that are a direct result of glaciation are intact. Natural resources that may not be a direct result of glaciation are managed, as necessary, to reveal glacial features (land cover would need to meet certain criteria and specifications such as height requirements). Structures or manipulated landscapes (such as agricultural fields and yards) do not prevent visitors from being able to recognize glacial and driftless features from key viewpoints.
Desired Visitor Experience	Orientation. Visitors come to this area for access and to gain an understanding of this site and its resources. Visitor activities might include viewing orientation maps at trailheads, viewing exhibits and/or participating in interactive exhibits, watching a film, and enjoying programming in both indoor and outdoor sheltered settings. Visitors would generally have access to this entire area, except for office spaces and maintenance and operation areas.	Access to these areas would be highly controlled to protect resources and ensure safety.	Direct sensory experience of natural resources from foot paths would be provided. Interpretation is primarily provided by wayside exhibits and audio tours. Visitors could participate in low-impact activities such as snowshoeing, cross-country skiing on ungroomed trails, berry picking, photography, bird watching, and earth caching.	Views of the results of glaciation on the land across a wide expanse from key points on foot paths, as well as direct experience of smaller-scale features along paths. Interpretation is primarily provided by wayside exhibits and audio tours. Visitors could participate in low-impact activities such as snowshoeing, cross-country skiing on ungroomed trails, berry picking, photography, bird watching, and earth caching.	The primary use is hiking. Other allowed uses include primitive camping, following "leave-no-trace principles," and low-impact activities such as snowshoeing, cross-country skiing on ungroomed trails, berry picking, photography, bird watching, and earth caching. Existing snowmobiles and horse trails are accommodated.
Appropriate Facilities	Facilities (newly constructed and/or existing) would be developed to serve purposes such as a visitor center or contact station; indoor and outdoor exhibits; sheltered picnic areas; outdoor gathering areas (such as an amphitheater); office space; maintenance and operations space; parking, bike racks, and bus shelters; access roads and trails; and hardened trails and trailheads leading out of this area.	Trails and overlooks would be carefully designed and located to afford access to or views of resources while avoiding impacts.	Trails would be designed and located to afford direct experience of natural resources. Wayside exhibits, directional signage, and occasional benches as roads for service vehicles to use for maintenance and resource preservation purposes and in emergencies, might also be located in this management area.	Trails would be designed and located to afford views and direct experience of glacial features. Wayside exhibits, directional signage, and occasional benches, as well as roads for service vehicles to use for maintenance and resource preservation purposes and in emergencies, might also be located in this management area.	Trails would be built in this management area. Spaces and minimal enhancements to accommodate primitive camping, such as a privy, would be provided. Roads for service vehicles to use for maintenance and resource preservation purposes and in emergencies might also be located here.

of these five activities (dog walking) would be acceptable on all publically owned land within the complex, and hunting would be acceptable on some publically owned land in the complex under specific circumstances (see #3 below). The evaluations of horseback riding, snowmobiling, and mountain biking can be found below in the section titled “Alternatives Considered but Dismissed.” Hunting will be evaluated as part of a deer management plan.

All three public landowners in the Ice Age Complex allow dogs to be walked on-leash. On WDNR and U.S. Fish and Wildlife Services (USFWS) properties, dogs could be off-leash if used for hunting. In evaluating whether or not to continue to allow dogs at the complex, NPS *Management Policies 2006* (Chapter 8); federal regulations (36 Code of Federal Regulations [CFR] 2.15); and state regulations (NR 45.06) were consulted. Dog walking is an acceptable activity at the complex (provided that leash rules are followed) because dog walking is compatible with the purpose for which the park was established and could be sustained at current levels without causing unacceptable impacts. Dogs used during hunting (when they do not have to be leashed) on WDNR and USFWS lands also cannot enter the sensitive resources management area given the fragility of resources in that area. If, in the future, dog walking compromises the park managers’ ability to ensure that resource conditions and visitor experience meet standards, and is therefore causing unacceptable impacts, then actions would be considered to address this problem. The indicators and standards outlined in the “User Capacity” section of this document would be used to monitor resource conditions and quality of the visitor experience.

3. A deer management plan would be developed jointly by all public landowners in the Ice Age Complex. The plan’s purpose would be to manage the deer herd at appropriate numbers, as well as provide recreational opportunities for hunters consistent with the different landowners’ policies and regulations governing hunting. The following statements apply to current and future land ownership:

U.S. Fish and Wildlife Service Lands.

The USFWS lands are open to all forms of hunting. This plan does not recommend any changes to these existing regulations.

National Park Service Lands. The NPS lands are closed to all forms of public hunting. A deer management plan would consider multiple techniques to control the deer population; however, public hunting cannot be considered in any form.

Wisconsin Department of Natural Resources Lands. The state of Wisconsin lands are classified as state park, thus requiring state legislation to permit hunting. The state recognizes the existing chronic wasting disease issue for the Ice Age Complex and the responsibility to control this disease. This property is within deer management unit number 76m and is also included as part of the chronic wasting disease zone. The management unit head goal is 10 deer per square mile. In addition, deer numbers in the park are severely hindering regeneration of park vegetation, and it is clear that changes are needed to more effectively reduce the number of deer in this area. It is recommended that a deer hunting framework be established for all current and future

WDNR lands west of Timber Lane and south of Old Sauk Pass; the framework would

allow deer hunting during all seasons, beginning on the Saturday immediately before the Thanksgiving holiday through the end of December

prohibit hunting on the traveled portion of the Ice Age National Scenic Trail

There are currently 742 publically protected acres in the Ice Age Complex. Under the management guidance described above, most of the WDNR-owned parcels south of Old Sauk Pass and all of the USFWS-owned parcels would be open to some form of hunting.

4. A management agreement between the Wisconsin Department of Natural Resources and the National Park Service would govern the day-to-day responsibilities (operations and maintenance, interpretation, and administration) for the complex. This Management Agreement will be developed and refined as the site's visitation and facilities' profile changes to reflect the new needs and opportunities these changes bring. In the meantime, the partners will continue to coordinate activities and to pursue joint planning.
5. There would be close coordination between the administration of the Ice Age National Scenic Trail and management of the Ice Age Complex. Administration and management tasks would be performed in different locations as proposed under alternatives 1 and 2, but under alternatives 3, 4, and 5, the tasks would be co-located at a central Ice Age National Scenic Trail headquarters office within the complex. For

comparison purposes, the costs of both trail administration and complex management are factored together in the cost analysis for the alternatives.

6. Each landowner will remain responsible for vegetation management on the land they own. Actions to manage vegetation will be designed to achieve the desired conditions outlined in this plan and will be coordinated for effectiveness and efficiency as much as possible.

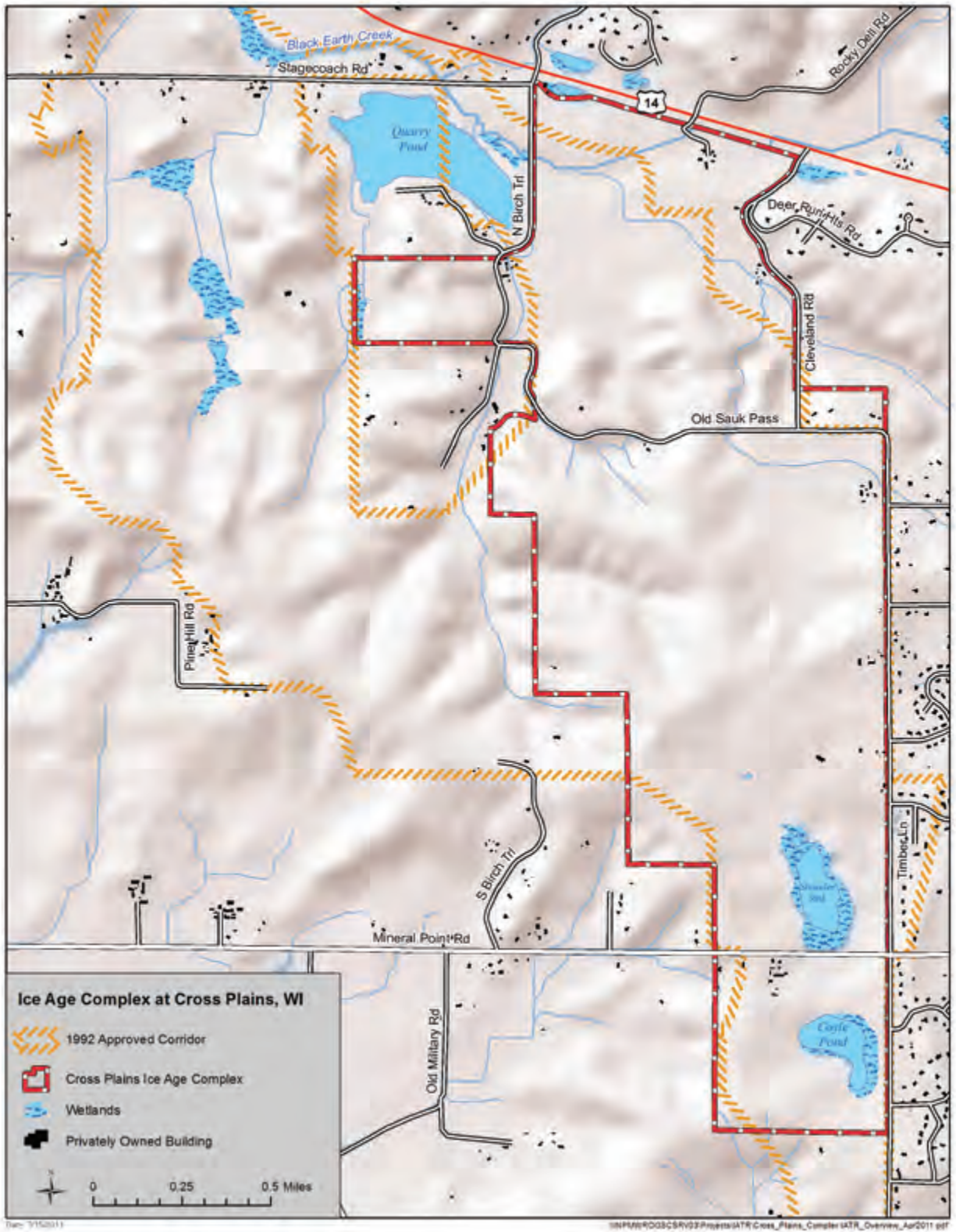
Alternative 1: No-Action, Continuation of Current Management. This alternative describes how the Ice Age Complex would look in the future if no *new* actions were taken. The description for the no-action alternative was used as a baseline against which to assess the benefits, costs, and impacts of action alternatives 2, 3, 4, and 5. Figure 4 provides an overview of the Ice Age Complex at Cross Plains.

The Ice Age Complex is undeveloped for visitor use and minimally maintained. Each public landowning agency manages vegetation on the land it owns. Staff members for the Ice Age National Scenic Trail have stabilized facilities to prevent their deterioration. There are currently no improvements (such as parking or constructed trails) on either WDNR- or NPS-owned lands to facilitate visitor experience. The Shoveler Sink Waterfowl Production Area, managed by the U.S. Fish and Wildlife Service, is open to visitors for hunting, fishing, and other wildlife-dependent activities, but the production area has no visitor facilities other than two small unsurfaced parking lots. Privately owned lands in the complex consist of agricultural fields, along with several homes and their outbuildings.

The segment of the Ice Age National Scenic Trail would still be built within the identified corridor under this alternative, but other trails would not be constructed.

The proposed management areas do not apply to the no-action alternative.

FIGURE 4: OVERVIEW OF THE ICE AGE COMPLEX AT CROSS PLAINS



Boundary expansion — The boundary of the Ice Age Complex would not be expanded.

Estimated costs and staffing — There would be one-time costs for stabilizing the Wilkie property and purchasing seed to reestablish natural vegetation conditions. These total one-time costs would be approximately \$1.24 million (in 2011 dollars) and do not include costs for land protection, such as acquisition or easements. The annual operating costs (in 2011 dollars) would be approximately \$560,000 including costs for resource management, employee salaries and benefits, and leasing office space.

The work necessary to administer the Ice Age National Scenic Trail across the state overlaps significantly with the work required to manage the Ice Age Complex at Cross Plains, thus the annual costs above include costs to support staff whose work would involve both of these functions. The joint staff would comprise six full-time equivalent employees: A trail superintendent and trail manager, who would be responsible primarily for the trail across the state, a half-time site manager, who would be responsible for the complex, two planners to prepare plans for the trail state-wide as well as for the complex, and half-time volunteer coordinator, GIS and administrative support. Because managing the Complex would be a partnership effort, this staff would be a mixture of federal employees, state employees, and volunteers.

Alternative 2: Ecological Restoration Emphasis.

Figure 5 is the map for alternative 2. The ecosystem throughout most of the site would be restored to a period before European settlement (circa 1830). The restoration would support interpretation of how natural conditions in the complex would have evolved after the glacial period under minimal human influence. Vegetation would be managed at key points to reveal glacial landscapes, but the focus would be on ecosystem management. Visitors would enjoy a sense of perceived remoteness and quiet, primarily by hiking on trails.

This management concept would be implemented by

- restoring presettlement vegetation by applying natural processes wherever possible

- removing the buildings at the core of the site that belonged to the Wilkie family and providing parking and trail access at this location, as well as outdoor exhibits and primitive restrooms

- providing a minimally developed trail to and along the rim of Cross Plains gorge

- interpreting the site with wayside and outdoor exhibits

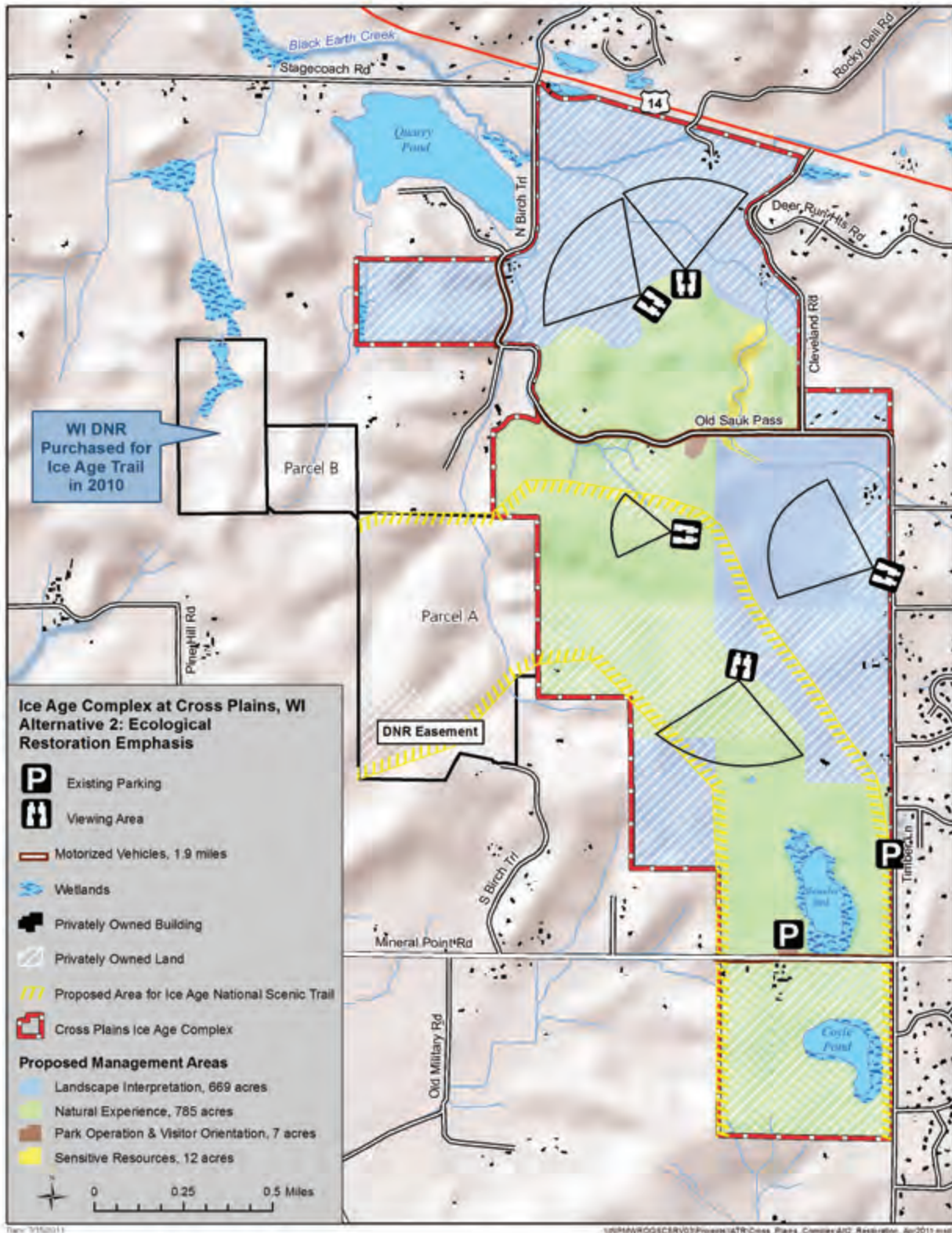
- managing the complex from an off-site location; there would be no permanent staff stationed at the site, and visitor interaction with park staff would be rare

Boundary expansion — The boundary of the Ice Age Complex would not be expanded.

Estimated costs and staffing — There would be one-time costs for removing the Wilkie structures, constructing trails, and purchasing seed to reestablish natural vegetation conditions. The total one-time costs would be approximately \$1.94 million (in 2011 dollars) and do not include costs for land protection, such as acquisition or easements. The annual operating costs (in 2011 dollars) would be approximately \$760,000, including costs for resource management, employee salaries and benefits, and leasing office space.

The work necessary to administer the Ice Age National Scenic Trail across the state overlaps significantly with the work required to manage the Ice Age Complex at Cross Plains, thus the costs above include costs to support staff whose work would involve both of these functions. That joint staff would comprise eight full-time equivalent employees: A trail superintendent and trail manager, who would be responsible primarily for the trail

FIGURE 5: MAP FOR ALTERNATIVE 2: ECOLOGICAL RESTORATION EMPHASIS



across the state, a site manager, who would be responsible for the complex, two planners to prepare plans for the trail state-wide as well as for the complex, an administrative officer and a volunteer coordinator, GIS and administrative support. Because managing the Complex would be a partnership effort, this staff would be a mixture of federal employees, state employees, and volunteers.

Alternative 3: Interpretation and Education

Emphasis. Figure 6 is the map for alternative 3. The glacial landscape would be interpreted with a focus on how the Ice Age Complex has evolved over time since the retreat of the last glacier. Throughout most of the complex, ecological resources would be managed to reveal the glacial landscape. Visitors would have an opportunity to experience a wide variety of resources, both ecological and geological, as well as remnants of human use of the site. The visitor experience would involve sheltered and indoor settings at the core of the property and hiking throughout most other areas of the site. Trails would be placed to tell stories of the formation of the glacial landscape and, to a lesser extent, about the ecological resources, such as the oak savanna. Under this alternative, the Ice Age Complex would serve as the headquarters for the Ice Age National Scenic Trail. This management concept would be implemented by

- renovating the house and/or barn at the core of the site for adaptive reuse to accommodate visitor orientation, while interpreting human use and settlement patterns; space in these facilities would also be renovated for use as staff offices

- constructing a new facility at the core of the site to accommodate maintenance needs

- requesting the village of Cross Plains to manage traffic along Old Sauk Pass between Cleveland Road and North Birch Trail to reduce hazards to pedestrians

- providing a trail to and along the gorge with overlooks, surfaced at least in part to accommodate people with disabilities, as well as controlled partial access along the floor of the gorge

- preserving and enhancing key views through vegetation management (for example, by selective thinning and pruning)

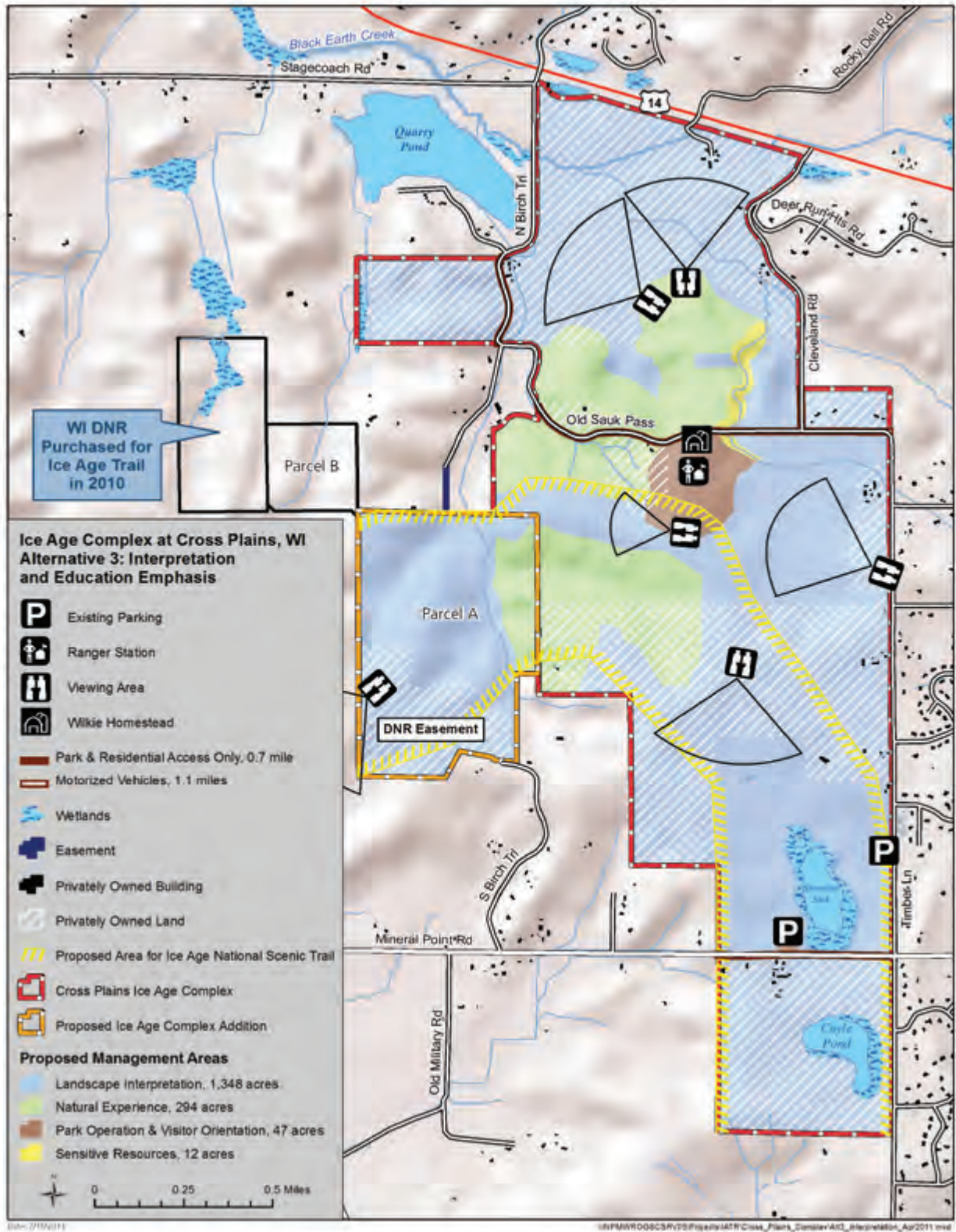
- expanding the complex boundary westward to include WDNR-owned land and enhance opportunities to interpret a wider expanse of driftless area terrain

Boundary expansion — Alternative 3 proposes to expand the boundary of the Ice Age Complex, as well as the boundary of Cross Plains State Park. The boundary would be expanded to include parcel A (shown on figure 3), which is a 228-acre WDNR-protected parcel. The Department of Natural Resources owns part of the parcel in full, and part of it is privately owned and protected by an easement. The parcel is recommended for incorporation into the complex's boundary in order to include and protect significant resources and values and to enhance opportunities for public enjoyment related to park purpose. Parcel A would offer visitors an expansive view of the Driftless Area, a rare sight along the Ice Age National Scenic Trail. This parcel would be feasible because

- it is already publically protected, so no additional land-protection costs would be incurred

- it is contiguous to the current boundary
- the land is currently open space (there are no structures or developments on this land) and would continue to be managed as such

FIGURE 6: MAP FOR ALTERNATIVE 3: INTERPRETATION AND EDUCATION EMPHASIS



It is possible that current ownership and management is adequate because this land is currently protected by the Department of Natural Resources. Thus, if the land were included in the complex, planning for it and managing it would be administratively seamless and would ensure consistency with current lands in the complex. In this sense, including parcel A in the complex's boundary would not only be feasible but also more efficient than managing it separately.

Estimated costs and staffing — There would be one-time costs to renovate the Wilkie property, to design and install exhibits, to construct trails and a maintenance facility, and to purchase seed to reestablish natural vegetation conditions. The total one-time costs would be approximately \$ 4.74 million (in 2011 dollars) and do not include costs for land protection, such as acquisition or easements. The annual operating costs (in 2011 dollars) would be approximately \$1.01 million, including costs for resource management, employee salaries and benefits, and maintenance and operations.

The work necessary to administer the Ice Age National Scenic Trail across the state overlaps significantly with the work required to manage the Ice Age Complex at Cross Plains, thus the costs above include costs to support staff whose work would involve both of these functions. That joint staff would comprise ten and a half full-time equivalent employees: A trail superintendent and trail manager, who would be responsible primarily for the trail across the state, a site manager, who would be responsible for the complex, two planners to prepare plans for the trail state-wide as well as for the complex, a chief of interpretation and at least one ranger (necessary to develop and support interpretive programming), a chief of maintenance (necessary to take care of the renovated Wilkie buildings), an administrative officer, a volunteer coordinator, and GIS support. Because managing the Complex would be a partnership effort, this staff would be a mixture of federal employees, state employees, and volunteers.

Alternative 4: Outdoor Recreation Opportunities

Emphasis. Figure 7 is the map for alternative 4. Visitors would be offered a variety of low-impact outdoor recreational experiences in support of and compatible with preserving and interpreting the glacial significance of the complex and restoring and managing the ecosystem. Visitors would be able to experience resources in diverse ways and would enjoy a broad range of interpretive programming in indoor and outdoor settings. Under this alternative, the Ice Age Complex would serve as the headquarters for the Ice Age National Scenic Trail.

This management concept would be implemented by developing the core of the complex to

- renovate Wilkie house and barn primarily for use as staff offices. The interior of these buildings might or might not be accessible to visitors; a site development plan would determine the most effective and efficient use of space

- selectively site and construct a new visitor center with orientation services (such as exhibits and film)

- selectively site and construct a new maintenance facility, unless future land acquisitions would allow for this development away from the core of visitor activity

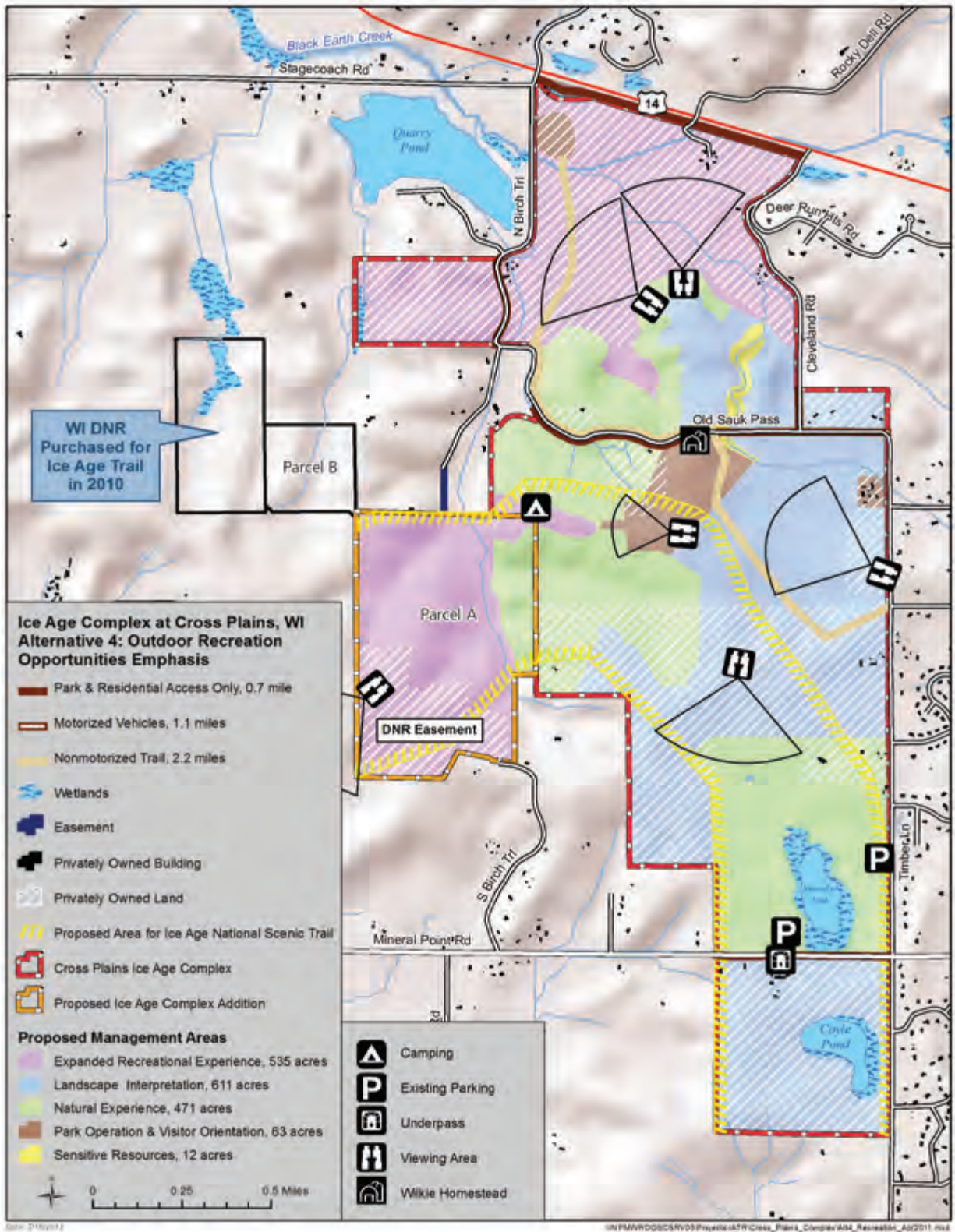
- provide outdoor gathering spaces such as an amphitheater and picnic shelter

This management concept would also be implemented by

- requesting the village of Cross Plains to manage traffic along Old Sauk Pass between Cleveland Road and North Birch Trail to reduce hazards to pedestrians (same as proposed under alternative 3)

- providing a trail to and along the gorge with overlooks that would be surfaced, at least in part, to accommodate people

FIGURE 7: MAP FOR ALTERNATIVE 4: OUTDOOR RECREATION EMPHASIS



with disabilities. If feasible, in terms of structural engineering, cost, and environmental impacts, a pedestrian bridge spanning the gorge could be built to provide visitors a unique perspective on its formation

providing extensive, varied trails, including a hardened bicycle/pedestrian trail across the site offering primitive camping in the western sections of the complex

expanding the complex's boundary westward to enhance opportunities for recreation, especially for a primitive camping experience near the Ice Age National Scenic Trail

Boundary expansion — The boundary of the Ice Age Complex would be expanded to include parcel A, which is shown on figure 3. Parcel A is the same 228-acre WDNR-protected parcel mentioned under alternative 3. This parcel would be necessary to enhance opportunities for public enjoyment related to park purpose. There is no appropriate area for camping along the Ice Age National Scenic Trail corridor within the current complex boundary, so parcel A would be managed for an expanded recreational experience (purple management area in table 2 above) to allow for primitive camping for hikers on the Ice Age National Scenic Trail, which would traverse this area. This addition would be feasible to manage for the same reasons cited under alternative 3. Similarly, the explanation for efficiency in managing parcel A as part of the complex under alternative 3 would also apply to alternative 4.

Estimated costs and staffing — There would be one-time costs to renovate the Wilkie property and construct a new visitor center and maintenance facility, to design and install exhibits, to construct trails, and to purchase seed to reestablish natural vegetation conditions. The total one-time costs would be approximately \$8.8 million (in 2011 dollars) and do not include costs for land protection, such as acquisition or easements. The annual operating costs (in 2011 dollars) would be approximately \$1.26 million, including costs for resource management, employee salaries and benefits, and maintenance and operations.

The work necessary to administer the Ice Age National Scenic Trail across the state overlaps significantly with the work required to manage the Ice Age Complex at Cross Plains, thus the costs above include costs to support staff whose work would involve both of these functions.

That joint staff would comprise fourteen full-time equivalent employees: A trail superintendent and trail manager, who would be responsible primarily for the trail across the state, a site manager, who would be responsible for the complex, two planners to prepare plans for the trail state-wide as well as for the complex, a chief of interpretation and at least two rangers (necessary to develop and support expanded interpretive programming as well as to provide law enforcement), a chief of maintenance and at least one maintenance employee (necessary to take care of the renovated Wilkie buildings as well as the new visitor center), an administrative officer, a volunteer coordinator, and GIS support. Because managing the Complex would be a partnership effort, this staff would be a mixture of federal employees, state employees, and volunteers.



Alternative 5: Preferred Alternative. Figure 8 is the map for alternative 5. This alternative would provide visitors with interpretation of the evolution of the complex from the last glacial retreat and opportunities to enjoy appropriate low-impact outdoor recreation. Ecological resources would largely be managed to reveal the glacial landscape. The most sensitive ecological areas would be carefully protected, and visitor access would be highly controlled in these areas. Visitors would experience a wide variety of indoor and outdoor interpretive programming. Under this alternative, the Ice Age Complex would serve as the headquarters for the Ice Age National Scenic Trail.

The management concept for alternative 5 would be implemented by developing the core of the site (the former Wilkie property) to accommodate offices for Ice Age National Scenic Trail staff (who would support administrative and maintenance functions) and provide for a visitor center, including a sheltered picnic area. The elements involved in developing the site include

- producing a building complex that would be highly sustainable (the overall goal of this development); certified under the U.S. Green Building Council's Leadership in Energy and Environmental Design rating system at a gold level; have a minimal carbon footprint; and employ systems to carefully control surface water runoff and avoid impacting the quality of Black Earth Creek.

- retaining parts of the existing house and barn to the extent that is practical, given the need for a cost-effective, environmentally sustainable visitor center, office space, and space to support maintenance functions. Unfortunately, the existing house and barn are not adequate today in size or condition to fully and permanently serve these functions. Ultimately, the design of

- the core area for public and operational use would reflect public feedback as well as cost and environmental factors.

Until the visitor center, office, and maintenance facility complex described above can be funded and constructed, the existing buildings in the core area may be minimally modified, as necessary, to make them useful on an interim basis as a visitor contact station and for maintenance and storage purposes.

The management concept for alternative 5 would also be implemented by

- requesting the village of Cross Plains to manage traffic along Old Sauk Pass between Cleveland Road and North Birch Trail to reduce hazards to pedestrians (same as alternatives 3 and 4)

- providing a trail leading to and along the gorge with overlooks surfaced at least in part to accommodate people with disabilities. Vegetation in the gorge would be restored and volunteer trails removed.

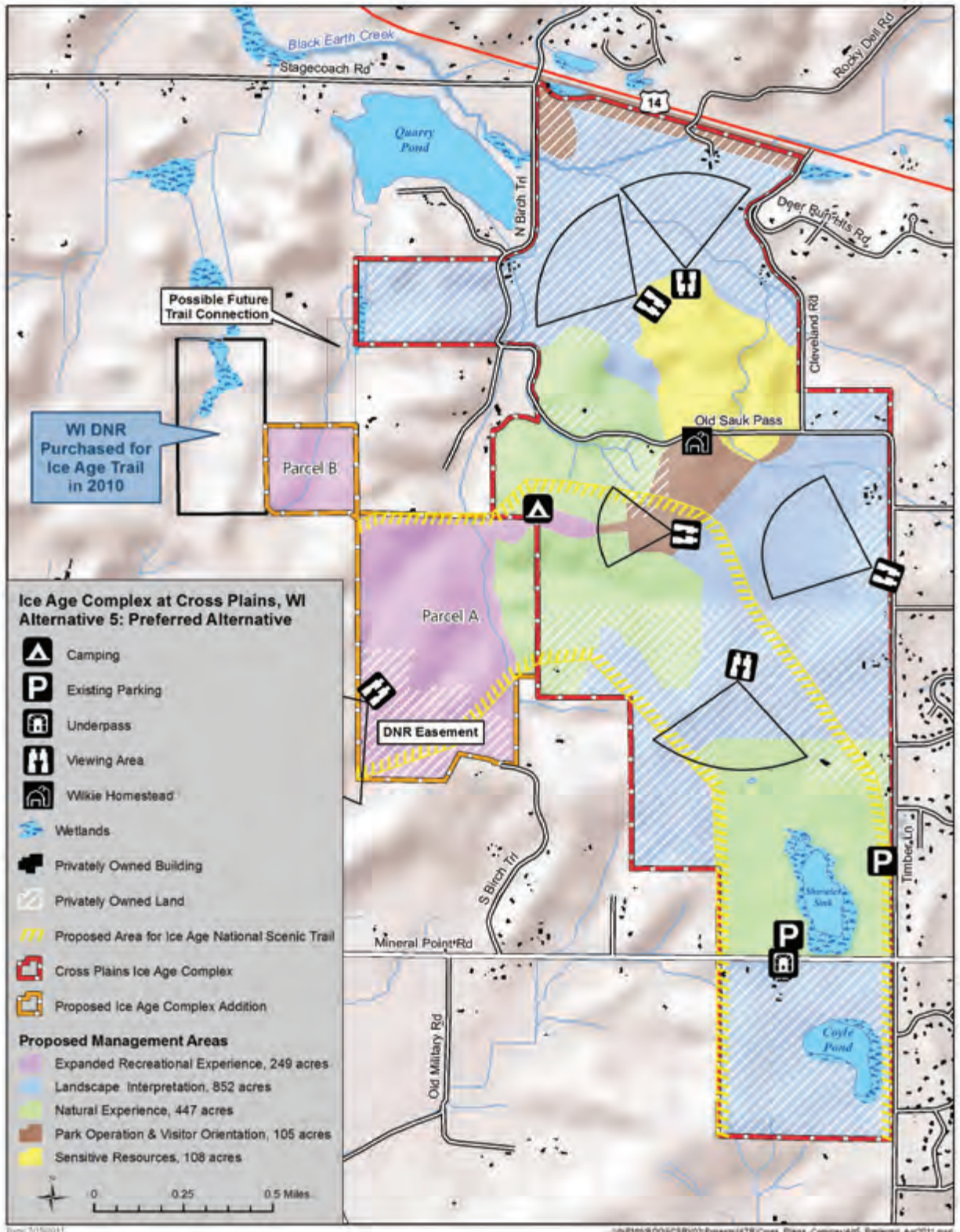
Additionally, the management concept for alternative 5 would be implemented by

- providing an extensive, varied hiking trail network throughout the complex

- providing a management area in a narrow strip along U.S. Highway 14 to accommodate a bicycle path (in the planning stages) to connect Middleton to Cross Plains. This alternative does not envision the National Park Service or the Wisconsin Department of Natural Resources building the bicycle path but, rather, would accommodate local efforts to build the path

- offering primitive camping equipped with a privy in the western part of the complex

FIGURE 8: MAP FOR ALTERNATIVE 5: PREFERRED ALTERNATIVE



establishing a wildlife corridor of unbroken habitat between the former Wilkie property and Shoveler Sink. The area of this corridor is defined as “landscape interpretation” because of the abundance of opportunity to view glacial features here. While the landscape interpretation management area generally allows for agricultural fields, the intent of landscape interpretation in this particular corridor is to return the land to a type of native vegetation (such as short prairie grasses rather than tall prairie grasses) that would not obscure the view of glacial features

providing picnic tables next to parking areas along U.S. Highway 14 and along Mineral Point Road

Boundary expansion — Alternative 5 proposes to expand the complex boundary westward to incorporate expansion areas (parcels) A and B shown on figure 3. Parcel A is the same 228-acre WDNR-protected parcel mentioned above under alternatives 3 and 4, and parcel B is a 40-acre parcel protected and owned by the Department of Natural Resources. Both parcels would be necessary in order to enhance opportunities for public enjoyment related to park purpose under this alternative. Parcels A and B would be managed for an expanded recreational experience (purple management area on table 2) to allow for primitive camping for hikers on the Ice Age National Scenic Trail, which would traverse this area, and for hiking on other trails.

The two parcels would be feasible to manage because

there would be no acquisition costs since the lands in the two parcels are already protected by the Department of Natural Resources

the inclusion of the two parcels in the boundary would not substantially change the current conditions of these parcels. Today, the parcels

are undeveloped open space; after inclusion, the parcels would be used to enhance opportunities for public enjoyment related to park purpose

The explanation under alternative 3 for efficiency in managing these parcels as part of the complex would also apply to this alternative 5.

Estimated costs and staffing — There would be one-time costs to renovate the Wilkie property and/or for new construction in the core area, to design and install exhibits, to construct trails and to purchase seed to reestablish natural vegetation conditions. The total one-time costs would be approximately \$7.09 million (in 2011 dollars) and do not include costs for land protection, such as acquisition or easements. These one-time costs would be lower than in alternative 4 because alternative 5 does not propose constructing a bicycle path to traverse the property, constructing a pedestrian bridge spanning the gorge or renovating the former Wilkie buildings (unless the cost would be comparable to building new facilities). The annual operating costs (in 2011 dollars) would be approximately \$1.26 million, including costs for resource management, employee salaries and benefits, and maintenance and operations.

The work necessary to administer the Ice Age National Scenic Trail across the state overlaps significantly with the work required to manage the Ice Age Complex at Cross Plains, thus the costs above include costs to support staff whose work would involve both of these functions. That joint staff would comprise fourteen full-time equivalent employees: A trail superintendent and trail manager, who would be responsible primarily for the trail across the state, a site manager, who would be responsible for resource management activities for the complex, two planners to prepare plans for the trail state-wide as well as for the complex, a chief of interpretation and at least two rangers (necessary to develop and support expanded interpretive programming as well as to provide law enforcement), a chief

of maintenance and at least one maintenance employee (necessary to take care of the new spaces for visitors and for staff offices), an administrative officer, a volunteer coordinator, and GIS support. Because managing the Complex would be a partnership effort, this staff would be a mixture of federal employees, state employees, and volunteers.

Alternatives Considered but Dismissed

Four elements for potential inclusion in the range of management alternatives were dismissed from further consideration. This section describes the four elements and the reasons they were dismissed.

Element 1, Locating the Primary Access Point and Visitor Center away from the Center of the Complex. The northern, southern, and eastern boundaries are all major roads and would be obvious access points to the complex. The GMP/EIS team considered areas along each of these boundaries for visitor center placement but did not select any of these locations for the following reasons:

- (1) The complex measures roughly 3 miles from north to south. Placing a visitor center and parking area on either the northern or southern boundary means visitors would have to hike as much as 3 miles from the primary orientation site to see the entire complex. Additionally, the features that are expected to be most attractive to visitors, and that are also the fundamental resources of the park, such as the Cross Plains gorge and most high points, are concentrated toward the center of the site. Placing a visitor center on the north or south boundaries would exclude the opportunity for the park to conduct programs in which rangers would walk short distances with visitors (0.5 mile or less) from the visitor center to these resources. Lastly, it would be easier to protect resources and monitor for signs of misuse or vandalism if staff were closer to the resources.
- (2) While locating a visitor center on the eastern side of the complex, along Timber Lane, midway between the north and south boundaries, would have been a convenient location, only a small portion of that land is currently publically owned, which would limit the site-development options. The partners involved in this project did not want to plan for developments on land not currently publically owned because, even though the goal is to eventually protect this land through acquisition or other means, it is not possible to predict when this goal would be realized. In order to move forward with developing this site for visitor use after this plan is approved, it was necessary to identify land already publically owned for a visitor center.

Element 2, Separating Maintenance Operations from the Core Visitor Area. Physically separating maintenance space from the space most developed for visitors would keep the area where visitors congregate quieter and potentially safer. Because of this, the GMP/EIS planning team initially thought about placing a management area for park operations and support facilities along Timber Lane, in the area where it intersects Old Sauk Pass, rather than as part of the visitor complex at the core of the site. None of the proposed action alternatives include this option for the same reason cited above under item 2; that is, land in this area is not publically owned (at the time of this writing). Even though the goal is to eventually protect this land through acquisition or other means, it is not possible to predict when this goal would be realized. In order to move forward with developing the complex after approval of this plan, it was necessary to identify land already publically owned for maintenance operations.

Element 3, Establishing Horse Trails. The planning team considered but dismissed the possibility of establishing horse trails at the Ice Age Complex. The appropriateness of

accommodating horseback riding in the Ice Age Complex was evaluated according to NPS *Management Policies 2006* (chapter 8); federal regulations (36 CFR 2.16 – Horse and Pack Animals); and WDNR design standards for horse trails. The horseback riding policies for the agencies are presented below.

Policy on NPS-owned land: Horses are prohibited outside of trails designated for their use. There is no designated route on NPS-owned land.

Policy on WDNR-owned land: Horses are prohibited except in areas or on trails designated for their use. There is a short trail used as a horse trail connection on state-owned lands west of the current boundary, and these lands are proposed for inclusion in the boundary under alternatives 3, 4, and 5.

Policy on USFWS-owned land: Horses are prohibited.

Evaluation of horseback riding — Currently, of all the lands included in the complex’s boundary under alternatives 3, 4, and 5, horseback riding is allowed on only a short trail on the state-owned lands (parcel A on figure 3). This horse trail connects two parcels of private land. When the Department of Natural Resources gave permission for horseback riders to pass across state-owned lands between these two private parcels, the understanding was that, eventually, the horseback riding public would be able to access this trail. Today, however, access remains available to only those with permission from the owner of these private parcels. Despite the years that have passed since this permission was granted, the horse trail still provides exclusive access to public lands and is therefore no longer appropriate. This trail would be closed to horses. Beyond the state-owned lands, horseback riding is an inappropriate use of public lands at the Ice Age Complex given the potential for resource degradation. Well-used horse trails in the

area of glacial topographical features would likely damage or destroy these features. In addition, the Ice Age National Scenic Trail segment (when constructed) would be an inappropriate location for horses. The Ice Age National Scenic Trail is built and maintained by volunteers to sustainable footpath standards for hiking. Consequently, there is a high probability that horse use would degrade the trail as well as compromise the NPS and WDNR relationship with their primary nonprofit partner (the Ice Age Trail Alliance) who builds and maintains the Ice Age National Scenic Trail statewide. It is unlikely that a horse trail would be established in the parts of the complex (where glacial features are absent) outside the Ice Age National Scenic Trail corridor that would, from a length perspective, provide a quality experience.

Element 4, Establishing Snowmobile Trails. The planning team considered but dismissed the possibility of establishing snowmobile trails at the Ice Age Complex. The appropriateness of allowing snowmobiles in the Ice Age Complex was evaluated according to NPS *Management Policies 2006* (Chapter 8) and federal regulations (36 CFR 2.18 – Snowmobiles).

The snowmobile policies for the agencies are presented below.

Policy on NPS-owned land: Snowmobiles are prohibited except on designated routes. There is no designated route on NPS-owned land.

Policy on WDNR-owned land: There is currently a snowmobile trail on the state-owned lands that dips into the southwest corner inside the current complex boundary (to be included in the boundary under alternatives 3, 4, and 5). Any other snowmobiling would need to be approved through a planning process.

Policy on USFWS-owned land: Use of snowmobiles is not appropriate.

Evaluation of snowmobiling — A new snowmobile route beyond the established area on state-owned lands would be an inappropriate use of public lands at the Ice Age Complex. New snowmobile trails would be inconsistent with natural (such as wildlife), scenic, and aesthetic values and safety and management objectives. The existing snowmobile route will remain open, but no new trails will be established. The existing snowmobile trail on state-owned lands is a small part of a much larger statewide network of snowmobile trails and functions as a connector between other trails used by snowmobilers. In addition to conflicting with management objectives at the complex, using lands in the Ice Age Complex for snowmobiling is unnecessary given the extent of the existing snowmobile trail network and the mechanisms in place to identify and maintain snowmobile trails across the region.

Element 5, Establishing Mountain Bike Trails. The planning team considered but dismissed the possibility of establishing mountain bike trails at the Ice Age Complex. The appropriateness of allowing off-road biking on trails in the Ice Age Complex was evaluated according to the *NPS Management Policies 2006* (chapter 8); federal regulations (36 CFR 4.30 – Bicycles); and state regulations (NR 45.05).

The bicycling policies for the agencies are presented below.

Policy on NPS-owned land: Bicycles are prohibited except on park roads, in parking areas, and on routes designated for bicycle use. There are no designated bicycle trails in the complex. The established practice of road biking along Old Sauk Pass would continue.

Policy on WDNR-owned land: Bicycles are prohibited except in areas and trails posted for their use. As mentioned above, the established practice of road biking along Old Sauk Pass would continue.

Policy on USFWS-owned land: Use of bicycles is not appropriate.

Evaluation of mountain biking — Mountain biking is an inappropriate use of public lands at the Ice Age Complex given inconsistency with safety and management objectives, as well as the potential for resource degradation. Even if the impacts of off-road biking could be mitigated effectively, it seems very unlikely that the complex would provide a satisfactory mountain biking experience. Well-used mountain bike trails in the area of glacial topographical features would likely damage or destroy these features. Beyond the state-owned lands, mountain biking is an inappropriate use of public lands at the Ice Age Complex given the potential for resource degradation. Well-used off-road bike trails in the area of glacial topographical features would likely damage or destroy these features. In addition, when constructed, the Ice Age National Scenic Trail segment would be an inappropriate location for bikes.

The portion of the Ice Age National Scenic Trail outside the complex is built and maintained to sustainable footpath standards for hiking. Consequently, there is a high probability that bike use would degrade the trail, as well as compromise the NPS and WDNR relationship with their primary nonprofit partner (Ice Age Trail Alliance) who builds and maintains the Ice Age National Scenic Trail (the statewide portion of the trail outside the complex). In addition, the Ice Age National Scenic Trail is not an appropriate location for mountain biking given the potential to compromise the trail experience for hikers, who are not only the primary users of the Ice Age National Scenic Trail, but who also comprise the membership of the primary volunteer group (Ice Age Trail Alliance) that maintains the trail. It is unlikely that a mountain biking trail would be established in the parts of the complex (where glacial features are absent) outside the Ice Age National Scenic Trail corridor that would, from a length and topographic perspective, provide a quality experience for mountain bikers while not interfering with other park users.

ESTIMATED COSTS AND STAFFING (IN 2010 DOLLARS) OF THE FIVE ALTERNATIVES

The National Park Service requires that cost estimates of projects be included in general management plans (costs are required under the 1978 Parks and Recreation Act and are requested by Congress for budget control purposes). The purpose of cost estimates is to assist managers with setting priorities and to inform the public. Table 3 provides very broad estimates based on costs of construction, supplies, and employee salaries and should not be used for budgeting and project planning. Actual costs would be determined at a later date, considering the design of facilities, identification of detailed resource protection needs, and changing visitor expectations. The NPS facility models were used to estimate the needed size and therefore presumed costs of future facilities. Note that potential costs for land protection tools (such as easements and acquisitions) to fully protect lands in the Ice Age Complex are not included in these estimates. The estimated staffing costs in table 3 cover not only costs for staffing the complex but also for staffing the Ice Age Trail administration. The reason for including both of these functions in the cost estimate of all of the alternatives is for comparison purposes.



USER CAPACITY

General management plans for units of the national park system are required, by law, to identify and address implementation commitments for user capacity, also known as carrying capacity. The National Park Service defines user capacity as the types and levels of visitor use that could be accommodated while sustaining the quality of park resources and visitor experiences consistent with park purposes. Managing user capacity in national parks is inherently complex. It depends not only on the number of visitors but also on where the visitors go, what they do, and the “footprints” they leave behind. Rather than just regulating the number of people in a park area, the park staff and partners rely on a variety of management tools and strategies to manage user capacity.

In addition, the ever-changing nature of visitor use in parks requires a deliberate and adaptive approach to user-capacity management. Figure 9 presents the NPS user-capacity framework.

The purpose, significance, special mandates, and management areas associated with the Ice Age Complex comprise the foundation for making user capacity decisions in this document. The purpose, significance, and special mandates define why the park was established and identify the most important resources and values (including visitor opportunities) that must be provided and protected. The management areas in each action alternative describe the desired resource conditions and visitor experiences, including appropriate types of activities and general use levels for different locations throughout the park. The management areas, as applied in the alternatives, are consistent with and would help the park achieve its specific purpose, significance, and special mandates. The NPS staff at the complex commit to abiding by these directives for guiding the types and levels of visitor use that would be accommodated, while sustaining the quality of park resources and visitor experiences consistent with the purposes of the park.

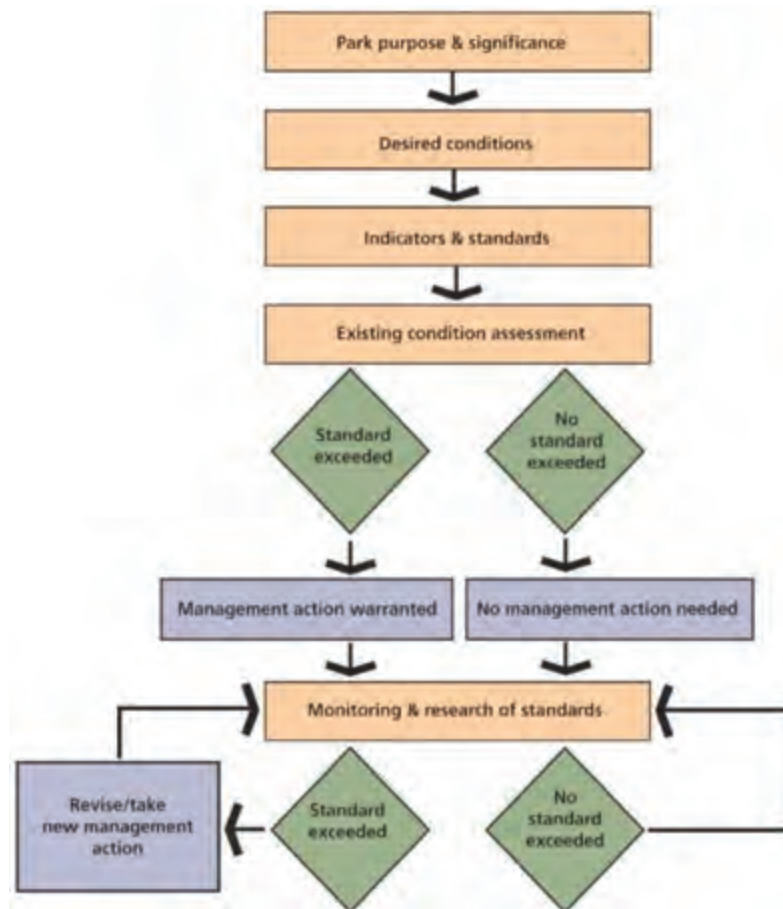
TABLE 3: ESTIMATED COSTS OF IMPLEMENTING EACH OF THE FIVE ALTERNATIVES

Cost Category	Alternative 1: No Action, Continuation of Current Management	Alternative 2: Ecological Restoration	Alternative 3: Interpretation and Education Emphasis	Alternative 4: Outdoor Recreation Emphasis	Alternative 5: Preferred Alternative
Annual Operating Costs ^a	560,000	760,000	1,010,000	1,260,000	1,260,000
Staffing (FTE) ^b	6	8	10.5	14	14
One-time Costs ^c					
Facility Costs ^d	40,000	170,000	2,270,000	5,400,000	3,600,000
Nonfacility Costs ^e	1,200,000	1,770,000	2,470,000	3,400,000	3,490,000
Total One-time Costs	1,240,000	1,940,000	4,740,000	8,800,000	7,090,000

Notes:

- All costs in 2010 dollars. Annual operating costs include maintenance and operations, utilities, supplies, staff salaries and benefits, and leasing costs.
- Total full-time equivalents (FTE) are the number of employees required to operate the complex (includes staff for maintenance and operations, visitor services, resource management, and so forth) and to administer the Ice Age National Scenic Trail statewide. Employee salaries and benefits are included in the annual operating costs.
- The one-time costs are divided between facility and nonfacility costs.
- One-time facility costs are for design and construction of new buildings and other structures, roads, parking areas, and trails, as well as changes to existing buildings.
- One-time nonfacility costs include actions for the preservation and/or restoration of natural resources and development of visitor use tools not related to facilities. Examples include purchase of seed for restoring native vegetation and wayside exhibits.

FIGURE 9: NPS USER-CAPACITY FRAMEWORK



INDICATORS AND STANDARDS

This plan includes indicators and standards for the Ice Age Complex that are in addition to the important directives discussed above. Indicators and standards are measureable variables that are monitored to track changes in resource conditions and visitor experiences. The indicators and standards help the National Park Service ensure that desired conditions are being attained and that those conditions support the fulfillment of the park's legislative and policy mandates. The general management plan identifies the types of management strategies that would be taken to achieve desired conditions and also identifies related legislative and policy mandates.

Table 4 presents the indicators, standards, and potential future management strategies (allocated by management area) that would be implemented as a result of this planning effort. The planning team considered many potential issues and related indicators that would identify impacts of concern, but those described below were considered the most significant, given the importance and vulnerability of the resource or visitor experience affected by visitor use. The planning team also reviewed the experiences of other parks with similar issues to help identify meaningful indicators. Standards that represent the minimum acceptable condition for each indicator were then assigned, taking into consideration the qualitative descriptions of the desired conditions, data on existing conditions, relevant research studies, staff management experience, and scoping on public preferences.

TABLE 4: INDICATORS, MANAGEMENT AREAS, STANDARDS, AND POTENTIAL MANAGEMENT STRATEGIES

Recommended Indicator(s)	Assigned Management Area	Recommended Standard(s)	Management Strategies
Number of unauthorized campsites* per year *As evidenced by obvious vegetation damage (such as flattening, trampling, or removal)	Expanded recreational experience, natural experience, and sensitive resources	<i>Expanded recreational and natural experience</i> No more than 3 unauthorized campsites per year <i>Sensitive resources</i> Zero tolerance for unauthorized campsites in any season	Educate public on park regulations, resource sensitivity, and appropriate behaviors Install signage on park regulations, resource sensitivities, and appropriate behaviors Regulate and enforce designated camping areas Increase frequency of patrols Temporarily or permanently close areas
Number of campfires* per year *As evidenced by obvious fire activity (such as blackened soil, fire rings, or burnt materials)	Parkwide, especially near parking areas	<i>Sensitive resources</i> No tolerance for campfires in any season <i>All other management areas</i> No more than 1 campfire per year	Educate public on park regulations, resource sensitivity, and appropriate behaviors Increase frequency of patrols Install signage at parking areas and trailheads

TABLE 4: INDICATORS, MANAGEMENT AREAS, STANDARDS, AND POTENTIAL MANAGEMENT STRATEGIES (CONTINUED)

Recommended Indicator(s)	Assigned Management Area	Recommended Standard(s)	Management Strategies
Decrease in populations of specific plant and animal species Levels, density, and diversity of important/targeted plant and animal species	Parkwide	(Dependent on plant species and communities) No more than 5% decrease in plant and animal diversity in the expanded recreational experiences, natural experience, and landscape interpretation management areas combined No more than 1% decrease in plant and animal diversity in the sensitive resources management area	Conduct formal review of visitor-caused impacts in order to isolate the possible reason for the impacts and determine the appropriate management response. Educate public on low-impact practices, park regulations, and appropriate behavior Increase fences and barriers Increase staff presence Increase monitoring Regulate or restrict access (especially while undergoing restoration or during breeding seasons)
New occurrences or expansion of existing known priority invasive plant species detections** **See the list following this table of known priority invasive plant species.	Parkwide	No new occurrences of invasive species where they do not presently exist; no spread or growth of existing invasions	Conduct formal review of visitor-caused impacts in order to isolate possible reasons for the impacts and determine the most appropriate management response. Remove invasive species and restore disturbed areas Educate public on low-impact practices and park regulations Require the cleaning of gear and equipment that is capable of transferring plant material Reduce use levels Temporarily or permanently close areas (especially while undergoing restoration or in sites with sensitive resources)
Incidences of damage to or removal of geologic features Visitor-caused erosion to bluffs	Parkwide	Zero tolerance for the removal, damage, or defacement of geologic features Zero tolerance for visitor-caused erosion to bluffs	Educate public on appropriate behaviors, regulations, process of reporting, and low-impact practices Increase staff presence Limit public access Temporarily close areas for restoration Increase fences and barriers
1. Number of unauthorized trails	1. Parkwide 2. Sensitive area and natural experience	Zero tolerance for unauthorized trails	Conduct formal review of impacts caused by an unauthorized trail (either visitor or animal related) in order to isolate possible reasons for the impacts and determine most appropriate management response Educate public on resource sensitivity, low-impact practices, appropriate behaviors, and park regulations Increase enforcement of trailing especially on steep slopes

TABLE 4: INDICATORS, MANAGEMENT AREAS, STANDARDS, AND POTENTIAL MANAGEMENT STRATEGIES (CONTINUED)

Recommended Indicator(s)	Assigned Management Area	Recommended Standard(s)	Management Strategies
			<p>Improve delineation (marking/mapping) of designated trails and overlooks (placement of border logs or other barriers along formal trails at the junction with unauthorized trails)</p> <p>Redesign and relocate trail and overlook areas</p> <p>Remove excess (unauthorized) trails</p> <p>Formalize the unauthorized trails, possibly on new alignment, to accommodate visitor interest</p> <p>Install temporary or permanent signage</p> <p>Limit or reduce levels of use</p>
Percent increase of trail width beyond designated trail tread over a distance of at least 20 feet	All management areas, more frequent monitoring in sensitive resource and park operations and visitor orientation	No more than a 50% increase of trail width beyond designated trail tread over a distance of at least 20 feet	<p>Educate public on resource sensitivity, low-impact practices, appropriate behaviors, and park regulations</p> <p>Increase trail maintenance or rehabilitation</p> <p>Improve delineation of designated trails</p> <p>Redesign or relocate the trail</p> <p>Redirect visitor use</p> <p>Regulate activities</p> <p>Temporarily or permanently close trails</p>
<p>Percent increase of disturbed area* (measured in square feet) beyond designated overlook area</p> <p>*As evidenced by obvious damage (such as flattening, trampling, or removal) to vegetation</p>	Sensitive resources	No more than a 10% increase in disturbed area (measured in square feet) beyond designated overlook area	<p>Educate public on low-impact practices</p> <p>Increase overlook maintenance, such as improving edging or rehabilitation</p> <p>Improve delineation of overlook area, such as adding barriers, resurfacing, and so forth</p> <p>Redesign or relocate the overlook area</p> <p>Add overlook areas</p> <p>Regulate group sizes</p> <p>Temporarily or permanently close the overlook</p>
Percent increase in the number of complaints related to any specific visitor experience or interaction issues (such as crowding, conflicts between specific visitor groups) per year, above the three-year rolling average	Parkwide	No more than a 20% increase in the number of complaints related to any specific visitor experience or interaction issue per year, above the three-year rolling average	<p>Educate public on low-impact practices, activity etiquette, and park regulations and policies</p> <p>Separate visitor groups</p> <p>Increase enforcement</p> <p>Regulate activities</p> <p>Temporarily or permanently close areas</p>
Increase in the total volume of litter picked up during biannual clean-up events and during regularly scheduled staff/volunteer patrols	Parkwide	No more than a 25% increase in the total volume of litter picked up during biannual clean-up events and during regularly scheduled staff/volunteer patrols	<p>Increase education</p> <p>Increase enforcement</p> <p>Restrict certain activities</p> <p>Add trash receptacles, if appropriate</p>

TABLE 4: INDICATORS, MANAGEMENT AREAS, STANDARDS, AND POTENTIAL MANAGEMENT STRATEGIES (CONTINUED)

Recommended Indicator(s)	Assigned Management Area	Recommended Standard(s)	Management Strategies
Number of incidences of unauthorized overnight parking	Parkwide	Zero tolerance for unauthorized overnight parking	Increase enforcement Increase education Increase coordination with local authorities

**** The following are the known exotic (nonnative) invasive plant species in the Ice Age Complex (NPS and WDNR properties)**

autumn olive (<i>Elaeagnus umbellata</i>)	common chicory (<i>Cichorium intybus</i>)	oriental bittersweet (watch list) (<i>Celastrus orbiculatus</i>)
black locust (<i>Robinia pseudoacacia</i>)	garlic mustard (<i>Alliaria petiolata</i>)	Queen Anne's lace (<i>Daucus carota</i>)
bull thistle (<i>Cirsium vulgare</i>)	Japanese honeysuckle (<i>Lonicera japonica</i>)	reed canary grass (<i>Phalaris arundinacea</i>)
burdock (<i>Arctium spp.</i>)	leafy spurge (<i>Euphorbia esula</i>)	St. John's wort (<i>Hypericum perforatum</i>)
Canada thistle (<i>Cirsium arvense</i>)	multiflora rose (<i>Rosa multiflora</i>)	white and yellow clover (<i>Melilotus alba</i> and <i>Melilotus officinalis</i>)
common buckthorn (<i>Rhamnus cathartica</i>)	musk thistle (<i>Carduus nutans</i>)	wild parsnip (watch list) (<i>Pastinaca sativa</i>)

**** The following plant species are native but can be problematic because they are vigorous growers and invade other plant communities**

staghorn sumac (<i>Rhus typhina</i>)	walnut (<i>Juglans spp.</i>)	raspberries (<i>Rubus spp.</i>)
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User-capacity decision making is a form of adaptive management (refer to figure 9) in that it is an iterative process in which management decisions are constantly informed and improved. Indicators are monitored, and adjustments are made as appropriate. As monitoring of conditions continues, managers might decide to modify or add indicators if better ways are found to measure important changes in resource and social conditions. Information on the NPS monitoring efforts, related visitor use management actions, and any changes to the indicators and standards would be available to the public.

Priority Visitor Experience Indicators and Standards

The issues associated with the priority visitor experience indicators for the Ice Age Complex are

visitor experience impacts at campsites, the creation of unauthorized trails due to crowding on trails or at attraction points or from illegal or unauthorized uses

number of complaints related to any specific visitor experience or interaction issues

amount of litter

overnight parking or parking in undesignated areas

Similar to the natural resource indicators, visitor opportunities and related experiences in the complex are already being managed in various ways, but they are not routinely monitored. The indicators presented in table 4 above would help park staff track these specific issues to ensure that desired conditions are being achieved.

Visitor activities that might impact visitor experience could include crowding on trails and overlooks, which contribute to the creation of unauthorized trails, widening of formal trails, and degradation of overlooks; user conflicts related to unauthorized camping; and illegal or prohibited activities such as the unauthorized removal of resources, vandalism, campfires, overnight parking, and littering. The impacts on visitor experience from visitor activities could include disturbance to natural resources (vegetation, wildlife, and geologic features); disturbance to other visitors or nearby residents; and injuries from unauthorized trailing on steep slopes and injuries related to campfires.

These impacts could be widespread, with greater emphasis in areas that would be more heavily used, such as along trails, in parking areas, at points of interest, and at designated campsites.

Several of the indicators described above, with regard to visitor use impacts on natural resources, also apply to visitor experience. Visitor-use impacts on natural resources could also affect the aesthetic qualities of the complex, contribute to visitor conflict and crowding, and require management actions (refer to table 4) in response to resource degradation.

Currently, the complex provides no visitor amenities and minimal signage, so members of the public (other than local residents who are aware of its existence) do not visit. There are no formal trails, overlooks, or designated camping areas. Therefore, visitor conflicts and crowding are currently minimal or nonexistent. The potential for conflicts and crowding could greatly increase if the site becomes established and if formal trails, overlooks, and designated camping areas were developed.

In designated camping areas, failure to adhere to the policies outlined in a camping management plan could also lead to crowding or conflict between users. Weather conditions could sometimes force visitors to stay in a particular location, and this would be unavoidable. The concern is when visitors stray from camping policies solely for convenience or preference. Park staff would monitor the indicator related to the number of unauthorized campsites per year.

Long-term Monitoring

The park staff would monitor use levels and patterns throughout the park. In addition, the park staff would monitor the user-capacity indicators. The rigor of monitoring (such as frequency of monitoring cycles and amount of geographic area monitored) the indicators would vary considerably, depending on how close existing conditions are to the standards listed in table 4. If the existing conditions are far from exceeding the standard, the rigor of monitoring might be less than if the existing conditions are close to or trending toward exceeding (not meeting) the standard.

Initial monitoring of the indicators would determine if the indicators are accurately measuring the conditions of concern and if the standards truly represent the minimally acceptable condition of the indicator. Park staff might decide to modify the indicators or standards and revise the monitoring program if better ways are found to measure changes caused by visitor use. Most of these types of changes should be made within the first several years of initiating monitoring. After this initial testing period, adjustments would be less likely to occur. Finally, if use levels and patterns change appreciably, the park staff might need to identify new indicators to ensure that desired conditions would be achieved and maintained. This iterative learning and refining process, a form of adaptive management, is a strength of the NPS user-capacity management program.

NEEDED FUTURE STUDIES AND PLANS

Various implementation plans would be needed under all action alternatives; those plans are a

- deer management plan (by all project partners) that addresses deer overpopulation, as well as concerns regarding chronic wasting disease

- trails development plan that identifies the location and type of trails throughout the complex in accordance with the management areas and descriptions in the final general management plan

- resource stewardship strategy that describes the steps necessary to manage resources, followed by a vegetation management plan that would provide day-to-day guidance on methods and means of managing vegetation in the different management areas of the complex

long-range interpretive plan that describes programming necessary to interpret the themes described in the foundation statement in chapter 1 of this draft general management plan / environmental impact statement

The implementation plan needed under alternatives 2, 3, 4, and 5 would be a

site development plan for the core area of the complex identified with the “Park Operations and Visitor Orientation” management area; this plan would consider options for locating and designing facilities specified in the alternative description for this area. The plan would focus on analyzing impacts (such as impacts on visitor experience and archeology but that are unknown at this time) that could be associated with this development. Specific design and location decisions would influence these impacts.

The implementation plan needed under alternatives 4 and 5 would be a

camping management plan to help decide how to ensure leave-no-trace camping opportunities would be available for long-distance hikers on the Ice Age National Scenic Trail, while avoiding resource degradation; a permitting system would be considered as part of this plan

It is possible that, as these plans are developed and implemented, the need for other plans might surface.



ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferable alternative is defined as “the alternative that will promote national environmental policy as expressed in Section 101 of the *National Environmental Policy Act*.” Section 101 states that “it is the continuing responsibility of the federal government to . . .

- (1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- (2) assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
- (3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
- (4) preserve important historic, cultural, and natural aspects of our national heritage; and maintain, wherever possible, an environment which supports diversity, and a variety of individual choices;
- (5) achieve a balance between population and resource use which would 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.”

Table 5 shows the extent to which each of the alternatives in this plan would meet the above six criteria for assessing the environmentally preferred alternative.

TABLE 5: SIX CRITERIA FOR ASSESSING THE ENVIRONMENTALLY PREFERRED ALTERNATIVE

Criterion	Alternative 1: No Action, Continuation of Current Management	Alternative 2: Ecological Restoration Emphasis	Alternative 3: Interpretation and Education Emphasis	Alternative :4 Outdoor Recreation Emphasis	Alternative 5: Preferred Alternative
Generations as trustees	Would partially meet criterion	Would partially meet criterion	Would fully meet criterion	Would fully meet criterion	Would fully meet criterion
Pleasing surroundings	Would fully meet criterion	Would partially meet criterion	Would fully meet criterion	Would fully meet criterion	Would fully meet criterion
Beneficial uses without consequences	Would fully meet criterion	Partially meets criterion	Would fully meet criterion	Would fully meet criterion	Would fully meet criterion
Preserve with diversity and choices	Would partially meet criterion	Would partially meet criterion	Would partially meet criterion	Would fully meet criterion	Would fully meet criterion
Balance permitting high standard of living and sharing of amenities	Would fully meet criterion	Would fully meet criterion	Would fully meet criterion	Would fully meet criterion	Would fully meet criterion
Renewable resources and recycling	Would partially meet criterion	Would partially meet criterion	Would partially meet criterion	Would partially meet criterion	Would fully meet criterion

Because there would be no on-site staff to monitor visitor activity on a daily basis under alternatives 1 and 2, the park’s ability to avoid damage to resources would be less than under alternatives 3, 4, and 5. Because of this, alternatives 3, 4, and 5 would fully realize the responsibilities of each generation as trustee of the environment for succeeding generations than would alternatives 1 and 2 (criterion 1).

Alternative 1 would present safety concerns for visitors who park along Old Sauk Pass and cross the road with traffic as it is now. Under each of the other alternatives, the park would work with the village of Cross Plains to limit access to Old Sauk Pass in order to provide safe passage between the north and south sections of the complex. Therefore, alternatives 3, 4, and 5 would more fully prevent risks to safety surroundings than would alternatives 1 or 2 (criteria 2 and 3).

Under alternatives 1, 2, and 3, visitors would not have the choices for enjoying the complex that they would have under alternatives 4 and 5 due to a lack of interior space.

Alternatives 4 and 5 would enable a larger diversity of experiences through multimedia exhibits, as well as personal interaction with more rangers (an advantage over alternatives 1, 2, and 3). Alternatives 4 and 5 would also add primitive camping to the Ice Age National Scenic Trail hiking experience. These factors, combined, mean that alternatives 4 and 5 would more fully promote an environment that supports diversity and a variety of individual choices than would the other alternatives (criterion 4).

None of the alternatives would entail such a strong shift in socioeconomic or resource use that standard of living or sharing of life’s amenities would change (criterion 5).

Because alternatives 3, 4, and 5 specify retention and reuse of the Wilkie structures, and alternative 5 would result in a highly environmentally sustainable complex, these alternatives would more fully enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources than alternatives 1 and 2 (criterion 6).

Considering all of the criteria, alternative 5 is the most environmentally preferable alternative.

PREFERRED ALTERNATIVE

The value-analysis method, “Choosing by Advantages,” was used to build the preferred alternative. As mentioned in the beginning of this chapter, the CBA process is a tool for determining the specific advantages each alternative would provide toward meeting specific park objectives, taking into account any expected environmental impacts. The objectives for this analysis process, against which the elements of each alternative were weighed, were drawn from the park purpose statements described in the foundation statement in chapter 1. Those objectives are to

preserve and protect identified resources in light of visitation

facilitate interpretation of identified themes

provide an attractive stopping point or destination for Ice Age National Scenic Trail hikers

provide supportive, compatible outdoor recreation opportunities to the general public

After determining the advantages each alternative would offer toward meeting these objectives, the expected costs of each alternative were then compared to these advantages to determine the cost-benefit ratio of each alternative. The elements of the alternatives that provided the most benefit per dollar, with the least adverse environmental impacts, were combined to craft alternative 5, the preferred alternative. For example, having a visitor center would offer so much advantage in interpretation, so the cost of building the center was considered reasonable. However, the bicycle path across the site was removed from alternative 5 because it was considered unnecessary, given the existence of a scenic on-road alternative — North Birch Trail and Old Sauk Pass — that could accommodate this activity; and because it was not publically

supported and would be costly to construct. Similarly, a pedestrian bridge that would span the gorge did not offer great advantages toward meeting objectives, was not supported by the public, and costs to construct the bridge would be high. Thus, constructing the bridge was not considered reasonable, and it was not included in alternative 5.

COMPARISON OF THE ALTERNATIVES

Table 6 summarizes the key elements of each of the five alternatives. Table 7 provides a summary comparison of the environmental impacts of each alternative.



TABLE 6: SUMMARY OF THE KEY ELEMENTS OF THE ALTERNATIVES

	Alternative 1: No Action, Continuation of Current Management	Alternative 2: Ecological Restoration	Alternative 3: Interpretation and Education Emphasis	Alternative 4: Outdoor Recreation Emphasis	Alternative 5: Preferred Alternative
CONCEPT	This alternative reflects the continuation of current management. There would be few trails, no sheltered space for visitors, and very limited parking. Resources would be managed inconsistently.	Ecological restoration is the emphasis in this alternative. While most of the site would be restored to a period before European settlement, glacial landscapes would be revealed over part of the site as well. Interpretation would be largely through outdoor exhibits and waysides (nonpersonal). Visitors would enjoy a sense of remoteness and quiet while hiking trails, but they would not have access to indoor sheltered space.	Interpretation and education are the emphases in this alternative. Most resources would be managed to reveal the glacial landscape. Visitors would have a variety of interpretive experiences in sheltered and indoor settings and while on hiking trails throughout the site.	Outdoor recreation opportunities are emphasized in this alternative. Visitor opportunities would include low-impact outdoor recreational experiences compatible with the preservation and interpretation of the glacial significance of the complex, as well as with the restoration and management of the ecosystem. Visitors would also experience a wide variety of indoor and outdoor interpretive programming.	This alternative combines concepts of the other three action alternatives. This alternative would provide visitors with interpretation of the evolution of the complex from the last glacial retreat and opportunities to enjoy appropriate low-impact outdoor recreation. Ecological resources would largely be managed to reveal the glacial landscape. Sensitive areas would be protected, and visitor access would be highly controlled in these areas. Visitors would experience a wide variety of indoor and outdoor interpretive programming.
FACILITIES					
Wilkie Farmstead	Buildings preserved but not open for public access	All buildings removed	Buildings renovated while maintaining extensive integrity and opened to public access in visitor contact space.	Buildings renovated and reused. Incidental public access to part of the Wilkie property.	Original appearance of the buildings would be retained to the extent that is practical given the overall goal of using this area to support administrative, maintenance, and visitor center functions while demonstrating sustainable building.
Old Sauk Pass	No changes	No changes	Limited access for through traffic on Old Sauk Pass to allow safe passage between north and south sections of complex.	Limited access for through traffic on Old Sauk Pass to allow safe passage between north and south sections of complex.	Limited access for through traffic on Old Sauk Pass to allow safe passage between north and south sections of complex.

TABLE 6: SUMMARY OF THE KEY ELEMENTS OF THE ALTERNATIVES (CONTINUED)

	Alternative 1: No Action, Continuation of Current Management	Alternative 2: Ecological Restoration	Alternative 3: Interpretation and Education Emphasis	Alternative 4: Outdoor Recreation Emphasis	Alternative 5: Preferred Alternative
Construction	No new construction	No new construction	New construction and some renovation	New construction and extensive renovation	Development of the core of the site to accommodate administrative and maintenance functions and provide for a visitor center. Development would meet high standards for sustainability.
LANDSCAPE					
Resource conditions and management	No comprehensive guidance on resource management — glacial features would either be revealed for public viewing or not, depending on management approach at the time.	Comprehensive management zoning: a mix of resource conditions in corridor, about 80% of vegetation in natural experience management area and 20% in landscape interpretation management area.	Comprehensive management zoning: a mix of resource conditions in corridor, about 80% of vegetation in landscape interpretation management area and 20% in natural experience management area.	Comprehensive management zoning: a mix of resource conditions in corridor, about 50% of vegetation in landscape interpretation and expanded recreational experience management areas and 50% in natural experience management area.	Comprehensive management zoning: a mix of resource conditions in corridor, about 50% of vegetation in landscape interpretation and expanded recreational experience management areas and 50% of vegetation in natural experience and sensitive resources management areas. A wildlife corridor would be established between Shovelers Sink and the former Wilkie property.
Cross Plains gorge	Gorge trail would not be signed or maintained — remains an informal volunteer trail No trail into the gorge No bridge construction Vegetation would not be comprehensively managed	Minimally improved trail around gorge would replace volunteer trail, maintained and with interpretive signs No trail into the gorge No bridge construction Vegetation would not be comprehensively managed	Improved trail around gorge would replace volunteer trail, maintained and with interpretive signs Trail into part of the gorge No bridge construction Vegetation would not be comprehensively managed	Trail to and along the gorge with overlooks would replace volunteer trail, surfaced at least in part for people with disabilities No trail into the gorge Construct bridge (if feasible) Vegetation would not be comprehensively managed	Trail to and along the gorge with overlooks would replace volunteer trail, surfaced at least in part for people with disabilities No trail into the gorge No bridge construction Vegetation would not be comprehensively managed
Oak savanna	Preserved or restored on an ad hoc basis	Preserved or restored	Preserved or restored	Preserved or restored	Preserved or restored

TABLE 6: SUMMARY OF THE KEY ELEMENTS OF THE ALTERNATIVES (CONTINUED)

	Alternative 1: No Action, Continuation of Current Management	Alternative 2: Ecological Restoration	Alternative 3: Interpretation and Education Emphasis	Alternative 4: Outdoor Recreation Emphasis	Alternative 5: Preferred Alternative
Views	Contrast between glaciated and unglaciated areas may be lost Views from 5 highpoints, most not interpreted and no formal access	Contrast between glaciated and unglaciated areas obvious over 45% of site and potentially obscured over 55% (3 out of 5 views obvious) Views from 5 highpoints, interpreted and with formal trails to viewpoints	Contrast between glaciated and unglaciated areas obvious over 80% of site and potentially obscured over 20% (6 out of 6 views obvious) Views from 6 viewpoints, interpreted and with formal trails to viewpoints (significant sixth point)	Contrast between glaciated and unglaciated areas obvious over 70% of site and potentially obscured over 30% (6 out of 6 views obvious) Views from 6 viewpoints, interpreted and with formal trails to viewpoints (significant sixth point)	Contrast between glaciated and unglaciated areas obvious over 70% of site and potentially obscured over 30% (6 out of 6 views obvious) Views from 6 viewpoints, interpreted and with formal trails to viewpoints (significant sixth point)
VISITOR EXPERIENCE					
Recreation	Hiking on volunteer trails and low-impact activities The Ice Age National Scenic Trail would be built. One or two short formal trails to key interpretive locations would also be built Bicycling on existing roadways No camping No indoor sheltered space to rest and obtain information	Hiking on formal trails (about 6 miles) and low-impact activities Formal trails would be developed, marked, interpreted, or maintained to direct use Spur trails from the Ice Age National Scenic Trail throughout complex Bicycling on existing roadways No indoor space to rest but covered, sheltered kiosks offering information	Hiking on formal trails (about 13 miles) Formal trails would be developed, marked, interpreted, or maintained to direct use Spur trails from the Ice Age National Scenic Trail throughout complex Bicycling on existing roadways No camping No outdoor facilities offering information and visitor contact	Hiking on formal trails (about 13 miles) Formal trails would be developed, marked, interpreted, or maintained to direct use Spur trails from the Ice Age National Scenic Trail throughout complex Bicycling on existing roadways and paved bicycle trail Camping (primitive and limited) Outdoor facilities such as picnic shelters Indoor facilities at the visitor center	Hiking on formal trails (about 13 miles) Formal trails would be developed, marked, interpreted, or maintained to direct use Spur trails from the Ice Age National Scenic Trail throughout complex Bicycle path would be accommodated along U.S. Highway 14 Camping (primitive and limited) Indoor facilities and picnic area at the visitor center
Quiet/solitude Encounters with other visitors	Feeling of quiet along the trail Solitude is likely Strong sense of nature immersion	Feeling of quiet along the trail Solitude is probable Definite sense of nature immersion	Feeling of quiet along the trail Some encounters with other visitors would be expected Some sense of nature immersion	Feeling of quiet and nature immersion is less likely during the day due to presence of developed management area High level of encounters with other visitors expected given level of amenities at complex Possibility for an overnight stay offers a type of immersion (due to length of stay)	Feeling of quiet and nature immersion is less likely during the day due to presence of developed management area High level of encounters with other visitors expected given level of amenities at complex Possibility for overnight stay offers a type of immersion (due to length of stay)

TABLE 6: SUMMARY OF THE KEY ELEMENTS OF THE ALTERNATIVES (CONTINUED)

	Alternative 1: No Action, Continuation of Current Management	Alternative 2: Ecological Restoration	Alternative 3: Interpretation and Education Emphasis	Alternative 4: Outdoor Recreation Emphasis	Alternative 5: Preferred Alternative
Interpretation	No interpretation beyond 1–2 waysides Possible volunteer-led tours, limited Interior space not visitor-ready, no shelter	Very limited interpretive programming would focus on the evolution of natural conditions since the glacial period under minimal human influence	Interpretive programming would focus on the influence of glacial activity on human use and settlement patterns Scheduled ranger-led tours	Variety of interpretive programming Potential for more than two waysides and interpretive trails (about 15 miles) designed to allow visitors to have contact with the fundamental resources	Scheduled and frequent ranger-led tours Interior exhibits and media (such as film) and adequate space for large education classroom-type programming
	No restrooms, parking would remain as it is now, very limited	Potential for more than two waysides and interpretive trails (about 6 miles) designed to allow visitors to have contact with the fundamental resources Occasional volunteer-led tours No interior shelter for visitors Parking and privies	Some interior exhibits, inadequate space for large education classroom-type programming Parking and restrooms	Scheduled and frequent ranger-led tours Interior exhibits and media (such as film) and adequate space for large education classroom-type programming Evening interpretive programs Parking and restrooms	Evening interpretive programs Parking and restrooms
BOUNDARY					
Acreage	Total Acres: 1,473	Total Acres: 1,473	Total Acres: 1,701	Total Acres: 1,701	Total Acres: 1,701

TABLE 7: SUMMARY COMPARISON OF IMPACTS OF THE ALTERNATIVES

Resource Topic	Alternative 1: No Action, Continuation of Current Management	Alternative 2: Ecological Restoration Emphasis	Alternative 3: Interpretation and Education Emphasis	Alternative 4: Outdoor Recreation Emphasis	Alternative 5: Preferred Alternative
SOIL RESOURCES	<p>Alternative 1 would have some beneficial impacts on soils due to conversion of farm land to prairie.</p> <p>There could be moderate to major adverse effects from erosion due to unauthorized trails.</p> <p>The potential impacts on soils from trail construction and use of the Ice Age National Scenic Trail would be mitigated to a negligible level.</p>	<p>Alternative 2 would have some beneficial impacts on soils due to conversion of farm land to prairie.</p> <p>Increased trail usage would likely result in minor impacts on trails from compaction.</p> <p>There could also be moderate impacts from compaction in parking areas, which would eventually be paved.</p> <p>Erosion impacts in the gorge itself would be negligible.</p> <p>There could be moderate adverse impacts on soil and the forest duff covering the gorge walls until the park has the capacity to keep the public off the walls.</p>	<p>Alternative 3 would have some beneficial impacts on soils due to conversion of farm land to prairie.</p> <p>Construction activities could potentially have a temporary moderate adverse impact on soils from erosion and compaction in areas subject to construction.</p> <p>Minor adverse impacts from foot traffic following construction would be confined to areas around buildings and parking lots.</p> <p>There would be a reduction in uncontrolled human activity, thus a reduction in the potential for soil compaction and erosion, resulting in minor to moderate beneficial impacts on those areas.</p>	<p>Alternative 4 would have some beneficial impacts on soils due to conversion of farm land to prairie.</p> <p>Construction activities could potentially have a temporary moderate adverse impact on soils from erosion and compaction in areas subject to construction.</p> <p>Minor adverse impacts from foot traffic following construction would be confined to areas around buildings and parking lots.</p> <p>Increased visitation could result in a moderate adverse impact on the steep slopes facing Black Earth Creek, especially along the trail.</p> <p>There would be a reduction in uncontrolled human activity, thus a reduction in the potential for soil compaction and erosion, resulting in minor to moderate beneficial impacts on those areas.</p>	<p>Alternative 5 would have some beneficial impacts on soils due to conversion of farm land to prairie.</p> <p>Construction activities could potentially have a moderate adverse impact on soils from erosion and compaction during construction.</p> <p>Minor adverse impacts from foot traffic following construction would be confined to areas around buildings and parking lots.</p> <p>There would be a reduction in uncontrolled human activity, thus a reduction in the potential for soil compaction and erosion, resulting in minor to moderate beneficial impacts on those areas.</p>
	<p>Future actions would contribute very little to cumulative impacts when considered with the long-term negligible to major adverse impact on soils from alternative 1.</p>	<p>Future actions would contribute very little to cumulative impacts when considered with the long-term negligible to moderate adverse impact on soils.</p>	<p>Future actions would contribute very little to cumulative impacts when considered with the long-term minor to moderate adverse impact on soils.</p>	<p>Future actions would contribute very little to cumulative impacts when considered with the long-term minor to moderate adverse impact on soils.</p>	<p>Future actions would contribute very little to cumulative impacts when considered with the long-term minor to moderate adverse impact on soils.</p>

TABLE 7: SUMMARY COMPARISON OF IMPACTS OF THE ALTERNATIVES (CONTINUED)

Resource Topic	Alternative 1: No Action, Continuation of Current Management	Alternative 2: Ecological Restoration Emphasis	Alternative 3: Interpretation and Education Emphasis	Alternative 4: Outdoor Recreation Emphasis	Alternative 5: Preferred Alternative
WATER QUALITY					
	There would be negligible adverse impact from agricultural runoff because no chemicals are being applied.	Restoring presettlement vegetation would result in negligible adverse effects on groundwater.	There would be a negligible impact on groundwater from installation of a new well and septic system near the core area of the property.	Same as alternative 3.	Same as alternative 3.
		The discontinuation of agricultural chemicals would likely have a beneficial effect on groundwater, but the amount of this effect cannot be quantified.			
	Impacts on water quality from road maintenance activities, such as road salt runoff, would continue. Future actions would contribute very little to cumulative impacts when considered with the potential long-term negligible adverse impact on water quality.	Impacts on water quality from road maintenance activities, such as road salt runoff, would continue. If impacts from future actions were added to the negligible adverse impacts on water quality from alternative 2, there would be long-term negligible to moderate adverse cumulative impacts on water quality in the complex.	Impacts on water quality from road maintenance activities, such as road salt runoff, would continue. If impacts from future actions were added to the negligible to moderate adverse impacts on water quality from alternative 3, there would be long-term negligible to moderate adverse cumulative impacts on water quality in the complex.	Same as alternative 3.	Same as alternative 3.
SOUNDSCAPES					
	There would be negligible adverse impacts on the soundscape from visitation.	There would be negligible adverse impacts on the soundscape from increased visitation. Building removal would result in temporary moderate adverse impacts on the soundscape.	There would be minor adverse impacts on the soundscape from increased visitation. Renovation activities would result in temporary moderate adverse impacts on the soundscape.	There would be minor adverse impacts on the soundscape from increased visitation. Construction activities would result in temporary moderate adverse impacts on the soundscape.	There would be negligible to minor adverse impacts on the soundscape from increased visitation.
	Future actions would contribute very little to cumulative impacts when considered with the long-term negligible adverse impact on the soundscape.	Future actions would contribute very little to cumulative impacts when considered with the long-term negligible to moderate adverse impact on the soundscape.	Future actions would contribute very little to cumulative impacts when considered with the long-term minor to moderate adverse impact on the soundscape.	Cumulative impacts would be the same as described for alternative 3.	Future actions would contribute very little to cumulative impacts when considered with long-term minor to moderate adverse impact on the soundscape.

TABLE 7: SUMMARY COMPARISON OF IMPACTS OF THE ALTERNATIVES (CONTINUED)

Resource Topic	Alternative 1: No Action, Continuation of Current Management	Alternative 2: Ecological Restoration Emphasis	Alternative 3: Interpretation and Education Emphasis	Alternative 4: Outdoor Recreation Emphasis	Alternative 5: Preferred Alternative
VEGETATION AND WILDLIFE					
	Because there would be few defined trails, there would be some risk of vegetation trampling from the creation of social trails, but potential adverse vegetation impacts from trampling would likely be negligible.	Managing the complex for a natural experience, in which vegetation would be restored to presettlement conditions, would have a moderate beneficial impact on vegetation and wildlife.	Since there would be a range of ways to reveal glacial features through natural resource management (for example, planting short row crops or short prairie grasses), impacts on vegetation and wildlife would range from negligible to moderately beneficial.	The combination of management prescriptions (almost evenly divided between landscape interpretation, expanded recreational experience, and natural experience) would result in minor beneficial impacts on vegetation and wildlife.	Same as alternative 4.
	Future actions, when considered with the long-term negligible adverse impact on vegetation and wildlife, under alternative 1, would contribute very little to cumulative impacts when considered with the long-term negligible adverse impact on vegetation and wildlife.	If future actions were added to the beneficial impacts of alternative 2, there would be combined long-term minor to moderate adverse cumulative impacts on vegetation and wildlife in the complex. However, the effects would not add to the overall adverse cumulative impacts because alternative 2 actions would all be beneficial.	Cumulative impacts would be the same as described for alternative 2.	Cumulative impacts would be the same as described for alternative 2.	Cumulative impacts would be the same as described for alternative 2.
SOCIOECONOMICS					
	All alternatives would produce beneficial impacts by likely increasing the value of adjacent lands; all alternatives would have adverse impacts on the local tax base if lands were federally owned. Economic impacts could be beneficial or adverse, depending on net property tax receipts.	Same impacts as presented for alternative 1.	Same impacts as presented for alternative 1.	Same impacts as presented for alternative 1.	Same impacts as presented for alternative 1.

TABLE 7: SUMMARY COMPARISON OF IMPACTS OF THE ALTERNATIVES (CONTINUED)

Resource Topic	Alternative 1: No Action, Continuation of Current Management	Alternative 2: Ecological Restoration Emphasis	Alternative 3: Interpretation and Education Emphasis	Alternative 4: Outdoor Recreation Emphasis	Alternative 5: Preferred Alternative
VISITOR USE AND EXPERIENCE					
	There would be either long-term beneficial or long-term adverse cumulative impacts on the socioeconomic environment, depending on the nature and scope of any development on adjacent lands and the level of visitation to the complex. All five alternatives would contribute a very small increment to cumulative impacts.				
	Available activities would offer some beneficial experience for visitors over current conditions, and this alternative would result in negligible to minor beneficial impacts on visitor experience.	Same impacts as presented for alternative 1.	Available activities would offer a beneficial experience for visitors over current conditions, and this alternative would result in minor beneficial impacts on visitor experience.	Available activities would offer a beneficial experience for visitors over current conditions, and this alternative would result in minor to moderate beneficial impacts on visitor experience.	Available activities would offer a beneficial experience for visitors over current conditions; this alternative would result in moderate beneficial impacts on visitor experience.
	The beneficial impacts on visitor experience from each of the five alternatives, when combined with other present and reasonably foreseeable future actions outside the complex, would result in long-term negligible to minor adverse cumulative impacts, depending on the amount and location of development and level of increase in traffic volume. However, the development of the bike path would add a moderate beneficial increment to the overall cumulative impact.	Cumulative impacts would be the same as presented for alternative 1.	Cumulative impacts would be the same as presented for alternative 1.	Cumulative impacts would be the same as presented for alternative 1.	Cumulative impacts would be the same as presented for alternative 1.

Affected Environment



Chapter Three

AFFECTED ENVIRONMENT



THIS CHAPTER DESCRIBES the existing environment of the Ice Age Complex and the surrounding region.

It focuses on the park resources, uses, and facility and socioeconomic characteristics that could potentially be affected by each of the alternatives.

GEOLOGIC AND SOIL RESOURCES

The Ice Age Complex at Cross Plains (“Ice Age Complex” or “complex”) straddles two distinctly different landscapes. The northern and eastern edges were covered by glaciers during the Late Wisconsin glaciation, which began 25,000 to 30,000 years ago. Excellent examples of end moraine, ice marginal and subglacial channels, glacial outwash, and ice marginal lakes are within the boundaries. The remainder of the complex is in the driftless area and was apparently never glaciated. Its hills and valleys are a product of millions of years of hillslope and stream erosion on sedimentary bedrock that consists of sandstone and dolomite. The soils in this area consist of weathered bedrock covered by windblown silt called loess.



At some time in the past, solution of the dolomite resulted in the formation of cave passages that likely run beneath the area. A collapse of over-lying sandstone into one of these caves has resulted in at least two sinkholes. One of sinkholes now drains water from Shoveler Pond into this likely cave system during the spring when water levels are high.

During the Late Wisconsin glaciation, this erosional landscape was modified by torrents of glacial meltwater that flowed down Black Earth Creek valley and lesser amounts that flowed from the ice margin along what is now Timber Lane and Old Sauk Pass Road. This water flowed northward along the ice margin before draining into the Black Earth Creek valley, first along the ice edge and later beneath the ice in what is now called Cross Plains gorge.

*Early morning
dew drops.*



Bedrock Geology

The bedrock in the Ice Age Complex is all sedimentary and consists primarily of sandstone and dolomite of Paleozoic age. Figure 10 shows the distribution of bedrock units at the complex. Figure 11 portrays a north-south cross section through the complex showing the sedimentary rock units. Cambrian sandstone does not crop out at the surface, but it is close to the surface in Black Earth Creek valley. There are small surface outcrops of the remaining rock units at the complex, and not all of these have been mapped. There are no other large outcrops.

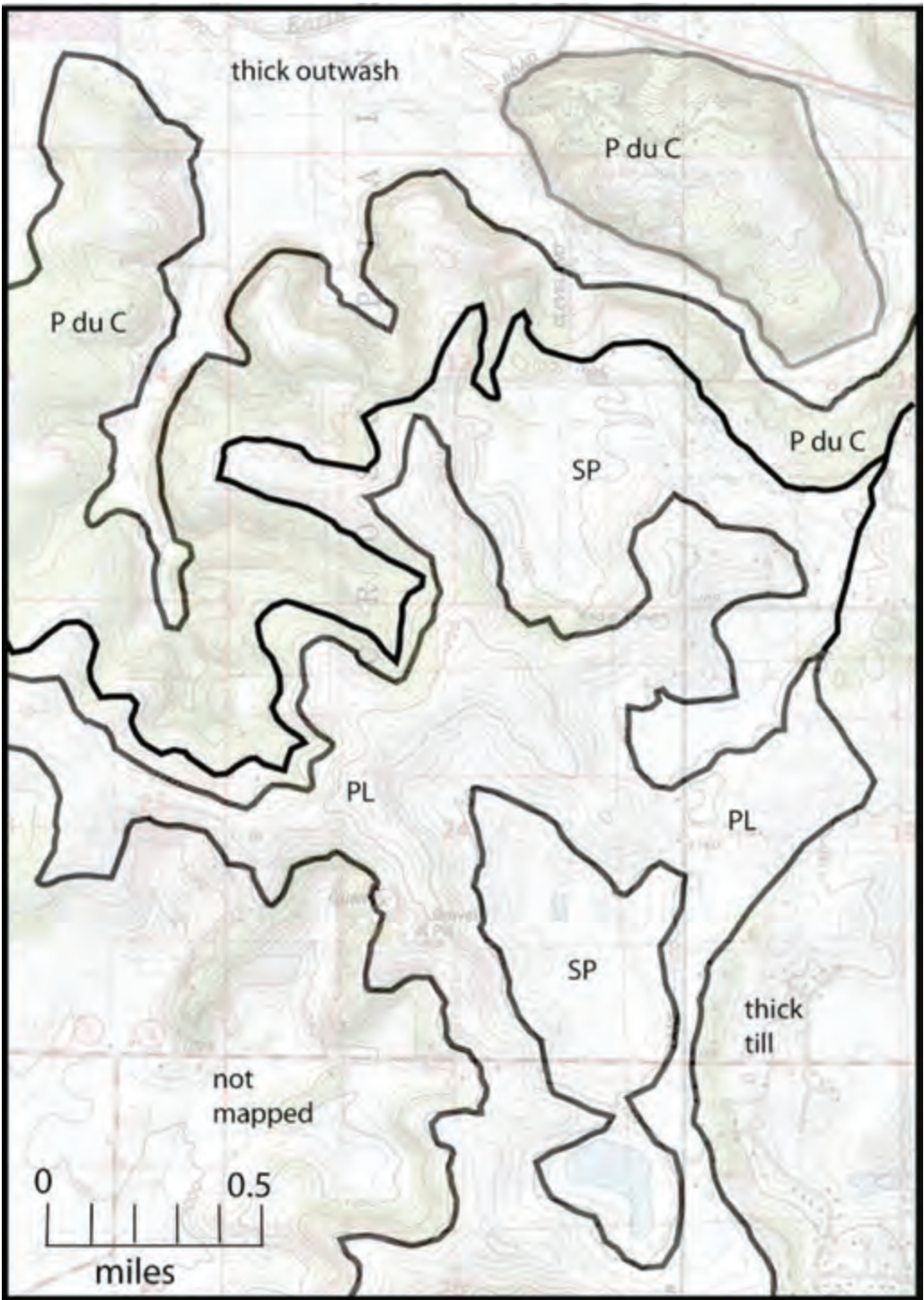
All of the remaining sedimentary rocks exposed at the Ice Age Complex are Ordovician age. The oldest rock unit exposed in outcrop is dolomite of the Prairie du Chien Group. The best exposures are along the

walls of Cross Plains gorge and along steep slopes facing Black Earth Creek. Fossils called “stromatolites” dominate the rocks deposited during this time, but they are rare and are not an important part of the resource.

Figure 11 shows that sand and gravel cover the bedrock units in most valley bottoms and under the Johnstown moraine, so rock is not mapped there. Because most of the contacts are covered, this map portrays the likely distribution of rocks, but it should not be used for site-specific purposes without drilling or further research.

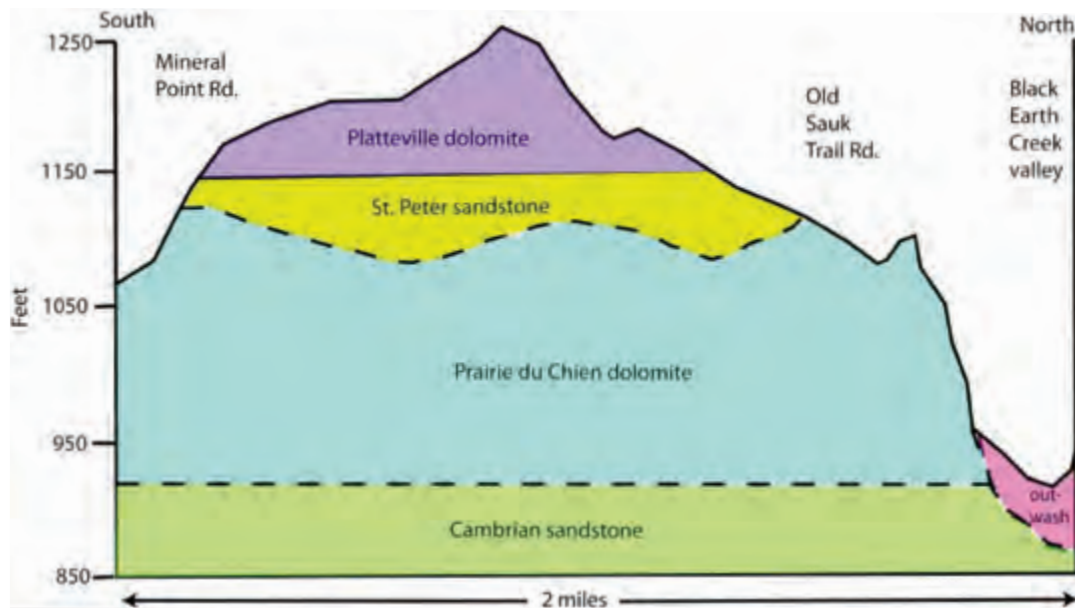


FIGURE 10: DISTRIBUTION OF NEAR-SURFACE BEDROCK UNITS AT THE ICE AGE COMPLEX



- Notes:
- a. Only three units occur near the surface beneath windblown silt (loess).
 - b. PL is Platteville dolomite, SP is St. Peter sandstone, P du C is Prairie du Chien dolomite.

FIGURE 11: NORTH-SOUTH CROSS-SECTION THROUGH THE ICE AGE COMPLEX



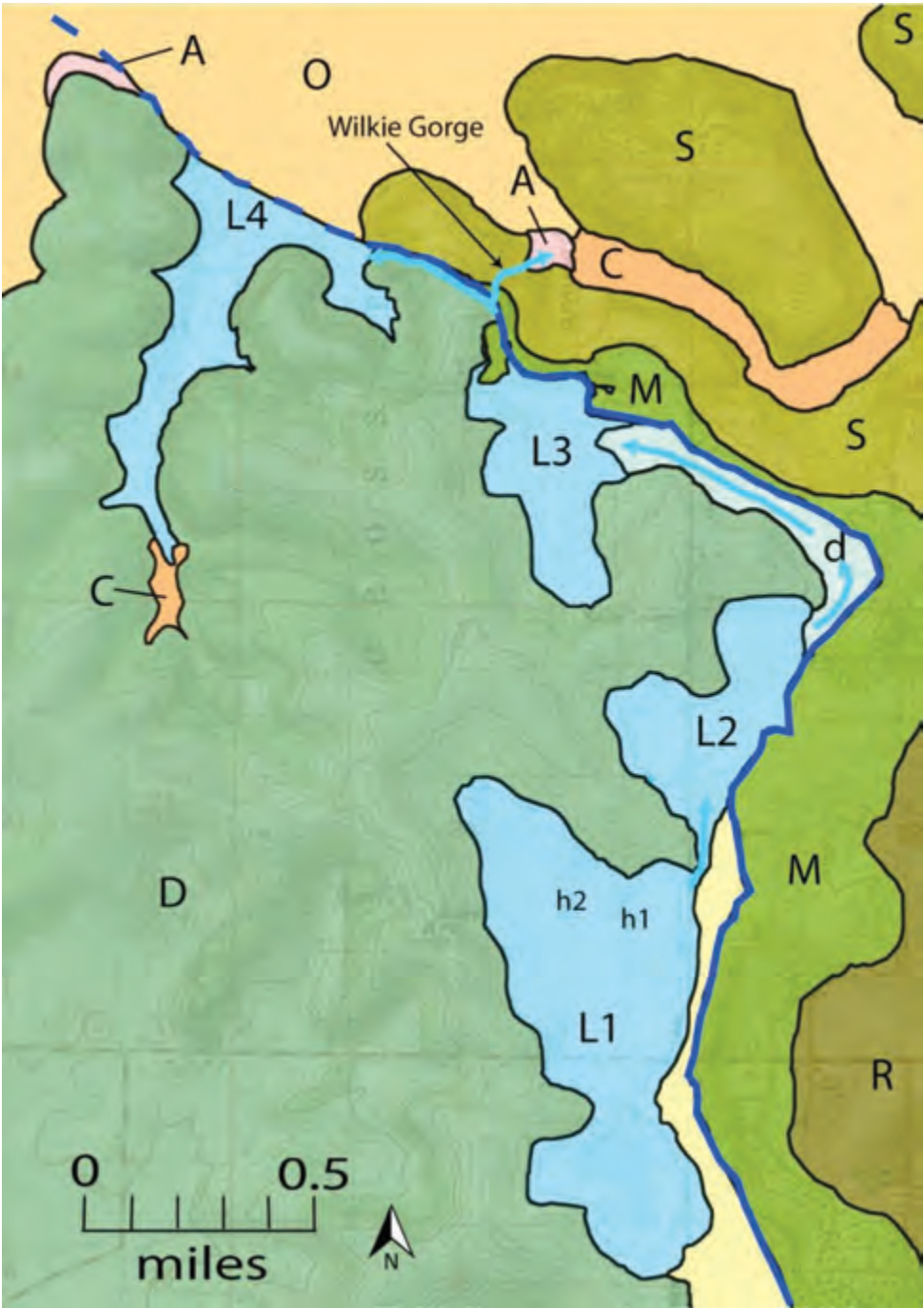
The materials above the bedrock are too thin to show on figure 11. Contacts between bedrock units are mostly projected into the cross-section from logs of wells located south, east, and west of the complex. Because most of the contacts are covered, this cross section portrays the likely distribution of rocks but should not be used for site-specific purposes without drilling or other further research. In particular, the bottom contact of the St. Peter sandstone is quite variable over short distances, and its thickness varies considerably.

The Prairie du Chien dolomite is overlain by the St. Peter sandstone. Although most of the sandstone was deposited in the shallow ocean, part of the St. Peter sandstone consists of wind blown sand. All of it is made up of well-rounded, quite pure quartz sand. St. Peter sandstone is the surface rock in much of the central part of the Ice Age Complex. It is well exposed at the sinkhole near the northeastern edge of the Shoveler Pond ("h1" on figure 12). It is also exposed along the trail just south of the Wilkie farm buildings. St. Peter sandstone contains some trace fossils, such as worm burrows, but they are not seen in the small outcrops at the Ice Age Complex. Fossils are not an important part of this resource.

Figure 12 shows that several shallow lakes were present when the ice was at the Johnstown moraine. L1 is the highest; L2 was just slightly lower and was dammed by ice in the present position of Old Sauk Road; and L3 was substantially lower than L1 and L2. Possible sinkholes are depicted by h1 and h2.

Platteville dolomite of the Sinnipee Group was deposited in the sea about 450 million years ago. It is well exposed in the Wingra Stone quarry north of Mineral Point Road and the road cut on Mineral Point Road. There are low exposures of it elsewhere. Corals, mollusks, and brachiopods are common, especially farther west in the driftless area. They are very difficult to find in the dolomite at the complex, and they are not an important part of the resource. The Platteville dolomite is the youngest bedrock in the Ice Age Complex. Many of the surrounding hills that are part of the viewscape, especially those to the west, are capped with the even younger Galena dolomite. West Blue Mound, the highest hill that can be seen from the Ice Age Complex, is capped by even younger Silurian dolomite.

FIGURE 12: DETAILED MAP OF GLACIAL AND RELATED DEPOSITS IN THE ICE AGE COMPLEX



Notes:

C = colluvium	d is a drainage ways
M is the Johnstown moraine	A is alluvial fan
D is driftless area	O is outwash
R is thick till not in moraine	S is steep slope controlled by bedrock with patchy till cover

There is also colluvium at the base of most steep slopes, but it is too narrow to map at this scale

The remaining geologic and soil resources result from earth surface processes such as weathering, erosion, and glaciation.

Karst Topography. Karst topography develops when limestone bedrock is eroded and dissolved by surface and groundwater. Caves and caverns are common in limestone, and a common surface expression of karst is the sinkhole, or sink. A sinkhole forms where surface water finds a path down into the limestone. Solution of the limestone takes place, slowly enlarging the opening and allowing more water to pass through. In some cases a sinkhole can form rapidly when the roof of the cave collapses.

Shoveler Sink drains into a sinkhole at times of high water. It has no other outlet. The location of the sinkhole is shown as h1 on figure 12. The land around the sinkhole appears to have been modified by human activity. There is another depression north of the h1 sinkhole. This might be a sinkhole, or it might be an abandoned small quarry that was mined at some time in the past. When viewed in 2009, there was no evidence of water entering the ground through this depression.

When the glacier was present just to the east, it is possible that these sinkholes were actually springs where groundwater discharged. Water under pressure would have been forced through the groundwater system, and would have been able to come to the surface outside the ice-covered area. There were likely also springs discharging glacial melt water into the upper part of the Sugar River basin at the southwest edge of the Ice Age Complex.

Glacial Deposits. The most recent glaciation, the late Wisconsin Glaciation, began in Wisconsin about 30,000 calendar years ago. Ice from Canada, north of the eastern part of the Lake Superior basin, advanced southwestward down the Green Bay–Lake Winnebago lowland. This lobe of ice is called the Green Bay lobe, and its maximum extent lies along the eastern and northern edges of the Ice Age Complex.

Johnstown Moraine. Moraines are ridges of glacial debris. They form wherever sand and gravel and till are piled up either on or adjacent to a glacier. End moraines are those that form at the edge (end) of the glacier as debris is carried to the ice margin and released as the glacier ice melts. The moraine at the outer edge of the southern Green Bay lobe is called the Johnstown moraine.

In much of southern Wisconsin, moraines are only about 50 feet high and 0.25 to 0.5 mile wide. The best place to see the moraine at the Ice Age Complex is northwest of the intersection of Cleveland Road and Old Sauk Pass. There is a single crested ridge up to 50 feet high. There are scattered erratics on the surface.

Glacial Lakes. Glacial lakes are also called ice-dammed lakes. When the glacier sat at the Johnstown moraine, the climate was very cold, and there was permafrost in front of and beneath the glacier edge. Meltwater was probably only produced on warm days for a month or two in summer. Water that was produced by melting was dammed between the glacier and the hills of the driftless area landscape to the west in several small basins at the Ice Age Complex. Lake L1 on figure 12 had the highest level. There is still silty lake sediment at least up to an elevation of 1,150 feet and perhaps slightly higher. A narrow band of outwash sand separates the finer silty lake sediment from the till in the Johnstown moraine. Lake L2 seems to have been just slightly lower than Lake L1. Water from Lake L2 drained through a drainage way into Lake L3.

It appears that Lake L3 drained through an ice-marginal channel along the ice edge across the ridge north of Old Sauk Pass and into Black Earth Creek valley before Cross Plains gorge was cut. At some point, perhaps when climate warmed enough to allow melting at the bottom of the glacier near its edge, water found its way under the ice and down the steep slope on the side of Black Earth Creek valley. It was this flow of water that eroded Cross Plains gorge.

Lake L4 formed in a north-flowing tributary valley of Black Earth Creek between the glacier edge and the Driftless Area upland. It could have been dammed directly by the ice, or it could have been dammed by the accumulating outwash in Black Earth Creek valley.

Cross Plains Gorge and Black Earth Creek Valley.

Cross Plains gorge is a submarginal chute, a type of channel that carries water from the ice edge down under the ice. Its location was probably determined by a pre-existing weakness or opening in the ice such as a crevasse. The water in Lake L3 (on figure 12) was about 200 feet higher than the Black Earth Creek valley, and water would naturally take the steepest path available to the bottom of the valley. Once water made its way beneath the ice to the bottom of Black Earth Creek valley, water under high pressure and flowing rapidly cut the deep gorge that we see today. Black Earth Creek valley now has outwash sand and gravel over 200 feet thick that was deposited by braided streams flowing beneath and in front of the glacier.

Soils

Tens of millions of years of erosion by rainwash on slopes and by streams produced most of the hills and valleys in the landscape today. Soils on bedrock in the driftless area are of two main origins. Weathering of sandstone produced quartz sand, and weathering of dolomite produced a clayey residuum that is distinctly different. Over both of these weathering products, windblown silt, called loess, was deposited during the last glaciation. In general, soils in the unglaciated part of the Ice Age Complex are thin silt loams that are susceptible to erosion on steep slopes. Soils are thicker near the base of slopes.

Soils on the moraine are also silt loam soils for the most part. In places where the loess cover is thin, rocks from the underlying till show through. Soils on the former lake beds (refer to figure 12) are silty and sandy with few stones. In its comprehensive plan (VCP 2008), the village of Cross Plains commented on the

productive nature of these soils: “Dane County is one of the most productive agricultural counties in Wisconsin.” At the same time, the comprehensive plan notes that “the County is in the third most threatened farm area in the country.” One of the reasons for this threat is the rapid pace of development that removes productive soils from cultivation (VCP 2008, p. 17).

WATER QUALITY

The region surrounding the Ice Age Complex contains one of the Midwest’s most important trout fishing streams, the Black Earth Creek. This small spring-fed stream runs from the terminal moraine near Cross Plains, northwest to the Wisconsin River, traversing a number of scenic hill-and-valley landscapes along the way. The creek and its surrounding lands provide a number of recreational opportunities such as fishing, hiking, snowshoeing, cross-country skiing, and horseback riding. Because of its high recreational and ecological value, the creek was named as one of Wisconsin’s “Land Legacy” areas, which are regions of the state that are important in meeting the state’s recreation and conservation needs. Within the proposed complex, the glacier originally impounded four proglacial lakes. Today, the southernmost proglacial lake has been divided in two by County Trunk S (Mineral Point Road) and consists of two water-filled basins: Coyle Pond and Shoveler Sink. The other proglacial lakes are dry and filled with agricultural crops. There are a few intermittent streams that bisect the complex. One follows a deep ravine on the south side of the former Wilkie property before emptying onto the former McNutt property at the western edge of the proposed site. There is at least one spring north of Old Sauk Pass that has been partially developed to include a stock tank. The spring drains northward toward Black Earth Creek. In the center of the complex, south of Old Sauk Pass, water runoff travels north to a depression where it enters and flows through the gorge, eventually reaching Black Earth Creek.

Nearly all of the Ice Age Complex is a groundwater recharge area, meaning surface water goes into the groundwater system. However, much of the precipitation that falls on the uplands runs off on the surface. Some of that water flows northward to Black Earth Creek, some southward to the Sugar River, and some eastward to the Yahara River basin. Because the walls and the floor of Cross Plains gorge are steep, precipitation that falls there does not remain in the gorge, but instead flows northward towards Black Earth Creek. Shoveler Sink and Coyle Pond sit on the surface water divide between these basins.

SOUNDSCAPES

There is abundant natural quiet within most of the complex given its isolation from road noise and from an urban center. While there are farms throughout the site, they are small farms, not large agricultural operations, and generate little unnatural sound. As one moves from the center of the complex towards its northern and eastern edges along U.S. Highway 14 and Timber Lane, natural quiet dissipates and road noises begin to dominate. Similarly, the sound of traffic from the two roads (Old Sauk Pass and Mineral Point Road) that traverse the site becomes louder the closer one moves towards those roads. This sound assessment is based on experience of the team members writing this plan; a formal sound inventory has not been conducted at the complex.

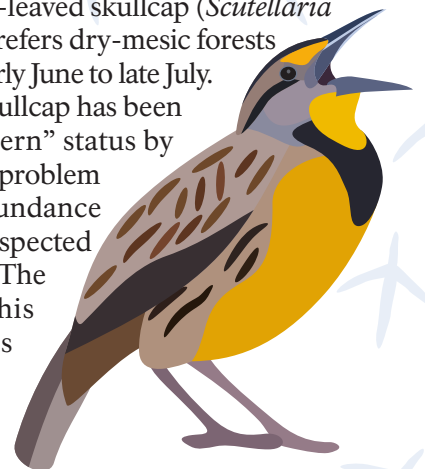
VEGETATION AND WILDLIFE

The Wisconsin Department of Natural Resources notes that the Ice Age Complex comprises three ecological landscapes: Western Coulee and Ridges, Central Sand Hills, and Southeast Glacial Plains. Although this combination of landscapes in the complex indicates a variety of native vegetation, southern dry-mesic forest dominated the site before European settlement.

The southern dry-mesic forest is prominently red and white oak, with shagbark hickory, black cherry, white oak, and basswood as canopy associates. Disturbance history and landscape position have allowed variability within the areas of southern dry-mesic forest. This variability includes areas dominated by large white oak, some greater than 24 inches in diameter, and open grown; some areas dominated by red oak with white birch and big-tooth aspen as canopy associates; and other areas with a very widely spaced canopy and a dense tall shrub layer composed mostly of common buckthorn and prickly ash.

The southern mesic forest can be found in the narrow bottoms of steep ravines. This forest is characterized by a canopy of sugar maple with basswood and ironwood as associates. The shrub layer has a moderate cover, with eastern prickly gooseberry as a common species. The forest ground layer has many species that bloom in the spring and include wild ginger, sharp-lobed hepatica, jack-in-the-pulpit, mayapple, and bloodroot. Spring ephemerals are also present, although not abundant. Shoveler Sink is currently fringed by reed canary grass with some sedges and smartweeds. Many of the uplands have been planted into prairie with big bluestem and switch grass, as well as smooth brome grass for hay and pasturing. Many of the open fields in the Ice Age Complex are cropped for corn and soybeans or remain as old fields.

There is one rare plant in the Ice Age Complex: the heart-leaved skullcap (*Scutellaria ovata*). This plant prefers dry-mesic forests and flowers from early June to late July. The heart-leaved skullcap has been given “special concern” status by the state, wherein a problem with the species abundance or distribution is suspected but not yet proved. The main purpose of this category is to focus attention on certain species before they become threatened or endangered.



Because oak openings, also called “oak savanna,” are so rare today in comparison to their large historic range, restoring oak openings has been given special attention in recent years. The Board of Regents at the University of Wisconsin has noted that “In the 1800s, oak savanna (or oak openings) once covered more than 5,000,000 acres in Wisconsin . . . now, only a few thousand [acres] of this native landscape remain” (UW 2001). The Ice Age Complex historically contained oak openings. In the absence of fire, many of the historic oak openings have converted to closed-canopy forests. According to Wisconsin’s Natural Heritage Inventory Program, “the presence of several areas with open-grown and semi-open-grown oaks and some residual savanna ground layer species such as Tinker’s weed, indicates that there is a possibility of restoring the critically imperiled globally rare oak opening natural community within the project area” (WDNR et al. 2006).

Some invasive plants are well-established within the Ice Age Complex, including common buckthorn, Tatarian honeysuckle, prickly ash, and reed canary grass. Other invasive plants that occur and present possible future threats to diversity include garlic mustard, winged burning-bush, star-of-Bethlehem, multiflora rose, Asian bittersweet, Japanese barberry, and common burdock. Numerous other invasive species are present in the old field and planted prairie areas.

There are two species of birds that are listed as “threatened” on a state level in the Ice Age Complex and two species that have a special concern status. The threatened birds are Henslow’s sparrow, which prefers old fields, open grasslands, wet meadows, unmowed highway right-of-ways, undisturbed pastures, timothy hay fields, and fallow land grown up to tall weeds; and the Hooded warbler, which is found in large upland forest tracts in southern Wisconsin, where they occur in pockets of dense understory near small or partial canopy openings. The breeding season for the Henslow’s sparrow extends from mid-May through mid-July. The breeding season for the

hooded warbler starts a bit later (in late May) and also extends through mid-July.

The two birds of special concern are the western meadowlark and the yellow-billed cuckoo. The western meadowlark inhabits pastures and small grain fields, as well as other short, open grasslands and agriculture fields, including hayfields. The yellow-billed cuckoo prefers open deciduous woodlands with dense shrubby undergrowth, especially along the backwaters of a major river or slow-moving creek.

The WDNR staff have observed the red-headed woodpecker, a “species of greatest conservation need,” in the walnut grove bordering the south side of Old Sauk Pass. This presence indicates that red-headed woodpeckers would be expected to nest in cavity trees if oak opening is restored.

Shoveler Sink, a remnant glacial depression, provides excellent habitat for migratory birds such as waterfowl, shorebirds, songbirds, and waterbirds seeking a freshwater pond, marsh, and grassland. An online checklist program (“eBird”) for recreational and professional bird watchers highlights this important resource, in that at least 17 species of waterfowl have been observed using the pond. Waterbirds recorded include several species of herons and large numbers of geese and cranes that stage there (eBird 2008). The presence of food and water are two important resources present at Shoveler Sink that allow for large numbers of individuals from many species to accumulate during migration. The pond provides floating and submerged plants in the open water zone and is surrounded by an emergent zone that includes cattails, smartweed, and arrowheads whose tubers provide important food for migrating waterfowl and geese.

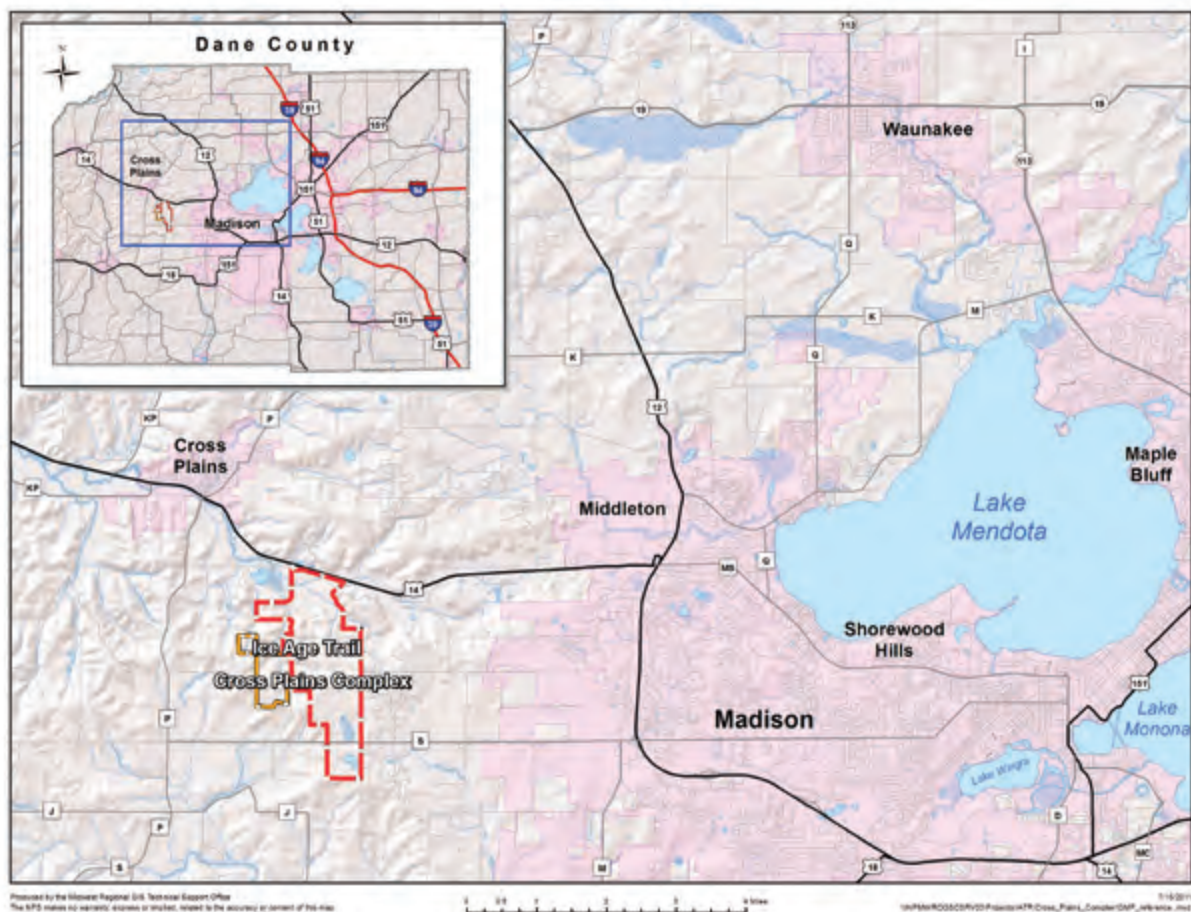
Shoveler Sink is also an important area for breeding amphibians, which in turn, makes it very attractive for waterbirds such as herons and cranes. Stresses to migratory birds include habitat destruction and habitat alteration (Duncan 2002). Many similar ponds and depressions have been filled for agriculture and development, both of which could threaten the viability of this valuable resource. As this depression is maintained through direct precipitation and runoff from the surrounding landscape, nutrient runoff could pose an indirect threat if not monitored closely.

The grasslands surrounding Shoveler Sink, as well as the old agricultural fields in the complex, such as the former McNutt lands, support several conservative grassland obligate species like Henslow's sparrow (8–10 nesting pairs in 2008); eastern meadowlark; one western meadowlark; several bobolink; and dickcissel.

SOCIOECONOMICS

The Ice Age Complex is located in the village of Cross Plains, Wisconsin, between Cross Plains and Middleton, and about 10 miles west of the center of Madison (figure 13).

FIGURE 13: MAP OF DANE COUNTY AND THE ICE AGE COMPLEX



This area is increasing in population. The village of Cross Plains grew from 2,362 to 3,084 in the 1990s — a 23% increase. This growth makes Cross Plains among the fastest growing communities in Dane County (other communities are Middleton and Madison). The county had a population in 2000 of 426,526 and is also a fast-growing area. Dane County is estimated to have a population of 505,385 by 2030. In comparison, the 2030 estimate for Cross Plains is 3,654. Note that these growth projections are from the Wisconsin Department of Administration, but the village of Cross Plains used a different method (acceptable levels of residential development) in its recent comprehensive plan (VCP 2008) to come up with a projection for Cross Plains of 6,084 by 2030. Extrapolating this method to the overall Dane County population, the projection for Dane County would be 841,478. Therefore, using this alternate estimating method, population growth could be even stronger.

Today, the population of this area is relatively young (40% are between ages of 20 and 44) and relatively well-educated (60% have attended at least some college in comparison to 50% statewide) (VCP 2008, p. 9).

Like many local governments around the country, Cross Plains has been struggling in recent years to increase tax revenues and retain open space. There has been pressure to develop the lands that comprise the complex in order to increase property tax revenue, but at the same time, there is tremendous support for keeping these lands free from development. The vision stated in the *Village of Cross Plains Comprehensive Plan* includes these sentences: “The rich natural resources of the village and surrounding countryside and the Black Earth Creek in particular will continue to be a defining feature of the community due to careful preservation efforts” and “Though ties with Madison will strengthen, the Village will retain its character and identity.” Among the specific goals of the comprehensive plan are to “limit conversion of farmland” and “safeguard against increased future erosion.”

Although land use is typically a separate consideration in a socioeconomic analysis, impacts on land use would be the same because all of the GMP/EIS alternatives would change how land is used in essentially the same way. Each of the alternatives proposes working with private owners of all of the land in the complex to protect it from incompatible uses, such as dense development, either by publically acquiring the land or by employing another land protection tool, such as the purchase of an easement. All of the alternatives would change land use in this way, and their impacts on land use do not differ (see chapter 4 for impacts that could result from each alternative).

VISITOR EXPERIENCE

NPS *Management Policies 2006* state that the enjoyment of park resources and values is part of the fundamental purpose of all parks and that the National Park Service is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks. Because many forms of recreation can take place outside a national park setting, the National Park Service seeks to

provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in a particular unit

defer to local, state, and other federal agencies; private industry; and nongovernmental organizations to meet the broader spectrum of recreational needs and demands that are not dependent on a national park setting

Unless mandated by statute, the National Park Service will not allow visitors to conduct activities that

would create an unsafe or unhealthful environment for other visitors or employees

are contrary to the purposes for which the park was established

would unreasonably interfere with the atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic, or commemorative locations within the park; NPS interpretive, visitor service, administrative, or other activities; NPS concessioner or contractor operations or services; or other existing, appropriate park uses

Part of the purpose of the Ice Age Complex is to “provide outdoor recreation and educational opportunities in support of and compatible with the conservation and enjoyment of the nationally significant scenic, historic, natural, and cultural resources within the Complex.” Each of the action alternatives proposed in this document are designed to meet the purpose of the complex but in different ways. The impact analysis presented in chapter 4 estimates impacts on the ability of visitors to experience Ice Age resources under each alternative.



Environmental Consequences



Chapter Four

ENVIRONMENTAL CONSEQUENCES

THE CEQ REGULATIONS that implement the procedural provisions of the *National Environmental Policy Act* (40 Code of Federal Regulations [CFR] 1502) require that environmental documents discuss the environmental impacts (both adverse and beneficial) of a proposed federal action, feasible alternatives to that action, and any adverse environmental effects that cannot be avoided if a proposed action is implemented. In this case, the proposed federal action would be the adoption of a general management plan for the Ice Age Complex at Cross Plains.

The National Park Service (NPS) Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decisionmaking* and its accompanying Handbook require that impacts on park resources be analyzed in terms of their context, duration, and intensity. It is crucial for the public and decision makers to understand the implications of those impacts in the short and long term, cumulatively, and within context, based on an understanding and interpretation by resource professionals and specialists.

This chapter analyzes the environmental impacts of implementing any one of the five alternatives proposed in this document. For each impact topic, there is a description of the methods and assumptions used for the impact analysis. The impact analysis discussions are organized by resource topic, followed by each alternative under each topic. Table 7 in chapter 2 provides a summary of the impacts.

*Bird tracks in
the snow.*



DEFINITIONS FOR EVALUATING EFFECTS

The impact discussion for each resource topic describes the types of impacts (same as the term “effects”) that would result from taking no action or implementing any of the four action alternatives; those effects are described according to the definitions shown below.

Types of Effects

Beneficial Effects. These effects would result in a change that moves a resource toward its desired condition.

Adverse Effects. These effects would result in a change that moves a resource away from its desired condition.

Direct Effects. These effects would be caused by the action and occur at the same place and time as the action.

Indirect Effects. These effects would also be caused by the action, would occur later in time, and would be further removed in distance but would still be reasonably foreseeable; or the response of the target resource would be triggered by the reaction of another resource to the action.

Cumulative Effects. These effects would result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions.

Duration of Effects

Short-term Effects. These effects would be temporary, lasting a year or less, such as effects associated with construction.

Long-term Effects. These effects would last more than one year and could be permanent.

Intensity of Effects

“Intensity” refers to the severity of effects or the degree to which an action would adversely or beneficially affect a resource. The intensity definitions are presented in each resource section because they vary by resource topic.

PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS ON OR IN THE VICINITY OF THE ICE AGE COMPLEX

Cumulative actions are those that have additive impacts on a particular environmental resource. It is irrelevant who takes these actions (that is, they are not confined to NPS or even federal activities), or whether they took place in the past, are taking place in the present, or could take place in the reasonably foreseeable future. The Council on Environmental Quality (CEQ) interprets the *National Environmental Policy Act* (NEPA) and CEQ’s NEPA regulations on cumulative effects as requiring analysis and a concise description of the identifiable present effects of past actions to the extent they are relevant and useful in analyzing whether the reasonably foreseeable effects of the agency’s proposed action and alternatives could have a continuing, additive, and significant relationship to those effects.

The current or reasonably foreseeable future actions considered for the purpose of assessing cumulative effects in this chapter include

agricultural activities

construction of a bike path by the village of Cross Plains along U.S. Highway 14, with a possible decision by NPS staff to provide a route through the complex to connect the city of Middleton to the village of Cross Plains

new residential development

snowmobiling outside the complex boundaries

events, such as the Ford Ironman (whose course currently runs through the complex)

road maintenance activities such as salting for ice melt, which results in runoff and impacts on water quality

SOIL RESOURCES

Analysis Methodology

This impact analysis is based on the knowledge of the soil types at the complex and also how development and other land use changes would impact soils. Soils could be adversely impacted by human activity in two ways: either by increased activity, which would cause soil compaction along trails, parking areas, and other developed areas; or by disturbance of vegetation cover and forest duff on the soil surface, which could lead to soil erosion. Disturbance of vegetation is a potential problem, particularly on steep slopes in the Cross Plains gorge and along the edge of Black Earth Creek valley.

“Intensity” refers to the severity of effects or the degree to which an action would adversely or beneficially affect a resource. The intensity levels used to evaluate impacts on soils are listed below. The intensity levels below apply only to adverse impacts. When the term “beneficial” is used in this analysis to describe impacts, those impacts would always be negligible and long term. In this case “beneficial” refers to the avoidance of loss of productive soil as opposed to increasing the amount of soil. The formation of soil is a complex process that can take more than a thousand years to produce just a single inch of soil. During the process rocks, minerals, and other parent materials are weathered. The resulting soil varies, depending on the degree of weathering (a function of climate); the duration of weathering (a function of time); the site-specific biological activity; and landscape position (a function of topography). Because of this long, natural process, the activities that would take place under any of the alternatives would either adversely affect soil in a way that would take generations to reverse or avoid adverse impacts that would otherwise be expected (called “beneficial impacts” in this analysis).

Negligible. Soil compaction or vegetation disturbance that creates erosion might occur, but the change would be so small that it would not be measurable.

Minor. Soil compaction or vegetation disturbance that creates erosion would occur and would be measurable but would have little consequence.

Moderate. Soil compaction or vegetation disturbance that creates erosion would occur and would be measurable, resulting in small-scale consequences that could be remedied.

Major. Soil compaction or vegetation disturbance that creates erosion would be substantial at certain locations and would not be easily remedied.

Alternative 1: No Action, Continuation of Current Management — Direct and Indirect Impacts on Soils

It is expected that alternative 1 would have some beneficial impacts on soils due to conversion of farm land to prairie. Some soils would be removed from cultivation and converted to their presettlement condition (mostly prairie). The ability to farm the prime soils today would be curtailed, and the soils would be retained for the future because the deep roots of prairie grasses are very effective at holding soil.

The intensity of impacts on soils caused by trail construction would be limited to minor ground disturbance within the narrow tread corridor. The potential impacts on soils from constructing and using the trail would be mitigated to a negligible level with proper layout of the trail on the landscape (for example, on slopes less than 10%), erosion control techniques, planking or bridges, and trail monitoring. The proper erosion-control techniques that would be employed, as necessary, include sidehill construction, waterbars, and drainage dips. Soils that are particularly unsuitable, such as in poorly

drained areas, would be avoided. If the trail must cross a wet area, planking or bridges would minimize the negative impacts from this crossing. Volunteer trail maintainers would monitor trails to help identify any cumulative erosion problems so that appropriate erosion-control actions could be taken. The National Park Services, in conjunction with the Wisconsin Department of Natural Resources and the Ice Age Park and Trail Foundation, has developed a handbook on trail design, construction, and maintenance for the Ice Age National Scenic Trail. This handbook is used by all volunteer trail builders. The Ice Age Trail Alliance also has a “mobile skills crew” that trains volunteers to build sustainable trails with minimal environmental impacts.

The present land use in the Ice Age Complex would continue to be a mix of row crop agriculture (corn and soybeans), forest land, and oak savanna. When agricultural fields are plowed, soil surface is disturbed, and there is wind erosion of silt particles and organic particles off those surfaces. There is also water erosion from the fields. There is similar land use throughout Dane County. The impacts of agriculture on erosion would be minor to moderate, depending on numerous factors, such as the amount of tillage and use of grass strips to limit erosion in critical spots.

The Ice Age National Scenic Trail would still be built under this alternative but other trails would not. Over time, unauthorized trails (paths created by visitors, rather than formally planned and constructed) would proliferate. Since there would be no plan providing comprehensive guidance on resource management, resources would likely be managed inconsistently. There is currently minimal impact from erosion and compaction in forest and oak savanna areas under present use, with the exception of the Cross Plains gorge and the moraine between the Cross Plains gorge and Cleveland Road. There is currently minor impact on the trail on the moraine; impact would remain minor if usage

is limited to hiking. If there is no enforcement of restrictions on the use of this trail, and if use by horseback riders were to increase, there would be a moderate impact due to compaction. There is compaction at small parking areas off Mineral Point Road and Timber Lane, but this land has already been disturbed, and there would be minimal further compaction.

The steep walls of Cross Plains gorge attract visitors, and human activity has the potential to damage both forest duff cover and soils, which could lead to substantial erosion problems. While the steep walls of Black Earth Creek valley are also susceptible to erosion if vegetation is disturbed, under present use, the slopes are not visited as much as those of the Cross Plains gorge. As time passes, however, this site could become better known, and residential development might increase in the area. If increased use is not accompanied by measures to protect these areas, such as a designed and delineated trail, damage to the steep walls would be expected. There could potentially be moderate to major erosion impacts if uncontrolled human activity in the vicinity of Cross Plains gorge and Black Earth Creek valley increased.

Alternative 2: Ecological Restoration Emphasis — Direct and Indirect Impacts on Soils

Alternative 2 would have the same beneficial impacts on soils as expressed in the first paragraph under alternative 1.

This alternative would contribute to increased trail usage, compared to alternative 1 (no action), and would therefore likely have a minor impact on soils from compaction. There would be moderate impact on soils from compaction in parking areas, but these would not be large areas and would likely be in the same places as in alternative 1. Paving the parking lots would contribute to increased runoff and would require proper management.

The installation of trails near, but not in, Cross Plains gorge would minimize impact on the walls of the gorge. Erosion impacts in the gorge itself would be negligible because the public would be directed (with trail design and signage) to stay off the walls of the gorge. Because the complex would be managed from an off-site location, there would be little ability to enforce this direction. If the public does not comply with the direction to stay off the gorge walls, there could be moderate adverse impacts on soil and the forest duff covering the wall until the park has the capacity to stop this from happening, given the minimal off-site staff.

Alternative 3: Interpretation and Education Emphasis — Direct and Indirect Impacts on Soils

Alternative 3 would have the same beneficial impacts on soils as expressed in the first paragraph under alternative 1.

The construction of buildings and a surfaced trail to Cross Plains gorge could potentially have a temporary moderate adverse impact on soils from erosion and compaction in areas subject to construction. Once construction is completed, there would still be some potential for minor compaction from visitor use, but the minor impacts would be confined to areas around buildings and parking lots. The on-site interpretation and maintenance facilities would potentially focus some visitor foot traffic to the interpretation building and away from the steep walls of Cross Plains gorge and steep slopes at the edge of Black Earth Creek valley. This would reduce the potential for soil compaction and erosion from uncontrolled human activity, resulting in minor to moderate beneficial impacts on those areas.

Alternative 4: Outdoor Recreation Emphasis — Direct and Indirect Impacts on Soils

Alternative 4 would have the same beneficial impacts on soils as expressed in the first paragraph under alternative 1.

The construction of buildings and a surfaced trail to Cross Plains gorge, as well as a bridge across the gorge, could potentially have a temporary moderate adverse impact on soils from erosion and compaction in areas subject to construction. There would be additional trails across the site that would create moderate compaction in the vicinity of the trail. Once the landscape is stabilized following construction, compaction from visitor foot traffic would be confined to the areas around buildings and parking lots, which could potentially result in minor adverse impacts. The addition of a bicycle trail from the visitor center to a parking lot north of Black Earth Creek would increase visitor activity in a sensitive area, resulting in a moderate adverse impact on the steep slopes facing the creek, especially along the trail. The on-site interpretation and maintenance facilities would potentially focus some visitor foot traffic to the interpretation building and away from the steep walls of Cross Plains gorge and steep slopes at the edge of Black Earth Creek valley. This would reduce the potential for soil compaction and erosion from uncontrolled human activity, resulting in minor to moderate beneficial impacts on those areas.

Alternative 5: Preferred Alternative — Direct and Indirect Impacts on Soils

Alternative 5 would have the same beneficial impacts on soils as expressed in the first paragraph under alternative 1.

The construction of buildings and a surfaced trail to Cross Plains gorge could potentially have a moderate adverse impact on soils from erosion and compaction during construction. There would be additional trails across the site that would create moderate compaction in the vicinity of the trail. Once the landscape is stabilized following construction, compaction from visitor foot traffic would be confined to the areas around buildings and parking lots, which could potentially result in minor adverse impacts. The on-site interpretation and

maintenance facilities would potentially focus some visitor foot traffic to the interpretation building and away from the steep walls of Cross Plains gorge and steep slopes at the edge of Black Earth Creek valley. This would reduce the potential for soil compaction and erosion from uncontrolled human activity, resulting in minor to moderate beneficial impacts on those areas.

All Alternatives — Cumulative Impacts on Soils

The soils in much of the Ice Age Complex have likely been altered by past activities (such as agricultural practices). Some soils on lands adjacent to the complex could be lost or modified in the future if the village of Cross Plains builds a bike path along U.S. Highway 14. The decision could be made by NPS staff to provide a route through the complex to connect the city of Middleton to the village of Cross Plains. These actions would result in cumulative effects on soils in localized areas.

Alternative 1: No Action, Continuation of Current Management. If impacts of the above-described developments were added to the continuing minor to major adverse impacts under the no-action alternative, there would be a long-term negligible to major adverse cumulative impact on area soils.

Alternative 2: Ecological Restoration Emphasis. If impacts of present or future actions were added to the negligible to moderate adverse impacts under alternative 2, there would be a long-term minor to moderate adverse cumulative impact on area soils.

Alternative 3: Interpretation and Education Emphasis; Alternative 4: Outdoor Recreation Emphasis; and Alternative 5: Preferred Alternative. If impacts of present and future actions were added to the minor to moderate adverse impacts under alternatives 3, 4, and 5, there would be long-term minor to moderate adverse cumulative impacts on area soils.

WATER QUALITY

Groundwater could potentially be contaminated through openings in dolomite rock. Of particular concern is the area of Shoveler Sink and Coyle Pond, which both sit on the surface water divide between Black Earth Creek, Sugar River, and Yahara River basins. The sink and pond are closed basins with no surface water outflow. The closed basins collect water from adjoining hillslopes and are areas of concentrated groundwater recharge. Normally, this takes place slowly through sediment at the bottom of the ponds. At times of high water levels, they drain into a sinkhole in fractured limestone, thus potentially introducing contaminants into the groundwater system. The sinkhole allows surface water to rapidly enter the groundwater system without the benefit of “filtering” out contaminants. There is possibly a small cave system somewhere beneath this part of the complex.

Analysis Methodology

This impact analysis is based on knowledge of water resources and flow patterns at the Ice Age Complex. The analysis focuses on groundwater impacts because, as described in chapter 3, nearly all of the complex is a groundwater recharge area, meaning surface water goes into the groundwater system. All impacts on groundwater also apply to surface water (such as Coyle Pond, Shoveler Sink, and Black Earth Creek).

The intensity levels used to evaluate impacts on water quality are provided below.

Negligible. Changes would be either barely detectable or would have effects that would be considered slight and localized.

Minor. An action would have measurable effects on water quality in a localized area.

Moderate. An action would have clearly detectable effects on water quality and would potentially affect natural ecological processes.

Major. An action would have substantial effects on water quality and would potentially affect natural ecological processes.

Alternative 1: No Action, Continuation of Current Management — Direct and Indirect Impacts on Water Quality

At this time, the small basin that collects surface water that flows into Coyle Pond is partly used for row crops. Whatever tillage techniques are used, the application of herbicides and fertilizer has the potential to contaminate groundwater by passing through the limestone beneath the sinkhole. At this time land around Shoveler Sink is not in intensive agriculture, and chemicals are not being applied to the fields, so there is currently negligible adverse impact from agricultural runoff.

Alternative 2: Ecological Restoration Emphasis — Direct and Indirect Impacts on Water Quality

Any adverse impact on groundwater would be negligible because the small basin that collects surface water flowing into Coyle Pond would be put back into presettlement vegetation under this alternative. In fact, over time, agricultural chemicals would not enter the groundwater system through the sink, so this would likely have a beneficial effect on groundwater quality, but the amount of this effect cannot be quantified.

Alternative 3: Interpretation and Education Emphasis; Alternative 4: Outdoor Recreation Emphasis; and Alternative 5: Preferred Alternative — Direct and Indirect Impacts on Water Quality

These alternatives envision an indoor facility with modern amenities (such as indoor plumbing) for visitors, so there would be a need for a new well and septic system near the core area of the property. These would be built to appropriate codes and would therefore have a negligible impact on groundwater.

Cumulative Impacts on Water Quality

Water quality in much of the Ice Age Complex is generally in good condition and has not been greatly altered by past activities (such as agricultural practices).

The small basin that collects surface water that flows into the Coyle Pond is partly used for row crops at this time. None of the alternatives would restrict land use in this area, so it could remain in intensive agriculture. Whatever tillage techniques are used, the application of herbicides and fertilizers could result in a moderate potential to contaminate groundwater by passing through the limestone beneath the sinkhole. Land around Shoveler Sink is not in intensive agriculture, and chemicals are not being applied to the fields, so there would be minimal impacts from agricultural runoff. If land use were to remain the same, then any impacts from the alternatives, combined with agricultural activities, would potentially result in negligible cumulative impacts. Impacts on water quality from road maintenance activities, such as road salt runoff, would continue.

Water quality could be adversely affected by potential future new development on adjacent lands. The Ice Age National Scenic Trail would eventually be developed through the complex. The possible future actions outside the complex boundary could affect water quality in Black Earth Creek and possibly Shoveler Sink.

Alternative 1: No Action, Continuation of Current Management. If potential impacts from the above activities were added to the continuing negligible adverse impacts under the no-action alternative, there would be long-term negligible adverse cumulative impacts on water quality, depending on the type and quantity of pollutants that enter the waters within the complex. However, the level of impacts added by the no-action alternative would be relatively small compared to the impact from pollutants being added from actions outside the complex boundary.

Alternative 2: Ecological Restoration Emphasis. If impacts from the above activities were added to the negligible adverse impacts on water quality under alternative 2 (negligible because of the conversion of agricultural lands back to presettlement vegetation), there would be long-term negligible to moderate adverse cumulative impacts on the complex's water quality, depending on the type and quantity of pollutants that might enter the waters in the complex. However, the level of impacts added by alternative 2 would be relatively small compared to the impact from pollutants that could potentially be added from actions outside the complex boundary.

Alternative 3: Interpretation and Education Emphasis; Alternative 4: Outdoor Recreation Emphasis; and Alternative 5: Preferred Alternative. If impacts from future actions were added to the negligible to moderate impacts under alternatives 3, 4, and 5 (due to no restrictions on land use), there would be negligible to moderate adverse cumulative impacts on water quality, depending on the type and quantity of pollutants that could potentially enter the waters within the complex. However, the level of impacts added by each of the three alternatives would be relatively small compared to the impact from pollutants that could potentially be added from actions outside the complex boundary.

SOUNDSCAPES

Analysis Methodology

As mentioned in chapter 3, there is abundant natural quiet in areas of the complex furthest from the roads (U.S. Highway 14, Timber Lane, Old Sauk Pass, and Mineral Point Road) that surround and traverse it. One of the fundamental resources of the complex is "the opportunity for people, particularly those in the adjacent urban area, to experience immersion into a large, natural landscape." Therefore, in this analysis, activities in the alternatives that would remove or lessen

unnatural sounds would be beneficial to the soundscape, and activities that would add or increase unnatural sounds would result in adverse impacts. Note that traffic noise on U.S. Highway 14, Timber Lane, and Mineral Point Road would likely continue to grow regardless of the future direction of the complex. The volume of traffic on these roads is related much more strongly to land use patterns in the region (suburban and exurban development) than to land use in the complex. The analysis below refers only to the soundscape impacts that might result from the actions that the park would take under each alternative.

The intensity levels used to evaluate impacts on the soundscape are provided below.

Negligible. There would be no audible impacts on the soundscape. Impacts would be of short duration and well within natural fluctuations. Noise would not affect appropriate transmission of natural sounds.

Minor. Impacts on the soundscape would be slight but audible. Impacts would likely not be outside the range of natural variability. Noise would be expected to have short-term impacts on the soundscape or short-term impacts on appropriate transmission of natural sounds.

Moderate. Impacts on the soundscape would be clearly audible. Impacts would sometimes be outside the range of natural variability. Noise would not be expected to have long-term impacts on the soundscape or any long-term impacts on appropriate transmission of natural sounds.

Major. Impacts on the soundscape would be clearly audible and would be well outside the range of natural variability. Noise would have long-term impacts on the soundscape or long-term impacts on appropriate transmission of natural sounds.

Alternative 1: No Action Alternative, Continuation of Current Management — Direct and Indirect Impacts on the Soundscape

Due to minimal development of visitor amenities, this alternative would be expected to have the lowest level of visitation out of the five alternatives and therefore the least visitor-created noise. It seems likely that, overall, there would be negligible impacts on the soundscape.

Alternative 2: Ecological Restoration Emphasis — Direct and Indirect Impacts on the Soundscape

This alternative would increase trail usage over the no-action alternative, which could potentially result in more visitor-generated noise. In the short term, there would be noise generated from the removal of the structures at the core of the property, but those moderate adverse impacts on the soundscape would be temporary. Over the long term, most of the complex would be managed to allow visitors “a direct sensory experience of natural resources” (refer to table 2 in chapter 2 for the natural experience management area description for desired visitor experience), indicating negligible impacts on the soundscape.

Alternative 3: Interpretation and Education Emphasis — Direct and Indirect Impacts on the Soundscape

Alternative 3 would result in a considerable increase in visitation compared to the no-action alternative, which could lead to more visitor-generated noise. In the short term, there would be noise generated from the renovation of the structures at the core of the property, but these moderate adverse impacts on the soundscape would be temporary. Over the long term, most of the complex would be managed for landscape interpretation, under which the management prescription (refer to table 2 in chapter 2) for visitor experience would concentrate on offering views of the

results of glaciation instead of offering direct sensory experience of natural resources, as the natural experience management area would, indicating the potential for minor adverse soundscape impacts.

Alternative 4: Outdoor Recreation Emphasis — Direct and Indirect Impacts on the Soundscape

Alternative 4 could result in a considerable increase in visitation, which would lead to considerably more visitor-generated noise. There would be noise generated from the construction of structures at the core of the property, but these moderate adverse impacts on the soundscape would be temporary. The bike path across the complex could generate more visitors and more noise per visitor than the hiking trails under the other alternatives. Most of the complex would be managed for landscape interpretation or for an expanded recreational experience, under which the management prescription for visitor experience would concentrate on offering views of the results of glaciation and the opportunity for low-impact recreation. However, there would also be a large natural experience area at the corner of two of the major roads on the edge of the complex. Overall, adverse impacts on the soundscape would be minor.

Alternative 5: Preferred Alternative — Direct and Indirect Impacts on the Soundscape

Impacts on the soundscape under the preferred alternative would be very similar to alternative 4, albeit slightly less because there would not be a bike path across the complex under this alternative. Overall, adverse impacts on the soundscape would be negligible to minor.

Cumulative Impacts on the Soundscape

Noise from outside the complex has minimally affected the complex's soundscape in the past and would continue to affect the soundscape, but perhaps at greater levels as the population continues to grow and traffic increases on roads adjacent to and through the complex. Depending on the location in the complex, common human-caused sounds (such as vehicles on roads, maintenance activities, and agricultural activities) would continue to be heard. In the winter, noise from snowmobiles passing by the complex would also continue to be heard. It is possible that events, such as the Ford Ironman, would continue to occur (the Ford Ironman course currently runs through the complex and generates substantial noise). In addition, new residential development could occur on lands adjacent to the complex, which would result in noise during and after the construction period in these areas.

These activities could produce intermittent to long-term (occurring every year) negligible to moderate adverse cumulative impacts from noise. The adverse impacts would vary depending on the type of noise, duration, and location.

Alternative 1: No Action, Continuation of Current Management. If impacts of the above actions were added to the negligible adverse impacts under the no-action alternative, there would be long-term negligible to moderate adverse cumulative impacts on the soundscape. However, the cumulative impacts would primarily occur at certain times of the year — either seasonally or on weekends. The continuation of activities under the no-action alternative would result in a minimal contribution to the overall cumulative impacts.

Alternative 2: Ecological Restoration Emphasis. If impacts of the above actions were added to the negligible to moderate adverse impacts under alternative 2, there would be long-term negligible to moderate adverse cumulative impacts on the soundscape. However, these

cumulative impacts would primarily occur at certain times of the year — either seasonally or on weekends. The proposed activities under alternative 2 would result in a minimal contribution to overall cumulative impacts.

Alternative 3: Interpretation and Education Emphasis and Alternative 4: Outdoor Recreation Emphasis. If impacts of the above actions were added to the minor to moderate adverse impacts under alternatives 3 and 4, there would be long-term minor to moderate adverse cumulative impacts on the soundscape. However, these cumulative impacts would primarily occur at certain times of the year — either seasonally or on weekends. The proposed activities under alternatives 3 and 4 would result in a minimal contribution to overall cumulative impacts.

Alternative 5: Preferred Alternative. If impacts of the above actions were added to the negligible to moderate adverse impacts under alternative 5, there would be long-term minor to moderate adverse cumulative impact on the soundscape. However, these cumulative impacts would primarily occur at certain times of the year — either seasonally or on weekends. The proposed activities under alternative 5 would result in a minimal contribution to overall cumulative impacts.

VEGETATION AND WILDLIFE

As noted in chapter 3, the Ice Age Complex comprises three ecological landscapes: Western Coulee and Ridges, Central Sand Hills, and Southeast Glacial Plains. Although this combination of landscapes in the complex indicates a variety of native vegetation, southern dry-mesic forest dominated the site before European settlement.

The NPS *Organic Act*, which directs parks to conserve wildlife unimpaired for future generations, is interpreted by the agency to mean that native animal life should be protected and perpetuated as part of the park's natural ecosystem. Natural processes are relied

on to control populations of native species to the greatest extent possible, otherwise, they are protected from harvest, harassment, or harm by human activities. According to *NPS Management Policies 2006* (section 4.1), maintenance of natural ecosystems is a priority in parks. Management goals for wildlife include maintaining components and processes of naturally evolving park ecosystems, including natural abundance, diversity, and the ecological integrity of plants and animals.

Analysis Methodology

This impact analysis is based on knowledge of native and current vegetative conditions and wildlife habitat at the Ice Age Complex (as described in chapter 3), as well as an understanding of the types of activities (such as visitor activity, construction, and resource management) in parks that affect vegetation and wildlife. This draft general management plan / environmental impact statement does not include site-specific actions because the desired resource conditions and visitor experience, as described in the management area prescriptions and applied to each alternative, inform the impact assessment.

The intensity levels used to evaluate impacts on vegetation and wildlife are provided below.

Negligible. Impacts would have no measurable or perceptible changes in plant community size, integrity, or continuity. There would be no observable or measurable impacts on native species, their habitats, or the natural processes sustaining them. Impacts would be of short duration and well within natural fluctuations.

Minor. Impacts would be measurable or perceptible but would be localized within a relatively small area. The overall viability of the plant community would not be affected and, if left alone, would recover. Impacts would be detectable, but they would not be expected to be outside the natural range of variability of key ecosystem processes and would not be expected to have any long-term effects on native

species, their habitats, or the natural processes sustaining them. Population numbers, population structure, genetic variability, and other demographic factors for species might have small short-term changes, but long-term characteristics would remain stable and viable. Sufficient habitat would remain functional to maintain viability of all species.

Moderate. Impacts would cause a change in the plant community (such as abundance, distribution, quantity, or quality); however, the impact would remain localized. Animals are present during particularly vulnerable life stages, such as migration, breeding, or juvenile stages. Mortality or interference with activities necessary for survival can be expected on an occasional basis but is not expected to threaten the continued existence of the species in the park unit. Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, and they could be outside the natural range of variability for short periods of time. Population numbers, population structure, genetic variability, and other demographic factors for species might have short-term changes but would be expected to rebound to pre-impact numbers and remain stable and viable in the long term.

Major. Impacts on the plant community would be substantial, highly noticeable, and permanent. Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, and they would be expected to be outside the natural range of variability for long periods of time or be permanent. Population numbers, population structure, genetic variability, and other demographic factors for species might have large short-term declines, with long-term population numbers significantly depressed. Key ecosystem processes might be disrupted in the long term or permanently. Loss of habitat might affect the viability of at least some native species.

Alternative 1: No Action, Continuation of Current Management — Direct and Indirect Impacts on Vegetation and Wildlife

There would be no comprehensive plan to guide management of the complex under alternative 1, so vegetation and wildlife habitat would not be consistently managed. Restoration goals (such as for the oak savanna or prairie) and activities (such as prescribed burning or mechanical invasive removal) would be decided on a case-by-case basis as funding and/or volunteer labor allows. Since there would be few defined trails, there would be a risk of vegetation trampling throughout the site from the creation of social trails. However, since the site would not be advertised, there would be no facilities to accommodate visitors, and user capacity management allows park managers a number of strategies to mitigate this risk; thus, adverse vegetation impacts from trampling would be negligible. It seems likely that, considering the site as a whole, there would be negligible impacts on vegetation and wildlife.

Alternative 2: Ecological Restoration Emphasis — Direct and Indirect Impacts on Vegetation and Wildlife

Most of the complex would be managed for natural experience, in which “Natural resources are managed to approximate presettlement (circa 1830) conditions. To the extent possible, natural ecological processes sustain the integrity of these resources” (refer to the natural experience management area prescription for desired resource conditions in chapter 2, table 2). This management prescription would have a moderate beneficial impact on vegetation and wildlife.

Alternative 3: Interpretation and Education Emphasis — Direct and Indirect Impacts on Vegetation and Wildlife

There would still be a significant area managed for natural experience, although most of the complex would be managed for landscape

interpretation, under which the management prescription for resource conditions would include managing natural resources to reveal glacial features. Since there would be a range of ways to reveal glacial features through natural resource management (for example, planting short row crops or short prairie grasses), impacts on vegetation and wildlife would range from negligible to moderately beneficial.

Alternative 4: Outdoor Recreation Emphasis and Alternative 5: Preferred Alternative — Direct and Indirect Impacts on Vegetation and Wildlife

Under these two alternatives, management prescriptions would be fairly evenly divided between landscape interpretation and expanded recreational experience (which share the same desired resource condition) and natural experience. Additionally, under alternative 5, a wildlife corridor of unbroken habitat would be established in the southern half of the complex. This combination of management prescriptions would result in minor beneficial impacts on vegetation and wildlife.

Cumulative Impacts on Vegetation and Wildlife

Several potential actions, independent of this plan, could affect the complex’s vegetation and wildlife. As described in the “Affected Environment” chapter, some of the park’s vegetation and wildlife habitat has been altered by past human activities (including agricultural uses and development) and have also been altered due to the absence of fire. The impacts of these past actions far outweigh the impacts of the actions being proposed in the alternatives in this plan.

Residential development could occur in the future on lands adjacent to the complex, which would result in the loss and modification of vegetation, modification or loss of wildlife habitat, and the displacement of wildlife in these areas. This would have a long-term minor adverse impact on natural vegetation and wildlife in the vicinity of the complex.

Hunting has affected wildlife in the past and would continue to affect wildlife as long as it continues to take place in the complex.

The possible development of a bike path along Highway 14 and through the complex would affect vegetation in the area and possibly displace some wildlife, which would add a long-term minor adverse incremental effect to the effects from all alternatives.

As noted in the “Affected Environment” chapter, the spread of nonnative plants is currently a problem in the complex. Nonnative species have been spreading in different locations in the complex, such as around the Cross Plains gorge, in the old field, and in planted prairie areas, due to visitor activities and natural sources like wind and birds. In addition, even with education efforts, some nonnative plants could be introduced or spread by visitors in the park, such as at picnic areas, campsites, and along trails. It is difficult to determine the impact of these nonnative species on native vegetation due to the uncertainties about the type of species that might be introduced in the future and the locations and frequencies of introductions. The adverse effects from the introduction and spread of nonnative species could range from minor to moderate and be long term.

Alternative 1: No Action, Continuation of Current Management. If the effects of all the past, present, and future actions were added to the continuing negligible adverse impacts under the no-action alternative, there would be long-term minor to moderate adverse cumulative impacts on vegetation and wildlife in the complex. However, the effects of the no-action alternative would result in a minimal contribution to the overall adverse cumulative impacts.

Alternative 2: Ecological Restoration Emphasis; Alternative 3: Interpretation and Education Emphasis; Alternative 4: Outdoor Recreation Emphasis; and Alternative 5: Preferred Alternative. If the impacts of all past, present, and future actions were added to the impacts of alternatives 2, 3, 4, and 5, there would be long-term, minor to moderate adverse cumulative impacts on vegetation and wildlife in the

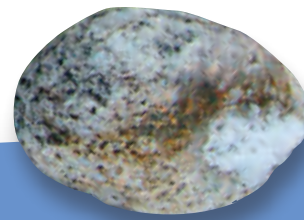
complex. However, the effects of alternatives 2, 3, 4, and 5 would not add to the overall adverse cumulative impacts because their actions would all be beneficial.

SOCIOECONOMICS

Social and economic goals are closely related and are therefore generally grouped together in this analysis as “socioeconomic impacts.” In this analysis, social impacts were determined by considering the goals that have been set by the local community and by judging the extent to which the alternatives would meet these goals. Economic impacts were determined by considering the impacts of each alternative on funding that would be available to the local government through tax receipts.

The Village Board of Cross Plains, Wisconsin, adopted a new comprehensive plan on June 9, 2008. Although the boundary of the village of Cross Plains is 1 mile from the northwest corner of the Ice Age Complex boundary, the comprehensive plan covers the extraterritorial boundary of the village, which includes unincorporated areas and overlaps with the complex on the northern end. The village’s comprehensive plan states the following vision for the planning area:

For the lands that comprise the Ice Age Complex, the comprehensive plan described most of the future land use as either agricultural/rural or woodlands/open space. The exception to these two designations is for the lots that are currently residential. These current residential lots are zoned as “single-family exurban.” All of the alternatives in this draft general management plan / environmental impact statement are consistent with these zones for future land use, and therefore, all of them would have beneficial impacts on social goals because the Ice Age Complex would comprise a large open area for the village of Cross Plains. Preserving the natural state of this area would amount to a long-term moderate beneficial impact on social goals established for the village. There are differences, however, in how the alternatives would impact economic goals — these are discussed below.



Village of Cross Plains Overall Vision

“LOOKING FORWARD TO 2025 AND BEYOND, the Village desires a safe, clean, attractive and prosperous community that residents of all ages are proud to call home. There will be available a range of housing choices by price and features and a sustainable business environment. The rich natural resources of the Village and surrounding countryside and the Black Earth Creek in particular, will continue to be a defining feature of the community due to careful preservation efforts. Residents and visitors alike will be able to travel freely throughout the community by car, bike, or foot, and commuter transit service to Madison will reinforce the strong economic relationship with the metropolitan area. Though ties with Madison will strengthen, the Village will retain its character and identity.”

Analysis Methodology

Property sales and income taxes are a large part of the economies of local governments. In order to determine the impacts on economic goals, it is necessary to consider the likely direction of the lands that comprise the Ice Age Complex if no alternatives were implemented and then compare that to the vision of each alternative. Under all alternatives, the National Park Service, the Wisconsin Department of Natural Resources, and their partners would seek to preserve as much open land as possible throughout the complex. This would mean that most potential for residential development would be removed, along with the property taxes these private residences would have paid. The extent to which payments in lieu of taxes would be made for publically owned lands depends on which of the project partners owns the land.

The potential for property tax payments would be lost over the long term if the land were owned federally. Although local governments are eligible for federal payments in lieu of taxes to help offset losses in property taxes due to nontaxable federal property within their boundaries, historically, these payments have not kept pace with lost potential property tax revenue. However, for all new properties purchased, the Wisconsin Department of Natural Resources makes an annual payment in lieu of real estate taxes that would have been paid had the property remained in private ownership. The payment is made to the local taxing authority where the property is located.¹

¹ Information on how the Wisconsin Department of Natural Resources pays property taxes can be found in a publication titled “Public Land Property Taxes” (publication number PUB-LF-001), available from the DNR.

The issue in determining the economic impacts of the alternatives is whether or not the potential loss of property tax would be offset by the economic benefits of visitation. The National Park Service uses an economic model called the “Money Generation Model” to estimate economic benefits of parks in terms of visitor spending (Stynes 2009). Unfortunately, data to feed into this model is not gathered for the Ice Age National Scenic Trail or for any other national trail. The analysis for the Ice Age Complex uses data from parks that are comparable in size and demographics to estimate potential economic benefits to the area around the complex.

The intensity levels used to evaluate impacts on economic conditions are provided below. All impacts were compared to the most likely future for the complex over the 15- to 20-year term of this plan if none of the proposed alternatives were implemented. In that case (without implementation), as much as half of the land currently publically owned would potentially be developed as residences, while the other half would likely remain in agriculture.

Negligible. No measurable effect on the economic environment.

Minor. Only a very small sector of the local and regional economies would be affected and would not be readily apparent.

Moderate. A small sector of the economic environment, or the relationship between sectors of the local and regional economies, would be measurably affected but would not alter basic economic functions and structure.

Major. Changes to the local and regional economies would occur and would become readily apparent in the form of shifts in economic functions and structure. In certain cases, entirely new economic sectors would be created or established sectors eliminated.

Geographic Area for Socioeconomic Analysis. The regional study area for the purpose of this socioeconomic impact analysis is Dane

County, Wisconsin. Dane County is about 1,200 square miles centered around the city of Madison. The Ice Age Complex is located in the northwestern part of Dane County. The west and northern county boundaries are roughly 10 miles from the complex, the southern boundary is roughly 20 miles away, and one would travel about 40 miles before crossing the eastern boundary of Dane County (refer to figure 13 in chapter 3).

All Alternatives — Direct and Indirect Impacts on Socioeconomics

All of the alternatives would produce beneficial impacts by increasing the value of adjacent lands. Similarly, all alternatives would have adverse impacts on the local tax base if lands were federally owned because federally owned land is exempt from property tax, and the payments in lieu of tax program historically has not fully compensated for this loss. However, these adverse impacts might be smaller than for similar areas of the National Park Service because the land would also be owned by the Department of Natural Resources, which would offset local property tax losses, so this potential tax loss would be mitigated. The impacts of land use changes were not considered separately in this analysis.

Alternative 1: No Action, Continuation of Current Management and Alternative 2: Ecological Restoration Emphasis — Direct and Indirect Impacts on Socioeconomics

These two alternatives would only provide an outdoor experience in which activities for visitors would be limited to hiking and other low-impact activities on a minimal trail system and rare interpretive tours. The visitation level under these alternatives could be compared to the most sparsely visited parks (10,000 visitors per year or less) in the national park system. These parks, on average, contribute about \$350,000 value-added annually to their communities (value-added is the sum of labor income, profits, rents, and indirect business taxes; see Stynes

2009, p. 6). Without knowing what type of housing would have been built if neither of these alternatives were implemented, it is impossible to know what the tax receipts would have been. If net property tax receipts from residential development (after the costs of improving infrastructure to accommodate these residences, such as schools and roads are taken into account) were to exceed \$350,000 annually, then the economic impacts of the no-action alternative and alternative 2 would be adverse. If, on the other hand, net property taxes were less than the estimated \$350,000 that visitation economic benefits would bring, the impacts of these two alternatives would be beneficial.

Alternative 3: Interpretation and Education Emphasis — Direct and Indirect Impacts on Socioeconomics

This alternative would not only offer an outdoor experience, but also a place to stop and rest indoors, view some exhibits, and talk with park staff. Visitors would also benefit from regular interpretive programming provided by rangers. These elements would attract more visitors to the complex, but overall, the estimated visitation would still be relatively low. Visitation under this alternative could be compared to parks with low visitation (50,000–100,000 visitors per year) in the national park system. These parks, on average, contribute about \$2.5 million value-added annually to their communities. It is not possible to know what the tax receipts would have been if this alternative is not implemented. If net property tax receipts from residential development (after the costs of improving infrastructure to accommodate these residences such as schools and roads are taken into account) were to exceed \$2.5 million annually, then the economic impacts of alternative 3 would be adverse. If, on the other hand, net property taxes were less than the estimated \$2.5 million that visitation economic benefits would bring, then the impacts of this alternative would be beneficial.

Alternative 4: Outdoor Recreation Emphasis and Alternative 5: Preferred Alternative — Direct and Indirect Impacts on Socioeconomics

These alternatives would offer a broader outdoor experience in a variety of ways, such as more trails, limited primitive camping, picnic areas, and for alternative 4, a bridge across the gorge and a bike path. The two alternatives would also offer a place to stop and rest indoors; view extensive exhibits, including a film; and talk with park staff. There would be space to accommodate visitors who come in a group, such as school groups. Visitors would also benefit from regular interpretive programming provided by rangers. These elements would attract more visitors to the complex, and overall, the estimated visitation would fall in the moderate range for visitation (150,000–200,000 visitors per year) in the national park system (see the “Visitor Use and Experience” section for an explanation of expected visitation). These parks, on average, contribute about \$5 million value-added annually to their communities. It is not possible to know what the tax receipts would be if these alternatives were not implemented. If net property tax receipts from residential development (after taking into account the costs of improving infrastructure, such as schools and roads, to accommodate the new residences) were to exceed \$5 million annually, then the economic impacts of these alternatives would be adverse. If, on the other hand, net property taxes were less than the estimated \$5 million that visitation economic benefits would bring, then the impacts of these alternatives would be beneficial.

Cumulative Impacts on Socioeconomics

Residential and commercial growth and development could gradually increase in Dane County — this is according to the county population projections discussed in the “Affected Environment” chapter. Given the exurban nature of the lands surrounding the complex, much of the population

increase would likely be absorbed by existing communities / employment centers with established infrastructure. The rate of growth would likely be slow but could result in new construction- and real estate-related jobs and new property tax revenue. If population growth were to occur, the addition of taxable property and consumer spending would likely have a beneficial impact on the socioeconomic environment over the long term.

All Five Alternatives. If the likely effects of each of the five alternatives were combined with the potential effects of present and reasonably foreseeable future actions, there would be either long-term beneficial or long-term adverse cumulative impacts on the socioeconomic environment, depending on the nature and scope of any development on adjacent lands and the level of visitation to the complex. All five alternatives would contribute a very small increment to this cumulative impact.

VISITOR USE AND EXPERIENCE

As mentioned in chapter 3, the action alternatives were designed to respond, in various ways, to demand for low-impact passive recreational activities, as well as the opportunity to learn about glaciation of the area. An assumption of the planning team, based on a wealth of experience in park management, is that the greater the variety of things to do at a park, the more visitors it would attract. Therefore, it is expected that each alternative might attract a different number of visitors.

Analysis Methodology

In order to estimate the number of expected visitors at the Ice Age Complex, the GMP/EIS planning team identified established comparable parks and researched their visitation counts. This comparison took into account state and local parks that are similar in theme and in size, as well as national parks in close proximity and in areas with similar demographics. Parks with similar themes used for comparison were

the interpretive centers for units of the Ice Age National Scientific Reserve. While hiking the Ice Age National Scenic Trail is a popular activity in the state of Wisconsin, especially in densely populated areas like the city of Madison and vicinity, there are few destination areas along the trail where visitors can learn more about the unique geology and no learning opportunities in the Madison area. The Ice Age National Scenic Trail passes through two units of the Ice Age National Scientific Reserve. The two units have interpretive centers: Interstate State Park and Chippewa Moraine, which are both about 200 miles from Madison. The Reserve Center at Interstate Park benefits from being part of a well-visited park and estimates 250,000 visitors a year. The Reserve Center at Chippewa Moraine, on the other hand, estimates only 20,000 visitors to its center per year, although staff there estimate higher visitation to the property.

There are four parks within 20 miles of the Ice Age Complex that are about the same size as the complex; those four parks are Blue Mounds State Park, Governor Nelson State Park, Lake Kegonsa State Park, and the University of Wisconsin Arboretum. Visitation counts at these parks range from 150,000 to 600,000. Lastly, the two units of the national park system used to estimate visitation were Effigy Mounds National Monument, the closest unit, and Wilsons Creek National Battlefield, which is similar demographically in that, like the Ice Age Complex, it is in the outskirts of a city (Springfield, Missouri) about the size of Madison. Effigy Mounds counts about 88,000 visitors a year; Wilsons Creek counts about 200,000.

Considering all of the comparable estimates for visitation, the GMP/EIS planning team estimated that, if the Ice Age Complex were minimally developed with little interpretation (as in the no-action alternative and alternative 2), the complex might attract only 10,000 visitors per year. Those visitors would essentially be hikers on trails and participants in occasional programming.

On the other hand, if the complex were developed to offer a wider range of interpretive and recreational opportunities (as in alternatives 3, 4, and 5), the complex might attract as many as 200,000 visitors per year. Among these 200,000 would be groups of visitors, such as school groups, for whom special programming would be provided, as well as more casual visitors taking short hikes along well-developed trails. These visitation estimates were used in the analysis of socioeconomic impacts above, as well as in this analysis of visitor experience.

The intensity levels used to evaluate impacts on visitor experience are provided below. The baseline against which these impacts were evaluated are the current conditions in which visitors are only aware that the complex contains publically owned parkland if they read the small signs at the boundary areas. The Ice Age National Scenic Trail is not constructed through the complex at this time, and the only existing trails are visitor-created social trails. Also, there is no interpretation. This baseline is different from the no-action alternative, which describes the future for the complex as it would evolve over the next 15–20 years under current management strategies.

Negligible. Visitors likely would not be aware of any additional opportunities to experience park resources.

Minor. Beneficial. Visitors would likely be aware of some additional opportunities to experience park resources but not a wide variety of different types of opportunities. They would be satisfied with the changes.

Adverse. Visitors would likely be aware of a decrease in opportunities to experience park resources and would be dissatisfied with the changes.

Moderate. Beneficial. Visitors would definitely be aware of additional opportunities to experience park resources in a variety of new ways. They would be very satisfied with the changes.

Adverse. Visitors would definitely be aware of a decrease in opportunities and/or diversity in opportunities and would be very dissatisfied with the changes.

Major. Beneficial. Visitors would be highly aware of additional opportunities to experience park resources in a wide variety of new ways. They would be so satisfied with these changes that most new visitors would make the trip due to referrals from past visitors.

Adverse. Visitors would be highly aware of a decrease in opportunities and/or diversity in opportunities and would be so dissatisfied with the changes that they would tell other potential visitors and visitation numbers would drop.

Alternative 1: No Action, Continuation of Current Management and Alternative 2: Ecological Restoration Emphasis — Direct and Indirect Impacts on Visitor Experience

These alternatives would only provide an outdoor experience in which activities for visitors would be limited to hiking and other low-impact activities on a minimal trail system and rare interpretive tours. While they activities would offer some beneficial experience for visitors over the current conditions, the benefits would likely range from negligible to minor.

Alternative 3: Interpretation and Education Emphasis — Direct and Indirect Impacts on Visitor Use and Experience

This alternative would not only offer an outdoor experience, but also a place to stop and rest indoors, view some exhibits (not extensive given space limitations), and talk with park staff. Visitors would also benefit from regular interpretive programming provided by rangers. For visitors interested in the human history of the site, the ability to view and interpret the Wilkie house and barn would provide a pleasant variety of experience. However, visitors who might

want to view a film in a theater or arrive in groups and gather in one indoor spot might be disappointed by the indoor space limitations. Overall, this alternative would offer beneficial visitor experience at a minor level.

Alternative 4: Outdoor Recreation Emphasis — Direct and Indirect Impacts on Visitor Use and Experience

This alternative would offer a broad outdoor experience in a variety of ways (more trails, limited outdoor camping, picnic areas, a bridge across the gorge, and a bike path). It would also offer a place to stop and rest indoors; view extensive exhibits, including a film; and talk with park staff. There would be space to accommodate visitors who come in group, such as school groups. Visitors would also benefit from regular interpretive programming provided by rangers. However, visitors seeking solitude and a quiet nature immersion experience might be disappointed to have to travel far from the core of the site to find this. Overall, this alternative would have a minor to moderate beneficial impact on visitor experience.

Alternative 5: Preferred Alternative — Direct and Indirect Impacts on Visitor Use and Experience

This alternative would offer a broad outdoor experience in a variety of ways (more trails, including a half-day-long loop trail; limited outdoor camping; and picnic areas). It would also offer a place to stop and rest indoors; view extensive exhibits, including a film; and talk with park staff. There would be space to accommodate visitors who come in group, such as school groups. Visitors would also benefit from regular interpretive programming provided by rangers. Various attractions (such as a bike path traversing the site and a pedestrian bridge across the gorge) are not proposed in this alternative (as they are in alternative 4) because those amenities were not widely supported by the public when they commented on the preliminary alternatives.

Therefore, it seems like not many benefits to visitor experience were lost with the removal of those elements. Because the sensitive resources management area was enlarged, visitors seeking solitude and a quiet nature immersion experience would not have to travel far from the core of the site to find this. Overall, this alternative would have a moderate beneficial impact on visitor experience.

Cumulative Impacts on Visitor Use and Experience

There are no foreseeable actions in the complex or surrounding area that would likely cause adverse effects on visitor use and experience. There is the possibility of development on adjacent lands, which could affect viewsheds. Traffic volume could increase due to a slight increase in visitation or a change in visitor interests and demand due to potential changes in regional populations or national recreation trends. The likelihood of these changes is unknown at this time. If they were to occur, they could cause a slight increase in visitor use concerns, such as crowding and conflicts at high-use areas or attraction sites, or have adverse effects on the visitor experience commensurate with the extent to which developments would be visible and traffic would be audible from various visitor use areas within the complex.

All of the Alternatives. The beneficial impacts on visitor experience from each of the five alternatives, when combined with other present and reasonably foreseeable future actions, would result in long-term negligible to minor adverse cumulative impacts, depending on the amount and location of development and level of increase in traffic volume. However, the development of the bike path would add a moderate beneficial increment to the overall cumulative impact.

UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts are defined here as major impacts that cannot be fully mitigated or avoided. No major adverse impacts are expected under any of the alternatives. It is expected that the development of trails and visitor, staff, and maintenance support areas at the core of the site would cause some impact. Those impacts, however, would be minimized through best construction practices, and any unexpected major adverse impacts would be mitigated. For example, if archeological resources were encountered during construction activities, mitigation measures would be implemented to protect those resources.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Implementing alternatives 3, 4, and 5 would likely result in the consumption of some nonrenewable natural resources in the form of construction materials and fuels that would constitute an irretrievable commitment of resources. There is also the potential for loss of archeological resources during construction projects. Future planning would examine this potential and would avoid or, if avoidance is not feasible, mitigate any loss.

RELATIONSHIP OF SHORT-TERM USES OF MAN'S ENVIRONMENT AND LONG-TERM PRODUCTIVITY

The first purpose of the Ice Age Complex at Cross Plains is to ensure protection, preservation, and interpretation of the nationally significant values of continental glaciation in Wisconsin. All five alternatives would achieve this purpose, and thus all of them would ensure long-term productive use of the complex. The only substantive development ("use of man's environment") would occur in a previously disturbed area. Outside the developed area, under all alternatives, productive ecosystem function would be maintained or restored throughout most of the complex, and where this is not feasible, the productivity of agricultural fields would remain.



Consultation and Coordination



Chapter Five

CONSULTATION AND COORDINATION

PUBLIC INVOLVEMENT

PLANNING FOR THE future of the Ice Age Complex began in fall 2007 with a workshop to develop a set of desired future conditions for the site. This workshop involved representatives of the NPS Ice Age National Scenic Trail office, as well as the Wisconsin Department of Natural Resources, U.S. Fish and Wildlife Service, and Ice Age Trail Alliance (then called the Ice Age Trail Foundation). Shortly after that workshop, the decision was made to move beyond a set of desired future conditions to a full general management plan for the complex as a joint NPS/WDNR plan.

Meetings were held first with local officials in summer 2008 and then with the general public to announce the beginning of the planning process for the general management plan. The National Park Service solicited public comments on the scope of the plan by mailing newsletters to an extensive mailing list maintained by the Ice Age Trail offices, as well as a list maintained by the Department of Natural Resources. Notices were

published in local newspapers to announce the beginning of the planning process. A project website was made available through the NPS “Planning, Environment, and Public Comment” (PEPC) website (<http://parkplanning.nps.gov/>). Two public meetings, one in Cross Plains, Wisconsin, and the other in Middleton, Wisconsin, were well-attended. The public entered comments directly into the PEPC website and sent comments through the mail. Comments were also recorded on flipcharts at meetings. Public input yielded a total of 275 comments.

*History of the
planning process
through today.*



The planning team took public comments into account as it crafted the preliminary alternatives. The preliminary alternatives were then presented for public review in September 2009. The National Park Service prepared a second newsletter that presented the preliminary alternatives and announced public meetings. The newsletter was sent to members of the mailing list and uploaded to the NPS PEPC website, and notices were again published in local media to announce the meetings. The Ice Age National Scenic Trail staff and members of the local planning team offered tours of the complex to members of the community so they could get to know the site and be able to visualize how the management alternatives might change it. Local officials were briefed on the alternatives in advance of the general public. This second public input process yielded a total of 428 comments. The proposal to limit access to Old Sauk Pass prompted questions and concerns on the part of those living in the area of the complex, so a separate meeting was held with those neighbors and with representatives of the village of Cross Plains (which has authority over that road) to discuss the concerns. One result of this discussion was the village of Cross Plains' resolution included in this document as appendix B.

The planning team reviewed public comments on the preliminary alternatives and took those comments into account as it analyzed, in detail, the costs, advantages, and environmental impacts of the alternatives. That process also contributed to the creation of a new alternative ("Alternative 5: Preferred Alternative") that could potentially yield the highest advantage and best value. This draft general management plan / environmental impact statement was then written and reviewed internally and has been distributed for public review and comment.

TRIBAL CONSULTATION

The following tribes were contacted in May 2008 (at the beginning of the planning process) to inquire of their interest in participating in the process:

Sac and Fox Nation of Oklahoma
 Sac and Fox Nation of Missouri
 in Kansas and Nebraska
 Bad River Band of Lake Superior Tribe
 of Chippewa
 Oneida Tribe of Indians in Wisconsin
 Red Cliff Band of Lake Superior Chippewa
 St. Croix Chippewa Indians of Wisconsin
 Forest County Potawatomi Community
 of Wisconsin
 Sokaogon Chippewa Community,
 Mole Lake Band
 Lac du Flambeau Band
 of Lake Superior Chippewa
 Lac Courte Oreilles Band
 of Lake Superior Chippewa
 Sac and Fox Tribe of the Mississippi
 in Iowa
 Stockbridge Munsee Community
 of Wisconsin
 Ho-Chunk Nation
 Menominee Indian Tribe of Wisconsin

None of these tribes responded to the invitational letters, but they were included on the mailing list and sent copies of the newsletters as the planning process progressed.



FEDERAL AGENCIES CONSULTATION

The following agencies were contacted in May 2008 (at the beginning of the planning process) to let them know the process had been initiated and to inquire of their interest in it:

- U.S. Fish and Wildlife Service,
Green Bay Field Office
- U.S. Natural Resources
Conservation Service
- U.S. Environmental Protection Agency
- U.S. Federal Highway Administration
- U.S. Geological Service
- U.S. Army Corps of Engineers
- U.S. Department of Agriculture
Forest Service

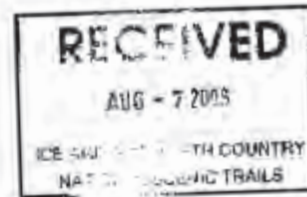
WISCONSIN STATE HISTORIC PRESERVATION OFFICE CONSULTATION

The Wisconsin Historical Society is the federally designated State Historic Preservation Office. The society was consulted before actions were proposed that could affect cultural resources at the Ice Age Complex. The structures at the core of the property that had belonged to the Wilkie family (and before them, the Lowe family) had not been formally evaluated for historic significance prior to initiation of the planning process. The National Park Service evaluated the structures and the landscape surrounding them and discussed their potential eligibility for listing in the National Register of Historic Places with the Wisconsin Historical Society. The society concluded that the Lowe-Wilkie farm is not eligible in the area of architecture or for its association with the area of settlement. The letter expressing the society's conclusion is included in this chapter.



The State Historic Preservation Office received a copy of the notification letter indicating the National Park Service and the Wisconsin Department of Natural Resources were initiating a General Management Plan for the Ice Age Complex at Cross Plains. The National Park Service sent the letter to the State Historic Preservation Office, along with federal agencies, at the beginning of the General Management Plan process. Two examples of the notification letter are included in this chapter.

CONSULTATION LETTERS AND RESPONSES



July 21, 2009

Pamela Schuler
National Park Service
Ice Age National Scenic Trail
North Country National Scenic Trail
700 Rayovac Dr.
Madison WI 53711-2463

Dear Ms. Schuler:

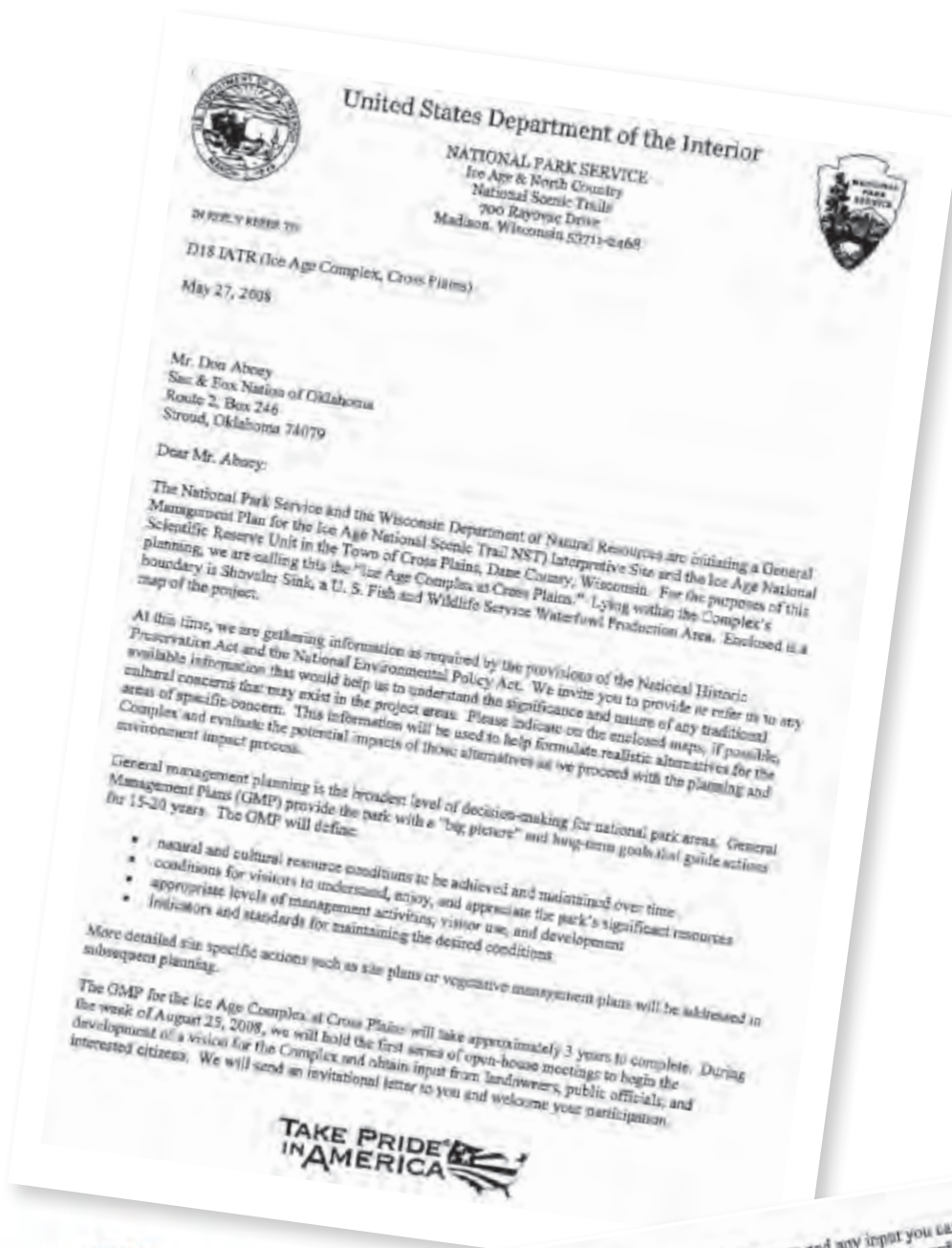
Thank you for the opportunity to comment on the potential National Register eligibility of the Lowe-Wilkie Farm located in the Town of Cross Plains, Dane County. We have had the opportunity to review the submitted information and offer the following comments. We do not believe the property to be eligible in the area of architecture or for its association with the area of settlement. The stone house has been altered and the modern addition, while the work of prominent architect William Kaker, is not a significant example of modern design. Further research may show that the property may be eligible for its association with Dr. Wilkie (and Jane Wilkie) in the areas of medicine and the conservation movement; however, more information is needed to fully assess the potential eligibility in these areas.

If you have any questions regarding the State or the National Register of Historic Places in Wisconsin, please call me at (608) 264-6501, or I may be reached by e-mail at daina.penkunas@wisconsinhistory.org.

Sincerely,

Daina Penkunas
State and National Register Coordinator
Wisconsin Historical Society

Collecting, Preserving, and Sharing Stories Since 1846
310 State Street, Madison, Wisconsin 53701
wisconsinhistory.org



We appreciate your cooperation in the GMP process and any input you can provide within your area of expertise and jurisdiction. If you have any questions or comments regarding the GMP, please contact Pam Schuler, Ice Age NST Manager, at 608-441-5610 or pam_schuler@nps.gov.

Sincerely,

Thomas L. Gilbert

Thomas L. Gilbert
 Superintendent

TLG:kk

Enclosures

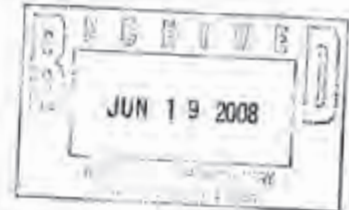


United States Department of the Interior

FISH AND WILDLIFE SERVICE

Green Bay ES Field Office
2661 Spott Tower Drive
New Franken, Wisconsin 54229-9565
Telephone 920/866-1717
FAX 920/866-1710

June 17, 2008



Memorandum

To: Superintendent, Ice Age and North Country National Scenic Trails, Madison, WI
From: Field Supervisor, Ecological Services Field Office, Green Bay, WI
Re: Management Plan for Ice Age Complex at Cross Plains, Dane County, WI

The U.S. Fish and Wildlife Service (Service) has received your request relative to your proposed project. The project entails the preparation of a General Management Plan for your Ice Age Complex at Cross Plains, located in the township of Cross Plains in Dane County, Wisconsin. You asked that we provide information on plans and activities relative to Shoveler's Sink, a U.S. Fish and Wildlife Service Waterfowl Production Area which lies within the Complex's boundary. You also requested information on federally-listed threatened and endangered species that may be present in the project area. Our comments follow.

Federally-Listed Species, Candidate Species, and Critical Habitat

Currently, our records indicate that there are no federally-listed threatened or endangered species or critical habitat known to be present at the project site. This precludes the need for further action on this project as required by the 1973 Endangered Species Act, as amended. Should additional information on listed or proposed species or their critical habitat become available or if project plans change or if portions of the proposed project were not evaluated, it is recommended that you contact our office for further review.

As noted in your letter, the Shoveler's Sink Waterfowl Production Area is located within your project boundary. This property is administered by our Leopold Wetland Management District, W10040 Cascade Mountain Road, Portage, WI 53901. Questions regarding the plans and activities related to this property should be directed to the Project Leader Mr. Steve Lenz, who may also be contacted at Telephone 608-742-7100, Extension 11.

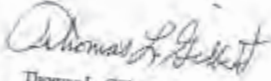
We appreciate the opportunity to respond. Questions pertaining to these comments can be directed to Mr. Joel Trick at 920-866-1737.

Louise Clemency
Louise Clemency

cc: Leopold Wetland Management District, Portage, WI Attn: Steve Lenz

We appreciate your cooperation in the GMP process and any input you can provide within your area of expertise and jurisdiction. If you have any questions or comments regarding the GMP, please contact Pam Schuler, Ice Age NST Manager, at 608-441-5610 or pam_schuler@nps.gov.

Sincerely,



Thomas L. Gilbert
Superintendent

TLC:kk

Enclosure



United States Department of the Interior

NATIONAL PARK SERVICE
Ice Age & North Country
National Scenic Trails
700 Raynor Drive
Madison, Wisconsin 53741-2468



IN REPLY REFER TO:

D18 IATR (Ice Age Complex, Cross Plains)

May 27, 2008

Ms. Patricia Leavenworth
Natural Resources Conservation Service
8030 Excelsior Drive, Suite 200
Madison, Wisconsin 53717

Dear Ms. Leavenworth:

The National Park Service and the Wisconsin Department of Natural Resources are initiating a General Management Plan for the Ice Age National Scenic Trail (NST) Interpretive Site and the Ice Age National Scientific Reserve Unit in the Town of Cross Plains, Wisconsin. For the purposes of this planning, we are calling this the "Ice Age Complex at Cross Plains." Lying within the Complex's boundary is Sherkey Sink, a U. S. Fish and Wildlife Service Waterfowl Production Area. Enclosed is a map of the project.

At this time, we are gathering information on plans and activities related to the project area, as required by the National Environmental Policy Act (NEPA). Please send us information on relevant planning documents and any current, planned, or potential projects that should be considered. This information will be used to help formulate realistic alternatives for the Complex and evaluate the potential impacts of those alternatives as we proceed with the planning and environment impact process.

General management planning is the broadest level of decision-making for national park areas. General Management Plans (GMP) provide the park with a "big picture" and long-term goals that guide actions for 15-20 years. The GMP will define:

- natural and cultural resource conditions to be achieved and maintained over time
- conditions for visitors to understand, enjoy, and appreciate the park's significant resources
- appropriate levels of management activities, visitor use, and development
- indicators and standards for maintaining the desired conditions

More detailed site specific actions such as site plans or vegetative management plans will be addressed in subsequent planning.

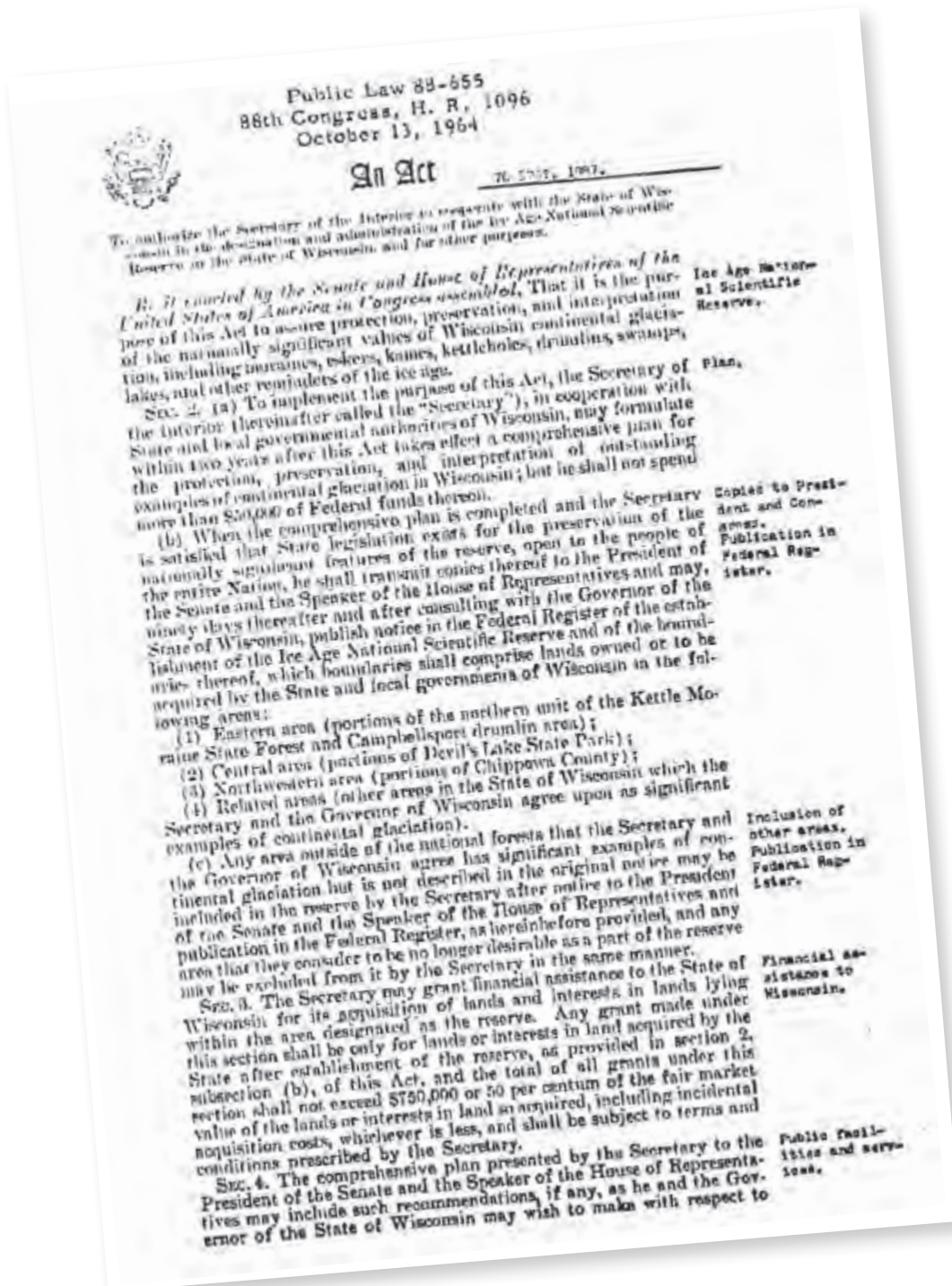
The GMP for the Ice Age Complex at Cross Plains will take approximately 3 years to complete. During the week of August 25, 2008, we will hold the first series of open-house meetings to begin the development of a vision for the Complex and obtain input from landowners, public officials, and interested citizens. We will send an invitation letter to you and welcome your participation.

TAKE PRIDE
IN AMERICA 

Appendixes, References, and Index



APPENDIX A: LAWS ESTABLISHING THE ICE AGE NATIONAL SCIENTIFIC RESERVE AND THE ICE AGE NATIONAL SCENIC TRAIL



Pub. Law 88-655

- 2 -

October 13, 1964

Termination of
contributions.

Federal and State participation in the financing of appropriate interpretive and other public facilities and services within the reserve, including facilities and services to be furnished by such private organizations as the Ice Age Park and Trail Foundation, a nonprofit corporation, but no commitment with respect thereto shall be made by the Secretary and no Federal appropriations shall be available for this purpose.

Sec. 5. (a) Whenever the Secretary determines that appropriate management and protection set down in the comprehensive plan are not being afforded the nationally significant values within the reserve or that funds are not being provided on the prescribed matching basis by the State of Wisconsin or other non-Federal sources, he may terminate contributions under this Act.

Appropriations.

(b) Any payment made by the Secretary under the provisions of subsection (2) of section 3 of this Act shall be made subject to the understanding and agreement by the State of Wisconsin that the conversion, use, or disposal, for purposes contrary to the purposes of this Act, as determined by the Secretary, of any land acquired by said State with funds supplied in part by the United States pursuant to said subsection, shall result in a right of the United States to compensation therefor from said State in the amount of one-half of the fair market value of the land, exclusive of any improvements thereon, as determined at the time of such conversion, use, or disposal.

Sec. 6. There are hereby authorized to be appropriated not to exceed \$600,000 to carry out the provisions of this Act.

Approved October 13, 1964.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 941 (Comm. on Interior & Insular Affairs).
SENATE REPORT No. 1008 (Comm. on Interior & Insular Affairs).
CONGRESSIONAL RECORD, Vol. 110 (1964):
Feb. 17, Aug. 3, Sept. 23: Considered and passed House.
Oct. 1: Considered and passed Senate.

94 STAT. 1360

PUBLIC LAW 96-370—OCT. 3, 1980

Public Law 96-370
96th Congress

An Act

To establish the Ice Age National Scenic Trail, and for other purposes

Oct. 3, 1980
(H.R. 7827)Ice Age National
Scenic Trail
establishment.

16 USC 1944

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the National Trails System Act (82 Stat. 919; 16 U.S.C. 1241), as amended, is further amended as follows:

(a) Section 5(a) is amended by adding the following new paragraph at the end thereof:

"(10) The Ice Age National Scenic Trail, a trail of approximately one thousand miles, extending from Door County, Wisconsin, to Interstate Park in Saint Croix County, Wisconsin, generally following the route described in "On the Trail of the Ice Age—A Hiker's and Biker's Guide to Wisconsin's Ice Age National Scientific Reserve and Trail", by Henry S. Reuss, Member of Congress, dated 1980. The guide and maps shall be on file and available for public inspection in the Office of the Director, National Park Service, Washington, District of Columbia. Over all administration of the trail shall be the responsibility of the Secretary of the Interior pursuant to section 5(d) of this Act. The State of Wisconsin, in consultation with the Secretary of the Interior, may, subject to the approval of the Secretary, prepare a plan for the management of the trail which shall be deemed to meet the requirements of section 5(e) of this Act. Notwithstanding the provisions of section 7(c), snowmobile use may be permitted on segments of the Ice Age National Scenic Trail where deemed appropriate by the Secretary and the managing authority responsible for the segment."

94 Stat. 68,
16 USC 1249Authorizations
effective date
16 USC 1949
note.

(b) Section 10(c) is amended by changing "(7), and (8)" to "(7), (8), (9), and (10)"; and by inserting "The Ice Age National Scenic Trail," after the phrase "North Country National Scenic Trail."

Sec. 2. Authorizations of moneys to be appropriated under this Act shall be effective on October 1, 1981. Notwithstanding any other provision of this Act, authority to enter into contracts, to incur obligations, or to make payments under this Act shall be effective only to the extent, and in such amounts, as are provided in advance in appropriation Acts.

Approved October 3, 1980.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 96-1314 (Comm. on Interior and Insular Affairs).
CONGRESSIONAL RECORD, Vol. 125 (1980):
Sept. 16, considered and passed House.
Sept. 18, considered and passed Senate.

94 STAT. 1360



APPENDIX B: VILLAGE OF CROSS PLAINS RESOLUTION REGARDING OLD SAUK PASS

Town of Cross Plains Resolution

WHEREAS, the Town of Cross Plains contains nationally significant landscape features resulting from continental glaciations, and

WHEREAS, these features in portions of sections 11, 12, 13, 14, 23, 24, and 25 are designated at the federal and state levels as the Ice Age National Scientific Reserve-Cross Plains Unit, Ice Age National Scenic Trail, and Cross Plains State Park, and

WHEREAS, collectively these features and lands have come to be known as the Ice Age Complex at Cross Plains, and

WHEREAS, the National Park Service and Wisconsin Department of Natural Resources are in the process of developing a General Management Plan for the Ice Age Complex at Cross Plains through a public planning process, and

WHEREAS, the center of visitor facilities and scenic attractions will likely be along Old Sauk Pass, west of Cleveland Drive, and

WHEREAS, the speed and sight lines along Old Sauk Pass pose a hazard for visitors parking along and crossing the road, and

WHEREAS, the Town of Cross Plains wishes to cooperate with the National Park Service and the Department of Natural Resources in the preservation and appropriate development of publicly owned land and these nationally-significant resources for enjoyment, recreation, and education by local residents as well as visitors from outside the Town, and

WHEREAS, this resolution shall not have any bearing on land privately owned, and

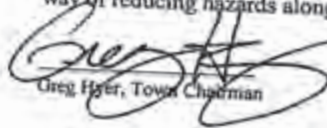
NOW, THEREFORE, the Town of Cross Plains Board of Supervisors acknowledges the pedestrian safety concerns along Old Sauk Pass associated with present and increasing future visitation to the Complex, and

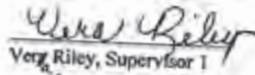
RESOLVES THAT, the Town of Cross Plains will work with the National Park Service and Department of Natural Resources to manage traffic along Old Sauk Pass so that the hazard to pedestrians is reduced through measures such as reducing the speed limit, designating crosswalks, erecting regulatory-cautionary signs, and installing speed bumps. The selection and addition of these improvements shall be commensurate with the amounts and patterns of

visitation to the Complex and contingent on approval of proposed improvements by the Town, and approval of federal and state funds to cover the cost.

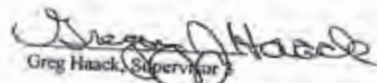
FURTHER RESOLVES THAT, the Town of Cross Plains will request a "speed study" of Old Sauk Pass from the Dane County Highway Commissioner to assess the current road and pedestrian safety conditions on Old Sauk Pass, contingent on the National Park Service offer to pay the costs of the study.

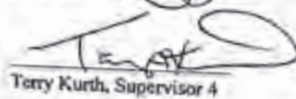
ADDITIONALLY, the Town of Cross Plains Board of Supervisors requests that the National Park Service and Department of Natural Resources take action to provide an off-street parking solution for current visitors, at least on an interim basis prior to permanent developments, as a way of reducing hazards along Old Sauk Pass for pedestrians, bicyclists, and motorists.


Greg Hyer, Town Chairman

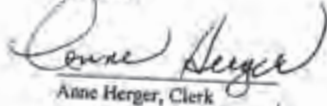

Vera Riley, Supervisor 1


Jeff Baylis, Supervisor 2


Greg Haack, Supervisor 3


Terry Kurth, Supervisor 4

ATTEST:


Anne Herger, Clerk

Adopted: 12/13/2010

Published: 12/23/2010

Posted: 12/15/2010

APPENDIX C: WISCONSIN DEPARTMENT OF NATURAL RESOURCES COMPLIANCE FORM

NR 150 Decision Form

Project Name: Ice Age Complex at Cross Plains / Cross Plains State Park County: Dane

DECISION (This decision is not final until certified by the appropriate authority)

In accordance with s. 1.11, Stats., and Ch. NR 150, Admin. Code, the Department is authorized and required to determine whether it has complied with s. 1.11, Stats., and Ch. NR 150, Wis. Admin. Code.

Complete either A or B below:

A. EIS Process Not Required



The attached analysis of the expected impacts of this proposal is of sufficient scope and detail to conclude that this is not a major action which would significantly affect the quality of the human environment. In my opinion, therefore, an environmental impact statement is not required prior to final action by the Department.

B. Major Action Requiring the Full EIS Process



The proposal is of such magnitude and complexity with such considerable and important impacts on the quality of the human environment that it constitutes a major action significantly affecting the quality of the human environment.

Signature of Evaluator 	Date Signed 11/14/11
--	-------------------------

Number of responses to news release or other notice:

Certified to be in compliance with WEPA Environmental Analysis and Liaison Program Staff	Date Signed
---	-------------

NOTICE OF APPEAL RIGHTS

If you believe that you have a right to challenge this decision, you should know that the Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed. For judicial review of a decision pursuant to sections 227.52 and 227.53, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to file your petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review must name the Department of Natural Resources as the respondent.

To request a contested case hearing pursuant to section 227.42, Wis. Stats., you have 30 days after the decision is mailed, or otherwise served by the Department, to serve a petition for hearing on the Secretary of the Department of Natural Resources. All requests for contested case hearings must be made in accordance with section NR 2.05(5), Wis. Admin. Code, and served on the Secretary in accordance with section NR 2.03, Wis. Admin. Code. The filing of a request for a contested case hearing does not extend the 30 day period for filing a petition for judicial review.

Revised 06/21/2010

**APPENDIX D:
ACRONYMS AND ABBREVIATIONS**

CBA	Choosing by Advantages
CEQ	Council on Environmental Quality
CLR	cultural landscape report
EIS	environmental impact statement
GMP	general management plan
NEPA	National Environmental Policy Act
NPS	National Park Service
CFR	Code of Federal Regulations
PEPC	Planning, Environment, and Public Comment
PL	public law
USC	United States Code
USDI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
WDNR	Wisconsin Department of Natural Resources
WDOT	Wisconsin Department of Transportation



APPENDIX E: PLANNING TEAM

NATIONAL PARK SERVICE

Ruth Heikkinen
Outdoor Recreation Planner
Project Manager, Primary Author
10 years with the National Park Service
Masters of Public Management,
University of Maryland

Christina Miller
Natural Resource Specialist-Planner
Project/Interdisciplinary Team Member
5 years with the National Park Service
Master's in Environmental Policy and
Management for Natural Resources,
University of Denver

Tom Gilbert
Superintendent, Ice Age National Scenic Trail
Participant
30 years with the National Park Service
B.S., Park and Recreation Resources,
Michigan State University

Pamela Schuler
Manager, Ice Age National Scenic Trail
Participant
20 Years with the National Park Service
Bachelor of Science,
Horticulture and Landscape Architecture,
University of Wisconsin

Dean Gettinger
Management Assistant
Participant
12 years with the National Park Service,
3 years with the Bureau of Land Management
M.S., Resource Recreation and Tourism,
University of Idaho

Mary Tano
Outdoor Recreation Planner
Participant
9 years with the National Park Service
Masters of Environmental Biology,
Governors State University

Douglas T. Wilder
Coordinator - Geospatial Support Center
Mapping and data development
8 years with the National Park Service
(15 years in Geographic Information Systems)
M.S., Marine Science (Geology),
University of South Florida



APPENDIX E: PLANNING TEAM (CONTINUED)

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Jeff Prey
Senior Planner
Participant
25 years with the State of Wisconsin
M.S., University of Wisconsin – Madison

Rene Lee
Park Manager
Participant
13 years with the Wisconsin Department of Natural Resources
Degree in Design Engineering and Law Enforcement, Madison Area Technical College

Dana White Quam
Participant
Wisconsin Department of Natural Resources
Regional Park Specialist
30 years with the Department of Natural Resources

U.S. FISH AND WILDLIFE SERVICE

Steven J. Lenz
District Manager,
Leopold Wetland Management District
Planning Team Member or Participant
31 years with the U.S. Fish and Wildlife Service
B.S., University of Wisconsin – Stevens Point

PARTNERS

Ice Age Trail Alliance

Mike Wollmer
Executive Director
Participant
Executive Director since 2007,
20 years as a volunteer associated with the Ice Age Trail Alliance
Bachelor of Business Administration, University of Wisconsin – Milwaukee

Andrew (“Drew”) Hanson III
Trailway Director
Participant
13 years with the Ice Age Trail Alliance
Bachelors in Geography, University of Wisconsin – Madison

University of Wisconsin

David Mickelson
Glacial Geologist
Participant, Secondary Author
39 years with the University of Wisconsin – Madison
Ph.D., Geology, Ohio State University

John Harrington
Professor of Landscape Architecture
Participant
27 years with the University of Wisconsin – Madison
M.S., Landscape Architecture, University of Wisconsin – Madison

Dee Finnegan
Community Preservation Planner (through NPS Student Temporary Employment Program)
Participant
Current University of Wisconsin – Madison
Landscape Architecture Graduate Student



REFERENCES AND WORKS CONSULTED

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- WDNR et al. (Wisconsin Depart of Natural Resources, Bureau of Parks and Recreation); National Park Service, Ice Age National Scenic Trail; Ice Age Park and Trail Foundation; and Bay-Lake Regional Planning Commission. 2006. *Ice Age National Scenic Trail Corridor Plan and Environmental Assessment for Kewaunee, Manitowoc, and Sheboygan Counties, Wisconsin*. PUB-PR-811 06. December. Available at http://dnr.wi.gov/master_planning/completed_archive/parks_trails/lmiat/LMIAT_Final.pdf
- WDNR (Wisconsin Depart of Natural Resources, South Central Region). 1998. *Feasibility Study and Environmental Analysis for the Cross Plains Unit, Ice Age National Scientific Reserve Study Area*. December.



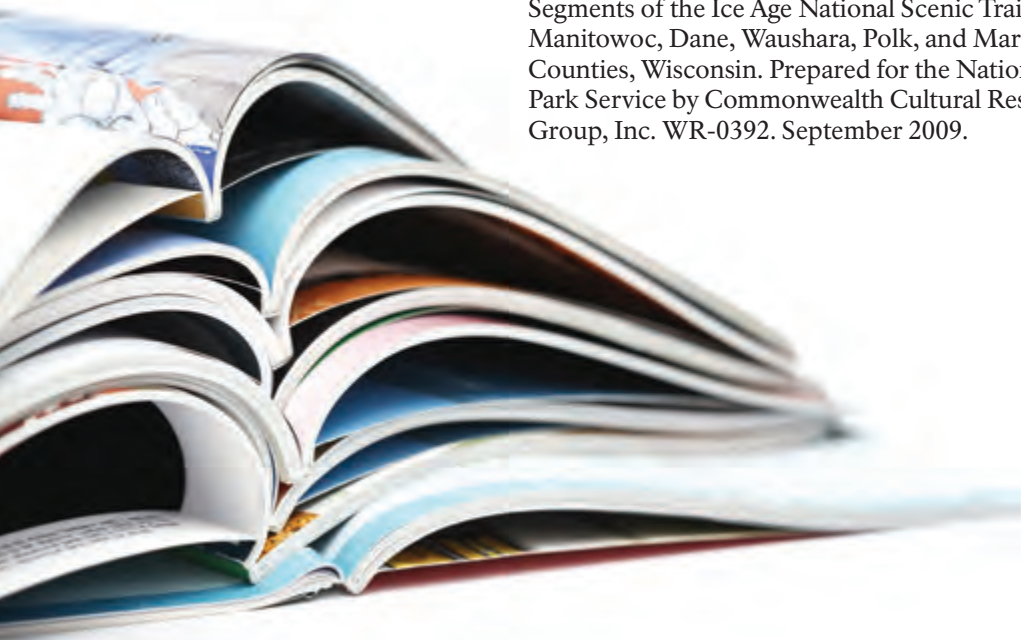
REFERENCES AND WORKS CONSULTED (CONTINUED)

<http://files.usgwarchives.net/wi/dane/history/1877/madison/crosspla39nms.txt>

Madison, Dane County and surrounding towns; being a history and guide to places of scenic beauty and historical note found in the towns of Dane County and surroundings, including the organization of the towns, and early intercourse of the settlers with the Indians, their camps, trails, mounds, etc. With a complete list of county supervisors and officers, and legislative members, Madison Village and City Council. Illustrated, Madison, Wis.: published by WM. J. Park & Co., Booksellers, Stationers and Binders, 11 King Street. 1877. Copyright. Wm. J. Park & Co. 1877. David Atwood, Stereotyper and Printer, Madison, Wis.

A Phase I Archeological Survey of Proposed Work on the Ice Age National Scenic Trail in Dane, pole, Marathon, Taylor, and Waupaca Counties, Wisconsin. Prepared for National Park Service by Mississippi Valley Archeology Center at the University of Wisconsin-LaCrosse. Reports of Investigations No. 587. September 2005.

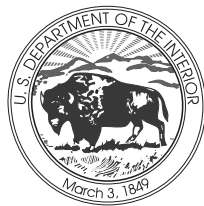
Phase I Archeological Investigations of Six Segments of the Ice Age National Scenic Trail in Manitowoc, Dane, Waushara, Polk, and Marquette Counties, Wisconsin. Prepared for the National Park Service by Commonwealth Cultural Resources Group, Inc. WR-0392. September 2009.



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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

