

**National Park Service  
U.S. Department of the Interior**



**Ice Age Complex at Cross Plains  
Wisconsin**

**March 2013**

**Final General Management Plan/  
Environmental Impact Statement**

**Record of Decision**



UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE

RECORD OF DECISION

FINAL GENERAL MANAGEMENT PLAN  
ENVIRONMENTAL IMPACT STATEMENT

Ice Age Complex at Cross Plains

Wisconsin

**INTRODUCTION**

The Department of the Interior, National Park Service (NPS) has prepared this Record of Decision (ROD) on the *Final General Management Plan / Environmental Impact Statement* (GMP/EIS) for the Ice Age Complex at Cross Plains (Ice Age Complex, or the complex) in accordance with the requirements of the National Environmental Policy Act of 1969, as amended (NEPA); its implementing regulations (40 CFR 1500–1508); and NPS Director’s Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* and *DO-12 Handbook*. This Record of Decision includes a description of the background of the project, a statement of the decision made, a listing of measures to minimize environmental harm, synopses of other alternatives considered, the basis for the decision, findings on impairment of park resources and values, a description of the environmentally preferable alternative, and an overview of public and agency involvement in the decision-making process.

**PROJECT BACKGROUND**

General management plans are intended to be long-term documents that establish and articulate a management philosophy and framework for decision making and problem solving in the parks. This GMP/EIS is intended to provide guidance for the complex for the next 15 to 20 years.

Actions directed by general management plans or in subsequent implementation plans are accomplished over time. Budget restrictions, requirements for additional data or regulatory compliance, and competing national park system priorities prevent immediate implementation of many actions.

Within the complex are lands owned and managed by the NPS, the Wisconsin Department of Natural Resources (WDNR), Dane County Parks, and the U.S. Fish and Wildlife Service (USFWS). This GMP/EIS is needed to establish a consistent vision for the Ice Age Complex that is shared by all of these partners and the public. The preferred alternative describes the general path the partners would follow in managing the Ice Age Complex over the next 15 to 20 years. The purposes of this GMP/EIS are as follows:

- To identify desired conditions in different parts of the Ice Age Complex.
- To identify any necessary developments and support facilities to achieve the vision and desired conditions.

- To ensure that the foundation for decision making has been developed in consultation with the public and adopted by NPS leadership after sufficient analysis of the benefits, impacts, and economic costs of alternative courses of action.

## DECISION (SELECTED ACTION)

The NPS will implement alternative 5, the preferred alternative, as described in the *Final General Management Plan / Environmental Impact Statement* issued in December 2012. The complete description of the selected alternative is provided below.

The selected alternative will 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 will largely be managed to reveal the glacial landscape. The most sensitive ecological areas will be carefully protected, and visitor access will be highly controlled in these areas.

Visitors will experience a wide variety of indoor and outdoor interpretive programming. Under this alternative, the Ice Age Complex will serve as the headquarters for the Ice Age National Scenic Trail.

The management concept for the selected alternative will be implemented by developing the core of the site (the former Wilkie property) to accommodate offices for Ice Age National Scenic Trail staff (who will 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 will 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 minimal carbon footprint; and employ systems to carefully control surface water runoff and avoid impacting the quality of the 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. Ultimately, the design of the core area for public and operational use will 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 the selected alternative will also be implemented by the NPS and WDNR working with the town 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), and by 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 will be restored and volunteer trails removed.

Additionally, the management concept for the selected alternative will 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 NPS or the WDNR building the bicycle path; rather, the agencies will 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 will 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 Adjustments**

Two boundary adjustments are recommended to carry out the purposes of the complex. Figure 8 on page 49 of the GMP/EIS shows the location of the expansion areas (parcels) described below. 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.

The recommended boundary adjustments include expanding the complex boundary westward to incorporate two parcels. Parcel A is the 228-acre WDNR-protected parcel. The WDNR 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. Parcel B would be a 40-acre parcel protected and owned by the WDNR.

## **MITIGATION MEASURES/MONITORING**

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.

As it relates to managing visitor use and related impacts, the GMP/EIS includes a framework for addressing user capacity. This includes the identification of visitor use related indicators, standards, and management strategies. Indicators and standards are measurable variables that are monitored to track changes in resource conditions and visitor experiences. The indicators and standards help the NPS ensure that desired conditions are being attained and that those conditions support the

fulfillment of the park's legislative and policy mandates. The GMP/EIS identifies the types of management strategies that would be taken to achieve desired conditions. The management strategies in Table 4 include a range of actions within the categories of education, site management, regulation, and rationing/allocation of visitor use. These strategies would be used as needed to minimize impacts and maintain desired conditions.

Finally, the GMP/EIS calls for several implementation plans that will guide future development and management efforts. These plans would include additional and appropriate levels of site planning, analysis, and compliance. These plans include a deer management plan, transportation plan, trails development plan, resource stewardship strategy, long-range interpretive plan, site development plan for the core area, and a camping management plan.

## **OTHER ALTERNATIVES CONSIDERED**

Alternative 1, no action, describes a continuation of existing management at the complex and provides a baseline for evaluating the changes and impacts of the other alternatives. In alternative 1, the Ice Age Complex would remain undeveloped for visitor use and minimally maintained. The WDNR and USFWS would continue to manage lands that each agency owns. The Shoveler Sink Waterfowl Production Area, managed by the USFWS, would continue to be open to visitors for hunting, fishing, and other wildlife-dependent activities. There would be no visitor facilities in the production area. Staff members for the Ice Age National Scenic Trail have stabilized facilities to prevent their deterioration. There would be no major development or maintenance for visitor services. 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.

Alternative 2 would emphasize ecosystem management and restoration. Vegetation would be restored to conditions prior to the settlement of Europeans and managed to reveal glacial landscapes. Visitors would be able to experience a sense of remoteness through hikes and trails. The management concept would be implemented through the restoration of vegetation, removal of buildings on the site that belonged to the Wilkie family, minimally developed trails to and along Cross Plain gorge, interpretive exhibits, and off-site operational management of the complex.

Alternative 3 would emphasize interpretation and education on how the Ice Age Complex 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. Under this alternative the Ice Age Complex would serve as the headquarters for the Ice Age National Scenic Trail. The alternative 3 management concept would be implemented through renovating the house at the core site to accommodate visitor orientation, construction of a new facility to accommodate maintenance needs, vegetation management to enhance key views, and providing a trail along the gorge.

Alternative 4 would emphasize low impact outdoor recreation experiences in support of, and compatible with, preserving and interpreting the glacial significance of the complex and restoring and managing the ecosystem. Visitors would experience resources in diverse ways and be able to participate in interpretive programming in indoor and outdoor settings. The Ice Age Complex would serve as the headquarters for the Ice Age National Scenic Trail under this alternative. The management concept of this alternative would be implemented by renovating the Wilkie house and barn for staff offices, constructing a new visitor center and maintenance facility, providing outdoor gathering spaces and primitive camping opportunities, requesting the Village of Cross Plains to limit

access to a portion of Old Sauk Pass, and providing trails to and along the gorge, as well as trails for bicycles and pedestrians.

## **Basis for Decision**

In reaching its decision to select the preferred alternative, the NPS considered the purposes for which the Ice Age Complex at Cross Plains was established and other laws and policies that apply to the management of the complex. The NPS also worked carefully with its partners and the public to develop a consistent vision for the Ice Age Complex that would be supported at both the state and federal levels. The specific objectives considered in evaluating the alternatives included preserving and protecting identified resources in light of visitation, facilitating interpretation of identified themes, providing an attractive stopping point or destination for Ice Age National Scenic Trail hikers, and providing supportive, compatible outdoor recreation opportunities to the general public. After assessing 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. Alternative 5 best preserves the outstanding natural and cultural resources of the complex, while providing appropriate and highly desired recreational and educational opportunities. Alternative 5 will enable a larger diversity of experiences, including overnight opportunities for visitors. This alternative includes more trails, including a half-day-long loop trail, and day use picnicking opportunities. It also offers a place to stop and rest indoors, view exhibits, and talk with staff. Because the sensitive resources management area was enlarged in this alternative, visitors seeking solitude and a quiet nature immersion experience would not have to travel far from the core of the site to find this opportunity. This alternative also maintains and reuses the Wilkie structures, which are highly valued by the public and make for a more sustainable operation. Ecological resources would be managed to reveal the glacial landscape, which directly supports the primary objectives of the site. Further, the most sensitive ecological areas would be carefully protected and visitor access would be highly controlled in these areas.

Alternative 1 does not provide as much resource protection and visitor opportunities as the other alternatives. This alternative would not open the complex to more recreational and educational opportunities, which would not fully meet the purpose of the site. Important natural and cultural resources would not receive the management needed to enhance their condition and interpret their significance to the public. Alternative 2 would remove the buildings on the site that belonged to the Wilkie family, which are valued by the public and provide the basis for a more sustainable, on-site operation of the complex. Further, this alternative would not provide the same level of recreational and educational opportunities that support the objectives of the complex and that were desired by the public, including overnight opportunities associated with hiking the Ice Age National Scenic Trail. Alternative 3 would not provide as much advantage in terms of a diversity of recreational opportunities, including not providing overnight camping along the Ice Age National Scenic Trail. In addition, this alternative does not include much indoor interpretive or gathering space, which can be beneficial for educational opportunities and supporting group activities. Alternative 4 would not have as many advantages in terms of resource protection. In particular, the increased visitation associated with the bicycle trail from the visitor center to a parking lot north of Black Earth Creek would increase visitor activity in a sensitive area, leading to impacts on the steep slopes facing the creek. Further, this alternative includes construction of the bridge across the gorge, which would be costly and was not highly supported by the public.

## ENVIRONMENTALLY PREFERABLE 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."

The environmentally preferable alternative is the same as the NPS preferred alternative (alternative 5). This alternative will more fully satisfy all the national environmental criteria than would alternatives 1–4.

Alternative 5 provides on-site staff to monitor visitor activity on a daily basis and attend to resource management needs of the site, resulting in a higher level of stewardship than some of the other alternatives. This alternative also provides more choices for enjoying the complex with a larger diversity of experiences through multimedia exhibits, as well as personal interaction with more rangers. In addition, this alternative adds primitive camping to the Ice Age National Scenic Trail hiking experience. It also limits access to a portion of Old Sauk Pass, in cooperation with the Town of Cross Plains, which would provide a safer experience. These factors, combined, suggest that alternative 5 would more fully promote an environment that supports diversity and a variety of individual choices than would the other alternatives. None of the alternatives would entail such a strong shift in socioeconomic or resource use that the standard of living or sharing of life's amenities would change.

Because alternative 5 specifies 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 some of the other alternatives.

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

## PUBLIC AND AGENCY INVOLVEMENT

### Public Involvement and Response to Comments

Public meetings and newsletters were used to keep the public informed and involved in the planning process for the Ice Age Complex at Cross Plains. The notice of intent to prepare an environmental impact statement was published in the *Federal Register* on August 12, 2008. 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 NPS solicited public comments on the scope of the GMP/EIS by mailing newsletters on August 8, 2008, to an extensive mailing list maintained by the Ice Age National Scenic Trail offices, as well as a list maintained by the WDNR. Notices were published in local newspapers on August 20, 2008, 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.

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 NPS 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 on August 18, 2009, to announce the meetings. The Ice Age National Scenic Trail staff and members of the local planning team offered tours of the complex on August 29, and September 2, 2010, 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 town of Cross Plains (which has authority over that road) to discuss the concerns. One result of this discussion was the resolution of the town of Cross Plains was included in the GMP/EIS 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 yielded the highest advantage and best value.

The draft general management plan for the Ice Age Complex was made available for public review and comment in March 2012. Public meetings to receive comments on the draft plan were held on March 26 and 27, 2012. Sixty members of the public attended that meeting and provided comments.

Twenty-nine correspondences were received during the comment period. They are reproduced in appendix F along with NPS responses to substantive comments. Many non-substantive comments are also addressed in this section if the comment addressed controversial or sensitive topic matter. Where appropriate, the text in the *Final General Management Plan / Environmental Impact Statement* has been revised to address the comments. These changes are identified in the NPS responses. The *Final General Management Plan / Environmental Impact Statement* was released to the public in December 2012.

## **Consultation with Other Agencies/Officials and Organizations**

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

During preparation of this document, NPS staff coordinated with the USFWS field office for this area in Green Bay, Wisconsin. In a letter dated June 2008, the USFWS indicated that there are no federally listed threatened and endangered species or critical habitat known to be present at the project site. This precluded the need for further action on the project as required by the 1973 Endangered Species Act, as amended. In addition, a letter dated May 2008 was sent to the Natural Resources Conservation Service (NRCS) in Madison, Wisconsin, to gather information on plans and activities related to the project area.

Correspondence with the USFWS and the Natural Resources Conservation Service is included in chapter 5 of the *Final General Management Plan / Environmental Impact Statement*.

### **Wisconsin State Historic Preservation Officer, Section 106 Consultation.**

Agencies that have direct or indirect jurisdiction over historic properties are required by section 106 of the National Historic Preservation Act to take into account the effect of any undertaking on properties eligible for listing in the National Register of Historic Places.

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. To meet the requirements of 36 CFR 800, the state historic preservation office received a copy of the notification letter in May 2008 indicating the NPS and the WDNR were initiating a general management plan for the Ice Age Complex at Cross Plains. 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 NPS 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, dated July 2009, expressing the society's conclusion is included in chapter 5 of the GMP/EIS. The NPS sent the letter to the state historic preservation office, along with federal agencies.

### **American Indian Tribes.**

The NPS recognizes that indigenous peoples have traditional interests and rights in lands now under NPS management. Related American Indian concerns are sought through consultation. The need for government-to-government American Indian consultation stems from the historic power of Congress to make treaties with American Indian tribes as sovereign nations. Government-to-government consultation with American Indians is required by various federal laws, executive orders, regulations, and policies. Consultation is needed, for example, to comply with section 106 of the National Historic Preservation Act. Implementing regulations of the Council on Environmental Quality for the National Environmental Policy Act also call for American Indian consultation.

Letters were sent to the following American Indian groups in May 2008 to invite their participation in the planning process:

- Bad River Band of the Lake Superior Tribe of Chippewa Indians
- Forest County Potawatomi Community, Wisconsin
- Ho-Chunk Nation of Wisconsin

- Lac Courte Oreilles Band of Lake Superior Chippewa Indians
- Lac du Flambeau Band of Lake Superior Chippewa Indians
- Menominee Indian Tribe of Wisconsin
- Oneida Tribe of Indians of Wisconsin
- Red Cliff Band of Lake Superior Chippewa Indians
- Sac and Fox Nation of Missouri in Kansas and Nebraska
- Sac and Fox Nation, Oklahoma
- Sac and Fox Tribe of the Mississippi in Iowa
- Sokaogon Chippewa Community, Mole Lake Band
- St. Croix Chippewa Indians of Wisconsin
- Stockbridge Munsee Community 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 and the draft GMP/EIS.

## CONCLUSION

The NPS has selected the preferred alternative (alternative 5) as its general management plan for the Ice Age Complex. Among the alternatives considered, this alternative best protects the complex's natural and cultural resources while also providing a range of high quality visitor experiences, meets NPS goals for managing the complex, and meets national environmental policy goals. As described in the "Mitigation" section of the GMP/EIS, all practical means to avoid or minimize environmental harm from the selected alternative has been adopted. As noted in the accompanying attachment, there will be no impairment of the complex's resources or values. After a review of these effects, the alternative selected for implementation will not impair resources or values of the complex and will not violate the NPS Organic Act. The official responsible for this decision is the NPS Regional Director, Midwest Region.

Approved:

  
 Michael T. Reynolds  
 Regional Director  
 Midwest Region, National Park Service

6.5.13  
 Date



## DETERMINATION OF NON-IMPAIRMENT

### Record of Decision for the Ice Age Complex at Cross Plains General Management Plan/EIS

In addition to determining the environmental consequences of implementing the preferred and other alternatives, National Park Service (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. However, the laws do give the National Park Service the management discretion to allow impacts on park resources and values when necessary and appropriate to fulfill the purposes of the park. That discretion is limited by the statutory requirement that the National Park Service must leave resources and values unimpaired unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values (NPS *Management Policies 2006*). Whether an impact meets this definition depends on the particular resources that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts.

An impact on any park resource or value may, but does not necessarily, constitute impairment. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

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

An impact would be less likely to constitute impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values and it cannot be further mitigated.

Impairment may result from visitor activities; NPS administrative activities; or activities undertaken by concessioners, contractors, and others operating in the park. Impairment may also result from sources or activities outside the park.

Impairment determinations are not necessary for visitor experience, socioeconomics, public health and safety, environmental justice, land use, and park operations, etc., because impairment findings relate back to park resources and values. These impact areas are not generally considered to be park resources or values according to the Organic Act, and cannot be impaired the same way that an action can impair park resources and values.

A determination of impairment is made for each of the resource impact topics carried forward and analyzed in the environmental impact statement for the preferred alternative. The description of park significance in chapter 1 was used as a basis for determining if a resource meets the impairment criteria listed above.

## **Geologic and Soil Resources**

The Ice Age Complex at Cross Plains 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 weather 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 in to one of these caves has resulted in at least two sinkholes. One of these 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 torrent of glacial meltwater that flowed down Black Earth Creek valley, first along the ice edge and later beneath the ice in what is now called Cross Plains gorge.

Preservation of geological features that tell the glacial story of the site are necessary to fulfill the purposes for which the park was established and are key to the natural integrity of the park. The actions in the preferred alternative would have only beneficial impacts on geological resources by providing measures for preserving these resources such as directing visitors away from the bottom of Cross Plains gorge and by establishing protective management areas, or zones. While there may be some short term adverse impacts on soils due to construction activities, in the long term, there would be beneficial impacts through directing visitors away from sensitive soils on steep slopes. Because of these beneficial effects, the preferred alternative would not result in impairment.

## **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, including the northern edge of the Complex. 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 draining northward towards Black Earth Creek that has been partially developed to include a stock tank. 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.

The preferred alternative envisions 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 quality. Additionally, the preferred alternative stresses that the facility at the core would be highly sustainable, and, specifically, would employ systems to carefully control surface water runoff and avoid impacting the quality of Black Earth Creek. Because of these measures, the preferred alternative would not result in impairment.

## **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. The sound assessment in this EIS is based on experience of the team who wrote the plan; a formal sound inventory has not been conducted at the complex. Since one of the fundamental values of the complex is "the opportunity for people, particularly those in the adjacent urban area, to experience immersion into a large natural landscape," activities that would remove or lessen unnatural sounds would be beneficial to the soundscape and those that would add or increase unnatural sounds would result in adverse impacts.

The preferred alternative could result in considerable increase in visitation, which would lead to considerably more visitor-generated noise concentrated in specific areas of the complex, mostly in the development zone at the core of the property. In this area, there would also be noise generated from construction of a visitor center complex, but these moderate adverse impacts on the soundscape would be temporary. 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. There would also be a large natural experience area at the corner of the two major roads on the edge of the Complex, in which the desired visitor experience includes providing direct sensory experience of natural resources. Overall, while there would be no more than a negligible to minor level of adverse impacts on the soundscape. This resource would not be impaired.

## **Vegetation and Wildlife**

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 prairie and oak savanna dominated the site before European settlement. 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. 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. NPS 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.

The preferred alternative divides management prescriptions fairly evenly between landscape interpretation and expanded recreational experience (which share the same desired resource condition) and natural experience. The preferred alternative also provides a wildlife corridor of unbroken habitat in the southern half of the complex. This combination of management prescriptions would result in minor beneficial impacts on vegetation and wildlife. Vegetation and wildlife would not be impaired under the preferred alternative.