ICE AGE NATIONAL SCENIC TRAIL Corridor Plan and Environmental Assessment For Marquette County, Wisconsin



Prepared by:

National Park Service Ice Age National Scenic Trail Cross Plains, Wisconsin

Wisconsin Department of Natural Resources

Ice Age Trail Alliance

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U.S. DEPARTMENT OF INTERIOR NATIONAL PARK SERVICE

ICE AGE NATIONAL SCENIC TRAIL

Corridor Plan and Environmental Assessment for Marquette County, Wisconsin

EXECUTIVE SUMMARY

The National Park Service (NPS) has prepared this Corridor Plan and Environmental Assessment (EA), also referred to as a Corridor Plan, to evaluate the potential environmental impacts of the Proposed Action to designate a corridor, approximately 2-5 miles wide, for land acquisition and management of the Ice Age National Scenic Trail (NST) within Marquette County, Wisconsin. When complete, the Marquette County portion of the Ice Age NST will be between 45 and 55 miles. The actual length of the remaining trail between the Marquette/Columbia County line, and Marquette/Waushara/Adams Counties line is dependent on the route. Each segment of trail will be developed as funds and approvals allow with a goal of a continuous completed trail through the county. The proposal is to establish a corridor within which lands for the trail may be acquired, developed, managed, and protected for the Marquette County portion of the Ice Age NST. This plan will help guide agencies and private volunteer organizations in their efforts to secure a route for the trail.

On October 3, 1980, an amendment to the National Trails System Act (NTSA) (16 U.S.C. 1241 et seq.), authorized the establishment of the Ice Age Trail as a National Scenic Trail (NST) in Wisconsin. Congress identified a general route for the trail. When complete, the trail will extend over 1,200 miles, from Interstate State Park on the St. Croix River in Polk County to Potawatomi State Park in Door County, tracing features left by the last continental glacier that swept over Wisconsin. Statewide, more than 670 miles of the trail have been built to date and are open for use including, 1.8 miles of Ice Age NST in Marquette County.

This document is intended to analyze the potential impacts of implementing the Proposed Action. Developing and managing the Ice Age NST through Marquette County may result in short-term minor adverse impacts during construction to wildlife and vegetation. The NPS, Ice Age Trail Alliance (IATA) and Wisconsin Department of Natural Resources (WDNR), referred to as the TRIAD, are jointly coordinating and facilitating the planning process to aid in the determination of a more specific route following the designation of the corridor. A Core Team was formed to evaluate a proposed corridor, possible trail route options, and conduct a public involvement process in Marquette County. The Core Team included representatives from NPS, WDNR, the Ice Age Trail Alliance (IATA), Marquette County, and the U.S. Fish and Wildlife Service (FWS). The Triad, NPS, WDNR, and IATA, is continuously working to establish the trail guided by the Memorandum of Understanding (MOU) which can be found online at: https://www.nps.gov/iatr/getinvolved/upload/IATR_MOU_TRIAD_Fully_Executed_508.pdf.. In addition, support and review was provided by the Marquette County Volunteer Ice Age Trail Chapter.

Since all participation is voluntary, the actual alignment of the trail to be established within the identified corridor is dependent on the willing cooperation of affected landowners.

This EA fulfills required planning for resource and visitor use management and development guidance. This plan is consistent with the general guidance of the 1983 Comprehensive Plan for Management and Use of the Ice Age National Scenic Trail (Comp Plan). The Proposed Action is consistent with the NPS mission and requirement to uphold National Environmental Policy Act (NEPA) of 1969, National Historic Preservation Act (NHPA) of 1966, and the Endangered Species Act (ESA) of 1973. The plan is also consistent with Wisconsin NR 44.04(13).

Written comments on this Plan and EA will be accepted by the NPS online at <u>http://parkplanning.nps.gov</u>

Or you may send written comments to the following address:

Eric Gabriel, Superintendent Ice Age National Scenic Trail National Park Service 8075 Old Sauk Pass Road Cross Plains, Wisconsin 53528

Acronyms

BNHC	Bureau of Natural Heritage Conservation
CPP	Corridor Planning Process
CWA	Clean Water Act
DOI	Department of Interior
DOT	Department of Treasury
EA	Environmental Assessment
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FWS	U.S. Fish and Wildlife Service
IATA	Ice Age Trail Alliance
LUG	Local Units of Government
NEPA	National Environmental Policy Act
NHI	National Heritage Inventory
NHPA	National Historic Preservation Act
NPS	National Park Service
NRHP	National Register of Historic Places
NST	National Scenic Trail
NSTA	National Scenic Trails Act
NWR	National Wildlife Refuge
PA	Programmatic Agreement
PILT	Payment in Lieu of Taxes
ROS	Recreation Opportunity Spectrum
SCORP	Wisconsin Statewide Comprehensive Outdoor Recreation Plan
SFA	State Fishery Area

- SFWA State Fishery and Wildlife Area
- SHPO State Historic Preservation Officer
- SNA State Natural Area
- SWA State Wildlife Area
- USACE U.S. Army Core of Engineers
- USDA U.S. Department of Agriculture
- WDNR Wisconsin Department of Natural Resources
- WEPA Wisconsin Environmental Policy Act
- WPA Waterfowl Production Area

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For Marquette County, Wisconsin

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1 BACKGROUND OF THE ICE AGE NATIONAL SCENIC TRAIL

The path of the Ice Age Trail was originally envisioned by Raymond Zillmer in the 1950s. He became the founder of Ice Age Trail Park and Trail Foundation, now the Ice Age Trail Alliance (IATA), and pursued efforts to establish the trail and create a National Park in Wisconsin. In 1964, the Ice Age National Scenic Reserve was created. The Ice Age Trail Council and volunteers across the state of Wisconsin began to determine ways to connect already existing trails and create new segments to fulfill Zillmer's vision. In October 1980, the National Scenic Trails Act was amended making the Ice Age National Scenic Trail (NST) one of eleven National Scenic Trails is the United States. In 1987, the Wisconsin State Legislature formalized, through (s 23.17), legislation designating the trail as a State Scenic Trail, assigning the Wisconsin Department of Natural Resources (WDNR) responsibility for coordinating the involvement of state agencies in the trail project and cooperating with the National Park Service (NPS).

The purpose of the Ice Age NST is to preserve some of the finest features of Wisconsin's glacial landscape, as well as other scenic, natural, and cultural resources, while providing opportunities for low impact recreational and educational activities. The Purpose and Significance of Ice Age NST can be reviewed at:

https://www.nps.gov/iatr/learn/management/upload/508-purpose-and-sig.pdf

The 1983 Comprehensive Plan for Management and Use of the Ice Age National Scenic Trail (Comp Plan) provides general guidance on where to locate the trail. It states that the trail shall follow the terminal moraine or glacial features left by the last glacial advance. The trail follows the path of the last advance of the glacier that covered the majority of Wisconsin approximately 15,000 years ago, during the last Ice Age. Indeed, the state has lent its name to the most recent series of glacial advances and retreat: the Wisconsin Glaciation lasted from about 100,000 to 10,000 years ago. Wisconsin's legacy from the glaciers and meltwater streams of the Ice Age is a landscape of great diversity and beauty. The state contains world-renowned examples of many landforms that are evidence of continental glaciation. These include moraines, eskers, kames, kettles, drumlins, wetlands, tunnel channels, and lakes (see Appendix C Definition of Terms).

In addition, the trail connects five of the nine Ice Age National Scientific Reserve units and many other Federal, state, county, and local parks. The NPS administers the trail in close cooperation with the Triad, counties, local governments, and other private organizations that are working to help build and maintain the Ice Age NST. A Memorandum of Understanding (MOU) between the Triad outlines their respective roles and responsibilities for the acquisition, development, operation, maintenance, and protection of the trail. A copy of this MOU can be found at: <u>https://www.nps.gov/iatr/getinvolved/upload/IATR_MOU_TRIAD_Fully_Executed_50</u>8.pdf.

The WDNR is responsible for implementing state laws that protect and enhance Wisconsin natural resources including but not limited to air, land, water, flora, and fauna. Nearly 300 miles of Ice Age NST are located on WDNR properties. The WDNR assists in the planning and development of the Ice Age NST, provides grants for acquisition and maintenance of the trail, and acquires and accepts gifts of land for the trail.

The IATA is a member-based non-profit organization that continues to develop the Ice Age NST into one of the premier hiking trails in the United States. They maintain the trail and its associated lands, promote the trail, raise money to support the trail effort, assist in planning, and acquire lands for the trail. In addition, the IATA is an Accredited Land Trust and can acquire and retain properties.

The Marquette County Chapter of the IATA officially formed in 1997 to complete the trail countywide. They sponsor hikes, work outings, and presentations to create awareness and promote the trail. In February 2022, the Marquette County Chapter brought forth a resolution to Marquette County Board asking for their continued support of the Ice Age NST in Marquette County. The Board approved the resolution, this resolution can be found in Appendix H.



Map 1-State of Wisconsin Showing Existing Location of Ice Age NST Segments

2 PLANNING, ISSUES & CONCERNS

2.1 THE CORRIDOR PLANNING PROCESS

When Congress authorized the Ice Age NST, it directed that "administration of the trail shall be the responsibility of the Secretary of the Interior..."; the Secretary delegated this administrative responsibility to the NPS. The purpose of preparing this EA is to carry out the Secretary's responsibility in section 7(a)(2) of the NTSA [16 U.S.C. 1246(a)(2)] and to uphold the NPS responsibility to comply with NEPA, NHPA, and ESA. In addition, the findings in this document support the WDNR requirements to uphold Wisconsin Environmental Policy Act (WEPA) of 1972.

It is the purpose of this plan to determine a more specific route for the trail by establishing a corridor within which lands may be acquired for the trail, and to do so through an open process involving affected agencies, landowners, trail users, and the public.

The Corridor Planning Process (CPP) for Marquette County began in 2012 with a meeting of representatives from the Core Team. Their task was to develop conceptual ideas for alternative corridors, possible route options for the Ice Age NST, and shepherd these ideas through the public review process. To determine a location for the trail, three important elements are identified: the Corridor, Trailway, and Trail. (see Definitions of Terms: Corridor, Trailway, and Trail in Appendix C)

The objectives of the CPP are to define a corridor within which funds may be used to acquire lands for the trail and design possible route locations for the trail within the corridor. The corridor is defined by locating clusters of outstanding, interpretable glacial and biological features, public lands, as well as areas of continuous scenic beauty. After these features are mapped, their patterns typically reveal a very general, natural alignment for the trail. The width of the corridor is usually on a landscape scale of 2-5 miles, although in the case of large significant features it can be wider. The corridor includes desirable features for the user to walk upon, view, or it may be desired for the feature to be preserved. Another reason for the corridor's width is it allows flexibility in working with landowners since participation in the project is voluntary. Pursuant to section 23.09(2)(d)10., Wisconsin Statutes, the corridor will establish the area within which WDNR may acquire lands for the Ice Age Trail. The corridor also defines the area within which federal and private involvement in land protection and acquisition for the Ice Age NST may occur.

When the corridor is first proposed, the geologic features, aesthetic values, distant views, and natural environment are taken into consideration. Most of these elements are contained within the proposed corridor, but some are located outside of it and can be

seen from high vantage points within the corridor. Conceptual trail routes are then designed to connect these various features. These views serve as a visual representation of how the glacier shaped the landscape of Wisconsin and created its diverse biological ecosystems and water resources. These features act as landmarks for hikers and as a map or way-finding system to identify where they are along the route of the trail.

Two other elements, the trailway and trail, fit within the corridor. The trailway is the width or area of land that is managed for the purpose of the Ice Age NST. It includes the trail and surrounding lands that are owned, leased, or managed as part of the Ice Age NST. These management purposes may include but are not limited to creating a buffer for the trail to separate it from adjoining land ownerships and uses, and protecting scenic or significant geological, cultural, or natural features. The trailway width will vary depending on a number of factors including character of the landscape through which it passes and private landowner desires. In urban areas, the trailway may be a sidewalk or other narrow feature. In non-urban areas, it generally will average 50 - 1,000 feet in width, with occasional wider areas to protect a significant natural/cultural feature or views.

The trail is the actual usable tread and surrounding space that is maintained for the purpose of passage along the trail route. The trail width may vary from 18 inches to 72 inches depending on the Recreation Opportunity Spectrum (ROS) classification. NPS has identified 3 major categories for the ROS that can be found along the trail: Urban, Rural/Roaded Natural, or Semi-Primitive. (See Definitions in Appendix C). Almost all the proposed Ice Age NST in Marquette County will be located in a Rural/Roaded Natural setting and will average 24-30 inches in width. Additional information related to NPS ROS can be found in Chapter 2 of the Handbook for Trail, Design, Construction and Maintenance at: https://www.nps.gov/iatr/getinvolved/upload/2021-508_Ice-Age-National-Scenic-Trail-Handbook.pdf

2.2 ISSUES AND CONCERNS RAISED DURING PLANNING

During the internal and external scoping process for this planning process, a few issues were identified. Members of the public, local units of government, state agencies, federal agencies, provided input on the plan at planning meetings, agency meetings, town and county board meetings, open house meetings and through letters and comment sheets. These issues are summarized below.

Why this location for the Ice Age NST?

During the Pleistocene epoch, the glacier advanced and receded across Marquette County many times creating the landscape that we see today. What remains are numerous geologic features such as the terminal in the NW corner of the county and recessional moraines, kettle ponds, tunnel channels, glacial drainage-ways, and outwash plains.

What are the allowable uses on the Ice Age NST?

The Ice Age NST is intended to be primarily a hiking foot trail. Other compatible uses may include winter activities such as snowshoeing and cross-country skiing. However, some trail segments may not be suitable for cross-country skiing unless this activity was considered in the initial design and layout. In general, horses, bikes, and snowmobiles are not allowed on the trail except for those sections where they are an allowed use, such as state/county recreational trails. On private lands, occasional travel on or across the trail with motorized vehicles by the landowner or manager for the purpose of managing and using their land is permitted. If necessary, various structures such as stiles, gates, or fences can be strategically placed along the trail to discourage unauthorized uses from occurring. Hunting is permitted on many of the publicly owned lands where segments of the trail exist, depending on the property type and use. Privately-owned lands are open to hunting only by permission of the landowner, and segments located on private property are often closed during the November hunting season. For more information see Chapter 3 of the Handbook for Trail, Design, Construction and Maintenance at : https://www.nps.gov/iatr/getinvolved/upload/2021-508_Ice-Age-National-Scenic-Trail-Handbook.pdf

Impacts on natural resources by trail construction and use

Concern was expressed about the impact on natural resources that could result from the construction and use of a new trail. The Ice Age NST has *A Handbook for Trail Design*, *Construction, and Maintenance* that guides its development. In Marquette County, future segments will have a native surface and be between 24 and 36 inches wide. If standards and best management practices are followed, temporary minor adverse impacts would only occur during construction. In sensitive environments such as wetlands, the trail would either be routed around them or would go through a permitting process to construct bridges or boardwalks through them. These issues are discussed in this document.

Preservation of the glacial landscape

Some individuals were interested in preserving the glacial features and resources that are important to the trail's geologic story in Marquette County, and the scenic experience of the hiker. The Preferred Alternative captures what is believed to be the best examples of geologic features left by the glacier in the study area. For further details see Chapter 5.3 Affected Environment-Geology.

Impacts on cultural resources by trail use and construction of new trail

Potential impacts on cultural resources that may occur because of trail construction were of concern to some people. By following the Section 106 process in the NHPA, the NPS will be coordinating and consulting with the Wisconsin State Historic Preservation Office (SHPO). The NPS has a Programmatic Agreement with the SHPO that defines methods to identify and avoid impacts to cultural resources when designing and building the Ice Age NST.

Impacts on private land and private ownership

Some people expressed concerns regarding the completion of the trail through the county and its impact to private land. The Ice Age NST has the potential of crossing both public and private lands. Private interests may be affected by the trail in a variety of ways such as the purchase of lands, community economic development, or change of land use from agriculture to conservation. However, participation in selling land or having the trail cross private land is voluntary.

2.3 PRELIMINARY ESTIMATED COSTS OF LAND ACQUISITION AND TRAIL DEVELOPMENT

Depending on the route selected, the Ice Age NST through Marquette County is expected to be 45-55 miles in length when complete. Recent property sales of rural land in the proposed Ice Age NST corridor have ranged from \$3,000-\$3,500 per acre. If 50 miles of trail would need to be developed on lands presently under private ownership, at a Trailway width of 100 feet, the total land acquisition cost would be in the range of \$1.8 M to \$2.1 M. The table below lists approximate costs based on different trail lengths and average width scenarios. Realistically, the trailway width will vary along its entire length because its breadth is determined by several factors including land use, geography, and sale price.

Table 1 Cost of Trailway For Ice Age NST (Assuming \$3,000 to \$3,500 per acre)							
Average Width of Trailway Purchased	45 miles	50 miles	55 miles				
100 feet (12 acre/mile)	\$1.62M\$1.89M	\$1.8M-\$2.1M	\$1.98M-\$2.31M				
200 feet (24 acre/mile)	\$3.24M\$3.78M	\$3.6M-\$4.2M	\$3.96M -\$4.62M				
330 feet (40 acre/mile)	\$5.4 M\$6.3M	\$6M-\$7M	\$6.6M-\$7.7M				

Table 1-Cost of Trailway

Land values provided by WDNR real estate staff December 2020.

Aside from the cost of tools, the labor will be provided mostly by volunteers. Since the exact location and length of the trail is currently unknown, it is difficult to provide exact costs.

Depending on the trail's location, several boardwalks and bridges may be needed. A reasonable estimate for boardwalk construction costs under the Preferred Alternative is approximately \$50/foot.

Existing public parking can be found at the French Creek State Wildlife Area (SWA), John Muir County Park, FWS Fox River National Wildlife Refuge/Muir Waterfowl Production Area (WPA), Observatory Hill State Natural Area State Natural Area (SNA), in the City of Montello, Moon Lake Boat Launch, Montello School Forest, Westfield School Forest, Village of Westfield, Lawrence Creek SWA, Caves Creek SWA (three locations), and on the Waushara County line at Chaffee Creek State Fishery Area (SFA). Based on available road crossings and an approximate spacing of four to six miles between trailhead parking areas, an additional 3-4 parking areas might be needed, depending on the trail's location. Most of these parking areas would be small, designed for approximately 4-10 vehicles, depending on need. Parking would be primarily provided on public lands as those sites have large lots to accommodate many activities. A total estimated cost of \$30,000 for parking would include 3 small areas (\$6,000) and 1 large lot (\$12,000). Simple informational kiosks will be placed in parking areas for an approximate cost of \$10-15,000. The cost of these exhibits is estimated to be between \$4,000 and \$7,000, depending on the number of panels created.

3 PURPOSE & NEED

The purpose and need of this EA is to identify and evaluate potential corridors where a route for the Ice Age NST could be established in Marquette County, from the Columbia County line north to the Waushara and Adams County lines. Although the Comp Plan designated a general route for the trail, the development of a corridor will help identify locations for the trail to get the trail off roads. The maps in the Comp Plan frequently identify roads as "Connecting Road Segment to NST" where there was no trail in existence and no specific off-road trail was identified for the future. This alignment was displayed on the maps even though it was known that these road routes could not serve as the route of the Ice Age NST over the long-term. The Comp Plan states that the Ice Age NST "should be a continuous overland (off-road) trail. The roads identified on the maps were "place holders" for a future alignment that would need to be determined through a detailed analysis. This planning work was identified as a priority action in the Comp Plan, "Detailed planning for the location and construction of new trail segments needed to make the Ice Age NST a continuous off-road trail as identified in this plan should begin as soon as possible as a cooperative effort between

the Ice Age Trail Council (now IATA), WDNR and the NPS." Map 2 illustrates the route identified in the Comp Plan.

The connection to Adams County would facilitate the development of the western leg (Glacial Lake Wisconsin segment) of the Ice Age NST's bifurcation—where the trail splits in two. Marquette County is one of five counties that are part of the 'bifurcation' found on the route of the Ice Age NST in southcentral Wisconsin. When the Ice Age NST is complete, the bifurcation will provide a 200-mile Ice Age NST loop that will wind through a diversity of landscapes composed of the Baraboo Range, Driftless Area (Sauk County), Glacial Lake Wisconsin (Adams and Juneau Counties), and the terminal and recessional moraines (Northern Columbia and Marquette Counties.) . The design of the proposed Ice Age NST corridor is based on several factors: general adherence to glacial features left by the Wisconsin advance, linkage to public lands for support facilities and interpretive opportunities, provision for a varied and scenic hiking experience, preservation of significant natural features, and reasonable directness of route.

Figure 1-Map of Wisconsin showing route of Trail from 1983 Comprehensive Plan.



4 ALTERNATIVES CONSIDERED

Three action alternatives and a No Action Alternative were considered and discussed throughout the public involvement process. The northern portions of Alternatives 1, 2, and 3 have distinct themes. All alternatives were approximately 2-5 miles wide with their southern portions mirroring each other through the John Muir Neighborhood located in the Township of Buffalo. All alternatives contain portions of the Elderon Moraine. As a result of the public involvement process, a hybrid alternative emerged and is discussed below.

No Action Alternative: In this alternative, the trail would not be constructed by the NPS.

Alternative 1: winds west under the Interstate Highway 39 to incorporate the Township of Springfield and the scenic, undulating topography of the terminal moraine, and encompasses the *greatest number and variety of glacial features*. After passing over the Elderon Moraine, Alternative 1 winds west to capture the dramatic Johnstown Moraine on its north end. This alternative passes through the City of Montello and Westfield.

Alternative 2: contains *the most public lands* and passes through the Township of Shields and Crystal Lake. It meanders north through the Township of Packwaukee and runs along the eastern edge of the Village of Westfield.

Alternative 3: takes the *most direct route* through Marquette County, paralleling Interstate Highway 39, bypassing the Township and City of Montello. This alternative closely followed the conceptual route identified in the Comp Plan and was the most direct route for the trail.

Alternative 4 (Preferred Alternative) remains on the east side of the county until almost reaching Waushara County where it winds west to the Coloma Rest Area along Interstate Highway 39. The City of Montello is the only urban area within this Alternative.

This hybrid alternative emerged because of public input. Alternative 2 was retained and refined to include some additional opportunities for routing the trail in the NW corner of the County and small portions of Alternative 1 and 3 incorporated, now referred to as the Preferred Alternative. Map 2 on page 13 illustrates the Preferred Alternative.

This EA only analyzes the No Action (required as a baseline comparison by NEPA) and Alternative 4, the Preferred Alternative. Maps of Alternatives 1-3 can be found in Appendix F.

4.1 NO ACTION ALTERNATIVE

Under the No Action alternative, the Secretary of the Interior's responsibility under the NTSA to select a specific route for the trail would not be carried out and no corridor, to more specifically identify the route of the Ice Age NST, would be established. The WDNR and/or other local and state entities could potentially continue to pursue the development of a trail, but there would be no direct NPS involvement. Local and private partners working to establish the trail could continue to be guided by the general route referenced in the Comp Plan, which for the most part is a conceptual route and could deviate from it at their discretion.

Any activities by partners to acquire lands for the trail would be done with limited or without federal funds or technical assistance. The project would rely on the WEPA and its associated policies regarding natural and cultural resource protections. Planning, public involvement, and implementation activities would be carried out by local, state, and trail advocates.

4.2 Alternative 4: PREFERRED ALTERNATIVE

The Preferred Alternative, formerly referred to as Alternative 4, allows for easier passage of the trail and includes additional lands. It contains the highest concentration of glacial features of any of the proposed alternatives. Among the natural resource features found are prairie and oak savanna ecosystems, woodlands, scenic waterways, and a host of glacial features that include kettle ponds, tunnel channels, moraines, and eskers. Well-placed scenic overlooks could potentially provide views of the glacial landscape. Also, approximately 4.5 Sections in the northwest corner of the Township of Springfield were added to the Preferred Alternative to capture some of the significant geological resources found there and allow easier access to Adams County.

This provides the potential to link several public properties including a FWS WPA, three WDNR SWAs, four WDNR SNAs, municipal parks, and John Muir County Park, where 1.8 miles of existing Ice Age NST have been constructed, the only Ice Age NST in Marquette County. A portion of the original Muir farmstead is a National Historic Landmark and SNA. In addition to Muir's homestead, the Preferred Alternative includes other areas that had an influence on Muir. In addition, this alternative provides opportunities for the trail to connect with the adjoining counties of Columbia, Adams, and Waushara to facilitate the bifurcation.



Map 2-Preferred Alternative

The following is a description of the Preferred Alternative corridor through Marquette County beginning at the county line in the Township of Buffalo traveling north through Packwaukee and Montello, through the Township of Harris, and ending at the county line in the northwest. The corridor boundaries tend to follow roads, section lines, and property lines. Maps 4 through 7 illustrate the Preferred Alternative. Possible trail route options are shown in Appendix A of this document.



Map 3-Preferred Alternative Overview

Township of Buffalo (Township 14 North, Range 10 East)

The Preferred Alternative within the Township of Buffalo varies in width from 3-4 miles. Beginning at Marquette County's southern border with Columbia County, the corridor generally winds north roughly paralleling the Fox River, County Trunk F, 10th Road and 13th Road. Any trail built here would require crossing County Road O, Gillette Drive, and Gem Avenue. County Trunk F and O are moderately busy, but all other roads are quiet town roads and remote driveways.

The topography here is flat to gently rolling, with prominent hills (a combination of glacial drumlins and older Precambrian out-crops) and valleys dotted with kettle lakes and ponds. The region is a mix of low-density rural residential development, farms, forest, and wetlands.

As the corridor enters Marquette County and advances north, it encompasses both private lands and the northern unit of French Creek SWA. The southern unit is located about a mile south in Columbia County. Both units, were established by WDNR in 1947 for waterfowl production, hunting, and to protect the French and Spring Creek watersheds. The site allows various outdoor recreational activities and offers an abundance of parking and access into the site. The property is representative of glacial forces as it has morainal ridges, drumlins and large depressions left by the Elderon Moraine which was created 16,000 years ago. The landscape is overlain by a great diversity of native plant communities that include oak woodland, savannas, prairie, restored wetlands, and even a tamarack swamp. The high ground, located on the site's western and eastern boundaries, provides scenic views to other geological features some distance away, including Observatory Hill. As the corridor moves northwest reaching the Townships of Westfield and Springfield, it winds onto a very scenic portion of the terminal Johnstown Moraine with undulating topography including kettle ponds and tunnel channels. At the northern end of the Township of Springfield, the proposed corridor connects to existing trail in Waushara County.

This general area of the Preferred Alternative is also the site of John Muir's neighborhood, a 4 square mile area with features that are known to be of importance to John Muir and his family when they emigrated from Scotland in 1849. John Muir, renowned conservationist, and author, known as the father of America's National Parks, spent his youth at Fountain Lake Farm National Historic Site (private property). Fountain Lake is now known as Ennis Lake, a 30-acre spring-fed kettle lake. Additional features related to John Muir in the corridor include John Muir County Park and National Historic Landmark, part of the original homestead, his second home site on Hickory Hill (private property); Wolf Hill; Mulhern Lake, formerly known as Knight's Lake where Daniel Muir baptized his children; United Presbyterian Church and cemetery known as Wee White Kirk Church and cemetery, and Observatory Hill (SNA). John Muir County Park is located on the west side of the corridor, north of County Trunk O, and adjacent County Trunk F and has restrooms available. The park is 172 acres and surrounds Ennis Lake. The lake is surrounded by sedge meadow, bog, northern wet forest, southern dry forest, oak opening, and wet-mesic prairie. The Park is managed as a county park overlain by WDNR SNA designation enacted in 1972. The park was designated a National Historic Landmark in 1989. The Ice Age NST circles Ennis Lake and offers views of a wide variety of plant communities. The Park has water, parking, and pit toilets, but no camping.

Southeast of the county park is property owned and managed by the IATA. The trail will eventually be extended in this direction once a connection to the park can be established.

Immediately west of John Muir County Park, is the FWS Fox River National Wildlife Refuge (NWR) and Muir WPA. This 1050-acre site is dedicated to the preservation and restoration of oak savanna upland and sedge meadow wetland historically found along the Fox River. These areas provide habitat for wildlife populations with special emphasis on species dependent on large expanses of marsh, such as the sandhill crane. While the site contains wetlands, there are hilly areas and uplands on its eastern edge that provide strategic points from which to view the surrounding countryside. The NWR/WPA has a few parking areas which can provide access to the trail but offers no camping or services.

Within the corridor, northeast of John Muir County Park, the topography changes from wetland to hillier lands. Located here are a few drumlins, one runs west from the intersection of County Road F and 10th Road and is close to a mile in length. Located northeast of John Muir County Park is an out-cropping of Precambrian Taylor Farms rhyolite, and a mesa of sandstone informally known as Wolf Hill. One mile east of this site is Observatory Hill, the second highest point in Marquette County. Observatory Hill a 175-acre site that is an out-cropping of erosion-resistant 1.76-billion-year-old Precambrian porphyritic rhyolite that bears the striations of millennia of passing glaciers and a 5,000-year-old thunderbird petroglyph. It is also a site Muir wrote fondly about that was designated a State Natural Area supporting a diversity of plant communities by WDNR in 1989. Currently, the WDNR is undertaking efforts to restore the state natural area to oak savanna/prairie. The site has parking but offers no camping or services.

On the east side of the corridor, just one mile south of Observatory Hill, are a cluster of kettle lakes called Madden Lakes. A stream flows southwest from Madden Lakes creating wetlands that are located north of the Wee White Kirk church and cemetery. This area is thought to be the "weird swamp" that John Muir mentions in his autobiography *The Story of My Boyhood and Youth*. The stream continues further south into the northern unit of French Creek SWA.



Map 4-Preferred Alternative-SOUTH

Township of Packwaukee (Township 15 North, Range 9 East)

Leaving John Muir's neighborhood, the Preferred Alternative moves north and expands from 4 to 6 then 8 miles in width to encompass the 2 crossings of Buffalo Lake in the community of Packwaukee (west side) and City of Montello (east side). This allows flexibility in locating the trail.

As the corridor winds northwest, it encompasses Page Creek Marsh SNA and the community of Packwaukee. The topography here is flat to rolling and hilly, with forest, farms, and wetlands. Initially, development is low-density rural residential, but increases closer to the community of Packwaukee on the immediate north and south shorelines of Buffalo Lake.

As the corridor advances north from the John Muir neighborhood, any route chosen would require crossing Gale Avenue, County Road D, and the Union Pacific (formerly Chicago and Northwestern) railroad line. The railroad tracks could be crossed at the wooden deck bridge at 10th Road or the at-grade crossing at 11th Drive. The higher topography between 10th Road and County Road F provides scenic views of the area. One particularly nice view is on Gale Avenue near the intersection with 11th Drive south.

Following County Trunk D west, the road bends north crossing Buffalo Lake on the causeway entering the unincorporated community of Packwaukee, which hugs the west end of the lake. If the Ice Age NST is routed through Packwaukee, it could use existing sidewalks and roads. Packwaukee provides a post office, library, park, and bar, but there are no re-supply stores (groceries/hardware) or lodging. A public boat ramp at County Road C and 10th Drive provides restrooms and includes a hiking trail and informational kiosk about the area's history. Exiting the north side of Packwaukee to reach the Township of Harris, the trail could cross County Road C, 10th Drive, State Hwy 23, Fern Avenue, or County Road B.

Immediately north of Packwaukee are wetlands associated with the Mad River. Crossing Wisconsin State Highway 23 North to the Harris Township line are lands devoted primarily to agriculture, larger residential lots, and wooded hillsides that cover discontinuous recessional moraines interspersed with kettle ponds from its glacial past.

Returning to the south side of Buffalo Lake, between County Trunks D and K, lies the 643-acre Page Creek Marsh SNA owned by The Nature Conservancy, and some other smaller land holdings. The SNA has a few parking areas located around its periphery and some existing trails, but there are no other services. The SNA was designated a SNA by WDNR in 1996. It is a wetland preserve that supports northern and southern sedge meadow, sandy oak savanna/prairie, and a wide variety of bird species. There are three linear kettle lakes located in Page Creek Marsh: Polly's Lake, Mud Lake, and Bright

Lake. They lie in a very distinctive glacial tunnel channel. The tunnel channel has an east-west orientation and is also visible at the dip in 11th Drive.

East of Page Creek Marsh SNA and 11th Drive is the 40-acre Montello School District "Muirland" forest plantation located just south of Buffalo Lake. Along with agricultural land, there are large residential sites and small parcels located around Williams Lake as the corridor moves east into the Township of Montello.



Map 5-Preferred Alternative-CENTRAL

Township of Montello (Township 15 North, Range 10 East)

The Preferred Alternative incorporates portions of the Township of Montello, which is east of the Township of Packwaukee, and includes the City of Montello. In the Township of Montello, the topography is generally flat to rolling with a mix of forest, agricultural, and residentially developed lands. Residential density increases closer to Buffalo Lake and the City of Montello. The trail may need to cross the Union Pacific railroad line and County Roads D, XX, or K.

The east side of the corridor, south of the City of Montello, parallels 14th Road, which overlays an east-facing ice-contact slope of almost 2 miles in length, one of the best-defined in the county. The ridge also provides scenic views of the Grand River SWA, a large marshland east of State Hwy 22. The tunnel channel from Page Creek Marsh SNA is located just north of this site at the intersection of County Road F, County Road D, and 14th Road. Here the tunnel channel is a valley occupied by two small unnamed lakes, the channel has an east-west orientation and is visible to the west from County Road F.

Advancing north, the corridor enters the City of Montello. In this location, the Ice Age NST would utilize existing road, sidewalks, and park lands. As the potential trail travels through the city, it could access the Andrew Krakow Memorial Fishing Area and meander through the greenway along Sunset Drive, which edges the east side of Buffalo Lake. Both sites have public parking. From Lakeshore Road it could follow sidewalks to the county property on Underwood Avenue (SH 23) exiting the City north. The City of Montello would be an excellent full-service trail town, offering opportunities for water, food, and other general re-supply for long-distance hikers, restaurants, museums, and various types of lodging, including motels, resorts, and campgrounds within and close to the city center.

As the Preferred Alternative exits the City of Montello north, it crosses State Highway 23 (Underwood Avenue) and County Road B, which provide views of Lake Montello. The Montello River flows southward from Harris Pond into Montello, where a dam located on West Park Street creates Lake Montello on the north side of the city. Just outside and northwest of the city limits, before reaching the Township of Harris, the proposed 4-mile wide corridor encompasses the scenic kettle lakes of Kilby, Echo, and Moon Lakes, all roughly within the same one square-mile section and all still relatively undeveloped. The County has a boat launch and parking lot off Fern Avenue on Moon Lake.

Township of Harris (Township 16 North, Range 9 East)

As the Preferred Alternative winds northwest into the Township of Harris, the corridor is 4-miles wide with gently rolling to hilly topography, covered with agricultural fields, woodlands, and forest plantations found on the flatter lands. On the edge of the

township line is an 80-acre pine tree plantation owned by the Montello School District which is supportive of developing the Ice Age NST across their lands. It sits above and provides a very scenic view of an excellent example of a tunnel channel (private ownership), well defined by the chain of unnamed ponds that lie in the small valley bottom. Moving westward from this site, the topography becomes hilly and more wooded. There are parallel recessional moraines formed by the retreating glacier. One scenic viewpoint in this hilly area is along 9th Avenue between Fawn Court and Ember Drive. There is a very large wetland area several sections large to the east of this area.

As the Preferred Alternative continues north, the land becomes agricultural interspersed with wooded hillsides. The corridor takes in Christensen Lake and crosses Elk Lane, Elk Road, and Klawitter Creek. Residential density increases with the proximity to roads, Interstate Highway 39, and the Village of Westfield.

North of Klawitter Creek to County Road J the terrain is hilly with recessional moraines and is relatively dry. An expansive view of the landscape can be found in this area on 9th Drive between Elk Avenue and County Road J. Just west of the viewpoint is the 40-acre Westfield School District pine tree plantation, an assortment of pine plantation and wooded hills with a kettle pond at its center. The Westfield School District is supportive of building the Ice Age NST across their lands. Farmlands mostly occupy the corridor between the school forest and County Road J, which runs westward into the Township and Village of Westfield.

The unincorporated community of Harrisville is found in the northeast corner of the corridor, on the west side of Harris Pond. Harrisville provides very basic services (public rest rooms and water at the Fireman's Park and basic supplies (food) but no lodging or camping.

Township of Westfield (Township 16 North, Range 8 East)

Crossing nterstate Highway 39, the Preferred Alternative incorporates the Township and Village of Westfield into the corridor. The Village of Westfield is critically located along Interstate Highway 39 and could function as a full-service trail town, offering opportunities for water, food, parking, restaurants, motels, and other amenities for long-distance hikers. If the trail winds north out of Westfield, it would follow sidewalks until it reaches Pioneer Park and the Westfield Community Trail. Parking is available on these lands and there are trailheads that could be used to provide information for hikers.

The Preferred Alternative in the Township of Westfield runs westward from the Village of Westfield along County Road E toward Lawrence Lake, a significant tunnel channel. A dam at County Road A creates Lawrence Lake; from the lake westward, the larger Lawrence Creek valley is the largest tunnel channel in the corridor, over three miles in length and a mile wide. Part of the valley is managed by WDNR as the Lawrence Creek SFA, a portion of which is designated SNA, to protect the high-quality trout stream and its headwaters. The 961-acre SFA includes a diversity of forest, lowland, grassland vegetation, restored prairie, and scenic views, which extend westward into Adams County. The land has higher residential density mixed with mainly agricultural lands, small tracts, and subdivided lands for vacation houses located along the lake's edges.

Township of Springfield (Township 17 North, Range 8 East)

The Preferred Alternative includes a large portion of the Township of Springfield because of the significance and diversity of its natural resources, geologic story, and the desired connections to Waushara and Adams Counties for the Ice Age NST. The corridor allows trail developers to find a way through this area and connect it with some of these special features. The middle to west side of the Township of Springfield encompasses the edge of the terminal Johnstown Moraine, deposited at the edge of the glacier 25-30,000 years ago. As a result, where this large moraine was deposited, there is dramatic, undulating, scenic topography along with and other glacial features like kettle ponds, and tunnel channels, as well as earlier sandstone/ limestone geology.

Land use within the corridor consists of agriculture, scattered houses on large acreages, wetlands toward the south and east sides, hilly woodland, and scattered agriculture on the west. The primary roads through the township are County Trunks M and CH. The remaining town roads are relatively quiet. The northwest corner of the township has a large roadless area that connects to Adams County.

As the Preferred Alternative enters the Township of Springfield north of the Village of Westfield, and adjacent to the interstate, it contains mostly agricultural fields and wetlands, including, Section 26, which is a square mile of open wetland. Just north of this is Caves Creek, a Class 1 Trout Stream considered to be one of the finest in central Wisconsin. There are three Caves Creek SFA properties centrally located within the Township of Springfield. The furthest property to the west is 70-acres with small moraines and is located southeast of the intersection of 4th Avenue and Dover Court. Near to the east, is a 205-acre parcel with a moraine on its eastern boundary. The third is a 115-acres parcel located east of County Road CH at Duck Creek Avenue, and includes a long ice-contact margin. A 73-acre undeveloped parcel owned by the Department of Transportation (DOT) lies just south of this unit of the SFA and provides a continuous wooded connection to the forested moraine located just north of the Westfield High School.

In the southwest corner of the Preferred Alternative lies Lawrence Creek SWA. Northward from the SWA is the scenic Johnstown terminal moraine covered with a mixture of agriculture and woodlands. The west half of Section 27 and all of Section 28, are divided into small wooded residential lots of 10-20 acres in area. Most of Section 20 is owned and managed as Pine Lake Campground, wooded acreage surrounding a kettle lake at the section's center. A primitive camping facility, Eagle's Nest Campground is located on the east of Lake Burnita.

The north and northwestern portion of the Preferred Alternative lies on the borders of Waushara and Adams Counties allowing the Ice Age NST passage north to Pleasant Lake and Chaffee Creek SFA and west to create the Ice Age NSTs bifurcation that will be in Adams County. This portion of the corridor lies on a particularly scenic portion of the Johnstown Moraine that was created under permafrost conditions. The nose of the glacier was frozen to the ground and as the wall of ice behind it continued to move forward, the glacial till stacked up creating undulating topography. Overlaying this topography are agricultural and private recreational lands encompassed by semi roadless area. Potential views from the top of the moraine would provide spectacular views to Glacial Lake Wisconsin and the limestone island buttes that include Quincy Bluff and Roche-a-Cri State Park amongst others.

To the east of this area in the northcentral portion of the Preferred Alternative is Glover Bluff Quarry, a 70-acre, privately-owned property whose quarry wall faces show the various sedimentary strata lain down over the millennia. Deformations in the strata indicate the quarry may be located near the rim of a structure formed by a meteor (Read, 1983). Currently, the trailhead for existing Ice Age NST is located at the Rest Area #81 parking on southbound Highway 39. This trailhead connects to a trail segment on Chaffee Creek SFA that heads north into Waushara County. In the future, volunteers will be constructing Ice Age NST at Chaffee Creek SWA in Waushara County from the rest area to Pleasant Lake. This segment will allow a connection from a variety of locations into Marquette County depending on landowners.



Map 6-Preferred Alternative-NORTH

4.3 ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The Council on Environmental Quality (CEQ) regulations (40 CFR 1500-1508) and the DO-12 require the NPS to identify the alternative that best promotes the goals of Section 101 of the National Environmental Protection Act. The environmentally preferred alternative is defined by the CEQ as: "...the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources" (CEQ 1981).

Based on the above, the Preferred Alternative is the environmentally preferable alternative. The Preferred Alternative would best protect some of the geological, biological, and archeological resources within the corridor from development and would create a protected, undeveloped trailway of diverse habitats (both uplands and wetlands) that would best promote an increase in biodiversity.

The Preferred Alternative would also best increase public recreational opportunities and connect existing recreational resources. Securing a trailway in public ownership would help protect wildlife, and in some cases may protect their habitat. It would also provide opportunities for local landowners and visitors to have access to the glacial features along the trail as well as enhance public awareness of Wisconsin's glacial landscape through interpretation of the glacial features.
5 AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES

5.1 IMPACT TOPICS CONSIDERED

To comply with the NEPA and WEPA, an analysis of a Preferred Alternative on elements of the environment is required. Impact topics are either retained or dismissed based on their potential to impact the environment. Some elements of the environment are subject to requirements specified in statutes, regulations, or by executive order, such as those governing air, water, and threatened or endangered species. Based on the alternatives retained for analysis, the following are impact topics that have been either retained or dismissed; a rationale is provided for dismissal.

Table 2 Impact Topics Retained and Dismissed								
Resource	Retain	Dismiss	Rationale for Dismissal					
Geology (Paleontology)	x							
Soils and Vegetation (Forestry, Rangeland, Farmland, Prime & Unique Farmland, Grazing Permits, Noxious Weeds, Invasives, Exotics, Threatened and Endangered Species, Special Status Species, Fuels & Fire Management)	x							
Water Resources (Surface and Ground Water Quality & Quantity, Hydrology, Floodplains, Wetlands, Riparian, etc.)	x							
Wild & Scenic Rivers		x	There are no designated Wild and Scenic Rivers in the study area.					
Air Quality		x	Air quality would not be affected as a result of either alternative considered in any measurable way.					
Acoustic Resources (Natural Sounds, Soundscapes, etc.)		x	The quality, type and level of acoustic resources present in the current environment would not be affected in any measurable way as a result of implementing either alternative.					
Wildlife (General Wildlife, Fisheries and Other Aquatic Species, Threatened & Endangered Species, Special Status Species, Invasive Species, etc.)	x							

Table 2-Impact Topics Retained and Dismissed

Table 2 Impact Topics Retained and Dismissed								
Resource	Retain	Dismiss	Rationale for Dismissal					
Recreation Resources (Visitor Use and Management, Visitor Experience, Visual Resources & Values)	x							
Cultural Resources (Archeology, Ethnography, Historic Structures, Cultural Landscapes, Museum Collections, etc.)	x							
Native American Cultural Resources	X							
Socioeconomics (Local Economies, Lands & Realty, Tax Base, etc.)	x							
Environmental Justice		x	Implementing either alternative would not have any disproportionately high adverse effects on minority and/or low-income communities within the study area.					
Recreation Resources (Visitor Use and Management, Visitor Experience, Visual Resources & Values)	x							
Human Health & Safety (Public Health, Traffic, Hazardous Materials Exposure, etc.)		x	Overall, implementing the Preferred Alternative would likely have beneficial impacts to human health as it would increase recreation opportunities; however, it would be difficult to quantify those benefits.					

5.2 IMPACT ANALYSIS SUMMARY AND ASSUMPTIONS

The Ice Age NST adheres to the standards and best management practices in *A Handbook for Trail Design, Construction, and Maintenance.* Most of the proposed trail in Marquette County would be classified as Rural Roaded on the ROS, which calls for a 24-inch tread, with an additional 1-foot vegetation clearance zone on either side. Ground disturbance would be limited to those areas where side slope benching is required to create a level tread. Total surface impacts are estimated to be less than one-half acre per mile of trail construction. Generally, trail construction and maintenance would take place using hand tools and volunteer labor. Considering the end length of the trail will be approximately 45-55 miles long, that would result in approximately 22.5-27.5 acres of surface disturbance.

Impact analysis includes direct and indirect impacts as well as cumulative impacts as a result of trends and past, present, and reasonably foreseeable future actions.

5.2.1 Past, Present and Reasonably Foreseeable Future Actions and Trends

- Past actions:
- Future and connected actions:
 - Following the completion of this planning effort, planning for trail development will occur. The development of the trail will be analyzed as each individual segment is proposed. Appendix A illustrates the possible routes for developed trail, impacts of trail development will be addressed at trail building stage. All natural resources, cultural resources, and threatened and endangered species will be analyzed to determine if adverse impacts would result from trail development.
 - The NPS, WDNR, and IATA plans to acquire land in the future. NPS acquisitions will be analyzed to determine if they would result in adverse impacts.
- Development:
 - Marquette County has continued to have an increase in population. These population trends could result in an increased demand for resources and available housing in the county.
 - Due to the continuation of current development trends, new home construction, gravel extraction, and associated infrastructure such as new access roads may also increase. Statewide, significant portions of the terminal moraine are being developed for houses because due to suitable soils and drainage.
 - Increased demand may increase the price of land making in more challenging for NPS, WDNR, and IATA to acquire land with unique geologic features. These unique lands offer spectacular views making the land a highly desirable building site.
- Climate Change:
 - If climate change continues to cause an increase in water levels, it could impact the way the trail is built. Increased water levels may result in the need to build more boardwalks, especially in areas near lakes and waterways.

5.3 AFFECTED ENVIRONMENT- Geology

About 2 million years ago the earth's climate began to periodically cool and warm. During the colder periods averaging 100,000 years each, the deposition of snow and ice in the Hudson Bay region of Arctic Canada exceeded the rate of melting. Snow compressed upon itself to form ice sheets that grew to as high as three miles at the center and spread outward across northern North America. During intervening warmer periods averaging 10,000 years in duration, snow deposition was outpaced by melting and the ice sheets receded. This cyclical process occurred as many as two dozen times during the 2 million years of the Pleistocene Epoch, or the Ice Age. Portions of Wisconsin were likely blanketed many times by these ice sheets – most evidence of these earlier events was eroded away by moving ice sheets or buried beneath deposits left by the most recent glaciation.

The last main glacial advance of the late Pleistocene Epoch, known as the Wisconsin Glaciation, entered what we now know as the State of Wisconsin roughly 30,000 to around 12,000 years ago. The Laurentide Ice Sheet divided into a number of glacial lobes, the relatively large Green Bay lobe covering much of what is now east-central Wisconsin and Marquette County, it left a landscape that is largely defined by glacial geologic features. The furthest extent of the Green Bay Lobe was around 15,000 years ago, known as the Johnstown Phase of the Wisconsin Glaciation.

A defining geologic feature from the Johnstown Phase of glaciation is the Johnstown and Elderon moraines. Moraines are ridges of material that are built up when a glacier is stationary for a long period of time: rock, soil and debris continue to be picked up and transported by the glacier's forward advance and are deposited at the glacier's melting edge, almost as if by conveyor belt. A terminal moraine marks the furthest advance of a glacier – the Johnstown moraine is such a feature which has been traced as far south as Johnstown in eastern Rock County, Wisconsin, to as far north as the village of Coloma in southwest Waushara County, Wisconsin, and passes just through the northwest corner of Marquette County. The terminal moraine in the northwest corner of Marquette County and the Township of Springfield is a particularly striking example of this geologic feature with its undulating, scenic topography caused by the build-up of glacial till behind the glacier's nose that was frozen to the ground (permafrost.)

The ice sheet had an advance-and-retreat episode during the Elderon Phase (from about 14,000 years to 13,000 years ago) which created a few lesser recessional moraines behind the terminal moraine. These landforms are found east of the terminal moraine throughout Marquette County, but there is a concentration of them in the county's northwest corner. A geologic feature of similar form to a moraine but of different genesis, an outwash head is a ridge formed along the edge of a glacier poised on a slope. Material and sediment is carried by melting water toward upward-sloping topography which prevents drainage away from the glacier, and a ridge builds up at the glacier's edge, much like a river delta. An outwash head usually displays a steep *ice-contact slope* on the side that faced the glacier. Marquette County's topography generally slopes downward toward the Lake Michigan basin, and a few outwash heads and ice-contact slopes are present (Mickelson et al 2011, Hooyer 2012).

Tunnel channels form when melted water beneath glacial ice manages to drain, usually forcefully, from below the glacier. A drainage channel is created under the glacier; this often-later fills with sediment outwash and till and appears as a valley or chain of ponds or lakes in modern topography. The line of ponds along Page Creek Marsh SNA and the Montello School Forest (Hungry Hills) are great examples of tunnel channels. One of the largest examples of a tunnel channel in Marquette County is the valley that forms Lawrence Lake in the Township of Westfield.

The geology of Marquette County was also influenced by large, long-standing lakes of glacial meltwater. The Green Bay lobe advanced to the quartzite bedrock of the Baraboo Hills and dammed glacial meltwater that would have otherwise drained southward in the Wisconsin River channel. Water rose to the north to create Glacial Lake Wisconsin, a single large basin with several smaller basins interconnected by narrow straits. At its maximum area the main basin of Glacial Lake Wisconsin covered approximately 1,800 square miles atop what are now Adams and Juneau Counties to a depth of around 150 feet (Schultz 2004); the next-largest, Lewiston basin, about 600 square miles, occupied an area just east of the main basin primarily over eastern Adams and western Marquette counties; the smaller Hulbert, Dell Creek, Reedsburg, and east and west Baraboo basins were confined to an area that is now northern Sauk County. The corridor in Marquette County provides and access to Adams and Juneau Counties, which are the future location of the Ice Age NST's bifurcation, a 200—mile trail loop through southcentral Wisconsin.

Other interesting geology found in Marquette County is some of the oldest geologic material in Wisconsin, dating from the Precambrian Era. These highly resistant igneous and metamorphic rocks are 600 million years of age and older. The exposed bedrock in northern Wisconsin is this type of geologic material, the Precambrian Shield, which extends northward into Canada. The largest exposed Precambrian bedrock formation in southern Wisconsin is the Baraboo Range, located in Sauk County, with scattered instances of smaller Precambrian bedrock exposures at other locations. Observatory Hill is an outcropping of porphyritic rhyolite, a highly resistant igneous rock which is thought to be more than 1.75 billion years old and bears the grooves and striations of the passage of glaciers (Mickelson et al. 2011, WDNR 2013(1)). Also, the City of Montello possesses a single elliptical mound of granite. This reddish, close-textured, erosion resistant rock is of extremely high quality and was once quarried for buildings and monuments, most famously for Grant's Tomb in New York City (Schultz 2004).

In northern Township of Springfield is Glover Bluff, a 70-acre, privately-owned property with several hills that have been mined for limestone and dolomite. A few of the quarry walls show various sedimentary strata lain down over the millennia.

Unless otherwise referenced, information in the Geology section was taken from various publications authored by John W. Attig and/or Lee Clayton, et. al., *Wisconsin Geological and Natural History Survey*, as noted in references section.

Environmental Consequences Geology: No Action Alternative

Under the No Action Alternative, the trail may or may not be built by state or local entities. If built by state or local entities, there would be no obligation to adhere to NEPA mandates and its associated natural and cultural resource protection policies, and it would be up to the state enforce WEPA policies.

Under the No Action Alternative, loss of significant geological features that are not currently protected may occur, which would be adverse and permanent.

Cumulative Impacts

Impacts under the No Action Alternative, when combined with past, present and reasonably future actions and trends would continue to be adverse, but would likely not increase by a measurable degree.

Environmental Consequences Geology: Preferred Alternative

Under the Preferred Alternative there could be permanent protection of some of the geological resources described above from disruptive land uses. Protection of the corridor, combined with increased public awareness could have a long-term beneficial impact on these unique geologic features.

The Preferred Alternative, when combined with reasonably foreseeable planned actions and trends mentioned in Section 5.2.1 would not result in an increase in adverse impacts because of reasonably foreseeable future actions.

Cumulative Impacts

Impacts under the Preferred Alternative, when combined with past, present and reasonably future actions and trends would continue to be beneficial, but would likely not increase by a measurable degree.

5.4 AFFECTED ENVIRONMENT- Soils

There are over 69,000 acres of surface considered in the Preferred Alternative. According to the Marquette County Comprehensive Plan there are eight US Department of Agriculture (USDA) major soil associations in Marquette County. A soil association is a landscape that has a distinctive pattern of soils, relief, and drainage. It is typically named for the major soils even though it may contain other "minor" soil types. The soil associations within the corridor are as follows:

Plainfield-Gotham: the most extensive association that covers about 30 percent of the north and central parts of the Marquette County. These are excessively drained sandy soils, much of which is still under wooded cover, but some are used for agriculture.

Houghton-Adrain: these are organic soils with a loamy/sandy substrate at about three feet of depth, found in broad low-lying areas in the southern and eastern part of the county. This association covers about 18 percent of the county; much of these areas remain under native grass, sedge, and reed cover, but some has been cleared for farming.

Oshtemo-Gotham: well-drained loamy soil with a sandy substrate at about three feet of depth. This association, over about 16 percent of the county, is found on hills, ridges, sloping areas and outwash terraces in the east-central and southeast parts of the county, and has been used extensively for agriculture, with hillier areas better suited for grazing or woodland.

Delton-Briggsville-Mundelein: a well-drained sandy soil with a silty clay substrate at about three feet of depth, also found over about 15 percent of the county, is well-suited for agriculture and found in the western part of the county on hills, slopes, terraces, and low-lying areas.

Granby-Tedrow-Moundville (includes Yahara and Keown): found over about 10 percent of the central, northeastern, and eastern parts of the county are poorly drained soils found in low-lying areas, terraces, and outwash plains. Most are still under forest cover or are used for pasturage.

Environmental Consequences Soils: No Action Alternative

Under No Action, the trail may or may not be built by state or local entities. If built by state or local entities, there would be no obligation to adhere to NEPA mandates and its associated natural and cultural resource protection policies, and it would be up to the state to enforce WEPA policies. Impacts to soils would depend on where and how other entities choose to build the trail. When constructed, the trail may or may not go through a design and layout process, that includes development of possible alternative alignments and analysis of potential soil impacts. The assessment of impacts might not be ascertained and may be greater than negligible.

The No Action Alternative combined with the reasonably foreseeable planned actions and trends discussed in Section 5.2.1 could potentially lead to adverse impacts to soil caused by development. These losses would be adverse and permanent.

Cumulative Impacts

Impacts under the No Action Alternative, when combined with past, present and reasonably future actions and trends would continue to be adverse and would not likely increase by a measurable degree.

Environmental Consequences Soils: Preferred Alternative

Under the Preferred Alternative, the trail would be situated to the greatest extent practicable in suitable soils to minimize the possibility of compaction or erosion. Soil type, slope, and drainage would all be taken into consideration. Soils will be analyzed further when the route for the trail is determined, and trail is being proposed for construction.

During construction, best management practices would be used to limit the area of disturbance. Erosion control techniques such as sidehill construction and drainage dips would be employed. If the trail must cross a wet areas bridges would be used to minimize adverse impacts.

In addition, monitoring of the trail will identify any cumulative erosion problems so that appropriate erosion control actions can be taken. The *Ice Age National Scenic Trail, A Handbook on Trail Design, Construction, and Maintenance* that provide standards for trail development. This handbook is used by all volunteer trail builders, as well as other guidance and materials provided by NPS and partners regarding health, safety, vegetation management. Also, the IATA has a "Mobile Skills Crew" of highly trained volunteers who build sustainable trail with minimal environmental impacts. The Handbook is available online at : <u>https://www.nps.gov/iatr/getinvolved/upload/2021-508_Ice-Age-National-Scenic-Trail-Handbook.pdf</u>

The Preferred Alternative, when combined with reasonably foreseeable planned actions and trends mentioned in Section 5.2.1would not result in adverse impacts. If any adverse impacts were to occur during the construction phase, they would be minimized through best management practices.

Cumulative Impacts

Impacts under the Preferred Alternative, when combined with past, present, and reasonably future actions and trends would continue to be beneficial and would not likely increase by a measurable degree.

5.5 AFFECTED ENVIRONMENT- Vegetation

Regionally, Marquette County liesjust south of the ecotone (tension zone) between the Wisconsin's northern boreal forests and southern broadleaf forests and grasslands which contributes to a higher floral and faunal diversity of species found in biome types. Marquette County is located within a more localized ecological landscape classified by Wisconsin DNR as *Central Sand Hills*. This landscape covers areas immediately behind the Johnstown Moraine and lakebeds and shores of former glacial Lakes Wisconsin and Oshkosh. The landforms are terminal and ground glacial moraines that were later covered by outwash, with scattered kettle ponds and lakes (WDNR 2013(2)).

Vegetation communities found within the proposed Marquette County Ice Age NST corridor includes approximately 44% of the land area dedicated to agriculture (mainly corn, soybeans and alfalfa), about 43% of the area is forested, with lesser amounts of wetland, open water, shrub lands and barrens. Large contiguous areas of any natural vegetation type are uncommon (WDNR 2013(2)). The historic upland vegetation of this region consisted of oak forest, oak savanna, and tallgrass prairie; regional wetlands included fens, wet-mesic prairie, wet prairie and coastal plain marshes. Current forest communities include tree species such as oak (*Quercus*), white pine (*Pinus strobus*), red pine (*Pinus resinosa*), jack pine (*Pinus banksiana*), maple (*Acer*), basswood (*Tilia americana*), aspen (*Populus tremuloides*), birch (*Betula*) on uplands; and tamarack (*Larix laricina*) and black spruce (*Picea mariana*) on lowlands. Most of these forested areas are considered "scrub oak" with low timber value, made more difficult due to insects, disease, and forest fragmentation (Marquette County 2015).

According to FWS on December 2, 2021 Fassett's Locoweed (*Oxytropis campestris var. chartacea*) and Prairie Bush-clover (*Lespedeza leptostachya*), two federally threatened species, are located within the preferred alternative.

At the state level, the WDNR National Heritage Inventory (NHI) Data for Marquette County indicated there are a number of species present in Marquette County. This list was cross-referenced to the WDNR Endangered and Threatened Species list of State species of concern that could potentially be present. There is a complete list of Wisconsin Species of Concern, Threatened, Endangered, and Protected Species in Appendix G.

In the Executive Order 13112 an invasive species is "a species that is: 1) non-native (or alien) to the ecosystem under consideration and 2) whose introduction causes or is likely to cause economic or environmental harm to human health." The State of Wisconsin also has an invasive species rule, Wisconsin Administrative Code NR 40, which makes it "illegal to possess, transport, transfer, or introduce certain invasive species in Wisconsin without a permit."

Invasive species can be introduced intentionally (e.g. ornamental landscape, erosion control, range improvement, holiday decorations) or accidentally released into an environment. Without the presence of that species usual predators, those invasives can out compete native species.

In Marquette County the Ice Age NST will traverse a variety of ecosystems like forested hardwoods, coniferous wetlands, and various agricultural fields. According to the Marquette County Land & Water Conservation Department noxious and invasive species that could be found in the Preferred Alternative include brittle naiad, (Najas minor), curly-leaf pondweed, (Potamogeton crispus), eurasian watermilfoil (*Myriophyllum spicatum*), hybrid eurasian watermilfoil, (*M. spicatum x M. sibiricum*), japanese knotweed (Fallopia japonica), non-native phragmites, (Phragmites australis), narrow-leaf cattail (Typha angustifolia), reed canary grass (Phalaris arundinacea), purple loosestrife (Lythrum salicaria), yellow iris (Iris pseudacorus), autumn olive (Elaeagnus umbellate), buckthorn-common (Rhamnus cathartica), buckthorn-glossy (Frangula alnus), canada thistle (Cirsium arvense), chicory (Cichorium intybus), dames rocket (Hesperis matronalis), garlic mustard (Allaria petiolate), honeysuckle (Lonicera), japanese barberry (Berberis thunbergia) ornamental oriental bittersweet (Celastrus orbiculatus), prickly ash (Zanthoxylum Americanum), purple-spotted knapweed (Centaurea biebersteinii), sweet clover (Melilotus albus), tansy (Tanacetum vulgare), and wild parsnip (Pastinaca sativa).

Environmental Consequences on Vegetation: No Action Alternative

Under the No Action alternative, the trail may or may not be built by state or local entities. If not built, it is assumed that existing development trends would continue into the reasonably foreseeable future. If built by state or local entities, there would be no obligation to adhere to federal NEPA mandates and its associated natural and cultural resource protection policies, and it would be up to the state to enforce WEPA policies. Although there is the potential that the trail may be developed opportunistically, there is an equal chance that there would be no development at all and if that were the case, the affected environment would not change.

The No Action alternative combined with the reasonably foreseeable planned actions and trends discussed in Section 5.2.1 could potentially lead to the loss of unique vegetation features because of development. These losses would be adverse and permanent.

Cumulative Impacts

Impacts under the No Action Alternative, when combined with past, present, and reasonably future actions and trends would continue to be adverse and could increase by a measurable degree.

Environmental Consequences on: Preferred Alternative

Forest Communities/Ecosystem: Under the Preferred Alternative, development of the Ice Age NST in Marquette County will create a continuous, protected, and undeveloped trailway of diverse habitats that will promote an increase in biodiversity on lands purchased for the trail as well as on the public lands it connects.

This green trailway would have less adverse environmental effects than many of the existing land uses. Current agricultural land practices make the soils prone to erosion and use of pesticides and herbicides may have a negative effect on land and wildlife health. Depending on the trailway's width, it will create an improved biological habitat for birds and wildlife by supporting plant diversity, allowing natural processes to occur, and reducing fertilizer and pesticide use.

Further land acquisition and development of the Ice Age NST into adjacent counties and beyond will extend the protected trailway. This would enhance biodiversity, avoid future fragmentation of the trail, and serve as a wildlife corridor.

Threatened and Endangered Species and Species of Concern-- Vegetation: The NPS, USFWS, and WDNR have a review process in place to avoid impacting threatened and endangered species with the construction of the Ice Age NST state-wide, including Marquette County. This process occurs in two phases. The first is a broad review of the alternative trail corridors for endangered and threatened species when the planning process is carried out. A more detailed review would occur when trail developers design a specific alignment for the trail in preparation for construction. Both reviews are coordinated with the FWS and WDNR Bureau of Natural Heritage Conservation (BNHC).

With this process in place, the Preferred Alternative would not impact any state or federally listed species of concern and depending on specific circumstances may protect sensitive resources. Consultation and coordination would include formalizing stipulations during construction activities that may include the avoidance of certain areas during specific times of the year and insuring compliance with the ESA and Wisconsin's state endangered species law codified in WDNR Chs. NR 1-99; Fish, Game and Enforcement, Forestry and Recreation; Chapter NR 27.

Invasive Vegetation Species: Invasive species are currently spreading into ecosystems. Under all the alternatives it is possible that a non-native species could be introduced within the trailway. Under the Preferred Alternative, planned and coordinated development and maintenance of the Ice Age NST would occur, which would include monitoring and mitigation of invasive non-native plant species. This is part of the regular trail maintenance activities conducted by the IATA's local chapters, and on state lands by WDNR staff. Control of invasive non-native vegetation into native ecosystems would provide a long-term beneficial effect. A protected trailway would have beneficial long-term impacts to vegetation health and would promote increased biodiversity by discouraging habitat fragmentation and resource destruction.

Control activities follow the recommendations outlined in the *Wisconsin Manual of Control Recommendations for Ecologically Invasive Plants* (edited by Randy Hoffman and Kelly Kearns). This publication provides information about the identification, monitoring, and control of exotic and invasive species in a manner sensitive to both individual species and natural communities. It was produced by WDNR, Bureau of Endangered Resources in May 1997. The publication is available online through the department's Web Site: <u>http://dnr.wi.gov/topic/Invasives/control.html</u>. Best Management Practices for invasives may also be found on the following links:

- https://dnr.wi.gov/topic/Invasives/bmp.html
- <u>https://councilonforestry.wi.gov/Pages/InvasiveSpecies/Recreation.aspx</u>
- https://dnr.wi.gov/topic/Invasives/documents/pedestrian1.pdf
- <u>https://www.mipn.org/</u>



Interpretive sign with integrated boot brush.

A wayside exhibit and boot brush could be located at the entrances to Ice Age NST segments to inform hikers about the existence of invasive species, their effect on the native environment, appearance, and control measures. These interpretive materials include information about how the hiker can help to limit the spread of invasive species by staying on the trail and using the boot brushes.

The Preferred Alternative, when combined with reasonably foreseeable planned actions and trends mentioned in Section 5.2.1 would not result in an increase of adverse impacts. Any adverse impacts that may occur during construction would be mitigated by following best management practices and consulting with the FWS to ensure no impacts to sensitive vegetation.

Cumulative Impacts

Impacts under the Preferred Alternative, when combined with past, present, and reasonably future actions and trends could be beneficial but not likely increase by a measurable degree.

5.6 AFFECTED ENVIRONMENT- Surface and Ground Water Resources

When the Wisconsin glaciers retreated more than 10,000 years ago, in Marquette County they left glacial lakes, countless kettle holes (which today are spring lakes and ponds), and many miles of high-quality streams and wetlands. These water resources sustain fisheries, and wildlife, and provide ample opportunities for recreation.

Marquette County has approximately 5,700 acres of open water (US Census Bureau 2010) contained in 60 lakes, 5 rivers, and 15 streams (Marquette County website [marquettenow.com]). Its' seven major watersheds drain into the Upper Fox River Basin, which feeds into Lake Winnebago and the Lower Fox River Basin, which flows eastward into Green Bay and Lake Michigan. The glacial outwash areas in the northern and eastern part of the county support extensive wetlands and small kettle lakes and ponds, while glacial moraines, found mainly in the western part of the county, are the source of coldwater streams, with a number of these classified as Class I Trout Streams.

The Fox River flows northward into Marquette County from Columbia County. The Fox River creates the marsh located at the Fox River NWR and Muir WPA, just south of Buffalo Lake. An impoundment rather than a natural lake, Buffalo Lake is created by the dam on the Fox River in the City of Montello. Buffalo Lake is the county's largest water body at 2210 acres in area, with a mean depth of 5 feet (8 feet maximum). The communities of Endeavor, Packwaukee, and Montello are located on Buffalo Lake. Page Creek, Mad River, Ox Creek, and a few unnamed tributaries feed into Buffalo Lake.

Lawrence Lake is in northwestern Marquette County, located within a former glacial tunnel channel. Similar to Buffalo Lake, Lawrence Lake is also an impoundment created by the dam at County Road E and is fed by Lawrence Creek from the west. Lawrence Lake is 221 acres in area with an average depth of 8 feet. Below the dam, Westfield Creek flows eastward past the Village of Westfield and is fed by Tagatz Creek, Spring Creek, Caves Creek and other unnamed creeks. Westfield Creek ultimately feeds into Harris Pond from the north. Harris Pond is a relatively shallow, 245-acre pond created by the dam located in the community of Harrisville.

The Montello River flows southward from Harris Pond and is fed by Klawitter Creek and other unnamed streams before it feeds into Lake Montello, also an impoundment which is created by the dam on the north side of the City of Montello. Lake Montello is 286 acres in area and maximum depth around 17 feet. The Montello River flows about a half-mile more south through Montello, where it joins the Fox River just downstream from the Buffalo Lake dam.

In northern Marquette County, Wedde Creek, Chaffe Creek, and Little Pine Creek are tributaries to the Mecan River, which flows to Germania Marsh SWA and continues southward. The Mecan River flows into the Fox River at the border of Marquette and Green Lake Counties. From Germania Marsh SWA to Richford in Waushara County the Mecan River is classified as having outstanding recreational values under the Nationwide Rivers Inventory.

Environmental Consequences on Surface & Ground Water Resources: No Action Alternative

Under No Action, if the NPS would not participate in the development of the Ice Age NST through Marquette County and other entities would take the initiative, it is unknown what impacts to water quality would occur as a result. Placement of water structures and trail around water bodies can have negative impacts on water resources, if improperly constructed. If built by state or local entities, there would be no obligation to adhere to NEPA, ESA, or NHPA and it would be up to the state to enforce WEPA and other state water protection policies.

The No Action alternative combined with the reasonably foreseeable planned actions and trends discussed in Section 5.2.1 would not result in an increase of adverse impacts.

Cumulative Impacts

Impacts under the No Action Alternative, when combined with past, present, and reasonably future actions and trends would continue to be adverse but would not likely increase by a measurable degree.

Environmental Consequences on Surface & Ground Water Resources: Surface & Ground Water Resources: Preferred Alternative

The Preferred Alternative would incorporate rivers, kettle lakes and ponds, water impoundments, streams, marshes, and wetlands into the experience of the trail. Constructing the trail around these water features affords the opportunity to preserve them as well as interpret their significance within the landscape. Bridges would be constructed to span creeks and streams, as well as boardwalks through wetlands. Ongoing monitoring of water crossing structures would identify and alleviate issues that may come up over time. Wisconsin State Law NR 1.95 and NR 103 of the Wisconsin Administrative Code regulate the construction of trails and bridges in wetlands and crossing of streams. Any work on the bed or banks of navigable waters, including bridges, is governed under Chapter 30, Wisconsin Statutes. Permits from the WDNR would be needed to construct bridges and approaches or conduct development activities in wetlands.

The U.S. Army Corp of Engineers (USACE) and the Environmental Protection Agency (EPA) under Section 404 Clean Water Act (CWA) have jurisdiction over wetlands and navigable waters, and permits must be obtained under Executive Order 11990, Protection of Wetlands. The NPS has an obligation to uphold the CWA and to avoid,

where possible, impacts to wetlands and navigable waterways. Before trail construction begins on any portion of the Ice Age NST (including building of structures such as bridges and boardwalks and placement of fill materials), the NPS and WDNR require that all the necessary permits be obtained.

During construction, there could be some negligible short-term adverse impacts to water resources because of minor sedimentation, and temporary stream bank destabilization. Utilizing best management practices would greatly minimize these impacts. As with other resources, however, the trail would offer beneficial opportunities for conservation of natural resources, including water quality, which would be long-term and regional.

The Preferred Alternative, when combined with reasonably foreseeable planned actions and trends mentioned in Section 5.2.1 would not result in an increase of adverse impacts.

Cumulative Impacts

Impacts under the Preferred Alternative, when combined with past, present, and reasonably future actions and trends could be beneficial but not likely increase by a measurable degree.

5.7 AFFECTED ENVIRONMENT- Wildlife

General Wildlife:

Marquette County supports a wide range of wildlife species because of its diversity of local landscape types such as pine/oak forest, scrub forest, grassland, wetland, farmland, open water, as well as its regional location at the ecotone (tension zone) between the state's northern forests and southern forests and grasslands. For instance, bobwhite quail (Colinus virginianus) and black bear (Ursus americanus), generally associated with the southern and northern regions of the state, respectively, are both found in the county (Marquette County 2009). Other species include high density of white-tailed deer (Odocoileus virginianus), wild turkey (Meleagris gallopavo), cottontail rabbit (Sylvilagus floridanus), woodcock (Scolopax minor) and ruffed grouse (Bonasa umbellus). Some mammals include coyote (Canis latraus), red and gray fox (Vulpes vulpes) and (Urocyon cinereoargenteus), beaver (Castor canadensis), muskrat (Odatra zibethicus), otter (Lutra canadensis), mink (Mustela vison), raccoon (Procyon lotor), skunk (Mephitis *mephitis*) and opossum (*Didelphis virginiana*); larger avian species include Green heron (Butorides virescens) and Great Blue heron (Ardea herodias), egret (Ergretta thula), sandhill crane (Grus canadensis), swan (Cygnus columbianus), and raptor species such as bald eagle (Haliacetus leucocephalus), osprey (Pandion haliaetus), kestrel (Falco sparverius), and a number of species of hawk and owl; there are also numerous wetland birds, songbirds, reptiles and amphibians (Marquette County 2009).

There are a number of wildlife species which are considered by WDNR to be significantly, moderately, and minimally associated with the Central Sand Hills Ecological Landscape, of avian species including: Acadian flycatcher (*Empidonax virescens*), bald eagle (*Haliacetus leucocephalus*), black-billed cuckoo (*Coccyzus erythropthalmus*), bobolink (*Dolichonyx oryzivorus*), cerulean warbler (*Dendroica cerulea*), Henslow's sparrow (*Ammodramus henslowii*), red-headed woodpecker(*Melanerpes erythrocephalus*), red-shouldered hawk (*Butea lineatus*), western meadowlark (*Sturnella neglecta*), whooping crane (*Grus americana*), and willow flycatcher (*Empdonax traillu*). Reptiles and amphibians include Blanding's turtle (*Emydoidea blandingi*), midland smooth softshell turtle (*Apalone mutica*), ornate box turtle (*Terrapene ornata ornata*), and western slender glass lizard (*Ophisaurus attenuatus*). Mammal species include Franklin's ground squirrel (*Spermophilus franklinii*) (WDNR 2013(2)).

Fisheries:

Marquette County supports various sportfish including walleye (*Sander vitreus*), northern pike (*Esox lucius*), muskellunge (*Esox masquinongy*), trout (subfamily *Salmoninae*), largemouth (*Micropterus salmoides*), and smallmouth bass (*Micropterus dolomieu*), white bass (*Morone chrysops*), bluegill (*Lepomis macrochirus*), crappie (family *Centrarchidae*), perch (*Percidae flavescens*), bullhead (family *Ictaluridae*) and catfish (order *Siluriformes*). (Marquette County 2013). In Marquette County, 13 streams and 40 miles of waterway are classified as Class 1 Trout Stream. These include portions of the Mecan River, and Chaffee, Tagatz, Caves, Lawrence, and Little Pine Creeks (Marquette County 2005). Fish species considered by Wisconsin DNR to be "significantly associated" with the Central Sand Hills Ecological Landscape include: black buffalo (*Ictiobus niger*), lake sturgeon (*Acipenser fulvescens*), least darter (*Etheostoma microperca*), paddlefish (*Polyodontidae*), shoal chub (*Macrhybopsis hyostoma*), western sand darter (*Ammocrypta clara*) (WDNR 2013(2)).

Fishery areas managed by WDNR in Marquette County are mainly located in the northwestern part of the county. These are clear coldwater trout streams that originate in glacial moraines and are classified as high-quality trout waters. Within the Preferred Alternative is Caves Creek SFA, which is about 820 acres of fragmented parcels along 14 miles of stream. The Lawrence Creek Fish and Wildlife Area, a portion of which is also a State Natural Area, includes almost 1,000 acres of stream and its upland areas is split between Marquette and Adams Counties (WDNR 2013(1)).

Wildlife--Threatened and Endangered Species and Species of Concern:

Section 7 of the ESA requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, the Federal agencies (or their designated non-federal representative) must consult with the FWS if they determine their project "may affect" listed species or critical habitat. The proposed action will have no affect on threatened or endangered species since there will be no service disturbance. Under Wisconsin State Statute 29.604 and Administrative Rule Chapter NR 27, the state of Wisconsin also assumes responsibility for the protection of federal and state endangered species under Section 7 of the ESA.

The FWS currently has listed northern long-eared bat (Myotis septentrionalis), whooping crane (Grus americana), karner blue butterfly (Lycaeides melissa sameuelis), and monarch butterfly (Danaus plexippus) as endangered species that could be found within the corridor. There are twelve birds of concern that have potential to be found within the corridor. These birds may be on the FWS Birds of Conservation Concern list or warrant special attention within corridor: american golden-plover (*Pluvialis dominica*), bald eagle (*Haliaeetus leucocephalus*), black tern (*Chlidonias niger*), blackbilled cuckoo (*Coccyzus erythropthalmus*), bobolink (*Dolichonyx oryzivorus*), eastern whip-poor-will (*Antrostomus vociferus*), golden eagle (*Aquila chrysaetos*), henslow's sparrow (*Ammodramus henslowii*), lesser yellowlegs (*Tringa flavipes*), red-headed woodpecker (*Melanerpes erythrocephalus*), ruddy turnstone (*Arenaria interpres morinella*), rusty blackbird (*Euphagus carolinus*), short-billed dowitcher (*Limnodromus* *griseus*), and the wood thrush (*Hylocichla mustelina*). These birds are protected under the Migratory Bird Treaty Act of 1918 or the Bald Eagle Protection Act of 1940.

At the state level, there are several species found in and near the project area that are of special concern, threatened or endangered; a complete list can be found in Appendix G.

Environmental Consequences on Wildlife: No Action Alternative

Under No Action the NPS would not be involved in the development of the trail, and attaining a continuous, permanently protected corridor is unlikely. As with other resources, potential beneficial impacts as a result of deliberate conservation of certain habitat areas may or may not happen. If others acquire land and build the trail, then impacts to threatened and endangered resources would be dependent on their compliance with ESA and coordination with FWS, and WDNR BNHC. If they do not coordinate, then impacts could have an adverse impact on wildlife.

The No Action alternative combined with the reasonably foreseeable planned actions and trends discussed in Section 5.2.1 would not lead to the loss of wildlife.

Cumulative Impacts

Impacts under the No Action Alternative, when combined with past, present, and reasonably future actions and trends would not likely increase impacts to wildlife by a measurable degree.

Environmental Consequences on Wildlife: Preferred Alternative

A continuous trail through Marquette County would help to preserve open space, create wildlife corridors, and protect sensitive habitats, which would be beneficial for wildlife. During construction, some negligible, short-term, adverse impacts to wildlife and threatened and endangered species could occur, including limited displacement of certain species, however, overall patterns of use would not change. Over time, hikers would not have any measurable impacts on wildlife as they become accustomed to their occasional presence. All potential impacts would be mitigated by adhering to Best Management Practices and consulting with the FWS.

The Ice Age NST as a wildlife corridor would allow species to navigate human development, and not become isolated due to habitat fragmentation. It would also contribute to greater diversity and expansion of species, particularly insect pollinators and bird species. In the long term, the preservation of habitats associated with the trail would have long term and regional beneficial impacts.

There could be some negligible, short-term adverse impacts to fisheries during construction activities as a result of possible erosion, sedimentation and temporary stream bank destabilization. The impacts, including some displacement, would be

temporary and localized, and fisheries would recover quickly. In the long-term, as a result of proper trail design, coordination with WDNR, and best management practices, impacts to fisheries would be beneficial, and localized.

The Preferred Alternative, when combined with reasonably foreseeable planned actions and trends mentioned in Section 5.2.1 would not result in adverse impacts.

Cumulative Impacts Impacts under the Preferred Alternative, when combined with past, present, and reasonably future actions and trends could be measurably beneficial to wildlife.

5.8 AFFECTED ENVIRONMENT- Recreation Resources

Marquette County and the proposed corridor contains an abundance of public lands that provide an array of recreational opportunities and experiences. Each parcel of public land offers a unique recreational experience. The proposed corridor can serve as a connection between these public lands, creating another unique recreational opportunity.

The Fox River NWR, a 1,054-acre property and 121-acre Muir WPA are FWS sites in southcentral Marquette County. These properties are composed of wetland and upland habitat along the Fox River whose purpose is to protect waterfowl habitat. It is located opposite John Muir County Park on the west side of County Trunk F.

County-wide there are 33,500 acres of State Fishery and Wildlife Areas. Of particular importance and contained within the preferred alternative is French Creek SWA, Caves Creek SFA, and Lawrence Creek SFWA. French Creek SWA overlaps the southern boundary between Marquette and Columbia Counties. It is 3,500 acres in size and is primarily managed for waterfowl production and hunting opportunities. Lawrence Creek SFWA, a 961-acre site straddles the boundary between Adams and Marquette Counties in the Township of Springfield. It provides recreational opportunities for fishing, hunting, canoeing, and snow shoeing. It also encompasses the largest and one of the best examples of a tunnel channel in Marquette County. Also located in the Township of Springfield is Caves Creek SFA that is composed of scattered parcels totaling 823 acres. It contains one of the best brook trout fisheries in southern Wisconsin along 14 miles of stream.

Overlapping many of the county's SFWAs are 10 SNAs totaling 2,600 acres. They include: Mecan River Pine-Oak Forest, Wedde Creek Savanna, Germania Wet Prairie, Upper Fox Headwaters, Comstock Bog-Meadow, and Lawrence Creek, Page Creek Marsh SNA, John Muir Memorial Park, and Observatory Hill. SNAs protect

outstanding examples of Wisconsin's landscapes, natural communities, archaeological sites, and significant geologic formations. The purpose of SNAs is to protect outstanding examples of Wisconsin's native landscape of natural communities, significant geological formations, and archeological sites.

The 643-acre Page Creek Marsh SNA, located just south of Lake Buffalo, is owned and managed by The Nature Conservancy. Observatory Hill is a 175-acre state-managed site located just east of John Muir Park. Both Page Creek and Observatory Hill are are State Natural Areas (SNA) There are also a number of state-managed public access sites to water features in the county.

Aside from the Ice Age NST segment in John Muir County Park, Marquette County manages around 123 miles of snowmobile trail and 140 miles of designated bicycle routes. The Transportation Element of the Marquette County Comprehensive Plan (2015) seeks to promote and accommodate places to bike and walk within the county. This includes specific mention of the Ice Age NST and the county's intent to formally designate and map the Ice Age NST corridor and support partner agencies in acquiring land and easements from willing landowners. Finally, in February 2022, the Marquette County Chapter brought forth a resolution to Marquette County Board asking for their continued support of the Ice Age NST in Marquette County. The Board approved the resolution, this resolution can be found in Appendix H.

Support facilities area available through the corridor and provide for hiker convenience, comfort or sanitation. They include parking, trailheads, restrooms, camping and other overnight accommodations, potable or filterable water, and opportunities to obtain supplies such as food. Parking can be found at public parks described above. There is also street side parking in the City of Montello, Village of Westfield, and community of Packwaukee. Additional parking at trailheads may be developed once trail segments are established.

Statewide, as part of the 2011-2016 Wisconsin Statewide Comprehensive Outdoor Recreation Plan (SCORP), researchers completed a survey of state and local recreation plan recommendations. From this survey, the Ice Age NST was found to be a desirable feature across the state. A "lack of access to public lands" was identified as a primary environmental barrier for increased physical activity and outdoor recreation. In the report, recreation compatibilities were assessed for a number of common recreational uses across the state. Through this work it was found that hikers view hunting as an activity antagonistic to their own. From the hunters' perspective, however, hiking has a neutral, supplementary interaction with hunting. These findings suggest that hiking and hunting–as well as other potential trail uses—can be compatible given proper planning and management of user interactions.

Environmental Consequences on Recreation Resources: No Action Alternative

Under the No Action alternative, a trail may or may not be built by state or local entities. If not built, it is assumed that existing development trends would continue into the reasonably foreseeable future, which could mean no new significant additional recreation resources may be developed beyond what already exists. If built by state or local entities, there would be no obligation to adhere to federal NEPA mandates or recreation standards, and it would be up to state and local entities to plan for and construct additional recreation opportunities.

Under the No Action, increased opportunities for hiking, the enjoyment of important viewsheds, and education regarding unique geological features and processes may not be available above what currently exists today.

The No Action Alternative combined with the reasonably foreseeable planned actions and trends discussed in Section 5.2.1 could lead to the loss of recreational opportunities. The development of the trail is thought to increase recreational opportunities in the area, though the trail could still be developed without NPS involvement.

Cumulative Impacts

Impacts under the No Action Alternative, when combined with past, present, and reasonably future actions and trends would continue to be adverse decrease the recreational opportunities to a measurable degree.

Environmental Consequences on Recreation Resources: Preferred Alternative

Creation of the Ice Age NST through Marquette County will not only enhance public awareness of Wisconsin's glacial landscape through interpretation of the glacial features, but it would also connect the county with an outstanding, statewide, recreational trail system. There is currently only one segment of Ice Age NST in Marquette County: the 1.8-mile John Muir Park Segment that circles Ennis Lake in John Muir County Park. Completion of the Ice Age NST through Marquette County would connect with the Chaffee Creek Segment in Waushara County and the Portage Canal Segment in the City of Portage in Columbia County. Depending on its location, the trail could provide links between French Creek SWA, Fox River NWR and Muir WPA, John Muir County Park, Page Creek Marsh SNA, portions of the Cave Creek SFA, municipal lands, and multiple school forests. The trail will be used primarily for hiking as well as for bird watching, interpretive walks, and snowshoeing.

The Preferred Alternative could, over time, protect land within the trail corridor from development as the trailway would typically include an area greater than the width of the trail itself, protecting portions of the surrounding landscape and associated viewsheds. A planned corridor for the trail would ensure that possible trail route

options are evaluated to provide the most outstanding views and excellent hiking experiences.

Depending on its location, the trail would offer numerous opportunities to preserve views, vistas, and other visually appealing topographical and vegetative features. Their incorporation into the trailway would expose visitors to scenic resources they do not normally encounter as they travel through the area, which would be a beneficial impact. Depending on the eventual trail location, scenic overlooks may include a number of known viewpoints in the John Muir Neighborhood such as Observatory Hill (the second highest point in Marquette County), hills within the Fox River NWR and Muir WPA, and broad views of the southern Marquette County glacial landscape offered on Gale Road at 11th Drive. The mixture of native oak savanna, prairie and wetlands, against the backdrop of forest and agricultural lands, will provide a constantly changing environment. Hikers will wind around numerous glacial features catching views of drumlins, kettle ponds and tunnel channels. The distinct recessional moraines of the Elderon Moraine in the Townships of Harris and Springfield are easily recognizable. In the northwest corner of the Township of Springfield, a spectacular view west of the Johnstown Moraine overlooks Glacial Lake Wisconsin and the distinctive buttes such as Quincy Bluff, and Roche-a-Cri that were at one time islands.

Based on patterns of use on similar trails it is likely that use will be highest near populated areas or existing recreation areas. In some areas, perceived conflicts between user groups could develop such as between hikers and hunters, or hikers and farmers. In other areas of the state, farmers have raised concerns about how and to what extent hikers could impact their management practices (pesticide application, manure spreading). To address these concerns, the trail would provide a buffer between the trail and neighboring landowners.

Overall, the Preferred Alternative would have highly beneficial, long-term regional impacts on recreation resources and opportunities. The trail would add to existing recreation opportunities in the county, while preserving important landscapes and viewsheds and increasing educational opportunities regarding unique geological features and processes. As a continuous trail it would provide an important linkage to existing Ice Age NST located north in Waushara County as well as an important connection south to Columbia and Sauk Counties where there is extensive certified Ice Age NST.

The Preferred Alternative, when combined with reasonably foreseeable planned actions and trends mentioned in Section 5.2.1 would not lead to adverse impacts. The development of the trail will lead to an increased amount of available recreation opportunities in the area. **Cumulative Impacts**

Impacts under the Preferred Alternative, when combined with past, present, and reasonably future actions and trends would be measurably beneficial to recreational opportunity.

5.9 AFFECTED ENVIRONMENT- Cultural Resources

One of the first Europeans to visit the region, French explorer Jean Nicolet, passed through what is now Wisconsin in 1634. At the time, the Ho-Chunk (Winnebago), Potawatomi, Menominee and Chippewa Indian tribes inhabited the region (WI Historical Society 2013). They were drawn by the abundance of game and wild rice particularly on the Fox River and Buffalo Lake. The place name *Marquette* honors the French Jesuit explorer Father Jacques Marquette who, with fellow explorer and fur trader Louis Joliet, passed through the region in 1673 while exploring a route from the Great Lakes to the Mississippi River.

Marquette County was founded as a county in 1836; however, its area and shape changed over the years. It gained its current boundaries after Waushara and Green Lake Counties were excised in 1851 and 1858, respectively, from Marquette County's then-larger area.

The first private land claim in the vicinity of City of Montello was made in 1849 and included a site close to the Fox River for waterpower. The first dam was built on the Montello River, creating the Montello mill pond. Another dam created the 2180-acre Buffalo Lake was completed in 1850 and a sawmill was erected. The mills allowed for the construction of wood frame buildings in Montello, starting with a store, hotel, and post office. Other commercial structures built over the years included a grist mill (1854), Catholic church (1856), Protestant church (1858) and two flour mills (1876); the Montello Woolen Mills Company, considered at the time to be one of the most complete woolen manufacturers in the West, had also built their factory in 1867 (Montello Area Chamber of Commerce 2013).

The Montello Granite Company quarry opened around 1880 and operated until the early 1970s, producing monuments (most significantly, Grant's Tomb in New York), building blocks and paving stones. The quarry was one of the leading employers in Montello for close to 100 years (Montello Area Chamber of Commerce 2013). The two main quarry pits are now water-filled as part of a city park.

Packwaukee is an unincorporated community located on the west end of Buffalo Lake. A description from 1853 states that the community was established on the navigable waters of the Fox River to take advantage of the river trade of agricultural goods from Adams and Waushara Counties.

The Township of Buffalo in Marquette County was the site of the first family homestead of the family of naturalist and author John Muir (1838-1914) when they emigrated from Scotland in 1849. Muir's father Daniel purchased about 320 acres of land just north of Fountain (now Ennis) Lake and east of the Fox River for their family's first homestead. The family re-located to the Hickory Hill homestead in 1857 and Daniel sold the Fountain Lake property to son-in-law David Galloway. John Muir attended University of Wisconsin in Madison from around 1861 to 1863, then worked at various jobs and traveled before arriving in California in 1868 (Christensen and McGwin 2010).

John Muir was instrumental in the creation of the NPS and Sierra Club, but his love of nature was honed by his early years in Wisconsin and Marquette County. Several sites in the region that played a role in Muir's boyhood experiences including Ennis Lake, Observatory Hill, Wee White Kirk chapel, and Knight's (now Mulhern) Lake. These areas are scenic, but they also provide a connection to Muir's upbringing and how the region shaped his connection to the natural world that formed the heritage which he gave the nation.

Sites and structures in Marquette County on the National Register of Historic Places (NRHP) include: the Montello Commercial Historic District, which includes the Montello Granite Quarry; the County Courthouse, Sheriff's Office and Jail; the Bonnie Oaks Historic District in the Town of Douglas, Charles Samuel Richter House, which was constructed of the local Montello granite; Vaughn's Hall and Blacksmith House; and, the Fountain Lake Farm site, John Muir's boyhood home (now under private ownership).

The Fox-Wisconsin Heritage Water Trail stretches diagonally across Wisconsin for almost 300 miles from Green Bay to the convergence of the Wisconsin River at the Mississippi River, and includes the stretch of the Fox River and Buffalo Lake in Marquette County. The Water Trail follows Marquette and Joliet's exploration route through the upper Midwest, and the historical events, industry and recreation that followed (Fox-Wisconsin Heritage Parkway 2013).

Environmental Consequences on Cultural Resources: No Action Alternative

Under No Action, other entities may or may not take on the development of the trail. If others, such as the county, local units of government or interested stakeholders built the trail then they may not follow Section 106 of the NHPA contact, consult and coordinate with NPS and affected Tribes. The purpose of this consultation would be to identify and avoid potential impacts to resources such as historic properties and archeological resources and determine potential candidates for the NRHP.

Under the No Action alternative, if there is no approved corridor and trail construction could occur opportunistically without Section 106 coordination, then there is a higher risk of impacts to resources. Newly constructed trail could not be designated as NST, until compliance is fulfilled. If built trail was found to impact resources, it would need to be moved.

Should other entities take on the project, these adverse effects would hopefully be mitigated, but it is unclear to what extent.

The No Action Alternative combined with the reasonably foreseeable planned actions and trends discussed in Section 5.2.1 could potentially lead to the loss of unique cultural resources because of development. If the trail is developed without NPS involvement, it cannot be guaranteed that cultural resources will be protected. These losses would be adverse and permanent.

Cumulative Impacts

Impacts under the No Action Alternative, when combined with past, present, and reasonably future actions and trends would continue to be adverse increase the loss to a measurable degree.

Environmental Consequences on Cultural Resources: Preferred Alternative

The NPS and State Historic Preservation officer (SHPO) have a Programmatic Agreement (PA) that outlines how the NPS will carry out Section 106 regarding the Ice Age NST and North Country NST in the State of Wisconsin. In general, there are two situations where Section 106 is triggered: the CPP and individual trail segment construction and maintenance. The agreement outlines the stipulations for meeting requirements. The 2021 NPS Agreement with the Wisconsin SHPO is available on-line at: https://www.nps.gov/iatr/learn/management/lawsandpolicies.htm

Through the CPP, a broad area where the trail may be located is reviewed for potential sites either to interpret or avoid. When preparations for the construction of an individual trail segment are being undertaken, the process is more rigorous. If necessary, additional surveys are undertaken of both archeological and historic resources to determine if the resources could be directly or indirectly impacted by proposed project. For those resources determined eligible for inclusion in the National Register of Historic Places, the impacts of the proposed project and mitigation measures will be assessed. Copies of all survey reports are provided to the SHPO and THPOs for their records.

The Preferred Alternative would have localized, long-term and beneficial impacts to cultural resources. The consultation and coordination process outlined in the Programmatic Agreement would ensure the preservation or avoidance of important

cultural and potential archeological resources within the corridor. It also identifies historic sites to interpret that would enrich the Ice Age NST users' experience.

The Preferred Alternative, when combined with reasonably foreseeable planned actions and trends mentioned in Section 5.2.1 would not result in adverse impacts to cultural resources.

Cumulative Impacts

Impacts under the Preferred Alternative, when combined with past, present, and reasonably future actions and trends would not likely increase adverse impact to a measurable degree.

5.10 AFFECTED ENVIRONMENT- Native American Cultural Resources & Concerns

Early inhabitants were likely living in the region not long after the retreat of the last glacier, roughly 10,000 years ago, during the Paleo-Indian Period. The climate warmed to create tundra-like conditions in the region and subsistence consisted of hunting large mammals such as mastodon, mammoth, bison, and gathering crops such as hickory nuts and wild rice (Christensen and McGwin 2010, WI Historical Society 2013).

The Archaic Period began around 8000 years ago, marked by a warming and drying of the climate. Larger Ice Age mammals were replaced by wildlife species found more commonly in the state today (elk, deer). People lived in small groups in caves and shelters, generally close to sources of surface water; subsistence continued to be hunting and harvesting wild plants, nuts, and acorns (WI Historical Society 2013).

The Woodland and Mississippian Periods began about 3000 years and 1000 years ago, respectively. These periods saw increasing shifts to habitation in larger villages and more extensive use of agriculture and pottery; hunting tools also shifted from spear and atl-atl to bow and arrow. Significantly, these were the periods that effigy burial mounds, many in the shape of animals (or people) were built throughout the region (WI Historical Society 2103). It is believed that over 600 conical and effigy mounds once encircled Buffalo Lake in Marquette County (Christensen and McGwin 2010). Other evidence of earlier human habitation of the region includes petroglyphs pecked into Precambrian rock outcrops and petroforms, rock alignments that sometimes represent animals (Christensen McGwin 2010).

Though there are no tribal or reservation lands found within the Preferred Alternative, it is the ancestral lands the Ho-Chunk, Kickapoo, and Menominee Tribes. Much of the existing tribal and reservation lands are located some distance away (Native Land Digital Website 2021). As part of the planning process, each of Wisconsin's 14 federally

recognized tribes were contacted. No specific issues were raised. In the past, the ability to exercise treaty rights on ceded lands was identified as a concern, so it has been included in this analysis. Wisconsin's native tribes retain their right to hunt, fish, and gather within their former territories as a matter of federal treaty. The maintenance of these rights is comparable to a conservation easement and the off-reservation lands are known as ceded lands. Nothing in this plan or its implementation is intended to modify, abrogate, or otherwise adversely affect tribal reserve or treaty-guaranteed rights.

Environmental Consequences on Native American Cultural Resources & Concerns: No Action Alternative

Under No Action, other entities may or may not take on the development of the trail. If others, such as the county, local units of government or interested stakeholders built the trail then they may not follow Section 106 of the NHPA contact, consult, and coordinate with NPS and affected Tribes. If they do not coordinate with the NPS and the Tribes are not contacted to discuss their concerns or coordinate the location of trail, and construction occurs opportunistically, then there is a higher risk of impacts to resources, which could be considerable. As the responsible federal agency, the NPS would have to deny NST status to the newly constructed trail segments, until compliance occurs. Unfortunately, if compliance occurs after the trail's development, the ability to mitigate any impacts may not be possible and impacts to resources could be adverse.

The No Action Alternative combined with the reasonably foreseeable planned actions and trends discussed in Section 5.2.1 could potentially lead to the loss of unique cultural resources because of development. These losses would be adverse and permanent.

Cumulative Impacts

Impacts under the No Action Alternative, when combined with past, present, and reasonably future actions and trends could continue to be adverse impact unique cultural resources to a measurable degree.

Environmental Consequences on Native American Cultural Resources & Concerns: Preferred Alternative

The NPS and SHPO have a PA that outlines how the NPS will carry out Section 106 of the NHPA regarding the Ice Age and NST in the State of Wisconsin. In general, there are two situations where Section 106 is triggered for both trails. They are the CPP and individual trail segment construction and maintenance. The agreement outlines the stipulations for meeting requirements. The agreement can be found on-line at: https://www.nps.gov/iatr/learn/management/lawsandpolicies.htm

During the project's development, review and approval, early consultation with each of the federally recognized tribes in Wisconsin occurs. This is to ensure that trail development will not impact cultural properties and archeological resources. If necessary, additional resource surveys are undertaken to locate and avoid potential resources. Copies of all survey reports are provided to the SHPO and TPHOs for their records.

The Preferred Alternative, when combined with reasonably foreseeable planned actions and trends mentioned in Section 5.2.1 would not lead to adverse impacts.

Cumulative Impacts

Impacts under the Preferred Alternative, when combined with past, present, and reasonably future actions and trends would not likely increase adverse impact to a measurable degree.

5.11 AFFECTED ENVIRONMENT- Socioeconomics

The landscape of Marquette County is picturesque with glacial lakes, rivers, rolling terrain, and scattered tracts of public fish and wildlife areas surrounded by private agricultural lands. Located in south central Wisconsin, Marquette County is primarily rural with a population of 15,304 persons. It is located approximately 60 miles north of Madison, the state capital, 130 miles northwest of Milwaukee, and 205 miles north of Chicago. It is 65 miles directly south of Stevens Point, and 95 miles from Wausau. Interstate Highway 39, which passes through the west-central part of the county, and Interstate Highway 90/94 close to its southern boundary, provide easy access to these urban areas. State Highway 23 crosses both the county and the corridor in an east-west direction.

The predominant land use in the county is farmland interspersed amongst woodlands with dairy farming being an important contributor to the local economy. Top commodities produced by farming include dairy products, alfalfa, corn, soybeans vegetables, beef, hay, peppermint, spearmint, and other crops. County-wide the top employment sectors are manufacturing, educational services, health care, social services, recreation, arts, entertainment, and food service. The undulating glacial terrain, which covers most of the county, contains an abundance of natural resources providing great habitat for wildlife and contributing to a diversity of outdoor recreational activities. This includes the northwest corner of the county where headwaters for numerous Class I trout streams are found. These natural resources provide a landscape which makes Marquette County an attractive area for both seasonal and full-time residents.

Communities and Businesses:

Marquette County is composed of 14 unincorporated towns, four villages, and one city. Three of its more substantial communities are within the Ice Age NST's Preferred Alternative—the City of Montello, Village of Westfield, and community of Packwaukee. The City of Montello, with a population of 1,392, is the county seat and largest community in the county. The Village of Westfield has 1,369 residents, and the community of Packwaukee, approximately 1,300. A large, influential service center near, but outside the corridor and county, is the City of Portage, with a population of over 10,000.

The surrounding counties do provide employment opportunities for Marquette County's residents as 41% are employed in Columbia County, 15% work in Dane County, and residents commute to the surrounding adjacent counties of Sauk, Waushara, and Green Lake for work. Just as many people commute into Marquette County for work in manufacturing, education, and health services. County residents also seek jobs to subsidize their farming activities. Between 2001 and 2013, there was a 4% decrease in jobs; however, projections show jobs growing by 8% between 2013 and 2023. The two Interstate corridor, 90/94 and 39, located close to the corridor, allow Marquette County residents to utilize larger urban centers for employment and shopping. This trend is expected to continue as job opportunities expand in the greater Madison and Fox Valley metro areas.

The county's total population has been increasing slower than the rest of the State and their elderly population (65+) is the second highest group of 4 categories. Currently, the six unincorporated towns within the corridor—Buffalo, Packwaukee, Montello, Harris, Westfield and Springfield have densities of fewer than 21.7 homes per square mile, which is fairly low compared to the state's average of 48.5%. Although there will be little net change in population, a continuing trend will be a decline in the number of farm residences (and farm households). This decline will be offset by new rural residential development, which will house residents working in jobs elsewhere. This pattern of growth reflects a national trend where an increasing percentage of new residential development is occurring in outlying rural areas. In fact, between 2010 and 2040, Marquette County's 65+ population is expected to increase by 101%, the same as surrounding counties. These influences will likely continue to contribute to the increase of land values and development within the corridor. They will also create a greater need to protect significant natural resource features as well as provide additional areas for individuals to recreate.

In Marquette County, visitors spent 20.2 million in 2013 an increase of 4% from 2012. The leisure and hospitality employment sector provided about 11 percent of the county's total jobs in 2018, with an annual average of 414 jobs total (Job Center of Wisconsin 2018). Given the county's proximity to urban metropolitan areas (Chicago,

Milwaukee, Madison), existing tourist destinations and unique natural resources (glacial landscape, wildlife refuges, natural areas, lakes/rivers/trout streams, hunting lands), the Marquette County Comprehensive Plan recommends that Marquette County be a center for nature-based tourism—biking, hiking, climbing, canoeing, hunting, nature viewing, fishing, camping, and boating—that would fill an important market niche within the surrounding region where water parks, hotels and vacation homes predominate. This form of tourism would focus on utilizing the county's natural resources and local flavor to create a unique tourist destination and expand economic growth that allow it to protect its' natural areas, ag land with rural character, and scenic views. (Marquette County 2015). With the increased focus on attracting visitors and visitor-dollars in the local economy, the communities located near the proposed Ice Age NST corridor may benefit economically from trail users by providing such support as grocery stores, restaurants, campgrounds, and bed and breakfasts.

Land Use and Land Ownership

Marquette County is 462 square miles (296,000 acres) in total area. Approximately 45% of the county land area (133,611 acres) is classified as agriculture and 37% (about 111,413 acres) classified as forest. Wetlands account for around 15% (about 42,687 acres) and surface waters (open water) occupies just under 2.5% (7340 acres). Urban land use, including primarily low and high-density residential uses, account for around 0.5% (approximately 1,480 acres) county-wide (Marquette County 2005). Public open space (various parks, public lands and conservation areas) comprises 5 percent (around 13,700 acres) of the county's total area. The latest USDA Census of Agriculture (2017) calculates that the number of full-time farms in Marquette County is around 458 at an average size of 247 acres. With the total numbers of farms and acreage devoted to agriculture decreasing, the county is seeking to create Farmland Preservation Areas by using criteria to preserve areas of Class I, II, and III farmland, large blocks of land, undeveloped natural resources and open space, areas outside of city limits, etc.

The Preferred Alternative represents approximately 23.4% of the county's total land area. Primary land use within the Preferred Alternative is primarily agriculture (44%) and forestry (43%). While the proportion of agriculture and forest lands are similar to county as a whole, there are fewer wetlands (12.5%) and a larger proportion of surface (open) water (36%) present. There is scattered development throughout, but non-farm primary residences are generally located within urban communities such as City of Montello, Village of Westfield, and the communities of Packwaukee and Harris. This scattered development represents approximately 64% of the total urban/residential development found in the county.

The Marquette County Comprehensive Plan (2015) seeks to limit the conversion of agricultural lands to commercial and industrial development and promotes very low-density or clustered residential housing to reduce the fragmentation of farmland and

open space. Within the Preferred Alternative, the township of Buffalo, City of Montello, and Village of Westfield have adopted their own zoning. The townships of Harris, Montello, Packwaukee, and Westfield are currently under Marquette County zoning with most of the land zoned for agriculture. The Township of Springfield is not under the jurisdiction of general zoning ordinance. Stand-alone single-family residences or minor subdivisions are a permitted use in agricultural districts, making it easy for those wishing to build in rural areas. Re-zonings to Residential generally accompany platted subdivisions, but this type of development is rare except for lakeshore areas. In the 6 townships that contain the corridor there were 79 building permits issued between 2016 and 2020 (2021 Wisconsin DSPS). The Ice Age NST is a permitted use in all zoning classifications (ss. 236.292 Wis. stats.)

Table 3-Existing Land Use

Existing Land Use	Marquette County- Acres	Marquette County- % of total	Preferred Alternative- Acres	Preferred Alternative acres- % within Pref. Alt	% of County Total acres for existing land use within Pref. Alt
Agriculture	133611	45%	30637	44%	23%
Forest	111413	37%	30061	43%	27%
Open Water	7340	2.4%	2637	4%	36%
Urban-Golf Course	67	<0.1%	0%	0%	0%
Urban-High Intensity	539	0.2%	349	0.5%	64.7%
Urban-Low Intensity	877	0.3%	554	0.7%	63.1%
Wetland	42687	15%	5335	7.5%	12.5%
TOTAL ACRES	296534		69573		23.4%

Source: Marquette County Comprehensive Plan, 2015

Tax Base--The 2020 Marquette County assessment for property tax lists approximately 22,000 parcels of real estate in the county. The total assessed value for all county real estate was around \$520 million in total lands and \$1.062 billion in total improvements. Within the Preferred Alternative, the tax rolls list approximately 6,900 parcels with an assessed value of \$152 million in total lands and \$384 million in total improvements. (Wisconsin Statewide Parcel Layer Version 7.0.0, 2021). The Preferred Alternative which represents 23.4% of the county's total land area, represents 34% or the total tax base owing to the greater valuation given to residential properties and improvements.

Environmental Consequences on Socioeconomics: No Action

Communities and Businesses: Under the No Action Alternative, the NPS may or may not be involved in the development of the trail. The lack of a coordinated effort to plan the route of the trail and its' associated support facilities may mean losing opportunities to make important connections that would benefit the local economy. As with other resources, potential beneficial or adverse impacts as a result of constructing the trail may

or may not happen. If the trail is not constructed and local entities do not take the initiative, it is likely that current development trends and pressures would continue, as well as current land uses. Socioeconomic impacts as a result of No Action Alternative would be commensurate with recreation trends in the future and would depend largely on the local units of government initiatives to increase recreation opportunities.

Land Use and Land Ownership: Securing lands for the trail may change current land uses but does not preclude other future uses. If the trail is not built, no new commercial establishments associated with its development would be established and there would be no measurable socioeconomic impacts in addition to current trends, including tax revenues.

In summary, without a coordinated and collaborative approach to implement the Ice Age NST through Marquette County, it is likely that if the trail is built, it will be developed in an opportunistic way without forethought of economic benefit to the local area. Therefore, it is difficult to ascertain what beneficial impacts may occur, although they would likely be less than a more strategic approach to developing the trail in partnership with local communities and governments.

The No Action alternative combined with the reasonably foreseeable planned actions and trends discussed in Section 5.2.1 would not lead to adverse impacts.

Cumulative Impacts

Impacts under the No Action Alternative, when combined with past, present, and reasonably future actions and trends would no likely impact socioeconomics to a measurable degree.

Environmental Consequences on Socioeconomics: Preferred Alternative

Communities and Businesses: The University of Wisconsin-Whitewater Fiscal and Economic Research Center (UW-Whitewater) did a study on the users of the Ice Age NST Statewide (AAOIATU, 2020.) The UW-Whitewater study revealed that 2,300,000 visitors experienced the Ice Age Trail in 2018. Users contributed approximately \$355,000,000 annually to the state and local tourism economies. Primary businesses identified by study that benefit from Ice Age NST users include: convenient/grocery stores, misc/equipment, shopping/souvenirs, overnight accommodations (motel/private campgrounds), restaurants/bars, entertainment, and gas/travel. The study also showed that use has continued to grow over the last 5 years by 1.9-2.8 percent.

Land Use and Land Ownership: In some areas, land use will change from agricultural to conservation/recreational, which could be converted to native plant communities as part of the trail construction process. Projects that irreversibly convert farmland to non-agricultural uses are considered subject to the Farmland Protection Policy Act. The Ice

Age NST is not an irreversible conversion of farmland. Some land acquired for the trail may be leased back for agricultural purposes, preserving the existing land use.

Securing lands for the trail may change current land uses but does not preclude other future uses. The trail would restrict development and protect resources within the trailway (land that is managed for the purposes of the Ice Age NST, see page 13 for definition); however, it may also attract some types of development adjacent to the trail such as residential and vacation homes, and perhaps recreation-oriented businesses.

Tax Base: It is difficult to determine the fiscal impacts to local units of government resulting from the development of the Ice Age NST. This is because there is no way to predict what private lands will be available for future acquisition or donation on a "willing seller-buyer basis." Also, as land purchased for Ice Age NST purposes will generally not be developed, there will be fewer residences and cottages within the project area, thus reducing the demand for public services such as police and fire protection. Therefore, with support from the state and federal Payment in Lieu of Taxes (PILT) programs, the local tax base should not be significantly affected by this action.

The State's PILT are payments to Local Units of Governments (LUGs) that help offset losses in property taxes due to nontaxable state lands within their boundaries. Eligibility for payment under the PILT program is reserved for LUGs that provide services such as those related to public safety, environment, housing, social services, and transportation. Calculations for State PILT payments are based upon Wisconsin State Statute 70:1114. This law assures that purchase of lands by the state after June 30, 2011, are based on the equalized value of the land prior to the year in which the land was purchased. Under State Statute 70:1114, the tax base remains stable and local units of government should not observe any change to their revenue.

Should lands be purchased for the trail by the NPS or other federal agency, the Payment In Lieu of Taxes Act Federal Law U.S.C. 6901-6907, stipulates payment be made to certain units of local government with eligible Federal lands within their jurisdictions. These payments would occur under prescribed payment formulas and within amounts annually appropriated by Congress. The laws that implement these payments recognize that the inability of local governments to collect property taxes on Federally owned land can create a financial impact. PILT payments help LUGs carry out such vital services as firefighting and police protection, construction of public schools and roads, and searchand-rescue operations. PILT payments are made annually for tax-exempt Federal lands. The DOI administers the program by calculating payments according to formulas established by law. The two basic formulas are based on population and the amount of existing federal land in a local jurisdiction. If land is acquired by the IATA, a non-profit organization, a petition to exempt the land from property taxation could be filed. However, it is the current policy of the IATA to pay property taxes on all Ice Age NST lands it owns until invited by a local government to petition for tax exemption.

In summary, a coordinated effort to develop and complete the trail through Marquette County will, as documented in the UW study, have a direct beneficial impact on the local economy. Although there is no way to predict what private lands will be available for future acquisition on a "willing seller-buyer basis," nor how much private land will eventually be protected for the Ice Age NST, with the state and federal PILT programs, the acquisition of a trailway will have little to no effect on the tax base.

The Preferred Alternative, when combined with reasonably foreseeable planned actions and trends mentioned in Section 5.2.1 would not lead to adverse impacts.

Cumulative Impacts

Impacts under the Preferred Alternative, when combined with past, present, and reasonably future actions and trends could increase the socioeconomic value of the area but not likely to a measurable degree.

6 PUBLIC INVOLVEMENT, CONSULTATION, and COORDINATION

6.2 PUBLIC INVOLVEMENT

Throughout the planning process there has been considerable emphasis on public involvement. As a part of this effort, the NPS, IATA and WDNR contacted the public, Marquette County elected officials and affected townships, County Park and Rural Planning, as well as held numerous Scoping and Open House meetings. The Core Team also spent considerable time researching the glacial topography of Marquette County, the county's cultural history and development, as well as the feasibility of constructing the Ice Age NST through the project area.

6.2.1 Core Team Meetings

The Ice Age NST CPP for Marquette County formally began on May 7, 2012 with the initial meeting of the Core Team. The Core Team was composed of the Marquette County Chapter of the Ice Age NST Volunteers, IATA, WDNR, UW Extension, Marquette County, FWS, and NPS. The purpose of the meeting was to review the components of the CPP, discuss past efforts to establish the Ice Age NST in Marquette County, and evaluate the county's glacial landscape and other significant natural and

cultural features. Since that time, the Core Team has met regularly to conduct fieldwork, develop, and refine conceptual alternative trail corridors, potential route options, coordinate public involvement, and assess landowner interest.

6.2.2 Town and County Board Meetings- Scoping

Presentations to raise awareness regarding the Ice Age NST, and elicit comments occurred the Summer of 2012 through May 2013. The first presentation was by Geologist Thomas Hooyer to inform landowners and public officials of the county's glacial history on July 16, 2012. Town boards, village boards, and the City of Montello met in January and February of 2013. These presentations focused on providing an overview of the Ice Age NST CPP, obtain input, and respond to questions regarding the project. Similar presentations were made to the County Parks and Rural Planning Committee and Board of Supervisors in January and March of 2013.

6.2.3 Public Meetings-1: Scoping

After these initial presentations were held for public officials, the Core Team hosted a series of public open house meetings for landowners to learn about the Ice Age Trail, hear presentations and see maps of the glacial landscape of Marquette County, and collect additional information regarding opportunities and issues of concern to the public. These meetings were held on May 2, 18, and 23, 2012, in Westfield, Montello, and the Township of Moundville, respectively.

6.2.4 Development of Alternatives

In 2013, the Core Team began to develop Alternative corridors for the Ice Age NST through Marquette County. The alternatives were referred to as the No Action, Alternative 1-Glacial Features, Alternative 2- Public Lands, and Alternative 3-Most Direct Route. These alternatives were based on the conceptual ideas gathered during the initial scoping process. The Core Team spent the next year doing field reconnaissance, meeting with a variety of public and private individuals regarding the trail and defining the alternatives. In the fall of 2013, they once again met with local officials to announce the next series of open house meetings and present the concept alternatives and answer questions. To update local officials, they met with the town chairs at the All-Town Board Meeting (October 13), Endeavor Village Board (December 10), and Montello City Council (January 20, 2014). They also met with Marquette County Parks and Planning Committee (November 4), and Marquette County Board of Supervisors (November 12).

6.2.5 Public Meetings 2: Presentation of Alternatives

In the spring of 2014, three open house meetings for the public were held on February 4 (Township of Packwaukee), February 6 (Township of Westfield), and February 8 (City
of Montello) to present the four alternatives to landowners, local officials, and other interested stakeholders. These meetings were well attended and provided area landowners with an opportunity to learn about the project, gain insight on how it would impact them, and share their level of interest as potential participants.

6.2.6 Selection of Preferred Alternative

Due to staff turnover, there was a bit of time getting back up to speed again after the February 2014 meeting. Eventually, the Core Team reconvened and spent considerable time selecting a Preferred Alternative. They did this by identifying the priority features based on their criteria, these Alternatives can be found in Appendix F. They identified possible route options and support facilities for them within the selected alternative and placed them in a chart with defined criteria to evaluate. The Core Team went out on field reconnaissance to ascertain the feasibility of these possible routes. During this time, it was decided that the corridor should be expanded in the northwest corner of Marquette County to include the distinctive terminal moraine, scenic views, and access to Adams County for the Ice Age NSTs bifurcation loop. Letters were sent to the landowners in these four sections within the Township of Springfield and many returned comments. The 2-5 mile wide Preferred Alternative was then defined by roads, and section lines.

6.2.7 Public Meetings 3: Presentation of Preferred Alternative

To prepare for the final open house meetings to present the Preferred Alternative corridor to the public, the Core Team members met with all the communities that would be affected by the Proposed Action, Buffalo, Packwaukee, Montello, Harris, Westfield and Springfield, in January 2020. During the same time, the Core Team also met with the Marquette County Park and Rural Planning Committee. They gave an overview of the Preferred alternative, took comments, and answered questions. The NPS office prepared and sent letters to landowners and public officials inviting them to open house meetings to be held on March 26, 28 & 30. Due to the COVID-19 Pandemic, any in person meetings needed to be canceled. However, the NPS has continued to communicate with the Core Team. The Core Team worked to develop a process to solicit public comment. The public was contacted and invited to review and comment on this EA through the NPS Planning, Environment, and Public Comment (PEPC) system with another round of individual invitations and press releases to local media outlets.

6.3 CONSULTATION FOR PREPARATION OF ENVIRONMENTAL ASSESSMENT

Agencies and Tribes contacted:

State Historical Society of Wisconsin United States Fish and Wildlife Service Marquette County Parks and Rural Planning Committee Marquette County Land and Water Conservation Program WDNR Fish and Wildlife Parks Division WDNR Bureau of Facilities and Lands 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 of Wisconsin Red Cliff Band of Lake Superior Chippewa St. Croix Chippewa Indians of Wisconsin Forest County Potawatomi Community of Wisconsin Sakaogon 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 Mississippi in Iowa Stockbridge Munsee Community of Wisconsin Ho-Chunk Nation Menominee Indian Tribe of Wisconsin

6.4 COORDINATION FOR CORRIDOR PLANNING PROCESS

As mentioned in Chapter 5: Sections 5.5 Vegetation—Threatened and Endangered Resources, 5.9 Cultural Resources, and 5.10 Native American Resources, consultation, and development of the Ice Age NST is typically carried out in two phases—the first is a review of corridor Alternatives through the CPP, and the second is a more detailed review after trail developers have secured a specific trail alignment for construction.

Throughout the Marquette County Ice Age NST CPP (first phase), there was extensive communication and correspondence with federal agencies, tribes, federal and state representatives, county, and local officials, in regard to carrying out the CPP, and potential impacts to resources contained within the corridor Alternatives. Consulting federal agencies included: FWS, USDA Natural Resources Conservation Service, EPA, Federal Highway Administration, US Geological Survey, USACE, and USDA Forest Service.

Invitational letters for public scoping and open house meetings were also sent to federal agencies, federal and state representatives, county and local units of government and landowners within the Proposed Alternatives and Preferred Alternative. All the referenced correspondence is held in the historic administrative record at the NPS Ice Age NST office in Cross Plains, Wisconsin.

7 APPENDICES

APPENDIX A. Identification of Possible Trail Routes

In addition to identifying a corridor for the Ice Age NST, planners have found it useful and desirable to identify possible routes for the trail within the corridor. Because of the corridor's extensive width (generally 1-5 miles), identifying possible routes would focus efforts to establish the trail (time and money), and enable planners to design routes that best exemplify the trail's mission and goals. The trail was divided up into segments spanning the corridor's entire length. Again, since participation in the Ice Age NST project is voluntary, the trail's ultimate location would be determined by the willingness of landowners to sell lands or grant permission to cross their property.

To help design the alternative routes, the Ice Age NST Planning Team identified ten objectives listed below:

- Trail should provide scenic vistas
- Trail should traverse a variety of glacial features.
- Trail links other significant archeological, historical, cultural, geographical, geological, and biological sites.
- Trail utilizes public lands when possible.
- Trail traverses through a variety of plant communities.
- Trail has local landowner and town support.
- Trail avoids development in rural areas.
- Trail provides support facilities.
- Trail links to communities.
- Trail links other significant resource areas.

Trail development will be guided by criteria grouped into three broad categories of concern: trail quality, environmental considerations, and sociological considerations.

Trail quality is an assessment of each proposed route from the hiker's point of view. These criteria evaluate, as objectively as possible, how well each route meets the purpose and objectives of the Ice Age NST as set forth in the NTSA. The purpose of NST, as stated in the Act, is "to provide for maximum outdoor recreation potential and for the conservation and enjoyment of the nationally significant scenic, historic, natural, or cultural qualities of the areas through which such trails may pass" [16 U.S.C. 1242(a)(3)]. Criteria studied under trail quality include:

• Length – the length of each proposed route. Information was obtained from GIS digital files compiled by the National Park Service.

- Road Crossings the identification and number of road crossings. A high number of crossings may take away from the user's experience of the trail and create a greater potential for accidents.
- Diversity and Interest of Route identifies the significant points of interest that are designed into each route to create a desirable hiking experience. Elements evaluated may include significant geologic features, the amount of trail located in the sun and shade, amount of trail located on hills and valley, scenic views, and visually outstanding, unique or geographically limited plant communities. Information was obtained from the Core Team members, aerial photographs, and topographic maps.
- Existing development and the probability of future development (low, moderate, high) the level of existing development and the degree to which each route is likely to be affected by future development. Assessments of future development, while speculative, are based on extrapolations of current patterns of development. Information was obtained from recent aerial photographs, detailed topographic maps and, where available, proposed land use from local land management plans.

Environmental considerations are those impacts that the trail might have on the local natural resources. Information on these impacts has been gathered by questioning Federal, State and County agencies, and interested private organizations and individuals. Criteria studied under environmental considerations include:

 Construction Impacts/Number of Stream Crossings – an evaluation of each possible route based on the degree of development needed to construct the trail. The assessment is based on slope, bridge installations, potential of soil erosion or excessive compaction, and impacts to wetlands, floodplains, and fisheries. Information sources included but were not limited to the WDNR Bureaus of Wildlife Management and Water Resources Management.

Sociological considerations are those impacts that the trail might have on the local human environment, affected landowners, and communities through which the trail may pass. Criteria studied under sociological considerations include:

- Number of affected landowners the number of landowners whose property might be crossed by each route.
- Percentage of public land utilized the percentage of public lands crossed in relation to the total length of the possible route.
- Secondary benefits potential positive outcomes resulting from the development of the trail through an area that affect public access, natural resource preservation or enhancement, or economic resources. Information was obtained from local officials, University of Wisconsin staff, local chapters of the Ice Age Park and Trail Foundation, and landowners.



Corridor shown in white

Possible Route Options Map 1

Possible Route Options Map 2



Possible Route Options Map 3



Possible Route Options Map 4



Possible Route Options Map 5



Possible Route Options Map 6



APPENDIX B List of Contributors

Gary Ertl	Marquette County Ice Age Trail Volunteer Chapter Coordinator
Kathleen McGwin	Marquette County Ice Age Trail Volunteer
Jan Mink	Marquette County Ice Age Trail Volunteer
Karen Wollenburg	Marquette County Ice Age Trail Volunteer
Fred Wollenburg	Marquette County Ice Age Trail Volunteer
Laurel Bennett	Marquette County Ice Age Trail Volunteer
Jim Holzwart	Wisconsin Department of Natural Resources, Wildlife Biologist
Dana White Quam Coordinator	Wisconsin Department of Natural Resources, Regional Trail
Andrew Hanson III	Wisconsin Department of Natural Resources, Partnerships Liaison
Patrick Kilbey	Marquette County Conservationist
Pam Schuler	National Park Service, Trail Manager Ice Age NST
Mary Tano	National Park Service, Trail Planner Ice Age NST
Brad Crary	Ice Age Trail Alliance, Special Projects Coordinator
Dee Finnegan	National Park Service, GIS Specialist Ice Age NST
Matt Colwin	National Park Service, GIS Specialist Region 3,4 & 5
Katie Frauen	National Park Service, Trail Manager Ice Age NST
Bruce Luebke	U.S. Fish and Wildlife Service, Wildlife Refuge Specialist

APPENDIX C DEFINITION OF TERMS

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Core Team: A team of representatives from the NPS, WDNR, IATA, Marquette County, FWS, and local volunteers, formed to carry out the CPP. Their task was to develop conceptual ideas for alternative Corridors, possible route options for the Ice Age NST, and shepherd these ideas through the public review process.

Corridor: A planned and mapped linear space, generally about 2 to 5 miles wide, but wider in some places to protect exceptional features, within which the cooperating partners are working to establish the "Trail" and a suitable "Trailway". The "Corridor" has different implications for each primary partner:

- To the WDNR, it represents the area within which it may (1) accept gifts of lands for dedication for the Ice Age State Scenic Trail, and (2) acquire lands for the trailway.
- To the NPS, it represents the area within which it will exercise its authorities to establish, protect, and manage the Ice Age NST. It is an area that has been delineated through a public planning process and has met Federal environmental compliance requirements. The lines defining the Corridor will be treated as the "park" boundary for the trail and the limits within which Federal land acquisition authority for the trail would be exercised to create a suitable "Trailway." It also represents the area which will be considered in other planning documents such as resource management plans and land protection plans.
- To the IATA, it represents the area within which it will seek to protect or have protected a suitable "Trailway" for the Ice Age NST in order to preserve significant glacial features, provide an outstanding trail use experience, and manage on a sustainable basis the resources of the "Trailway". Also see Trail and Trailway.

Rarely will the partners seek to acquire or protect the entire width of the corridor for the trail unless it contains outstanding glacial features. The reason the corridor is wider than the Trailway that will be acquired is to provide the opportunity to be flexible in working with willing landowners on a voluntary basis. (see "Trailway")

Dedication: As provided for in Wis. Stats. 23.293, the transfer of land or a permanent interest in the land to the State of Wisconsin (for Ice Age NST purposes), and a binding unilateral declaration by the State that the land rights under the ownership of the State will be held in trust for the people by the WDNR in a manner which ensures the stewardship of the area. See also "Match-Grant Program."

Drumlins: Elliptical or elongate hills formed by erosion and deposition of material beneath thick glacial ice and streamlined in the direction of ice flow.

Ecotone: An area that acts as a boundary or a transition between two ecosystems.

Endangered Species: A species on the Federal or Wisconsin Endangered Species list and whose continued existence as a viable component of the State's wild animals or wild plants is determined by the FWS or the WDNR to be in jeopardy on the basis of scientific evidence.

Erratics: Boulders carried long distances by the glaciers and deposited when the glacier melted. They tend to be smooth and rounded.

Esker: A sinuous rounded ridge of sand and gravel deposited by the streams that flowed through tunnels at the base of the glacier.

Kettle: A depression formed by the melting of buried glacial ice. Some kettles contain water (pond or lake).

Moraine: A moraine is a ridge formed by the gravel, sand, and boulders carried along by the glacier and deposited where the glacier stopped. Morainal ridges vary in height.

Outwash: A sloping deposit of rounded gravel and fine sand left from the ice streams flowing away from the glaciers.

Recreation Opportunity Spectrum (ROS): A system of categorizing recreation settings originally developed by the USDA-Forest Service. The Ice Age Trail utilizes three categories: *Urban, Rural/Roaded Natural*, and *Semi Primitive*.

Rural/Roaded Natural (ROS): Recreation setting characterized by a more naturalappearing environment with moderate evidence of human activity. Generally, flat and rolling farmland and pastoral settings are *rural*. In contrast, *roaded* natural settings are more typical of the predominantly forested areas in northern Wisconsin on county and state forest properties

Semi-Primitive (ROS): Recreation setting characterized by predominantly natural environments of moderate to large size. The area is managed in such a way that the onsite controls and restrictions present are subtle with a moderate to high probability of isolation from the sights and sounds of humans.

Special Concern Species: Species about which a problem of abundance or distribution is suspected but not yet proven scientifically. This State classification focuses attention on species before they become threatened or endangered.

Stewardship Fund: A Wisconsin legislatively established fund administered by the WDNR, which provides funding for conservation and recreation programs, including matching grants to not-for-profit conservation organizations for certain projects. The Ice Age NST is one of the qualifying projects and may receive grants for land acquisition.

Terminal Moraine: A type of end moraine where a glacier or glacial lobe reached its maximum extent and melted back.

Threatened Species: A species on the Federal or Wisconsin Threatened Species list is one which appears likely, within the foreseeable future, based on scientific evidence, to become endangered.

Trail: The usable tread and immediate surrounding space that is maintained for the purpose of passage along the trail route. For walking only segments, this may be a 24- to 30-inch-wide tread and an additional 2 feet of cleared space on either side. For segments where other activities are also allowed, these measurements would likely be greater. Also see Corridor and Trailway.

Trailway: The width or area of land that is managed for the purposes of the Ice Age NST. It includes the "Trail" and surrounding lands that are owned, leased, held by easement, or in some way controlled for management as part of the Ice Age NST. Generally, its width ranges from 50-1000 feet. The secured rights are typically held by the WDNR, IATA, or County. Where the trail passes through existing public ownership or management areas, the "Trailway" is the width or area of land that the managing agency has committed to management for the trail. Also see Corridor and Trail.

Tunnel Channel: A landform produced by meltwater erosion at the base of a glacier that carves a valley. After the glacier has melted, the valley often contains a series of lakes.

Urban (ROS): Recreation settings characterized by substantially urbanized and modified natural environments. Since the trail passes through a number of picturesque small towns or medium-sized cities, particularly in southern Wisconsin, there are a number of segments that fit within the urban category

Wisconsin Glaciation: A period of the Earth's history at the end of the Pleistocene Ice Age, between 10,000 and 75,000 years ago.

APPENDIX D: LEGISLATION AND STATUES

This assessment serves to:

- A. (1) Comply with all provisions regarding environmental considerations and public involvement required by the National Environmental Policy Act (NEPA) by carrying out an open, public planning process to determine the corridor for the trail, and to identify and address public issues and concerns.
 (2) Comply with the Wisconsin Environmental Policy Act (WEPA) in accordance with sections NR 150.20(2)(a) and NR 150.40(2)(a) of the Wisconsin Administrative Code.
- B. Comply with consultation requirements for Section 106 of the National Historic Preservation Act and Section 7 of the Endangered Species Act.
- C. Comply with Executive Order 11988 Floodplain Management and Executive Order 11990 Protection of Wetlands.
- D. Provide information on the physical and social environment through which the trail passes for local trail clubs and the county to use as they plan the physical location, construction, and subsequent maintenance of the trail.
- E. Foster public involvement in and support for development and management of the trail, including recognition of the trail by public and private land use planning groups.
- F. Comply with required state designations and approvals:
- 1. The Natural Resources Board must approve land acquisition when an acquisition equals or exceeds \$150,000 (NR 1.41(1)(a), Wisconsin Administrative Code).
- 2. Wisconsin State Statutes, Chapter 23.09 (2) d, gives the WDNR approval to acquire lands for the Ice Age Trail.
- 3. Wisconsin State Statutes, Chapter 23.09 (2) c, gives the WDNR approval to provide grants for the acquisition of lands for the Ice Age Trail, through the Stewardship Program.
- 4. Wisconsin State Statutes, Chapter 23.17, designates the Ice Age Trail, as provided for in 16 U.S.C. 1244(a)(10), plus the land adjacent to each side of that trail designated by the WDNR, as a State Scenic Trail, to be known as the "Ice Age Trail".

- 5. Wisconsin State Statutes, Chapter 23.293, allows the transfer of land to the WDNR for the Ice Age Trail, through State Ice Age Trail area dedication.
- 6. Wisconsin State Statutes, Chapter 23.915(4), requires that the Joint Finance Committee must review a land acquisition when a Stewardship grant equals or exceeds \$250,000.

APPENDIX E: Species Lists

Wisconsin List of Plant Species that are threatened, endangered, or a Species of Concern (Last Revised 10/12/21 SOURCE: <u>Natural Heritage Inventory data access</u> -<u>Wisconsin DNR</u>)

Scientific Name	Common Name	WI Status	Group
Acris blanchardi	Blanchard's Cricket Frog	Endangered	Rare Amphibians
Agalinis gattingeri	Roundstem Foxglove	Threatened	Rare Plants
Alasmidonta	Elktoe	Protected Wild Animal	Rare Mussels and
marginata			
Ammospiza leconteii	LeConte's Sparrow	Protected by Migratory Bird Act	Rare Birds
Arigomphus	Unicorn Clubtail	Special Concern	Rare Dragonflies and
villosipes			Damselflies
Asclepias lanuginosa	Woolly Milkweed	Threatened	Rare Plants
Asclepias ovalifolia	Dwarf Milkweed	Threatened	Rare Plants
Asio otus	Long-eared Owl	Protected by Migratory Bird Act	Rare Birds
Bird Rookery	Bird Rookery	Special Concern	Miscellaneous Elements
Bombus fervidus	Yellow Bumble Bee	Special Concern	Rare Ants, Wasps, and Bees
Botaurus	American Bittern	Protected by Migratory	Rare Birds
lentiginosus		Bird Act	
Buteo lineatus	Red-shouldered Hawk	Threatened	Rare Birds
Calephelis muticum	Swamp Metalmark	Endangered	Rare Butterflies and Moths
Carex festucacea	Fescue Sedge	Special Concern	Rare Plants
Carex livida	Livid Sedge	Special Concern	Rare Plants
Carex merritt- fernaldii	Fernald's Sedge	Special Concern	Rare Plants
Carex swanii	Swan Sedge	Special Concern	Rare Plants
Centronyx henslowii	Henslow's Sparrow	Threatened	Rare Birds
Chlidonias niger	Black Tern	Endangered	Rare Birds
Chlosyne gorgone	Gorgone Checker Spot	Special Concern	Rare Butterflies and Moths
Colinus virginianus	Northern Bobwhite	Protected by Migratory Bird Act	Rare Birds

Coturnicops novehoracensis	Yellow Rail	Threatened	Rare Birds
Cypripedium	White Lady's-slipper	Threatened	Rare Plants
Cypripedium parviflorum var. makasin	Northern Yellow Lady's- slipper	Special Concern	Rare Plants
Diarrhena obovata	Ovate Beak Grass	Endangered	Rare Plants
Drosera linearis	Linear-leaved Sundew	Threatened	Rare Plants
Eleocharis engelmannii	Engelmann's Spike- rush	Special Concern	Rare Plants
Eleocharis flavescens var. olivacea	Capitate Spike-rush	Special Concern	Rare Plants
Eleocharis robbinsii	Robbins' Spike-rush	Special Concern	Rare Plants
Emydoidea blandingii	Blanding's Turtle	Protected Wild Animal	Rare Reptiles
Epilobium strictum	Downy Willow-herb	Special Concern	Rare Plants
Erimyzon sucetta	Lake Chubsucker	Special Concern	Rare Fishes
Etheostoma microperca	Least Darter	Special Concern	Rare Fishes
Fuirena pumila	Dwarf Umbrella Sedge	Endangered	Rare Plants
Hemileuca nevadensis ssp. 3	Midwestern Fen Buckmoth	Special Concern	Rare Butterflies and Moths
Hygrotus sylvanus	Sylvan Hygrotus Diving Beetle	Special Concern	Rare Beetles
Ixobrychus exilis	Least Bittern	Protected by Migratory Bird Act	Rare Birds
Juncus marginatus	Grassleaf Rush	Special Concern	Rare Plants
Lanius ludovicianus	Loggerhead Shrike	Endangered	Rare Birds
Lespedeza virginica	Slender Bush Clover	Threatened	Rare Plants
Lycaeides melissa samuelis	Karner Blue	Federally Protected	Rare Butterflies and Moths
Melanelia sorediata	Powdered Camouflage Lichen	Special Concern	Rare Lichens
Melanerpes erythrocephalus	Red-headed Woodpecker	Protected by Migratory Bird Act	Rare Birds
Migratory Bird Concentration Site	Migratory Bird Concentration Site	Special Concern	Miscellaneous Elements
Myotis lucifugus	Little Brown Bat	Threatened	Rare Mammals
Myotis septentrionalis	Northern Long-eared Bat	Threatened	Rare Mammals

Notropis anogenus	Pugnose Shiner	Threatened	Rare Fishes
Nycticorax nycticorax	Black-crowned Night- Heron	Protected by Migratory Bird Act	Rare Birds
Ophisaurus attenuatus	Slender Glass Lizard	Endangered	Rare Reptiles
Opuntia fragilis	Brittle Prickly-pear	Threatened	Rare Plants
Penstemon pallidus	Pale Beardtongue	Special Concern	Rare Plants
Peromyscus maniculatus bairdii	Prairie Deer Mouse	Special Concern	Rare Mammals
Phemeranthus rugospermus	Prairie Fame-flower	Special Concern	Rare Plants
Platanthera flava var. herbiola	Pale Green Orchid	Threatened	Rare Plants
Polytaenia nuttallii	Prairie Parsley	Threatened	Rare Plants
Quadrula quadrula	Mapleleaf	Protected Wild Animal	Rare Mussels and Clams
Rallus elegans	King Rail	Protected by Migratory Bird Act	Rare Birds
Rhexia virginica	Virginia Meadow- beauty	Special Concern	Rare Plants
Rhionaeschna mutata	Spatterdock Darner	Threatened	Rare Dragonflies and Damselflies
Rhynchospora scirpoides	Long-beaked Bald- rush	Threatened	Rare Plants
Scleria triglomerata	Whip Nutrush	Special Concern	Rare Plants
Scleria verticillata	Low Nutrush	Special Concern	Rare Plants
Setophaga cerulea	Cerulean Warbler	Threatened	Rare Birds
Sorex palustris	American Water Shrew	Special Concern	Rare Mammals

Appendix F Maps-Alternatives 1, 2, and 3







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APPENDIX H Marquette County Resolution

ROLL CALL - COUNTY BOARD OF SUPERVISORS

MARQUETTE COUNTY, WISCONSIN

February 15, 2022 Session Resolution 6- 2022



Committee Recommendation: Parks & Rural Planning Committee STATE OF WISCONSIN)) SS

County of Marquette

I, Kiley Lloyd, County Clerk of Marquette County, Wisconsin do hereby certify that the above is a true and correct copy of the resolution passed by the Marquette County Board of

)

Supervisors on this date 1572022

RESOLUTION IN SUPPORT OF THE ICE AGE TRAIL IN MARQUETTE COUNTY

WHEREAS, in 1980, the United States Congress designated the Ice Age Trail (the "Trail") to be a National Scenic Trail under the National Trails System Act; and

WHEREAS, the National Trails System Act encourages "volunteer citizen involvement in the planning, development, maintenance, and management, where appropriate, of trails;" and

WHEREAS, the development and maintenance of that portion of the Trail running through Marquette County is a co-operative project between landowners, local units of government, Marquette County, the Wisconsin Department of Natural Resources, the National Park Service, and volunteers with the Marquette County Chapter of the Ice Age Trail Alliance, Wisconsin Friends of John Muir, and the Muirland Bird Club; and

WHEREAS, the Trail is an all-season path for everyone to enjoy by foot, snowshoe, and ski; and

WHEREAS, the Trail is a recreational and educational resource that improves the quality of life for Marquette County citizens, families and children as well as visitors to Marquette County and increases tourism and interest in Marquette County; and

WHEREAS, the Trail is planned to connect public lands in French Creek State Wildlife Area, John Muir County Park, Fox River Wildlife Refuge, Caves Creek State Fishery Area, and Mecan River State Fishery Area through the townships of Buffalo, Packwaukee, Montello, Harris, Westfield, and Springfield; and

NOW, THEREFORE, BE IT RESOLVED that the County Board of Marquette County supports the continued development of the Trail through Marquette County;

BE IT FURTHER RESOLVED that this signed resolution be included in the Marquette County Outdoor Recreation Plan and that this signed resolution be sent to the National Park Service, Wisconsin Department of Natural Resources, and Ice Age Trail Alliance.