



State of the Park Report

Mississippi National River and Recreation Area Minnesota



April 2013

On the cover: Mississippi National River and Recreation Area. Photo by: Brian Peterson, Minneapolis StarTribune

Disclaimer. This State of the Park report summarizes the current condition of park resources, visitor experience, and park infrastructure as assessed by a combination of available factual information and the expert opinion and professional judgment of park staff and subject matter experts. The [internet version](#) of this report provides the associated workshop summary report and additional details and sources of information about the findings summarized in the report, including references, accounts on the origin and quality of the data, and the methods and analytic approaches used in data collection and assessments of condition. This report provides evaluations of status and trends based on interpretation by NPS scientists and managers of both quantitative and non-quantitative assessments and observations. Future condition ratings may differ from findings in this report as new data and knowledge become available. The park superintendent approved the publication of this report.

Executive Summary

The river itself has no beginning or end. In its beginning, it is not yet the river; at the end it is no longer the river. What we call the headwaters is only a selection from among the innumerable sources which flow together to compose it. At what point in its course does the Mississippi become what the Mississippi means? (T. S. Eliot, Introduction to *The Adventures of Huckleberry Finn*).

The mission of the National Park Service is to preserve unimpaired the natural and cultural resources and values of national parks for the enjoyment, education, and inspiration of this and future generations. NPS Management Policies (2006) state that “The Service will also strive to ensure that park resources and values are passed on to future generations in a condition that is as good as, or better than, the conditions that exist today.” As part of the stewardship of national parks for the American people, the NPS has begun to develop State of the Park reports to assess the overall status and trends of each park’s resources. The NPS will use this information to improve park priority setting and to synthesize and communicate complex park condition information to the public in a clear and simple way.

The purpose of this State of the Park report is to:

- Provide to visitors and the American public a snapshot of the status and trend in the condition of a park’s priority resources and values;
- Summarize and communicate complex scientific, scholarly, and park operations factual information and expert opinion using non-technical language and a visual format;
- Highlight park stewardship activities and accomplishments to maintain or improve the State of the Park;
- Identify key issues and challenges facing the park to help inform park management planning.

Congress established the Mississippi National River and Recreation Area (Mississippi NRRRA) in 1988 and stated that the Mississippi NRRRA corridor “represents a nationally significant historical, recreational, scenic, cultural, natural, economic and scientific resource.” It directed the NRRRA to:

- Protect, preserve, and enhance nationally significant resources and values in the Mississippi River corridor through the Twin Cities metropolitan area;
- Coordinate government programs in the corridor; and
- Provide a management framework to assist the state of Minnesota and its units of local government in the development and implementation of integrated resource management programs for the Mississippi River corridor in order to ensure orderly public and private development in the area.

The Mississippi NRRRA is a 72-mile river segment of America’s—and one of the world’s—greatest rivers and is the only National Park about the Mississippi River. The NRRRA strives to improve the public’s understanding of the river to promote public stewardship of its resources and strengthen people’s relationships with the Mississippi as a dynamic part of our nation’s heritage, our quality of life, and our legacy for future generations.

The Mississippi is one of the most complex ecosystems on the planet. The Mississippi Flyway serves as a route for 40% of the migratory waterbirds, nearly half of North America’s bird species, and is essential to the ecological health of the entire continent. The river environment is home to a rich array of fish, wildlife, and plants. Millions of people live on and near the river, drink its water and rely upon the river’s resources.

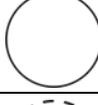
The Mississippi River lies at the heart of what is America, and more than any other natural feature is an unmistakable symbol of this nation. The Mississippi is one of the most recognized historic transportation routes in our country and features nationally significant natural, cultural, recreational, and economic resources. The Mississippi River has had spiritual importance to Native peoples for centuries. Most Americans and international visitors yearn to see and touch the Mississippi River when visiting the Twin Cities, showing that the river still has a spiritual draw to all people. The Mississippi is a working river, and commercial navigation is important to the economy of this region and the nation. Minneapolis, Saint Paul and most other communities in the corridor exist because of the Mississippi River. We believe answer to T.S. Elliot’s question about “At what point in its course does the Mississippi become what the Mississippi means” is here.

For its first 25 years, the Mississippi NRRRA focused far more on developing partnerships throughout the 72-mile corridor than on its own lands. Out of the 54,000 acres encompassed in the NRRRA’s boundaries, the park owned only 35 acres on nine islands. Other than minimal resource management, the park spent little time on the islands. The park did not need law enforcement or maintenance staff. This changed January 2010, when the Department of Interior placed the 29.5-acre, former Bureau of Mines, Twin Cities Research Center property under the park’s management. Over the next two years, the park completed plans and specifications for the removal of a dozen buildings and related infrastructure, and for restoration of the land to park and open space. The site closed in November 2011 for the demolition and restoration project and opened to the public on September 1, 2012. The property is now the Coldwater Spring unit of the NRRRA.

The demands on staff time and park needs have changed fundamentally with this new property. The Resource Management Team devoted much of the past three years to working on the demolition and restoration project and will continue working on the restoration in coming years. The Education and Interpretation Team began leading tours of the property while it was closed in 2011–2012 and has continued to do so since Coldwater Spring opened to the public. Immediately to the north, Minnehaha Park receives about 1.2 million visitors per year, and historic Fort Snelling to the south gets about 80,000. Coldwater Spring could see tens of thousands of visitors in the next few years. The NRRA is now dealing with maintenance and law enforcement issues on the property. For the first time, the park will need to spend more time on its own property, stressing our ability to work throughout the corridor as we did for our first 25 years.

The summary table, below, and the supporting information that follows, provides an overall assessment of the condition of priority resources and values at Mississippi National River and Recreation Area based on scientific and scholarly studies and expert opinion. The internet version of this report, available at <http://www.nps.gov/stateoftheparks/miss/>, provides additional detail and sources of information about the resources summarized in this report, including references, accounts on the origin and quality of the data, and the methods and analytical approaches used in the assessments. Many of the assessments of resource condition in this report are based on the 2012 [State of the River Report](#) developed in partnership with the Friends of the Mississippi River, which examines the status and trends of 13 key indicators of water quality and river health and highlights key strategies for improvement moving forward.

The Status and Trend symbols used in the summary table below and throughout this report are summarized in the following key. The background color represents the current condition status, the direction of the arrow summarizes the trend in condition, and the thickness of the outside line represents the degree of confidence in the assessment.

Condition Status		Trend in Condition		Confidence in Assessment	
	Warrants Significant Concern		Condition is Improving		High
	Warrants Moderate Concern		Condition is Unchanging		Medium
	Resource is in Good Condition		Condition is Deteriorating		Low

State of the Park Summary Table

Priority Resource or Value	Condition Status/Trend	Rationale
Natural Resources web ▶		
Weather and Climate		Annual mean temperatures and all seasonal mean, maximum and minimum temperatures have increased by more than 2 degrees F during the past 117 years. Recent climate models suggest that precipitation in the form of snow and rain will increase in late winter/early spring, which could cause increased flooding in the coming decades.
Air Quality		Estimated values for ozone and sulfur wet deposition in the park corridor for 2005–2009 warrant moderate concern based on NPS Air Resource Division benchmarks . Estimated nitrogen wet deposition and estimated average visibility warrant significant concern.

Priority Resource or Value	Condition Status/Trend	Rationale
Water Resources		Water quality has improved dramatically since the 1950s and 1960s. However, suspended solids, phosphorus, bacteria, and several persistent environmental contaminants continue to cause concern. Fish consumption advisories are in place for three contaminants on the Mississippi River.
Vegetation Communities		Numerous municipal parks and other protected areas within the boundary of the park provide habitat for a diverse vegetation community. Many tree species show good regeneration and snags provide habitat for a variety of wildlife. Regeneration of cottonwood and silver maple are of great concern in the riparian areas, and there is a constant influx of non-native plants.
Fish and Wildlife		Some fish and wildlife species have recovered from lows in the 1960s and 1970s. Bald eagle numbers have increased, and they have been removed from the endangered species list. River otters are returning to the river, and walleye now have fishable populations. Additional data are needed to better understand the status and trends in migratory and resident songbirds. White-tailed deer are over abundant.
Invasive and Nuisance Species		There are an estimated 100 plant species in the park that are non-native to the area and an additional 181 plant species that are encroaching. Several species are highly invasive and are known to adversely affect native habitat. Emerald ash borer has been found at Fort Snelling, in the center of the Twin Cities, and Asian carp are poised to invade the NRRRA and represent a potentially serious threat to the river's ecosystem.
Land Cover and Use		Urban population growth and development are putting greater pressure on the Mississippi NRRRA corridor's natural and cultural resources. This trend slowed, rather than stopped, with the economic downturn but will increase again as the economy improves.
Cultural Resources web ▶		
Coldwater Spring Unit		The 29.5 acre Coldwater Spring Unit was recently transferred to the park by the Department of Interior. The spring and surrounding land have attracted Native Americans, early settlers, the U.S. Army, and a research center for the U.S. Bureau of Mines. The park recently completed archeological, ethnographic and history studies that have added greatly to our knowledge of the property. The park will now begin working to interpret the site's rich history, with help from Dakota tribes, historians and others. The Coldwater Spring property is being restored to an oak savanna and bluff-top woodland in the heart of the Twin Cities metropolitan area and is expected to attract tens of thousands of visitors. The park has concerns about the ability to maintain the new park facilities, resources, and visitor experience at Coldwater Springs since it currently does not have funding and staffing for maintenance, law enforcement and other needed stewardship activities.

Priority Resource or Value	Condition Status/Trend	Rationale
Archeological Resources		Corridor-wide, Mississippi NRRRA relies on State Historic Preservation Office (SHPO) to review and comment on projects that could affect archeological sites. Section 106 reviews or other development reviews are driving what we know. Mississippi NRRRA completed an Archeological Overview and Assessment in 2000 and a Historic Resources Study in 2003. The latter included an archeological and historic sites inventory. Mississippi NRRRA also completed a Draft Resource Management Plan in 2002 that discusses archeological sites. No recent inventory has been completed. We do not know the condition of most sites and do not have enough information to establish a trend. Caution is warranted given urban growth.
Cultural Anthropology		Corridor-wide, the SHPO does not review and comment on projects that could affect ethnographic resources, unless those resources are National Register listed. Mississippi NRRRA has completed an ethnographic review of Coldwater Spring and the surrounding area. Otherwise little is being done in the corridor to assess ethnographic sites. Mississippi NRRRA has submitted a PMIS request in for a corridor-wide ethnographic study. This would help determine the status for these types of resources and future evaluations of those resources identified would help establish the trend.
Cultural Landscapes		Corridor-wide Mississippi NRRRA is relying on SHPO to review and comment on projects that could affect cultural landscapes. No proactive efforts are underway to discover and document such properties. We do not know how many cultural landscapes there are in the corridor or what their condition might be. The one exception is the Valley of St. Paul, which Mississippi NRRRA successfully nominated as one of the 10 Most Endangered Historic Sites in Minnesota. Mississippi NRRRA has submitted a PMIS request for a cultural landscape study. Without an inventory, we cannot know the condition of the cultural landscapes in the Mississippi NRRRA corridor.
Historic Structures		Throughout the 72-mile corridor, many more historic sites (standing structures) have been evaluated for the National Register than archeological sites, but we do not know what percentage of the total number of historic sites these represent. As the Historic Resources Study (2003) shows, the State did an extensive survey for historic and architectural sites for the whole state in the 1970s and 1980s, but this survey is significantly out of date.
Historic Sites		Three National Historic Landmarks (NHLs) lie within the park's boundaries: Fort Snelling, Pillsbury A Mill, and Washburn A Mill. The James J. Hill Stone Arch Bridge is a National Engineering Landmark. A much greater number of historic sites (standing structures) have been evaluated for the National Register than archeological sites, but we do not know the current condition of most historic sites. Caution is warranted, given lack of knowledge and the pace of urban development and expansion in the corridor.
History		Many historic sites in the corridor have substantial research behind them, but many others need more research. The Historic Resources Study (2003) makes this clear. Also, a lot of research may have been done of individual sites that the study did not have time to assess, and many more discrete studies have been completed for sites in the corridor since 2003, but no one has synthesized that information.

Priority Resource or Value	Condition Status/Trend	Rationale
Visitor Experience web ▶		
Number of Visitors		<p>Visitor numbers have increased steadily during the past five years. The park has continued to expand program opportunities for the public, especially through the Urban Wilderness Canoe Adventures partnership (UWCA). With the fall 2012 opening of the Coldwater Spring, the park began formally counting visitors on NPS-owned land within the park for the first time. We expect visitor numbers to increase significantly at Coldwater.</p>
Scenic Character		<p>The NRRRA's scenic character is experiencing increasing pressures from urban expansion and development. A Visual Resource Protection Plan is under development to identify and determine how best to protect high-quality views.</p>
Recreational Opportunities		<p>The land-based recreational opportunities for visitors in the NRRRA are exceptional in the park's urban areas and greatly improving in surrounding areas. Designation of the Mississippi River Trail (MRT), partner efforts to expand facilities to and along the river, and the NRRRA's efforts to work with partners to create awareness and enhance recreational access are key factors in this assessment. Water-based recreational opportunities are exceptional, as well, but many visitors are not as aware of these opportunities.</p>
Education and Outreach Programs		<p>The Mississippi NRRRA has demonstrated a consistent increase in numbers of people served by both public and school-based programs, with more than 56,000 programmatic interactions in 2012—roughly double that of five years ago. The range of programs has continued to diversify, and satisfaction with programs is high. Audiences reached are highly diverse relative to the surrounding area. Because the park is dependent on partner relationships and partner facilities, vulnerabilities exist that are beyond park control.</p>
Interpretive Media – Website, Brochures, Exhibits, Signs		<p>The Mississippi NRRRA works with partners to provide interpretive services in visitor centers throughout the park. Additionally, the park uses a suite of resources including online media, traditional waysides and an NPS administered visitor center to provide non-personal services to the public.</p>
Volunteers		<p>The park's Volunteers-In-Parks (VIP) program has had increases every year in the number of volunteers, the number of volunteer hours, the partners with which the program works, and in the type of volunteer opportunities. The VIP program is administered jointly with the Mississippi River Fund, the park's friends group. Volunteer satisfaction is high as measured by the number of years volunteers have been with the program and by the number of hours individuals volunteer. The Mississippi NRRRA volunteer program won the George & Helen Hartzog Award for "Outstanding Park Volunteer Program" in the Midwest Region in 2008 and 2011.</p>
Community Partners		<p>Community partnerships—a hallmark of the Mississippi NRRRA—have continued to grow, in terms of amount of funds received as well as number of partners and results. Well over one hundred organizations are engaged in a variety of partnerships (volunteering, educational, recreational, stewardship) that support the Mississippi NRRRA visitor experience.</p>

Summary of Stewardship Activities and Key Accomplishments to Maintain or Improve Priority Resource Condition:

The list below provides examples of stewardship activities and accomplishments by park staff and partners to maintain or improve the condition of priority park resources and values for this and future generations:

Partnerships

The establishment and nurturing of partnerships with other agencies and organizations is critical to meeting the three key purposes for which the Mississippi NRRRA was established: (1) protect, preserve, and enhance nationally significant resources in the Mississippi River corridor through the Twin Cities metropolitan area; (2) coordinate government programs in the corridor; and (3) provide a management framework to assist the state of Minnesota and its units of local government in the development and implementation of integrated resource management programs for the Mississippi River corridor in order to ensure orderly public and private development in the area. Some examples of the park's partnerships include:

- The Mississippi River Fund has become the park's primary partner, providing funding for and facilitation of projects throughout the corridor, as is demonstrated throughout this document.
- Educational partnerships. A core of approximately 20 local partners is led by the NRRRA to connect school children to the science, heritage and stewardship of the Mississippi River and its watershed.
- Initiated by NRRRA in 1996, the Metro WaterShed Partners formed to conduct collaborative public outreach and promote personal action for clean water and pollution prevention. The vital partnership numbers over 70 organizations.
- Water quality. The park partnered with the Freshwater Society, a local non-profit, to establish and secure private foundation funding for the Minnesota FarmWise project. This project expands farmer-to-farmer education on water-friendly and economically viable farming practices.
- Since 1996, the NRRRA has played a lead coordinating role in the Trails and Open Space Partnership, which is a coalition of over 50 agencies and organizations that are working together to achieve a continuous land and water based recreation trail, open space, and multimodal alternative transportation system along the Mississippi River in the Twin Cities metro area while protecting the river's significant resources.
- Fort Snelling National Historic Landmark. After years of close coordination, the park signed a Joint Powers Agreement with key partners to stabilize and restore National Historic Landmark buildings and preserve its landscape.
- The NRRRA partnered with Friends of the Mississippi River—a non-profit focused on the Mississippi River—to develop the first-ever “State of the River” report. Released in September 2012, the report has received praise for communicating scientific and complex issues in a manner that the general public can understand.

Coldwater Spring Unit

On January 15, 2010, the Department of Interior placed the former Bureau of Mines, Twin Cities Research Center Campus under the park's management, directing that it be used for park and open space purposes. In 2010 and 2011, the NRRRA oversaw the design and planning for the removal of 12 buildings and the restoration of the land to an oak savanna and bluff top woodland. On September 1, the Coldwater Spring unit opened to the public and is quickly becoming a key attraction in the area.

Natural Resources

- Eagle Survey. From 2006 to 2011 the National Park Service Great Lakes Inventory and Monitoring Network and its partners assessed population levels and levels of targeted environmental contaminants in bald eagle (*Haliaeetus leucocephalus*) nestlings at sites in and adjacent to the Mississippi NRRRA.
- Waterbird Survey. In 2009 the NRRRA and its friends group (the Mississippi River Fund) helped expand a U.S. Fish and Wildlife Service annual survey of waterfowl use on the upper Mississippi River to include its corridor.
- River otter. Otters are making a comeback in the NRRRA, and the park has initiated a program to determine their numbers and locations. Assistance for the program is provided by the Mississippi River Fund.
- The NRRRA has become an incubator and refuge for three mussel species on the federal endangered species list.
- Asian Carp Task Force and Forum. In January 2011, the NRRRA initiated a series of meetings that led to the creation of an Asian Carp Task Force for Minnesota and co-chairs the Task Force with the Minnesota DNR. When Non-Governmental Organizations (NGOs) began meeting on the issue and other interests wanted to be become part of the discussion, the NRRRA expanded the meetings into an Asian Carp Forum that brings together all those working on or concerned about the issue to discuss possible solutions.
- The park has established a strong water quality program within the last three years and has become a leading facilitator and communicator of information regarding the Mississippi River and influences on its water quality. For example, the NRRRA

coordinates a monthly meeting series—the Mississippi River Forum—for water resource practitioners and decision-makers to learn about and share information on Mississippi River and water quality topics. Over 1,000 people have attended these meetings, which are co-sponsored by the Mississippi River Fund.

Cultural Resources

- As part of the restoration of the newly-acquired Coldwater Spring unit, the park took Coldwater Creek out of a culvert and opened it to daylight for the first time in some 100 years. The NRRRA completed archeological, ethnographic, and historical studies of the unit during the past six years and conducted extensive coordination with Dakota Indian tribes.
- Fort Snelling Upper Post. Working together for more than seven years, the DNR, Hennepin County, Minnesota Historical Society and Mississippi NRRRA secured a \$575,000 Save America's Treasures grant that was matched one to one by Hennepin County. In addition, the State has provided more than \$2 million in bonding dollars to stabilize many of the Upper Post's 27 buildings and undertake essential restoration at some.
- National Historic Landmark Mills. The NRRRA, with significant help from Midwest Region cultural resources staff, has helped guide projects affecting the Pillsbury A and Washburn A mills, both of which are NHLs.

Visitor Experience

- Public contact at the park's Mississippi River Visitor Center, located in the lobby of the Science Museum of Minnesota, orients high numbers of people to the park. This is also one of the park's key partnerships.
- The park's new Coldwater Spring property is now open to the public; ranger-led tours are popular.
- Big River Journey, the park's flagship formal education program, has served over 55,000 students through a partnership with eleven other organizations.
- The Urban Wilderness Canoe Adventures (UWCA) program has surpassed its initial goal to serve over 10,000 youth and families annually and served more than 30,000 students over its four year history.
- School programs provided by the Mississippi NRRRA result in over 40,000 presenter-student program interactions each year, serving more than 100 schools.
- Teacher training workshops serve more than 150 teachers annually, and overall more than 400 teachers are involved with the Mississippi NRRRA education programs each year.
- Public program offerings have grown substantially during the past five years—including Bike with a Ranger and community outreach programs.
- Volunteer involvement at the park has grown tremendously, spurred significantly through partnerships with 25 organizations. The NRRRA volunteer program was recognized as best in the region in 2008 and 2011. In 2012, 7,221 volunteers provided 31,406 hours of service, the highest numbers ever for the park and 32% over 2011.

Park Infrastructure

- The NRRRA completed the initial restoration of the Coldwater Spring unit in August 2012. As part of the Coldwater project, the park oversaw the construction of a one-quarter mile handicap accessible trail to Coldwater Spring and used the existing parking lot and entry roads to provide public vehicular access. The NRRRA also salvaged the front entry steps and remnants of the main Bureau of Mines office walls to provide for additional interpretive opportunities representing the Bureau of Mines era at the site.
- The NPS arrowhead and Coldwater Spring unit name appear on the rebuilt Bureau of Mines entry monument.
- During the Bureau of Mines demolition work, the contractor removed 8.5 acres of impervious surfaces, roads, parking lots and buildings during the demolition phase; recycling 13,000 cubic yards of concrete and stone material.

Key Issues and Challenges for Consideration in Management Planning

Coldwater Spring and General Planning

- The Mississippi NRRRA has no control over what flows into the Mississippi and Minnesota rivers before they enter the park, and taking action to fix key problems facing these rivers is a challenge.
- The ability of the Mississippi NRRRA to control what happens on the land within the park's 54,000-acres is also limited, as it owns only 64 acres.
- Now that the Mississippi NRRRA owns 29.5 acres at the Coldwater Spring unit and may soon oversee another 18 acres adjacent to it, the park has to determine how to prioritize staff time between the new property and the rest of the corridor. The new property has pushed the park into a new era of land management and visitor services.

- The Mississippi NRRRA has to consider the impact of its success. The park is increasingly sought after by others as an active player on key issues. The challenge will be to determine how to maintain our current level of engagement and outreach, while growing strategically.

Natural Resources

- **Fish and Wildlife.** For the NRRRA's 72 miles of the Mississippi River and 4 miles of Minnesota River, the park does not have a good handle on the numbers and distribution of fish and wildlife species or their condition within those waters. Many herptile populations are struggling, and White-nose syndrome is likely on the way for local bat populations. Between warming temperatures and increasing numbers of invasive species arriving, more and more native species are losing ground. The NRRRA needs to find a way to quantify and address these issues.
- **Water Quality.** River flow to and within the park has increased significantly over the past 30 years, which is an important driver of water quality. Meaningful improvements will require changes in both upstream agricultural activities and nonpoint source urban runoff.
- **Contaminants of Emerging Concern.** A number of newer chemicals and their byproducts are present in the river and its associated environment. Many of these substances are not tracked in the same way that other contaminants are, making it difficult to know the extent of their presence, how they operate throughout the food chain, and their potential cumulative impacts.
- **Invasive Species.** The Emerald Ash Borer and three different species of Asian carp threaten to change the ecosystem of the river and of the lands along it in the coming decades.
- **Protecting key visual resources is difficult,** since the NRRRA does not own much land and has very little regulatory authority.

Cultural Resources

- **Coldwater Spring.** While three archeological surveys have been completed for the Coldwater Spring property, the lands immediately adjacent to it have not been surveyed. These lands hold archeological resources tied to Coldwater's history.
- **Archeological Sites.** A comprehensive archeological survey is needed for the Mississippi NRRRA corridor.
- **Historic Sites.** While state and local entities have completed standing structure surveys for most of the corridor's communities, many of these are out of date. This makes it harder to protect historic sites and to educate people about them.
- **Fort Snelling National Historic Landmark.** This NHL, with its 27 standing buildings, is one of the most important cultural and historic resources in the NRRRA and is in serious condition. It needs adaptive reuses, which will cost millions of dollars. There is some hope that projects on the horizon may help save it.
- **Cultural Landscapes and Ethnographic Sites.** No general surveys have been conducted of cultural landscapes or ethnographic sites in the corridor. Given the pace of urban expansion, the corridor could lose sites fitting both categories before we know they exist.

Visitor Experience

- Park visibility remains a challenge in this partnership-based park. Visits to the lands and waters within the NRRRA often leave no impression that the visit has occurred in a national park.
- Programmatic success at the park has led to increased expectations and pressure for more programs to serve more people, stressing limited staff resources.
- Creating a seamless and recognizable multi-modal alternative transportation system in the NRRRA to protect resources, improve the visitor experience, and create recreational access to and along the Mississippi River is a complex challenge.
- The park, in collaboration with over 50 entities, hopes to complete the Mississippi River Trail, a continuous land and water based trail along the Mississippi River in the Twin Cities metro area, for the National Park Service Centennial in 2016.
- Key partner-exhibits for the park at the Science Museum of Minnesota in the Mississippi River Gallery are slated for removal, potentially leaving the park with only small exhibits at other partner sites to go along with the park's orientation exhibits.
- The Mississippi NRRRA has no education center or facility of its own for use by school groups and other organized groups, but instead relies on partner-owned facilities.
- Volunteer involvement must be coordinated with a complex array of local partners and often occurs on partner sites, requiring significant planning, coordination and formal agreements.
- Meaningful evaluation of visitor satisfaction remains difficult because of the nature of a partnership park.

Park Infrastructure

- The park did not receive a base funding increase with the addition of the 29.5-acre Coldwater Unit, and therefore must carefully plan how it spends park funding on maintenance and repair of the roads, parking areas, trails and the Coldwater springhouse, reservoir and creek.
- The Mississippi NRRRA does not have law enforcement or maintenance staff, both of which are required at the new Coldwater Spring property. The park is developing partnerships with local law enforcement units and with the St. Croix National Scenic Riverway to address these issues.
- On-going restoration and planning for the Coldwater unit to address visitor use, safety and enjoyment and resource protection will require more funding to complete the necessary planning, compliance and civic engagement processes and documents.

Chapter 1 - Introduction

The purpose of this State of the Park report for Mississippi National River and Recreation Area is to assess the overall condition of the park's priority resources and values, communicate complex park condition information to visitors and the American public in a clear and simple way, and to inform visitors and other stakeholders about stewardship actions being taken by park staff to maintain or improve the condition of priority park resources for future generations. The State of the Park report uses a standardized approach to focus attention on the priority resources and values of the park based on the park's purpose and significance, as described in the park's Foundation Document or General Management Plan. The report:

- Provides to visitors and the American public a snapshot of the status and trend in the condition of a park's priority resources and values.
- Summarizes and communicates complex scientific, scholarly, and park operations factual information and expert opinion using non-technical language and a visual format.
- Highlights park stewardship activities and accomplishments to maintain or improve the state of the park.
- Identifies key issues and challenges facing the park to inform park management planning.

The process of identifying priority park resources by park staff and partners, tracking their condition, organizing and synthesizing data and information, and communicating the results will be closely coordinated with the park planning process, including natural and cultural resource condition assessments and Resource Stewardship Strategy development. The term "priority resources" is used to identify the fundamental and other important resources and values for the park, based on a park's purpose and significance within the National Park System, as documented in the park's foundation document and other planning documents. This report summarizes and communicates the overall condition of priority park resources and values based on the available scientific and scholarly information and expert opinion, irrespective of the ability of the park superintendent or the National Park Service to influence it.

Congress established the Mississippi National River and Recreation Area (Mississippi NRRRA) in 1988 and stated that the Mississippi NRRRA corridor "represents a nationally significant historical, recreational, scenic, cultural, natural, economic and scientific resource." It directed the NRRRA to:

- Protect, preserve, and enhance nationally significant resources in the Mississippi River corridor through the Twin Cities metropolitan area;
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The Mississippi River lies at the heart of what is America, and more than any other natural feature is an unmistakable symbol of this nation. The Mississippi River is one of the most recognized historic transportation routes in our country and is rich in nationally significant natural, cultural, recreational, and economic resources. The Mississippi River has had spiritual importance to Native peoples for centuries. Most Americans and international visitors yearn to see and touch the Mississippi River when visiting the Twin Cities, showing that the river still has a spiritual draw to all people. The Mississippi is a working river, and commercial navigation is important to the economy of this region and the nation. Minneapolis, Saint Paul and most other communities in the corridor exist because of the Mississippi River. We believe answer to T.S. Elliot's question about "At what point in its course does the Mississippi become what the Mississippi means" is here.

For its first 25 years, the Mississippi NRRRA focused far more on developing partnerships throughout the 72-mile corridor than on its own lands. Out of the 54,000 acres encompassed in the NRRRA's boundaries, the park owned only 35 acres on nine islands. Other than minimal resource management, the park spent little time on the islands. The park did not need law enforcement or maintenance staff. This changed January 2010, when the Department of Interior placed the 29.5-acre, former Bureau of Mines, Twin Cities Research Center property under the park's management. Over the next two years, the park completed plans and specifications for the removal of

a dozen buildings and related infrastructure, and for restoration of the land to park and open space. The site closed in November 2011 for the demolition and restoration project and opened to the public on September 1, 2012. The property is now the Coldwater Spring unit of the NRRA.

The demands on staff time and park needs have changed fundamentally with this new property. The Resource Management Team devoted much of the past three years to working on the demolition and restoration project and will continue working on the restoration in coming years. The Education and Interpretation Team began leading tours of the property while it was closed in 2011–2012 and has continued to do so since Coldwater Spring opened to the public. Immediately to the north, Minnehaha Park receives about 1.2 million visitors per year, and historic Fort Snelling to the south gets about 80,000. Coldwater Spring could see tens of thousands of visitors in the next few years. The NRRA is now dealing with maintenance and law enforcement issues on the property. For the first time, the park will need to spend more time on its own property, stressing our ability to work throughout the corridor as we did for our first 25 years.



Figure 1. Map of the Park

Chapter 2 - State of the Park

The State of the Park is summarized below for four categories—Natural Resources, Cultural Resources, Visitor Experience, and Park Infrastructure—based on a synthesis of the park’s monitoring, evaluation, management, and information programs, and expert opinion. Brief resource summaries are provided below for a selection of the priority resources and values of the park. Clicking on the [web ▶](#) symbol found in the tables and resource briefs below will take you to the internet site that contains content associated with specific topics in the report.

The scientific and scholarly reports, publications, datasets, methodologies, and other information that were used as the basis for the assessments of resource condition are referenced and linked throughout the report and through the [internet version of this report](#) that is linked to the NPS [IRMA data system](#) (Integrated Resource Management Applications). The internet version of each report, and the associated workshop summary report available from the internet site, provide additional detail and sources of information about the findings summarized in the report, including references, accounts on the origin and quality of the data, and the methods and analytical approaches used in data collection and the assessments of condition. Resource condition assessments reported in this State of the Park report involve expert opinion and the professional judgment of park staff and subject matter experts involved in developing the report. This expert opinion and professional judgment derive from the in-depth knowledge and expertise of park and regional staff gained from their being involved in the day-to-day practice of all aspects of park stewardship and from the professional experience of the participating subject matter experts. This expert opinion and professional judgment utilized available factual information for the analyses and conclusions presented in this report. This State of the Park report was developed in a park-convened workshop.

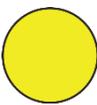
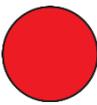
2.1. Natural Resources

Weather and Climate			
Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Temperature	Mean annual temperature		Reliable temperature measurements exist for the Minneapolis/St. Paul area since the 1890s. Using a 10-year running average, the mean annual temperature has increased about 2°F since 1895. Since 1980, it has been warmer than in the earlier period of record (NWS 2012). This suggests a long-term warming trend that could affect park resources negatively.
	Seasonal mean, minimum and maximum temperatures		All seasonal mean, maximum, and minimum temperatures have increased over the course of the last 117 years. The greatest change in seasonal temperatures has been an increase in winter minimum temperatures (2.6°F) (NWS 2012). These temperature changes could adversely affect the park’s flora and fauna.
Precipitation	Average annual precipitation		Average annual precipitation has increased slightly since the 1890s. This trend is strongly influenced by low precipitation during the “dust bowl” era of the 1920s and 1930s. Climate models suggest the amount of precipitation in the form of rain will increase in late winter/early spring, over the coming decades, which may cause more flooding (NWS 2012). A change in the timing of precipitation could introduce a series of consequences that would eventually impact the river (e.g., timing of agricultural production, chemical application, and cover crop availability).

Air Quality



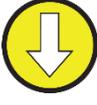
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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Ozone	Annual 4th-Highest 8-Hour Concentration		The estimated ozone level for 2005–2009 at Mississippi NRRA was 66.9 parts per billion (ppb), which warrants moderate concern based on NPS Air Resource Division benchmarks . For 2000–2009, ozone levels at the monitoring site representing the Mississippi NRRA remained unchanged (no statistically significant trend) (NPS ARD 2013). List of ozone-sensitive plant species .
Deposition	Sulfur Wet Deposition		For 2005–2009, estimated sulfur wet deposition was 2.6 kilograms per hectare per year (kg/ha/yr), which warrants moderate concern based on NPS ARD benchmarks . The park may be moderately sensitive to acidification effects (Sullivan et al. 2011a), including changes in water chemistry that impact aquatic vegetation, invertebrate communities, amphibians, and fish. No trend information is available because there are not sufficient on-site or nearby wet deposition monitor data (NPS ARD 2013).
	Nitrogen Wet Deposition		For 2005–2009, estimated nitrogen wet deposition was 5.4 kilograms per hectare per year (kg/ha/yr), which warrants significant concern based on NPS ARD benchmarks . Levels of nitrogen wet deposition at Mississippi NRRA are relatively high and the park may be moderately sensitive to nitrogen-enrichment effects (Sullivan et al. 2011b), which can affect biodiversity of certain vegetation communities, including wetland plant communities. No trend information is available because there are not sufficient on-site or nearby wet deposition monitor data (NPS ARD 2013).
Visibility	Haze Index		For 2005–2009, estimated average visibility in Mississippi NRRA was 8.8 deciviews (dv) above natural conditions, which warrants significant concern based on NPS ARD benchmarks . No trend information is available because there are not sufficient on-site or nearby visibility monitor data (NPS ARD 2013).

Water Resources



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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Water Quantity	Flow (cubic feet per second)		Mean annual flow increased significantly since the early 20 th century, with greater increases occurring in recent years. Winter and summer low flows, peak flow due to rainfall, and the number of days with high or extreme flow have also increased. High flows can cause increased erosion, flooding risk, habitat degradation, and can carry more pollutants into the river (State of the River Report 2012).

Water Chemistry	pH		pH remained within the state and federal standards range (6.5–9.0 or 6.5–8.5 SU, depending on river mile) between 1976 and 2005 (Lafrancois et al, 2013). NPS data collected since 2005 also show pH to be within state and federal standards (Elias and Sieracki 2007 ; VanderMeulen 2009 ; VanderMeulen 2011).
	Dissolved oxygen (DO)		DO levels remained well above the state and federal standard of 5mg/L between 1976 and 2005 and increased at sites in the lower portion of the river (Lafrancois et al, 2013). NPS data collected since 2005 also show DO to meet the state and federal standard, with one exception in 2006 (Elias and Sieracki 2007 ; VanderMeulen 2009 ; VanderMeulen 2011).
	Temperature (Temp)		Water temperature increased significantly at most study sites between 1976 and 2005 (Lafrancois et al, 2013). Continued increases can cause decreases in DO concentration and contribute to conditions harmful for aquatic life.
	Total suspended solids (TSS) – upstream of Minnesota River		TSS concentrations upstream of the Minnesota River decreased significantly (20%–40%) between 1976 and 2005, but with increased flow, TSS loads have been stable (Lafrancois et al, 2013). TSS concentrations were consistently below recently proposed state standards of 31 mg/L at upstream sites (Lafrancois et al, 2013 ; State of the River Report 2012).
	Total suspended solids (TSS) – downstream of Minnesota River		At downstream sites, TSS concentrations exceeded the standard (32 mg/L) at times between 1976 and 2005 but trended downward (Lafrancois et al, 2013). NPS data collected since 2005 show site UM822 exceeded the standards (Elias and Sieracki 2007 ; VanderMeulen 2009 ; VanderMeulen 2011 ; State of the River Report 2012).
	Total phosphorus (TP)		Although TP <i>concentrations</i> decreased significantly (15%–37%) between 1976 and 2005, changes in TP <i>loads</i> were not significant. Although <i>each gallon</i> of water flowing through the river now contains (on average) less phosphorus than in previous years, increased flow means there are many more gallons of phosphorus-laden water overall (Lafrancois et al, 2013 ; State of the River Report). TP concentrations remained above the recently proposed state standard (100µg/L) at most sites (Lafrancois et al, 2013). NPS data collected since 2005 show continued improvement, though TP levels often exceeded 100µg/L, especially downstream of the Minnesota River (Elias and Sieracki 2007 ; VanderMeulen 2009 ; VanderMeulen 2011 ; State of the River Report 2012).
	Nitrate- + Nitrite-Nitrogen (NO _x)		NO _x concentrations and loads increased significantly (47%–59%, and 37%–68%, respectively) between 1976 and 2005 (Lafrancois et al, 2013). However, NO _x concentrations were well below the federal drinking water standard (10mg/L) (Lafrancois et al, 2013). NPS data collected since 2005 show NO _x concentration has remained below the federal drinking water standard at all sites (Elias and Sieracki 2007 ; VanderMeulen 2009 ; VanderMeulen 2011 ; State of the

		River Report 2012).	
Chlorophyll-a (Chla)		Chla concentrations at upstream sites are stable but have increased significantly (14%–29%) at most downstream sites between 1976 and 2005 (Lafrancois et al, 2013). Chla loads have increased significantly (15%–30%) at all sites (Lafrancois et al, 2013). Chla concentrations generally exceeded recently proposed state standards (35 or 20 µg/L, depending on river mile) throughout the 30-year span during summer months (Lafrancois et al, 2013), but NPS data collected since 2005 show chla levels meet the standards at most sites (Elias and Sieracki 2007 ; VanderMeulen 2009 ; VanderMeulen 2011). Chla is an important indicator of algal blooms and water clarity—both of which impact fish and wildlife health.	
Bacteria (as measured by <i>E. coli</i>)		Minnesota’s water quality standard for <i>E. coli</i> in streams is based on the number of organisms per volume of sample water and the number of samples per month with a high number of organisms. The river exceeded the state standard in 2008 at several sites within park boundaries (Martell and Homayoun 2010). We do not have enough data to establish a trend. The river is a significant recreational resource; <i>E. coli</i> indicates the potential presence of waterborne pathogens with which recreational users should avoid contact (State of the River Report 2012).	
Environmental Contaminants	Mercury in eaglet feathers		Mercury levels are below the provisional 7.5 µg/g threshold established for eagle feathers by the NPS Great Lakes Inventory & Monitoring Network. Long term studies show there has been a decline in mercury across the region, but that these trends may be reversing (State of the River Report 2012). <i>See also the fish consumption advisory below.</i>
	Lead in eaglet feathers		Levels of lead are high in the lower portion of Pool 2, due to past land use practices near Pig’s Eye Lake. We do not have enough documentation to define a trend, however. Additional data analyses needed to determine trends (State of the River Report 2012).
	PCBs and metabolites of DDT (DDE and DDD) in eaglet blood		These legacy chemicals are still found in “hot spots” on the Mississippi River but are declining slowly. High levels for DDT/DDE have been observed in eaglets from some nests. The quantity found in one nestling suggests a local source. Local sources could include re-exposed soils contaminated with DDT, a leaching landfill, illegal use, or a mistaken release—for example use or discarding of an unlabeled container discovered in a garage, barn, or basement (State of the River Report 2012).
	Penta- and Octa-PBDE flame retardants in eaglet blood		Levels are high but declined from 2006 to 2011. We expect this trend to continue, because these chemicals have been removed from the market. They will, however, continue to leach from a multitude of products and disposal sites for many years (State of the River Report 2012).
	Perfluorinated chemicals (PFCs) in eaglet blood		Levels of PFCs, especially PFOS, in bald eagle nestlings declined substantially from 2006 through 2011. However, some nestlings had extremely high levels in 2011. And

		among the few studies of PFCs in bald eagles, levels are highest in nestlings from Pools 2 and 3 of the Mississippi. We expect PFC levels to continue declining because many of these chemicals have been removed from the market (State of the River Report 2012).
Fish consumption advisories		The Minnesota Department of Health lists fish consumption advisories for sections of the Mississippi River within the park due to contamination from mercury, PCBs, and PFOS. Trends in PCBs and PFOS show overall improvement, but recent MN Pollution Control Agency research indicates that fish from around and downstream of Cottage Grove (the lower portion of Pool 2) continue to show significant PFOS contamination. Mercury is the most widespread cause of fish consumption advisories within the park. Trends for these chemicals vary or are unclear (State of the River Report 2012). See also mercury, PCBs, and PFC indicators above.
Emerging contaminants		There are many new chemicals entering the environment including endocrine-active chemicals and pharmaceuticals that interfere with natural physiological processes in fish, wildlife, and humans. Studies show that wastewater treatment plants on the Mississippi River and its tributaries concentrate many of these chemicals. Toxic levels of these chemicals are unknown (State of the River Report 2012).

Resource Brief: Water Quality

The park worked with the Mississippi River Fund (its friends group), a private foundation, and county partners to make changes to this farm in order to improve water quality and runoff. The farm had allowed 60 cattle uncontrolled access to a tributary to the Mississippi River, upstream of the NRRA, contributing to high bacteria concentrations (as measured by *E. coli*). Project funds were used to install fencing to keep cattle out of the stream, to construct an improved stream crossing that will minimize and limit the cattle's impacts to the stream, and to re-vegetate the shoreline, whose vegetation had been trampled by cattle. Water monitoring conducted for this project indicates that an additional source of bacteria pollution is located upstream of this site. This information has allowed local Soil and Water Conservation District staff to locate additional pollution sources and identify ways to lower bacteria levels in this Mississippi River tributary. This effort serves as a demonstration project for Implement Best Management practices throughout Minnesota.



Vegetation Communities



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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Riparian Forests	Cottonwood and silver maple regeneration		Cottonwood and silver maple are experiencing regeneration failure. In silver maple forests there are few seedlings (four trees per hectare smaller than 5 cm DBH), and the majority are older-aged trees (>20 cm DBH). Similarly, there is little regeneration of cottonwoods (none under 15 cm DBH) and most were detected and most were greater than 35 cm DBH. Loss of mature trees with no regeneration would have adverse effects on riparian forests mix and also on bald eagles and other wildlife that depend on these super-canopy trees for nesting, perching, and feeding. (Sanders 2012).
	Large snags		There are an estimated nine large snags (≥ 30 cm DBH) per hectare in riparian forests. These snags provide habitat for birds (nesting, perching, feeding) and mammals (dens). (Sanders 2012).
Upland Forests	Upland tree regeneration		Most tree species in upland habitats, including slippery elm, basswood, hackberry, bitternut hickory, and green ash are exhibiting high density in the smallest size classes. This suggests sufficient regeneration to replace older individuals. (Sanders 2012).
	Large snags		There are 11.1 large snags (≥ 30 cm DBH)/ha in upland forests. These snags provide habitat for birds (nesting, perching, feeding) and mammals (dens). (Sanders 2012).
Ash Tree Composition	Basal area and density		Collectively (both black and green ash), ash basal area is 3.15 m ² /ha and density is 91.75 trees/ha. Although these values suggest ash composition is currently at healthy and appropriate levels, the emerald ash borer (EAB) is now present in the Twin Cities metro area. This invasive insect causes widespread ash mortality, and there are no effective, long-term control options (Sanders 2012).
Rare Plant Species	Species occurrence		There is one federally-listed plant species at the park: prairie bush-clover, or <i>Lespedeza leptostachya</i> , which is threatened. In addition, there are 41 plant species confirmed present, and 25 plant species probably present, that have a state-listed rare status (NPSpecies 2012).

Resource Brief: The Mississippi NRRA islands

The Mississippi NRRA currently owns nine islands. Three of these are located in the northern part of the corridor, and the remaining six are located in central and slightly southern sections of the corridor. When the NRRA was established, the park owned 10 islands. One of the islands was washed away during the 1993 Flood. Over time the remaining the NRRA islands have become smaller due to yearly flooding and boat traffic eroding their banks. The U.S. Army Corps of Engineers, St. Paul District partnered with the NPS to rebuild and stabilize the largest NPS island, and that effort has been successful. Island retention in a managed river system is an ongoing issue for the NRRA. Over the past 15 years the NRRA has been working to remove invasive plant species from the islands, remove structures and belongings left behind by island users, and remove trash and debris resulting from visitors and flooding. Houseboats routinely tie up to the park’s largest island for much of the summer, while on one of the NRRA’s northernmost islands there is a dock that gets put in every year. The park met with island users to explain island management objectives. One of the central islands is immediately adjacent to a very popular dog park, which has greatly diminished the undergrowth due to human and canine traffic. Managing island use in the NRRA is, and will remain, an ongoing issue.



Left: NRRA island visitors



Right: Island protection and restoration work and one of the park’s largest islands.

Fish and Wildlife



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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Migratory Songbirds	Relative abundance of priority species nesting in the park		Migratory species prioritized for conservation by state and federal agencies and expected to nest in the park include brown thrasher, dickcissel, field sparrow, and vesper sparrow (NPSpecies 2012). Observations of these species during surveys in 2009 and 2010 were low for dickcissel (one individual) and low to within expected numbers for the others (10–72). No trends are evident with only two years of survey data. More data are needed. Survey data are needed to document the expected transient species for the park.
Resident Songbirds	Number of species that nest in the park		Past records show 21 species of songbirds listed as resident in the park (NPSpecies 2012). Of these, 17 (81%) were verified as present (nesting) during surveys in both 2009 and 2010 (Martell and Homayoun 2010). Additional years of survey data are needed to verify presence and trends.
Bald Eagles	Bald eagle young per occupied nest		In surveys conducted between 2007 and 2011, the number of young per occupied nest has ranged from 1.5 to 2.2, well above the 1.0 considered necessary for a healthy population (Route 2012).
	Number of nesting bald eagle pairs		The number of nesting pairs has increased dramatically from all-time lows in the 1960s. Recent surveys suggest the population continues to grow, from an estimated 15 occupied territories in 2007 to 25 in 2011 (Route 2012).

Other Raptors	Presence and numbers		Osprey populations in the NRRA are low and have remained unchanged for many years. Peregrine falcon populations are doing well. There are no data for owls or other raptors. Additional survey data are needed for these raptors. (Martell and Homayoun 2010)
Waterfowl	Diving duck abundance		Diving duck numbers were lower in Pool 2 and Pool 3 in 2012 compared to 2009–2011. This may be due to the fact that water levels were much lower, leading to more mudflats and sandbars than deep water. Just downriver, on Lake Pepin, divers were increasing (Stemper 2013).
	Puddle duck abundance		Taken each fall since 2009, ground and aerial surveys have shown a slight increase in puddle/ dabbling ducks in pools 2 and 3 (Stemper 2013).
	Number of species		The number of species found in Pool 2 and Upper Pool 3 has remained stable over the duration of the water bird surveys, which have encompassed 4 years to date (Stemper 2013).
Great Blue Heron	% of colonies stable or increasing		<p>In 2011, a tornado hit a large heron colony in the northern corridor. Some herons relocated to the colony near Coon Rapids Dam and some created a new colony just downriver next to the Xcel Riverside Power Plant. As of January 2013, the herons have not returned to the North Mississippi Rookery, since the trees were completely destroyed. Some continue to re-nest near Coon Rapids Dam and some have remained as a new colony on the islands near the Excel plant (Stiteler 2013).</p> <p>Pigs Eye Scientific and Natural Area contains a large heron rookery and is closed during bird nesting season (spring/summer). This rookery is the Upper Midwest's largest and most diverse colonial nesting site. In addition to great blue herons and great egrets, little blue herons, black-crowned and yellow-crowned night herons, and double-crested cormorants nest in this area.</p>
Turtles	# basking turtles per km of riverway		Turtle populations in the Mississippi NRRA are currently stable but at much lower numbers than in pools immediately below the boundary. There is not a good, standardized protocol for monitoring and measuring turtles within the NRRA. The University of St. Thomas, in St. Paul, is starting pilot studies on these populations. However, at the present time adequate turtle population studies are lacking within the corridor (Moriarty 2012).
Frogs and Toads	% Area Occupied		Frog call stations will be installed during 2013 in natural areas within the NRRA to record and quantify species of frogs. Currently populations are low because breeding habitat within the corridor is scarce, requiring wetlands which are only available in a few parts of the NRRA. Toads and chorus frog populations do fairly well; however, other species such as leopard frogs are declining due to <i>Batrachochytrium dendrobatidis</i> fungus, pollutants and other problems. Other herptiles, such as salamanders, are also struggling (Moriarty 2012).

River Otter	Occurrence, Distribution & Occupancy		Natural sign surveys found otter in the corridor after decades of being absent. Occupancy (or percent of surveyed transects with otter activity) has remained unchanged across survey seasons throughout the park. Both 2010 and 2011 winter surveys found 61% occupancy, while 2011 and 2012 fall surveys found 37% and 42% occupancy, respectively. In 2012, certain areas of the park were scarce or absent of otter sign, however. Observed changes are likely due to urban development (Snelling Lake) or extreme, low water levels (Lower Vermillion River) (Mississippi NRRRA staff research).
	Abundance		No reliable data or estimates of local river otter abundance or population size currently exist. Research is underway to estimate local population size from survey data. In 2011, registered trappers harvested 38 river otter total within four of the five counties in the NRRRA (Mississippi NRRRA staff research).
	Genetic diversity		Currently there are no data to determine the genetic diversity of individuals in the corridor. The NRRRA is conducting research to find out how much genetic diversity there is and to determine where the individuals in the local population came from (Mississippi NRRRA staff research).
Bats	% of Expected Species Present		There are seven species of bats in the corridor, including big and little brown, northern myotis, tri-colored, eastern red, hoary, and silver-haired. There is no evidence of white-nose syndrome here yet (Koeper 2012; Nauman 2012). Bats use the many natural and man-made caves along the corridor.
Mussels	Species richness		Many species that were historically present in the corridor are absent today. The FWS and DNR have reintroduced the federally endangered Higgins Eye, Snuff Box and Winged Mapleleaf in the Mississippi River above its confluence with the Minnesota. The DNR completed a report for the entire NRRRA, but that report is over 10 years old, and we do not have trend data (Davis 2012).
	Population size		For most of the corridor, the estimate is based on data accumulated 10 years ago. In the reach just above the Mississippi-Minnesota Rivers confluence, the population size is strong with many reproducing individuals, including Higgens Eye (Kelner and Davis 2002).
Aquatic Macroinvertebrates	Population size/number of species		The general trend for aquatic macroinvertebrates shows improvement since the 1970s, corresponding to improvements in water quality. However, in a given year the trend may go up or down depending on rainfall levels. In low rain event years, macroinvertebrate numbers decline. This is due to less relatively clean rainwater entering the system that would normally dilute other discharges containing harmful pollutants. During years of high rainfall, macroinvertebrates increase, due to cleaner water. More study is needed on these populations, as they can serve as harbingers of climate change (Ferrington 2013).

Resource Brief: Bald eagles

From 2006 to 2011 the National Park Service Great Lakes Inventory and Monitoring Network and its partners (Audubon, MN Pollution Control Agency, Prairie Island Indian Community, and Mississippi River Fund) assessed population levels as well as levels of targeted environmental contaminants in bald eagle (*Haliaeetus leucocephalus*) nestlings at sites in and adjacent to three units of the NPS: Apostle Islands National Lake Shore, St. Croix National Scenic Riverway, and the Mississippi NRRRA. Blood and breast feather samples taken from nestlings were used to assess the levels and trends in six contaminants: total mercury, lead, DDT (and metabolites DDE and DDD), total PCBs, total PBDEs (flame retardants), and total PFCs or perfluorinated compounds. The perfluorinated compounds are a group of chemicals that repel both water and oil, are used in a multitude of products including pesticides, non-stick coatings (PFOA) and stain repellents (PFOS), and have been found to be toxic to humans and wildlife.

While all study areas averaged greater than one nestling per occupied nest, the Mississippi NRRRA had the highest nest productivity of all areas sampled, averaging 2.2 chicks per nest. This high level of productivity is believed to be associated with availability of prey at the park. Contaminant levels varied between study areas and years. Mercury levels were lowest in eaglets sampled along the NRRRA, while lead levels were among the highest. PFC levels in the NRRRA eaglets were high but generally declined between 2006 and 2011. PFOS levels appear to be declining due to the 2002 removal of PFOS from the market by 3M, its largest producer. No relationship was found between contaminant levels and eagle productivity, though nonlethal affects, such as endocrine disruption or neurological affects, were not examined. Field work for eagle contaminant monitoring will resume in 2014 and 2015. For further information, go to: <http://science.nature.nps.gov/im/units/GLKN/monitor/contaminants/contaminants.cfm>



Bill Route, the NPS Inventory and Monitoring Coordinator for the Great Lakes Network, taking blood and feather samples from a nestling.

Invasive and Nuisance Species



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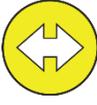
Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Invasive Shrubs	Occurrence of exotic buckthorn and honeysuckles		Buckthorn and honeysuckles are considered pervasive non-natives that negatively affect natural habitats. They were both present in 9 of 10 upland monitoring plots. The mean cover from the species across all upland plots was 13% for buckthorn and 6% for honeysuckle. Additional years will be required for trend estimates (Sanders 2012).
Invasive Groundlayer Vegetation	Occurrence and relative abundance of invasive species		In 2011 there were 15 non-native plant species documented in the ground layer on established plots in the NRRRA corridor. Four of these are considered invasive: garlic mustard (<i>Alliaria petiolata</i>), reed canarygrass (<i>Phalaris arundinaceae</i>), motherwort (<i>Leonuris cardiaca</i>), and narrowleaf bittercress (<i>Cardamine impatiens</i>). These four species were present in 25 of 33 total plots (76%) and in 20 of 23 riparian plots (87%). Additional years will be required for trend estimates (Sanders 2012).
Invasive Insects	Presence of emerald ash borer		Emerald ash borer was not detected on trees monitored at 33 established plots 2011. Nonetheless, it is known to be present in the Twin Cities metro area, and a significant infestation was discovered at Fort Snelling in 2012. As little can be done to control this pest, the trend arrow is down (Mississippi NRRRA staff research 2012).

Land Cover and Use



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Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Land Use	Percent of park classified as natural area		According to the 2011 Minnesota Land Cover Classification System (MLCCS), about 73% of the park was classified as natural. The largest areas of the natural classification were open water (28%), forested (26%) and grass (11%). Studies have shown that a landscape composed of less than 60%–70% natural area will adversely affect most species. We do not have enough data to establish a trend line (MLCCS 2011). *See chart below
	Percent of park classified as developed		According to the 2011 Minnesota Land Cover Classification System (MLCCS), about 27% of the park was classified as developed. Over 2/3rds of the developed land has greater than 25% impervious surface. According to the Center for Watershed Protection, when developed areas have greater than 25% impervious surface water quality and biodiversity becomes severely impacted and non-supporting. We do not have enough data to establish a trend line. (MLCCS 2011) *See chart below.
Land Cover	Road density		Road density within the Mississippi NRRA corridor is 3.6 km/km ² based on 2009 roads data. Roads provide necessary access throughout the park but also negatively impact a broad range of ecosystem functions (2009 U.S. Census Tiger/Line Shapefiles).
	Impervious surface		12.8% of the area within the park is impervious surface (18.2% of land area) based on the 2006 National Land Cover Dataset (NLCD). This was an increase of 1.03% from 2001. Effects of impervious surface include quicker runoff into streams, reduced input into aquifers, and increased contaminant transport directly into streams (NLCD 2001 and 2006).
	Forest Patch size characteristics (% <1 ha)		45% of the forest patches in the park are less than 1 hectare (2.47 acres) according to the National Land Cover Dataset (NLCD). This experienced no change from 2001 to 2006. Such a large percentage of small patches indicates a very fragmented forest landscape. Generally, a highly fragmented forest adversely affects most forest species (NLCD 2001 and 2006).
	Forest Patch size characteristics (% >10 ha)		Only 13% of forest patches were larger than 10 hectares (24.7 acres) which did not change from 2001 to 2006 (NLCD 2001 and 2006). This indicates that there are very few intact forests on the landscape which adversely affects forest species dependent on these characteristics.
	Forest density (% of forest identified as intact or interior)		None of the forest area in 2001 or 2006 was identified as intact or interior (NLCD 2001 and 2006). Interior or dominant forest provides refuge for deep forest inhabitants.

Land Cover	Forest density (% of forest identified as dominant)		Roughly 25% of the forest inside the park was identified as dominant, unchanged between 2001 and 2006. This density class is adequate to support many common, adaptive species (NLCD 2001 and 2006).
	Grassland Patch size characteristics (% <1 ha)		There was a positive trend in smaller patches of grassland on the landscape. The number of small patches decreased from 59% in 2001 to 57% in 2006. Even at 57%, this indicates a very fragmented grassland (NLCD 2001 and 2006).
	Grassland Patch size characteristics (% >10 ha)		There was positive trend in grassland patches larger than 10 hectares (24.7) between 2001 and 2006, increasing from 0.5% to 1% (NLCD 2001 and 2006).
	Grassland density (% of grassland identified as intact or interior)		None of the grassland within the park was classified as intact or interior in 2001 or 2006. Having a mix of different densities is desirable for many grassland species (NLCD 2001 and 2006).
	Grassland density (% of grassland id'd as dominant)		Just over 18% of the grassland inside the park was classified as dominant, unchanged between 2001 and 2006 (NLCD 2001 and 2006).

2011 Land Cover in the Mississippi National River and Recreation Area			
Land Cover Type	Classification	Percent of Total	Acres
Undefined	n/a	0.03%	14
4%–25% Impervious	Developed	9.18%	4,943
26%–100% Impervious		19.52%	10,505
Agriculture	Natural	3.52%	1,896
Grasses		10.96%	5,899
Forested		25.72%	13,841
Wetland		0.61%	327
Prairie		0.43%	233
Shrubland		0.30%	164
Exposed Earth		1.65%	887
Open Water		28.08%	15,111
Total			100.00%

Source: [MLCCS](#)

2.2. Cultural Resources

Cultural Resource programs include a suite of disciplines (anthropology, archaeology, landscape architecture, history, historical architecture and museum curation) that hold culture at the center of research and preservation activities. These disciplines differ in the methods, scale and emphasis at which studies are conducted but generally tie intangible aspects of human history and beliefs with tangible items and places. Because much of the meaningful work for cultural resources relies on bridging stories, concepts, and theories, with places and objects, the condition of cultural resources is qualitatively assessed through a series of measurable aspects of integrity that convey the significance of an area. Generally, the condition of cultural resources falls into three categories: 1) the level of complete inventory and documentation, 2) the physical stability of an area, property or object as it relates to risk of degradation or deterioration and 3) and aspects of integrity. The breadth of cultural resource management activities make it difficult for a single park to accomplish all of the work needed to meet inventory, documentation and monitoring expectations. These activities tend to be conducted through partnered park and regional assistance as well as agreements and contracts.

Coldwater Spring

The story of Coldwater Spring and the land around it stretches through centuries and includes many chapters. We assume American Indians visited the spring before U.S. soldiers located there in 1820, but we know little about their use of it. Three archeological studies have not discovered evidence of American Indian use on the property, but the land had been severely disturbed by past uses. The soldiers camped at Coldwater Spring to take advantage of the clean and abundant spring that flowed at over 100,000 gallons per day. The fort lay about one mile down the Mississippi River and overlooked the confluence of the Mississippi and Minnesota rivers. By 1824 the soldiers had largely completed the fort, and a community of squatters had started growing around Coldwater Spring. Blacksmiths, settlers, fur traders, and others made it their home. By 1837, some 150 people were living at Camp Coldwater, Minnesota's first American settlement. The Dakota, and less so the Ojibwa, visited the fort and stayed at Camp Coldwater.

Coldwater Spring is a natural groundwater spring and provided water to Fort Snelling for about one hundred years. Up through the Civil War, the Army hauled water to Fort Snelling in wagons. In 1879, however, the Army greatly expanded Fort Snelling, establishing the Upper Post, and needed a more efficient waterworks. In response, the Army built a reservoir and springhouse, pump house and water tower at Coldwater to deliver water through pipes to the fort. Then, in the early 1920s, the fort turned to St. Paul for its water. In 1946, following the end of World War II, the Army left Fort Snelling, and the waterworks began deteriorating.

From 1949 to 1996, the Bureau of Mines, Twin Cities Research Center (Center) occupied the land around Coldwater Spring. Engineers and scientists at the Center explored technologies to mine on the moon, conducted research leading to the growth of the taconite industry, and developed safety technologies, one of which dramatically reduced black lung disease in coal mines. The Bureau of Mines closed abruptly in 1996, when the federal government discontinued the Bureau of Mines as an agency. The dozen buildings on the property lay abandoned and deteriorating for the next 15 years.



Coldwater Spring Reservoir and Spring House, 1900. Source: Minnesota Historical Society



Coldwater Creek daylighted in 2012

In January 2010, the Department of the Interior transferred management of Coldwater to the National Park Service, and in November 2011, the Mississippi NRRRA initiated a contract to demolish the buildings, remove most of the infrastructure and start restoring the land. On September 1, 2012, the Coldwater Spring unit opened to the public. The Mississippi River Fund (the Mississippi NRRRA's friends group), volunteers and park staff have worked to restore habitat by pulling buckthorn and other invasive plants.

The park will now begin working to interpret the site's rich history, with help from Dakota tribes, historians and others. Being part of this urban national park is the newest chapter in Coldwater's rich history.

Coldwater Spring Unit		 web ▶	
Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Spring	Flow: quantity and quality		The quality and quantity of flow to the spring has decreased over time due to past highway construction and development in the watershed. While historically known as a potable water source, the Mississippi NRRRA does not recommend

			drinking the water now. The flow has remained mostly steady since 2002. Data on flow is available at the NRRA office and from the Minnehaha Creek Watershed District.
Reservoir	Structural integrity		The reservoir walls have deteriorated significantly since the Bureau of Mines closed in 1996. The current land restoration project will slow the deterioration, but without substantial repair work, the walls will continue to collapse.
Springhouse	Structural integrity		The springhouse has also deteriorated since the Bureau of Mines closed and is in need of maintenance and repair. In the Memorandum of Agreement resulting from the Section 106 process, the NRRA has agreed to maintain the springhouse. The park fixed a serious erosion problem at the southwest corner during the land restoration contract in 2012, but without additional work, the springhouse will continue to deteriorate.
Archeology	Knowledge of site		Three archeological surveys have been completed for the Coldwater Spring property. While little remains archeologically, we have a much better idea of where resources might be. Future archeological studies can target the areas with potential (Clouse 2001; Great Lakes Archaeological Center 2011; Ollendorf 1996).
Anthropology	Knowledge of site		The Mississippi NRRA completed an ethnographic study in 2006, which considered the site from an ethnographic resource perspective, as a Traditional Cultural Property per the National Register and as a sacred site under E.O. 13007. We still have more to learn in partnership with a number of American Indian tribes (Summit Envirosolutions 2006).
History	Knowledge of site		The park completed a history of Coldwater Spring for the Bureau of Mines Section 106 review. This history added to another study done by the Bureau of Mines that looked specifically at the Bureau's history. The NRRA also completed a Minnesota Historic Properties Documentation project that included updating the Bureau's history, oral interviews and photography of the Bureau of Mines campus and of historic documents (Henning 2002, U.S. West Research 2011).
Museum Collections	Storage and curation		The Mississippi NRRA has collected a number of artifacts related to the Bureau of Mines history, including rock drill cores and blue-green globes from the main building's entry. The NRRA will need to accession and store or exhibit these in the future. Artifacts from the archeological work in the summer of 2011 are housed at the Midwest Archeological Center. The artifacts found during this survey are detailed in the 2011 archeological report. The park does not have museum storage space, but the artifacts are secure and in no danger of deterioration.
Park Infrastructure at Coldwater Springs	Sustainability of park operations		The recent acquisition of the lands and park infrastructure (e.g., roads, trails, signage, springhouse and reservoir) at Coldwater Spring has required the park to divert staff time and funding from other park needs. These interim measures are not sustainable. Because these are the first park-owned facilities, the park does not have established maintenance

			staff and law enforcement personnel and other capacity for maintaining the facilities. Unless more permanent solutions can be found to maintain the facilities, the park is concerned that park infrastructure, resources, and visitor experience will suffer.
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For the Mississippi NRRRA, the reader needs to consider cultural resources on the lands the NRRRA owns separately from the lands the NRRRA does not own. Many of the measures below assume the park owns all the land within its boundaries.

Archeological Resources [web](#) ▶

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Knowledge	Percent of sites with known date ranges associated with a research theme		The Mississippi NRRRA completed an Archeological Overview and Assessment in 2000 and a Historic Resources Study in 2003. These studies provide a breakout of archeological sites by era, but we do not know what percent these represent of all sites in the corridor.
Inventory	Percent of park adequately surveyed		The NRRRA has evaluated 100% of the lands it owns, but most of the remaining lands in the corridor have not been surveyed.
Documentation	Percentage of known sites with adequate National Register documentation		The Archeological Overview and Assessment and the Historic Resources Study show that most archeological sites have not been evaluated for the National Register. The evaluation generally occurs when a site is threatened.
Condition	Percentage of archeological resources in good condition		A geomorphology study of the nine NRRRA islands revealed very little chance for archeological sites. The three surveys conducted on the Coldwater Spring unit show that most of the archeological sites have been destroyed. There is a small chance some areas may have deeply buried sites. We do not know the condition of most sites in the corridor.

Cultural Anthropology [web](#) ▶

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Knowledge	Sufficient research exists to understand the relationship of the park's ethnographic resources and the historic contexts		The overall ethnographic context for the corridor is well known, but the NRRRA needs to learn much more about specific sites. The park has not conducted an Ethnographic Overview and Assessment for the whole corridor. The NRRRA did complete an ethnographic study of the Coldwater Spring unit and surrounding area. A few Traditional Cultural Property studies, for Section 106 purposes, have been conducted elsewhere in the corridor, but little site specific research has been conducted (Summit EnviroSolutions 2006).

	Appropriate studies and consultations document ethnographic resources and uses with regard to the park.		During the Environmental Impact Statement and Section 106 review processes for the Coldwater Spring unit, the NRRRA contacted 20 American Indian tribes and closely coordinated with 10 Dakota tribes, across five states. For any projects or sites in the corridor that the NRRRA is the lead federal agency, the NRRRA initiates tribal coordination. The park does not know to what extent other organizations or agencies have conducted the appropriate studies and consultations with regard to ethnographic resources in the corridor overall.
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Cultural Landscapes  [web](#) ▶

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Knowledge	Sufficient research exists to understand the relationship of the park cultural landscapes to the historic contexts of the park.		The overall historic contexts for the corridor are well known, but the NRRRA needs to learn much more about specific sites.
	Adequate research exists to document and preserve the cultural landscape of the park.		Without an inventory, we do not know the nature or condition of the cultural landscapes in the Mississippi NRRRA corridor. The one exception is the “Valley of St. Paul,” which the Mississippi NRRRA successfully nominated as one of the 10 Most Endangered Historic Sites in Minnesota for 2007.
Inventory	The scope of cultural landscapes in the park is understood and a determination has been made whether or not they are a fundamental resource.		Most cultural landscapes identified within the corridor could be considered fundamental resources, although at different levels of significance. Other than the Valley of St. Paul, no cultural landscapes have been evaluated.
	Percentage of landscapes eligible for the National Register with accurate, complete, and reliable Cultural Landscape Inventory (CLI) data.		No cultural landscapes have been evaluated for the National Register.
Documentation	Percentage of cultural landscapes with adequate National Register documentation.		No cultural landscapes have been evaluated for the National Register.

Historic Structures



[web](#) ▶

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Knowledge	Percentage of historic structures evaluated using appropriate historical contexts.		Throughout the 72-mile corridor, many more historic sites (standing structures) have been evaluated for the National Register than archeological sites, but we do not know what percentage of the total number of historic sites these represent. As the Historic Resources Study (2003) shows, the State did an extensive survey for historic and architectural sites for the whole state in the 1970s and 1980s, but this survey is significantly out of date.
Documentation	Percentage of historic structures with adequate National Register documentation.		See the text above.
	All historic structures have been recorded commensurate with their significance and mandated purposes.		See the text under Knowledge.
Condition	Percentage of historic structures in good condition		There is no corridor-wide assessment of the condition of historic sites, although individual counties and communities track the condition of their historic sites.

Historic Sites



[web](#) ▶

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Fort Snelling National Historic Landmark – Upper Post	Integrity of structures and setting		Many buildings on the Upper Post are being stabilized, and there is a potential for adaptive reuse of about one-third of them in the next few years. The NPS, in partnership with the DNR, is changing the program under which the Upper Post is managed to allow for more uses. Most of the partners have signed a Joint Powers Agreement for cooperatively managing the broader area. Still, many of the buildings are in poor condition and something has to happen soon. A detailed analysis of the condition of each building’s exterior, interior and key structural elements is provided in the “Fort Snelling State Park ‘Upper Bluff’ Reuse Study,” as updated in 2006 by Miller Dunwiddie Architecture (Thomas R. Zahn & Associates, Miller Dunwiddie and others completed the original study in 1998). The Miller Dunwiddie update also provides details on the key architectural elements for the Upper Post overall and for individual buildings.

Fort Snelling National Historic Landmark – Lower Post	Integrity of structures and setting		The Minnesota Historical Society currently uses and maintains the Cavalry Barn, Quartermaster’s Building and Frontier Fort. The Cavalry Barracks are getting new roofs but need an adaptive reuse and are the reason for the condition assessment.
Fort Snelling National Historic Landmark – West District	Integrity of structures and setting		There has been no overall program for preservation and restoration in this area and some buildings are in poor condition. The Veterans Administration is adaptively reusing some of the buildings for homeless veterans housing. If done well, this project could improve the conditions of some buildings.
Pillsbury A Mill National Historic Landmark	Integrity of structures and setting		The Pillsbury A Mill complex stands abandoned but is in good shape overall. A current condominium proposal for the complex could lead to preservation through appropriate adaptive reuse or to inappropriate changes and demolition of some of the complex’s key features. A nearby condominium project could also affect the setting positively or negatively. We are waiting for more details on both projects.
Washburn A Mill National Historic Landmark	Integrity of structures and setting		In 1991 a fire largely destroyed this mill. In 2003, the site opened as a museum and office building inside the ruins. The Minnesota Historical Society has recently stabilized the elevators adjoining the mill.
James J. Hill Stone Arch Bridge	Integrity of structures and setting		The Stone Arch Bridge is a Minneapolis icon, and the Minneapolis Park and Recreation Board has restored it and now maintains it. There are no pending concerns.

History  [web](#) ▶

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Knowledge	Sufficient research is conducted to understand significance of sites.		Many historic sites in the corridor have substantial research behind them, but many others need more research. The Historic Resources Study (2003) makes this clear. Also, a lot of research may have been done of individual sites that the study did not have time to assess, and many more discrete studies have been completed for sites in the corridor since 2003, but no one has synthesized that information.
	Sufficient research is conducted to establish the reasons for park creation and site history.		The Historic Resources Study (2003) and individual nominations to the National Register for sites of national significance in the corridor support demonstrate why Congress established the NRRRA. Congress identified seven resource types of which historical is one.

	<p>Research at the appropriate level precedes planning decisions involving cultural resources.</p>		<p>All cultural resources work at the Coldwater Spring unit involved extensive planning. Throughout the corridor, the NRRA has limited authority or funding to ensure the appropriate level of research precedes planning decisions involving cultural resources. Other agencies or the SHPO are responsible, but the NRRA does provide comments on projects that could affect significant cultural resources in the corridor to the extent staff time allows.</p>
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Resource Brief: Fort Snelling National Historic Landmark

Fort Snelling is a National Historic Landmark (NHL) and a nationally significant National Register of Historic Places Historic District. The NHL lies entirely within the Mississippi NRRA corridor, but a small portion of the Historic District lies just outside the boundary. For the State of the Park Report, we have divided Fort Snelling into four areas: Upper Post, Lower Post, West District and Coldwater Spring.



Renovation of Building 165, the Territorial Jail, Fort Snelling National Historic Landmark. A large portions of the roof that had collapsed has been repaired and the brick and stone have been cleaned, replaced and repaired, with much of the work being done by Hennepin County Sentencing to Service crews.

The State of Minnesota acquired the 141-acre Upper Post complex, including 28 buildings, in 1971 through the Federal Lands to Parks Program. For many years, the structures were abandoned and suffered extensive deterioration. One building has collapsed. In 2006, the Upper Post made the National Trust for Historic Preservation’s 11 Most Endangered list. A multi-agency task force, led by the Department of Natural Resources, Hennepin County and NPS, began working to preserve the NHL in 2005 has made significant progress in stabilizing and restoring many of the buildings. The DNR issued a request for proposals to adaptively reuse many of the buildings in January 2013.

The Federal Government transferred the land on which the Lower Post lies to the State in 1969. This land includes the reconstructed frontier fort and four structures associated with the Upper Post. The Minnesota Historical Society (MHS) manages this land and the structures. MHS maintains and uses two of the buildings, but the two Cavalry Barracks are empty and have been deteriorating. In 2012, MHS reroofed the barracks with new slate tiles.

The land and buildings west of Bloomington Avenue are not in the NHL boundary but should be. They are within the National Register District. A variety of different entities own the lands and buildings, including the Veterans Administration (VA), Minneapolis Park and Recreation Board and Boy Scouts of America. The Boy Scouts have beautifully restored and are using Building 201, the Cavalry Parade Building, as their first urban base camp in the United States. The VA currently uses some of the buildings and plans to adaptively reuse others for homeless veterans housing. This could have positive or negative impacts, depending upon how the work is done. The Park and Recreation Board uses a large area for a tree shredding that detracts from the setting.



Building 201, Cavalry Parade Building, Boy Scouts of America Base Camp, Fort Snelling. Photo: Preservation Alliance of Minnesota.

Coldwater Spring provided the water supply to Fort Snelling for over 100 years and is one of the most important contributing elements. We have discussed this part of Fort Snelling under the section on Coldwater Spring.

2.3. Visitor Experience

Number of Visitors  web ▶			
Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Number of Visitors	Visitor Center Attendance		Visitor Center attendance has declined from a high of 112,672 in 2006 to 65,718 in 2012. Comparing 2006 to the average visitation of 2007–2012, there has been a 33.7% decline. The visitor center is housed within the Science Museum of Minnesota, and the center’s visitation is, therefore, linked to the Science Museum’s general attendance. In recent years, Science Museum attendance has declined, which in turn affected our visitation (NPS Servicewide Interpretation Report 2012).
	Participants in NPS Led Programs		NPS-led programs have diversified in scope, and participation has increased from 24,395 in 2006 to 56,652 in 2012. Comparing 2006 to the average participation of 2007–2012, there has been a 158.7% increase. NPS-led programs include major annual activities such as Big River Journey, Journey to The Falls, the Urban Wilderness Canoe Adventure, River City Review and smaller scale weekly activities, such as cycling, geocaching, fishing, and hiking. (NPS Servicewide Interpretation Report 2012).
	Visitors to NPS Islands		The park owns nine islands scattered throughout the park that collectively add up to about 35 acres. The park has never counted visitors on these islands. Seven of these islands probably receive little to no visitation each year. Several are small, difficult to reach and uninviting. One large island (Island 108) is connected to shore except during very high water. Most of the year, the island is connected to a very popular off-leash dog park, operated by the Minneapolis Park and Recreation Board. Visitors to the park unknowingly cross onto Island 108, and visitation there probably is in the tens of thousands annually. Another large island (Island 112–02) is inviting to pleasure boaters during the summer. This island has an undesignated campsite that receives some use during the summer. Visitation to this island probably runs into the hundreds annually (Servicewide Interpretation Report 2012).
	Coldwater Spring Visitation		Coldwater Spring reopened to the public as a park under NPS management on September 1, 2012. The park has started to conduct a visitation assessment so as to develop a formal visitor use estimate. Coldwater Spring lies adjacent or near to Minnehaha Falls, Fort Snelling Historic Site and Fort Snelling State Park, which together receive more than two million visitors per year. Based on visitation to these parks, we anticipate tens of thousands at Coldwater Spring in 2013.

	Visitation at Local and Regional River-affiliated parks, trails, and destinations		There are other agencies managing access points, public lands, and historic sites within the Mississippi NRRRA corridor. Examples of these agencies include the Metropolitan Council, the US Army Corps of Engineers, the Minnesota Historical Society, and the Minnesota Department of Natural Resources. The Metropolitan Council estimates visitation at numerous places in the Twin Cities, including 19 parks and trails in the NRRRA corridor. Visitation to these 19 parks and trails has increased 5.8% during 2008–2011, with an average of 7,924,925 visits per year. There was no data available for 2006 and 2007 (Metropolitan Council: Annual Use 2011).
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Scenic Character



[web](#) ▶

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Visual Quality of River Corridor	Intactness and scenic quality of specific sites, both natural and historic.		The NRRRA is experiencing increasing pressures from land uses associated with urban development. A Visual Resource Protection Plan is under development to identify and determine how best to protect high-quality views.

Recreational Opportunities



[web](#) ▶

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Water-based Recreation	Availability of boat launches		The quality and number of boat launches within the park is reasonable but could use improvements to soft landings and accessibility. Some partners plan to expand and improve some launches, especially in the urban reaches that serve the greatest population.
	Pedestrian River access		Pedestrian river access to water based recreation is good in many respects, but there are significant gaps that need improvement, especially from nearby bike/ped trails to enable fishing, walking, and canoeing.
Land-based Recreation	Bike trails		The bike trail infrastructure is excellent and improving for both on and off-road biking in the park. Improvements are needed to enhance safety, aging trail conditions, close gaps, and increase ridership. The Trails and Open Space Partnership (TOSP) is addressing these needs by identifying funding for priority projects. The Alternative Transportation Plan is addressing bike infrastructure needs.
	Footpaths		Existing formal trails span the park and are in good condition. There are many informal trails in the corridor. Informal trails can cause erosion, and destroy and fragment habitat.

Education and Outreach Programs



[web](#) ▶

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Public Programs	Number of participants in ranger-led programs		NPS-led programs have diversified in scope, and attendance has increased from 262 participants in 2006 to 5,158 participants in 2011. This is a 1,868.7% increase in participation as recorded by GPRA and SIR. The opening of the Coldwater Spring property creates a much greater demand for programs on NPS-owned land than we have ever had.
	Number of programs presented		NPS led programs have diversified in scope, and the number of programs presented has increased 267% over the 2006–2011 period. The number of programs is always dependent on partner relationships and seasonal staff availability. This assessment is based on SIR (Servicewide Interpretive Report) figures.
	Junior Ranger programs		The number of Jr. Ranger contacts has steadily increased from 553 in FY06 to 2022 in FY11. The Mississippi NRRRA expanded the variety of activities and reached out to community centers to promote the Jr. Ranger Program. Interest in the program is now tracked by an electronic newsletter. The numbers are based on SIR. Also of note, the number of Jr. Rangers increased, even though the park reduced the number of partner-site booklets.
School Programs	Number of student-presenter interactions		There is a long, steady trend of increasing participation in formal education programs at the Mississippi NRRRA. The number of student-presenter interactions was 23,876 in FY07. By FY12 the number was 42,170 (as reported in the annual Mississippi NRRRA Servicewide Interpretive Reports). While our numbers are high for a small park, there remains a large opportunity for growth, owing to our location in an urban area of nearly three million people. However, we remain far short of the ambition in the NPS Call to Action of serving 25% of the K–12 school population.
	Number of teachers served		The number of teachers served by the Mississippi NRRRA school programs has increased steadily for several years. In FY12, 442 teachers were served by the NRRRA teacher workshops and school programs (Sheldon and Daugherty 2012).
	Teacher Satisfaction		Teacher satisfaction with the Mississippi NRRRA school programs is high and has remained so for several years. In 2012, teachers rated Big River Journey 9.6 (outstanding) on a 10-point scale, and Journey to the Falls 9.5 (outstanding) on a 10-point scale (Mississippi NRRRA teacher ratings for BRJ & JTF). Formal evaluation of the Urban Wilderness Canoe Adventures program in 2012 revealed that 92% of the teachers agreed or strongly agreed that the river trip was a valuable experience; 92% also believed that the outdoor experience supported academic learning (Sheldon and Daugherty 2012).

	Diversity of participants		<p>Students served by the Mississippi NRRRA school programs include a high and increasing level of diversity that exceeds the surrounding metropolitan area. In 2012, Big River Journey served 48% students of color, and Journey to the Falls served 47% students of color. The Urban Wilderness Canoe Adventures program exceeded 60% students of color. Demographics of the surrounding Twin Cities metro area show a population that is 24% people of color.</p>
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Resource Brief: Big River Journey Serves 50,000 Students

The 50,000th student boarded the *Anson Northrup* riverboat in September 2011 for a “Big River Journey,” to learn about the science, heritage, and stewardship of the Mississippi River. During the field trip, over one hundred 4th–6th grade students explored the Mississippi River in the heart of the Twin Cities. Their enthusiasm never flagged as they engaged with science learning stations onboard and on land.

Big River Journey’s mission is to connect students to the science and heritage of the Mississippi River and its watershed, and to build a foundation for river stewardship. The program has become a model of successful outdoor learning in a national park setting and a model of partnership-based collaboration.

Onboard, students use binoculars and microscopes to explore the natural life of the river—from bugs to birds to otters. They examine rocks to understand how a waterfall, once greater than modern-day Niagara Falls, carved the river valley and set the stage for the Twin Cities to be located where they are. They visit the pilot house to learn what it takes to be a riverboat pilot, and they learn about water pollution and how to prevent it. From the historic riverboat landing that once served Fort Snelling, students continue their explorations on land with naturalists from Fort Snelling State Park and a costumed soldier from the fort.



Begun in 1996 and led by the Mississippi National River and Recreation Area (Mississippi NRRRA), Big River Journey (BRJ) is a partnership with eleven other organizations. Co-founders of the program include the Padelford Packet Boat Co., the Minnesota Department of Natural Resources and the Science Museum of Minnesota. Additional partners now include the Audubon Society Saint Paul Chapter, Fort Snelling State Park, Friends of the Mississippi River, Hamline University, Minnesota Historical Society, Project WET, Saint Paul Public Schools, and the Mississippi River Fund. Some partners support classroom activity components and help to conduct teacher workshops, while others assist on the field trips. Each year approximately 40 cruises are offered for 4,800 students. Over 60 schools and 165 teachers are involved annually. Over 55,000 students have now been served (end of 2012).

The Big River Journey field trip is just a part of the experience for students, whose involvement with the river subject matter typically extends six weeks or more. Back in the classroom students continue their science explorations, but with more interest after finding it to be relevant and fun on BRJ. They also write, read and create art for the annual Big River Art Contest, with winning art displayed at the Science Museum, where it’s viewed by tens of thousands of people each year. Many students conduct service learning projects such as storm drain stenciling to educate others in their community to help prevent river pollution.

Teacher workshops orient teachers to the trips and train teachers to conduct classroom activities. As a result, each year approximately 165 teachers conduct over 1,200 BRJ-related activities in the classroom. Volunteers are important to the field trip experience, with about 200 volunteers logging 1,200 hours annually in support of BRJ. Teachers’ ratings for BRJ field trips and BRJ educational value have remained consistently high—typically 9.5 (“outstanding”) on a 10-point scale.

Big River Journey includes a diversity far exceeding that of the surrounding metropolitan area. Students of color make up about 48% of the participants. Scholarships support nearly half of the students— e based on a requirement that scholarship schools must have a minimum of 50% participation in the free-and-reduced lunch program and/or 50% students of color. The Mississippi River Fund supports the scholarship schools.

In 2001 Big River Journey received the National Park Foundation’s educational partnership award. And in 2007 it was selected as the winner of the Minnesota Environmental Initiative’s Partnership of the Year, from over 60 statewide nominations.

Website: <http://www.nps.gov/miss/forteachers/brjindex.htm>

Resource Brief: Urban Wilderness Canoe Adventures: Surpassing goals to engage urban youth and families on the Mississippi River

The Urban Wilderness Canoe Adventures (UWCA) program has surpassed its initial goal to serve over 10,000 youth and families annually, while connecting participants to nature at their local river and fostering a life-long relationship with national parks and the outdoors. Since the inception of the program in 2009, the UWCA has served more than 25,000 people on 200 river trips. It is a model program for America’s Great Outdoors, engaging large numbers of people (primarily youth) with a national park experience, especially those who have never had such an opportunity. Highlights from 2012 include achieving the program’s participation goal, launching a new website, initiating more hands-on activities, strengthening partnerships and implementing a new strategic plan.

Success of the program is a result of the continued core partnership of the Mississippi NRRRA, Wilderness Inquiry, and the Mississippi River Fund, with support from a host of other local partners. Strengthened partnerships permitted UWCA to expand programming to younger and older grades, offer more overnight programming, visit partner historic sites, and co-lead interpretive programs in a state park.

The UWCA served 12,019 people with canoeing and related experiences during the 2012 season, exceeding the program’s participation goal of 10,000 participants. Growth came from expanded partnerships, broadened school programming, and the development of a nationwide campaign to share the program begun at the Mississippi NRRRA with other national parks through the Canoemobile. The Canoemobile, a roving trailer of voyageur canoes and Wilderness Inquiry guides, gave 1,909 people in seven cities the chance to paddle and experience the joys of the rivers in their backyards.

The UWCA website went live at the end of May. With it the program is able to use videos and other resources to communicate with participants prior to trips and provide a way for participants to stay connected afterwards through stewardship and other opportunities.

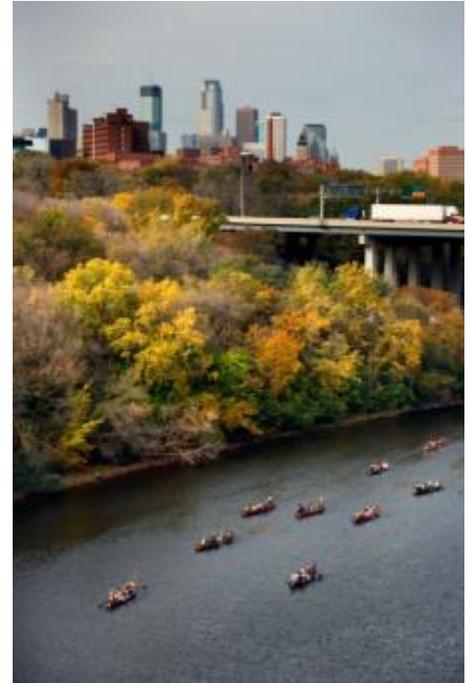
The activity focus in the summer of 2012 was to introduce more hands-on



programming, such as seine netting, and exploring mussels and water quality.

Thousands of students learned first-hand about how to improve the health of the Mississippi River during canoe trips where they caught fish and macro-invertebrates that can only survive in clean water.

UWCA partner organizations completed a strategic plan in 2012 that will provide guidance as the program continues to grow. Goals include expanding programming to reach 25,000 people annually by 2017 and further developing the connections between various levels of UWCA programming to create



a pathway for participants to move from introductory outdoor experiences to local overnight camping, to multi-day stays at distant national parks and even into internships and jobs in the outdoors. This vision is expressed visually in the UWCA’s “pyramid of engagement” model.

Link for more information: www.urbanwildernesscanoeadventures.com

Interpretive Media – Website, Brochures, Exhibits, Signs			 web ▶
Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale
Digital Media	Website visits		The Mississippi NRRA website receives an average of 30,000 page views per month over the last two years. Related websites include RangerOnCall.com, in cooperation with the Mississippi River Fund, and a weather station site with the Minnesota Department of Natural Resources.
	Social media contacts		The park has developed a Facebook page to “push” news about the park. Usage of this media is steadily increasing. The park also uses YouTube and Twitter to disseminate information. Park staff is in the early stages of discussing development of a park app that will include all social media, mapping tools, Ranger on Call Program and other media so there is one destination with all this information.
	Ranger On Call		The Mississippi NRRA is experimenting with a new approach using telecommunication, scannable codes, websites and voice recording to provide interpretive and wayfinding information to the public. The number of sites that are included and the numbers of people using the service are increasing. Many of the recently installed Nice Ride bike share stations in the park include Ranger on Call.
Printed Media	Brochures and cards available and distributed		The NRRA has an excellent suite of printed media, such as the River Companion. The unigrid brochure needs updating.
Signs and Waysides	Quality, condition of exhibits		Interpretive and wayfinding signs are located throughout the park. Plans for increasing the locations and numbers of signs and kiosks are underway. The NRRA has also funded various signage projects at local parks in the past.
NPS Visitor Center Exhibits	Quality, condition of exhibits		Most exhibits are in good condition, but many are almost 10 years old. There is currently no comprehensive plan or money for replacement and updates.
Partner Visitor Center Exhibits	Quality, condition of exhibits		Most of the NRRA exhibits at the Mississippi River Gallery in the Science Museum of Minnesota (SMM) are over ten years old. The SMM is slowly phasing out some of these exhibits. Coon Rapids Dam Regional Park (with two visitor centers), Mill City Museum, and Fort Snelling State Park are partner sites that include NRRA-oriented exhibits. While generally in good shape, none of these exhibits have been recently refurbished.

<p>NPS identity and visibility throughout the corridor</p>	<p>Number of signs, media presence</p>		<p>In 2012, the NRRRA received \$140,000 for new signs along the entire Mississippi River Trail (MRT) in Minnesota. Over 400 MRT signs were installed in the NRRRA in 2010, through a \$15,000 NPS Challenge Cost Share grant. The Nice Ride bikeshare stations in the park, funded through a \$843,000 FHWA grant, includes the NPS arrowhead and Ranger on Call Program, funded by the Mississippi River Fund. The placement of the arrowhead on these stations has improved wayfinding in the park.</p> <p>The NRRRA is also a host community for the MRT and serves as a clearinghouse for all 25 MRT communities in the corridor. MRT marketing activities promote the park as one of six major destination areas along the MRT and Great River Road.</p>
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Volunteers  [web](#) ▶

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale Comments
<p>Volunteer Opportunities</p>	<p>Variety of programs</p>		<p>The number of primary programs in which volunteers are engaged has increased from twelve programs in 2008 to 25 programs in 2012. Volunteers not only engage in support of habitat restoration and formal education programs but with wildlife monitoring, building program equipment—such as 24’ voyageur style canoes—and with recreation based programs (MISS volunteer database).</p>
<p>Volunteer Participation</p>	<p>Number of volunteers</p>		<p>General trends are up. The Mississippi NRRRA VIP program has expanded from 2,745 volunteers in 2008 to 7,221 volunteers in 2012, an increase of 163%. The diversity of volunteers continues to increase with more volunteers of color and more volunteers less than 30 years of age (NPS VIP Report 2012; MISS volunteer database).</p>
	<p>Volunteer hours</p>		<p>Volunteer hours increased from 17,124 in 2008 to 31,406 in 2012, an increase of 83%. The growth in hours is a result of two factors: individual volunteers volunteering more and from an increase in the number of groups attending events. Source: NPS document 10-150 (a standard NPS report filed yearly) and park volunteer database.</p>

Resource Brief: The Mississippi NRRRA Volunteers in Parks Program

The Mississippi National River and Recreation Area (Mississippi NRRRA) Volunteers in Parks (VIP) program has grown significantly over the past five years in the number of volunteers, the number volunteer hours, in the number of volunteer programs and in the numbers of partners with which the program works.

Link: <http://www.nps.gov/miss/supportyourpark/volunteer.htm>

In 2008 the Mississippi NRRRA VIP Program had 2,745 volunteers, providing 17,124 hours of service. The VIP program included 12 primary program areas and worked with eleven partners. The program has grown dramatically. In 2012 the NRRRA VIP program engaged 7221 volunteers, who contributed 31,406 hours of service. The program now includes 25 primary program areas and works with seventeen partners.

Mississippi NRRA VIP Program Growth Over 5 Years

	2008	2009	2010	2011	2012
Volunteers	2,745	3,360	5,941	5,495	7,221
Volunteer Hours	17,124	18,077	26,643	26,989	31,406
Programs	12	14	18	24	25
Partners	4	11	11	16	17

Volunteers assist with formal education programs, including working at learning stations on the Big River Journey and Journey to the Falls paddleboats, at the Journey to the Falls simulated archaeological dig station and at programs occurring along the river.

Volunteers help students identify birds, learn about Mississippi River geology, learn about the connection of urban storm sewers to the river, use GPS devices, restore habitat and discover river history.



Links:

<http://www.nps.gov/miss/forteachers/brjindex.htm>

<http://www.nps.gov/miss/forteachers/jtfindex.htm>

Other volunteer opportunities include the dedicated crew of volunteers that spends a 16 hour day on-board the Amtrak Empire Builder train providing interpretation as the train travels along the Mississippi River. Volunteers in the habitat restoration program have removed acres of invasive plants. Other volunteers provide assistance in recreational programs (biking, fishing, and canoeing) at events and in staffing the Mississippi River Visitor Center.



Volunteer Paul Kelly and NRRA partner Dennis Davidson (right) of NorthWest Canoe Company

The Mississippi NRRA VIP program has been awarded the George B. Hartzog award twice (2008 and 2011) for “Outstanding Park Volunteer Program.” In addition two volunteers received the award, Tom Rice for Outstanding Individual Volunteer (2008) and Holly Marsh for Outstanding Youth Volunteer (2010).

Partner support is key in the success of the MIS VIP program. The Urban Wilderness Canoe Adventures (UWCA) program is an excellent example of partnerships in action. The UWCA program gets 5th–8th grade students on the river in 24 foot voyageur style canoes. Students discover the urban wilderness within the cities of Minneapolis and Saint Paul while meeting educational objectives. Volunteers work with NorthWest Canoe, a VIP program partner, to build canoes used in the program. Other volunteers work with Wilderness Inquiry, the partner that administers the UWCA program. The NRRA provides volunteer support and recognition.

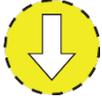
The Mississippi NRRA VIP program continues to grow through expanded partnerships, an increasing variety of programs utilizing volunteers and increased training options. The Mississippi River Fund is an important partner supporting the park through program funding and in hiring a staff person to support the NRRA VIP program. Other important NRRA VIP partners include Saint Paul Park and Recreation, Minneapolis Park and Recreation Board, Friends of the Mississippi River, Great River Greening, Audubon Bird Safe Program, MN Department of Natural Resources (Adopt-A-River) and Amtrak. These partnerships allow each organization to reach its organizational goals and to do more working together than each could do separately.

Support at the national and regional level through funding of volunteer special projects has facilitated program growth. The NRRA VIP program continues to support the park in reaching organizational goals as NPS moves into its second century.

Community Partners



[web](#) ▶

Indicators of Condition	Specific Measures	Condition Status/Trend	Rationale Comments
<p>Cooperative agreements and grants awarded by Mississippi NRRA</p>	<p>Dollar amount, results</p>		<p>The Mississippi NRRA has entered into 37 Cooperative Agreements and 15 Grants since its establishment (1988) totaling \$7 million. The majority of funds for the agreements and grants came from special project funding obtained from the NPS Servicewide Comprehensive Call, specifically PMIS requests. These projects included: historic property restorations, habitat restorations, exhibits, waysides and signs, alternative transportation planning and implementation, visual resource protection, scenic byways, critical area planning, resource planning, surveys and inventories, and recreation activities.</p> <p>Due to the tightening budgets and cuts, it has become harder to find funding for the NRRA's partnerships. The park's authorizing legislation provided for a grants program to be administered by the NRRA, but funding has never been appropriated.</p>
<p>Dollars contributed to NPS by partners</p>	<p>Dollar amount received from partners</p>		<p>Through the cooperative agreements and grants above, the NPS was able to benefit from \$9.2 million from our partners in dollars and/or in-kind matches. We remain optimistic that our partners will continue to assist with in-kind matches on our established programs as well and new.</p>
<p>One Time Funds and/or Grants received</p>	<p>Dollar amount received from other sources</p>		<p>The Mississippi NRRA has been the recipient of other funds totaling \$13 million. The McKnight Foundation provided funding for the building the NRRA Visitor Center in the Science Museum of Minnesota. The Land Water and Conversation Funds (through an effort by the Trust for Public Lands) provided funding for land acquisition for the Bruce Vento Nature Sanctuary and the Riverview Supper Club site. The NRRA also received Line Item Construction funds for the Mill City Museum and former Bureau of Mines (Coldwater Spring) sites.</p> <p>The National Park Foundation received settlement funds from Ashland Oil law suit, and this money was transferred to the park's friends group, the Mississippi River Fund. The Mississippi River Fund's contribution to the park keeps us at a great upward trend.</p>
<p>Volunteer partnerships</p>	<p>Number of partnerships</p>		<p>The number of partnerships associated with the Mississippi NRRA VIP program increased from three in 2007 to 16 in 2011. The NRRA has developed partnerships with major land holders within the park and with groups performing restoration, recreation or educational activities within the park. See the Resource Brief above for more. (MISS volunteer database).</p>
<p>Education partnerships</p>	<p>Number of education partners</p>		<p>Twenty partner groups collaborate on key NRRA formal education programs (Big River Journey, Journey to the Falls, Urban Wilderness Canoe Adventures, and Parks Climate</p>

			Challenge), a number which has remained fairly constant in recent years. Additionally, since 2010, three to four school districts have partnered annually in the Teacher-Ranger-Teacher program at the NRRA to train teachers through summer employment.
Watershed partnerships	Number of WaterShed Partners		As of 2012, 72 organizations known as the Metro WaterShed Partners collaborate on public outreach to educate and activate citizens to prevent urban runoff pollution. The group has shown growth in the past five years during facilitation by the NRRA. Metro WaterShed Partners website is hosted by Hamline University (http://www.hamline.edu/cgee/watershed/).
	Number of people reached through collaborative educational outreach		Metro WaterShed Partners' collaborative "Clean Water Media Campaign" resulted in a reported 7,959,206 media impressions across multiple media formats (TV, radio, web, etc.) in 2011. Collaborative interactive exhibits on pollution prevention are used by approximately 40,000–50,000 persons per year in past five years at the Minnesota State Fair and other venues (Metro Watershed Partners 2011).
Recreational Partnerships	Number of projects		<p>Numerous recreational partnerships attest to success in this area. Through Urban Wilderness Canoe Adventures, a partnership of three primary groups and a large and growing number of secondary partners, approximately 10,000 students, youth and families engaged in Mississippi River canoe-based recreation and learning in 2012 . Participation has grown in each of the past four years. Additional partnerships support bicycling, fishing and other recreational activities</p> <p>The Trails and Open Space Partnership (TOSP) is a coalition of over 50 agencies and organizations that are working together to achieve "a continuous land and water based recreation trail, open space, and multimodal alternative transportation system along the Mississippi River in the Twin Cities metro area while protecting the river's natural, cultural, and economic resources." Since 1996 the TOSP has helped partners secure funding (\$35 million), build consensus, and create awareness for its vision with local communities, the State Legislature, US Congress, and various national organizations and decision-makers. Key partners include the Metropolitan Council, the Minnesota Department of Natural Resources, the Parks and Trails Council of Minnesota, the Minnesota Department of Transportation, Mississippi Trail Inc., local river communities, and many non-profit organizations like the Trust for Public Land, the Saint Paul and Minneapolis Riverfront Corporations, and Friends of the Mississippi River.</p> <p>http://www.nps.gov/miss/parkmgmt/tosp.htm</p>

Resource Brief: The Mississippi NRRRA Alternative Transportation Plan



Nice Ride Station and Ranger on Call Program at the Mississippi River

The Mississippi NRRRA developed an Alternative Transportation Plan (ATP) for the 72-mile corridor and is working with partners to create a seamless and recognizable Alternative Transportation System (ATS) that serves its visitors and achieves the park’s ATP goals, as well as goals of America’s Great Outdoors (AGO) and the NPS Director’s Call to Action (C2A).

The challenge for the NRRRA is that no single transportation system serves visitors or connects area residents to the river and its major destinations. The absence of a recognizable transportation system creates visitor confusion, neighborhood disconnection, and challenges with the park’s identity and safe navigation. One of the ways the park addressed this challenge was through the installation of a bike share system along the river to serve as the link between existing transportation

facilities, river access and surrounding urban neighborhoods. In 2012, the NRRRA received \$843,000 from the Paul S. Sarbanes Transit in Parks Program (TRIP) to partner with Nice Ride MN to install 30 bike share stations along the river in Minneapolis and Saint Paul and to implement a pilot alternative transportation project in Minneapolis. The bikeshare stations were installed in June 2012 and have been extremely successful. They have increased access to the river without a car, built identity for the park (every station includes the NPS arrowhead and information on the innovative Ranger on Call Program), and, according to the report: “Sharing to Grow,” have had a positive impact on local economies and job accessibility in station areas.

In 2012, the NRRRA also initiated an Alternative Transportation Pilot Project, which will build out the park’s alternative transportation system (ATS) in traditionally underserved North Minneapolis, improve signage and install transit improvements at bus and light rail stops. In addition to providing sustainable access to the Mississippi River, increasing the park’s efforts to reduce congestion and emissions, and improving health, safety and economic vitality, the pilot project will connect diverse neighborhoods to the river’s parks, trails and greenspaces while creating awareness of our urban national park and its outdoor experiences. The pilot project is a partnership between NPS, Nice Ride Minnesota, Blue Cross Blue Shield of Minnesota, Mississippi River Fund (Ranger on Call Program), City of Minneapolis, MnDOT, Minneapolis Riverfront Corporation, Metro Transit, and the Metropolitan Council.

The park’s bike share system is the signature asset in the park that ensures all visitors and area residents recognize the alternative transportation system and have access to the NRRRA without a car.



A recent survey conducted by Nice Ride MN identified 19% of daily bike share users use a bicycle instead of driving a car. The additional 12,400 new Nice Ride users will reduce the average number of annual motorized vehicle miles travelled by 72,635. These stations will avert 7,440 car trips in the park and add an additional 37,202 bike share trips. According to Transit for Livable Communities, this mode change equates to 199 vehicle miles traveled averted per day translating to a reduction in:

Pollutant	Amount (lbs./year)
Hydrocarbons	217.0
PM10	0.8
PM2.5	0.8
NO _x	152.0
CO	1,981.0
CO ₂	58,954.0

Finally, the alternative transportation system will increase transit ridership in the NRRRA to further reduce carbon emissions. Metro Transit estimates a 3.5 lb. reduction in carbon emissions for every transit trip taken. If only 1% of the park’s visitors take transit, that will equate to a 1,029,000 lb. reduction in carbon emissions per year, which helps meet the C2A goal to reduce the NPS carbon footprint over 2009 levels.

Chapter 3. Summary of Key Stewardship Activities and Accomplishments

Activities and Accomplishments

Mississippi National River and Recreation Area (Mississippi NRRRA) has responsibility for managing seven resource types of national significance to the American people. The seven resource types are: cultural, historical, natural, recreational, scenic, scientific and economic. Given that the NRRRA owns only 64 acres of the 54,000 within its boundaries, the park has to rely on partnerships preserve and protect these nationally significant resources.

Coldwater Spring

On January 15, 2010, the Department of Interior signed a Record of Decision placing 27.32 acres, located between Minneapolis and St. Paul, under the park's management, directing that land be used for park and open space purposes. Over the next year and one-half, the NRRRA oversaw the design and planning for the removal of 12 buildings and the restoration of the land to an oak savanna and bluff top woodland. From November 2011 until August 31, 2012, the property closed for a \$2.2 million dollar contract to complete the work. On September 1, the Coldwater Spring unit opened to the public and is quickly becoming a key attraction in the area. The park already owned just over two acres at this site, as well as a 9-acre island on the Mississippi River down the bluff from Coldwater. The island is connected to land under most river conditions. So, the park owns 38.5 acres here.

In 2012, both during and after the demolition/restoration construction period, the NRRRA completed restoration activities that expanded the capabilities of the park to meet its management objectives.

- Eight hundred volunteers donated over 3000 hours of labor by planting trees and shrubs, wetland plants, and by removing invasive buckthorn and garlic mustard.
- Over 165 trees, 120 shrubs and 900 forbs and grasses were planted by nearly 200 volunteers on National Public Lands Day, 2012.
- A former Bureau of Mines building basement area was converted to a 13,500 square foot wetland, rather than filling it in and creating upland habitat, as the initial plans called for. A small portion of the wetland has the potential to become a unique calcareous fen, the first of its kind in Hennepin County.
- The NRRRA removed a culvert, road and parking area to daylight 100 lineal feet of Coldwater Creek, exposing to the open for the first time in about 100 years. The banks of the newly established creek were designed to maximize visitor access and enjoyment of the stream flow, while helping to prevent erosion.
- Volunteers and park staff cut and removed thousands of cubic yards of buckthorn, during 2011–2012, thereby clearing the entire 29.5 Coldwater Unit property of this invasive species. District Energy St. Paul hauled the material away and used it as biofuel to heat downtown buildings.
- Twelve acres of prairie and oak savanna were restored by removing 8½ acres of impervious surface and 3½ acres of bluegrass turf.

Partnerships

As the Mississippi NRRRA owns only 64 acres, creating and nurturing partnerships is essential. And, one of the park's authorizing purposes is to facilitate conversations between the many interests in the 72-mile corridor to protect and preserve the park's nationally significant resources.

- The Mississippi River Fund has become the park's primary partner, providing funding for and facilitating dozens of projects throughout the corridor, as is often demonstrated below.
- Educational partnerships. A core of approximately 20 local partners is led by the NRRRA to connect school children to the science, heritage and stewardship of the Mississippi River and its watershed. Together the groups conduct a range of field trips and educational experiences that reach over 11,000 students per year and foster the next generation of river stewards. Big River Journey, Journey to the Falls, Urban Wilderness Canoe Adventures, and the Parks Climate Challenge are each major partnership initiatives that bring students face-to-face with the Mississippi River using riverboats, canoes and other explorations.
- Initiated by the Mississippi NRRRA in 1996, the Metro WaterShed Partners formed to conduct collaborative public outreach and promote personal action for clean water and pollution prevention. The vital partnership, now numbering over 70 participating groups, includes a mix of local, state and federal agencies, watershed management groups, non-profits and

educational institutions. The WaterShed Partners conduct an annual media campaign with radio, television, and website spots that make several million media impressions each year. The partnership also maintains interactive exhibits that reach over 50,000 people per year at various events. The NRRRA continues its leadership role by serving on the group's Steering Committee

- Water quality. The park partnered with the Freshwater Foundation to establish and secure funding from the Mosaic Foundation for the Minnesota FarmWise project. This project expands farmer-to-farmer education on water-friendly and economically viable farming practices. The Minnesota River, which runs through a predominantly agricultural area of the state, is a significant contributor to the park's water quality problems. The park recognizes the strategic importance of working with partners to make water quality improvements upstream of the park.
- The Trails and Open Space Partnership (TOSP) is a coalition of over 50 agencies and organizations that are working together to achieve "a continuous land and water based recreation trail, open space, and multimodal alternative transportation system along the Mississippi River in the Twin Cities metro area. The partners are accomplishing this objective while protecting the river's natural, cultural, and economic resources." Since 1996 the TOSP has helped its partners secure over \$35 million, build consensus and create awareness for its vision. Key partners include the Metropolitan Council, the Minnesota Department of Natural Resources, the Parks and Trails Council of Minnesota, the Minnesota Department of Transportation, Mississippi Trail Inc., local river communities, and many non-profit organizations, like the Trust for Public Land, the Saint Paul and Minneapolis Riverfront Corporations, and Friends of the Mississippi River.
- Fort Snelling National Historic Landmark. After years of close coordination, the park signed a Joint Powers Agreement with the Department of Natural Resources, (DNR) Hennepin County, Minnesota Historical Society (MHS) and Minneapolis Park and Recreation Board to stabilize and restore key National Historic Landmark buildings and preserve the fort's landscape.

General Planning

- Project Reviews. Development projects in the corridor's 25 communities and five counties have had and will continue to have the potential to affect the park's resources. The Mississippi NRRRA has reviewed and weighed in on the most critical of these projects, as time and staff have allowed.
- Over the last few years, Minneapolis and St. Paul have undertaken major riverfront master plans aiming to protect and preserve key resources, bring people to the river and spur economic development. The Mississippi NRRRA has attended many of the meetings and provided substantive input to them.
- The Mississippi NRRRA has developed a park Alternative Transportation Plan and is currently developing a Visual Resource Protection Plan.

Natural Resources

- Eagle Survey. From 2006 to 2011 the National Park Service Great Lakes Inventory and Monitoring Network and its partners (Audubon, MN Pollution Control Agency, Prairie Island Indian Community, Mississippi River Fund) assessed population levels as well as levels of targeted environmental contaminants in bald eagle (*Haliaeetus leucocephalus*) nestlings at sites in and adjacent to three units of the NPS: Apostle Islands National Lake Shore, St. Croix National Scenic Riverway and the Mississippi NRRRA.
- Waterbird Survey. In 2009 the Mississippi NRRRA and its friends group (the Mississippi River Fund) helped expand a U.S. Fish and Wildlife Service survey of waterfowl use on the upper Mississippi River to include its corridor in weekly aerial water bird counts from St. Paul south to Lake Pepin. Survey results indicate water bird use in this stretch is much less than observed in pools (reservoirs behind the locks and dams) further downriver, where habitat is significantly better. This cooperative effort includes the USFWS, NPS, Minnesota and Wisconsin DNRs, Audubon and the Prairie Island Indian Community.



- Otter. River otters are indigenous to Minnesota and were historically common and widespread throughout aquatic habitats. River otter populations declined severely in the early 20th century, due largely to water pollution, wetland degradation and over harvesting (Crimmins 2009; DNR 2011). In August 2009, a pilot study was conducted by the NRRA to survey river otter sign on two-mile stretches of riparian habitat and shorelines within the Mississippi NRRA, with nine survey locations selected based on prior live otter sightings. This pilot study, funded in part by the Mississippi River Fund, confirmed the presence of otter populations at several sites along the Mississippi between Coon Rapids and downtown St. Paul and was further verified by surveys conducted over the following two winters. This preliminary investigation is ongoing and has confirmed an overlap in positive sign detection in both summer and winter seasons.



- Mussels
 - Winged mapleleaf and Snuffbox mussels. On August 17, 2012, state and federal biologists released federally endangered Winged mapleleaf and Snuffbox mussels into the Mississippi River in the heart of the Twin Cities. The Winged mapleleaf was once broadly distributed throughout the central United States and inhabited much of the upper Mississippi River. Before the recent release, it had been absent from the Mississippi River here for about 100 years, and only one population of the species was found along a 13-mile segment of the St. Croix River. According the U.S. Fish and Wildlife Service, the Snuffbox “has experienced a 62-percent rangewide decline. Most remaining populations are small and geographically isolated from one another, further increasing their risk of extinction.”
 - Higgins Eye Mussels. The Higgins eye was the first freshwater mussel to receive federal protection, which took effect in 1972. Degradation of the Mississippi River severely restricted the range of this species. In 2000 and 2001, biologists from the NPS, the Minnesota DNR and the USFWS relocated 471 federally endangered adult *Lampsilis higginsii* (Higgins Eye Pearlymussel). Taken from the Mississippi River at Cassville, WI, and Cordova, IL, the mussels were placed at two sites in the Mississippi NRRA, where zebra mussel densities are much lower.



<http://www.fws.gov/midwest/TwinCities/te/mussels/snuffbox/index.html>
http://www.fws.gov/midwest/mussel/documents/minnesota_plan_mussels.pdf

- Asian Carp Task Force and Forum. In January 2011, the Mississippi NRRA initiated a series of meetings that led to the creation of an Asian Carp Task Force for Minnesota and co-chairs the Task Force with the Minnesota DNR. When Non-Governmental Organizations (NGOs) began meeting on the issue and other interests wanted to be become part of the discussion, the NRRA expanded the meetings into an Asian Carp Forum that brings together all those working on or concerned about the issue to discuss possible solutions and their implications.
- Important Bird Area (IBA). The Important Bird Areas (IBA) program was created to solve the problem of habitat loss, which remains the greatest threat to bird populations around the world and across America. In Minnesota 20% of our bird species are at risk of decreasing. Designation of the Mississippi NRRA as an IBA was the result of a nomination process that involved an extensive look at the habitat that supports these birds, the bird species that use this reach of river and the potential threats to these species and the habitat that supports them.
- Bird/Bridge Strike Study. The NRRA and the Minnesota Department of Transportation are working in partnership to determine the effect of bridge size and design on bird strike mortality, particularly with bridges spanning rivers and intersecting migratory flyways. The goal of this literature review is to determine what correlations exist between bird-bridge collisions and bridge structure size, type (design) and lighting.
- Water Quality Program
 - The Mississippi NRRA partnered with Friends of the Mississippi River—a non-profit focused on the Mississippi River—to develop the first-ever “State of the River” report. The report assembles and communicates river data to the public in a meaningful, understandable way. Although much data exists for the NRRA portion of the river (collected primarily by other agencies), it had not been assembled, analyzed, and communicated to the public before. Released in September 2012, the report has received considerable praise for communicating scientific and complex issues in a manner that the general public can understand.

- The park has established a strong water quality program within the last three years, going from being quiet in the local and regional “water quality world” to becoming a leading facilitator and communicator of information regarding the Mississippi River and influences on its water quality.
- The park now has a permanent Water Quality Coordinator position; “seed” funding for position was initially provided by a private foundation.
- The park has developed a relationship with and provides information to “upstream” community partners about how their land use decisions can help improve water quality of a national park.
- Within the last five years, a water quality page was created for the park’s website. It is regularly updated with events, announcements, and resources for citizens, agricultural producers, and municipal entities interested in tools for better land management practices.
- The NRRA coordinates a monthly meeting series—Mississippi River Forum—for water resource practitioners and decision-makers to learn about and share information on Mississippi River and water quality topics. The Forum fills what had been a gap in information-sharing and networking opportunities for a diverse professional and engaged-public community. Over 1,000 people have attended these meetings since the series began, and keynote speakers have included Congressional Representatives and state agency Commissioners.
- Park staff serves on advisory committees for two major clean-up efforts that address substantial pollution issues within the NRRA: the South Metropolitan Mississippi River Total Suspended Solids (TSS) Total Maximum Daily Load (TMDL) committee, and the Upper Mississippi River Bacteria TMDL committee.
- The park partnered with research partners at the St. Croix Watershed Research Station to develop a research-based internship program for undergraduate students, resulting in the further development of data from the park, as well as the development of potential future river researchers.
- The NRRA has strengthened its relationships with local colleges and universities, particularly the University of Minnesota. These partnerships seek to improve the park’s visibility to students and to connect the park to more volunteer, intern, and research opportunities.

Visual Resource Protection

- Scenic views are some of the most highly valued resources in the Mississippi NRRA. These views are threatened by increasing pressures from land uses associated with urban development. Through a \$219,000 Scenic Byway grant, the NRRA, in partnership with the Mississippi River Parkway Commission, is developing a plan to preserve, protect, and enhance scenic views along the Mississippi River and surrounding area.



Natural View in the Mississippi NRRA

Cultural Resources

- Coldwater Spring Unit. The park took Coldwater Creek out of a culvert and opened it to daylight for the first time in some 100 years. This was an initial step in the restoration of the historic spring and reservoir area. The NRRA completed a history, an archeological study and an ethnographic study of the unit over the past six years.
- Fort Snelling Upper Post. Working together for more than seven years, the DNR, Hennepin County, Minnesota Historical Society and the NRRA secured a \$575,000 Save America’s Treasures grant that was matched one to one by Hennepin County. In addition, the State has provided more than \$2 million in bonding dollars to stabilize many of the Upper Post’s 27 buildings and undertake essential restoration at some.

- Former Bureau of Mines Campus, Twin Cities Research Center. The park completed documentation of the former Research Center, including photographs, oral history and a historical narrative, prior to demolishing the Campus for the Coldwater Spring project.
- National Historic Landmark Flour Mills. The NRRRA, with significant help from Midwest Region cultural resources staff, has helped guide projects affecting the Pillsbury A and Washburn A mills, both of which are NHLs.

Visitor Experience

- Visitor Center. The park's Mississippi River Visitor Center (MRVC), located in the lobby of the Science Museum of Minnesota, in downtown Saint Paul, is the only visitor center in the park operated by park service staff and volunteers. Visitation at MRVC remains relatively high, thanks to the park's partnership with the Science Museum.
- Public programs. The park's public program offerings have grown substantially over the past five years. Programs like the long running Bike with a Ranger remain steady visitor draws. Especially of note is the growing number of community outreach programs. These programs work with community centers, city park and recreation departments and similar organizations to offer river related interpretive programming for children.
- Coldwater Spring. During the construction phase of the Coldwater Spring, the park offered a series of ranger led weekend and evening tours. These ranger led tours proved to be very popular with the public, and the park has continued to offer these program since the site has reopened.
- School programs. Each year, over 42,000 presenter-student program interactions, serving over 100 schools, are provided and led by the Mississippi NRRRA and enhanced by partnerships with numerous educational groups. Experiences include: explorations of park science, history, climate change and more. Programs support academic standards and park stewardship objectives.
- Big River Journey, the park's flagship formal education program, has served over 55,000 students. Each student averages four weeks on river-related learning, receiving a solid foundation for river understanding and stewardship.
- The Urban Wilderness Canoe Adventures (UWCA) program has surpassed its initial goal to serve over 10,000 youth and families annually. The program connects participants to nature at their local river.
- Teacher training. Teacher training workshops, involving over 150 teachers annually, support classroom learning and the Mississippi NRRRA field trips. As a result, over 2,000 river-related activities are conducted by teachers in their classrooms each year. Overall, more than 400 teachers are involved with the Mississippi NRRRA education programs annually. Ten "Teacher-Ranger-Teachers" have been trained through summer employment in the park.
- Partner-provided experiences. Key NRRRA visitor experiences are offered by partners, such as riverboat tours, hiking, biking, picnicking, and birding. While not leading such experiences, the NRRRA supports them in a variety of ways. Over 7.9 million visits to the NRRRA occur through partner parks.
- Volunteer involvement at the NRRRA has grown tremendously, both in depth and breadth. Much of the growth is a result of partner collaboration. The program actively collaborates with 25 partners, supporting work with habitat restoration, youth programs and public programs. Park volunteers are recognized nationally, while the program as a whole has been recognized by the Midwest Regional Office with the Hartzog Award for "Outstanding Park Volunteer Program" in both 2008 and 2011. In 2012, 7,221 volunteers provided 31,406 hours of service, the highest ever for the park and 32% over 2011.
- The Mississippi NRRRA VIP program has started a volunteer enrichment program called the Monthly Opportunity for Volunteer Enrichment! (MOVE!). It serves to increase the knowledge base of current volunteers and to recruit new volunteers.
- The NRRRA's emerging Alternative Transportation System (ATS) will have a tremendous impact on visitor experience and access to park destinations. The ATS, when completed, will be a seamless and recognizable multi-modal system that enables visitors and residents to get to the river without a car. This will increase multi-modal access to the Mississippi River by canoe, bike, bus, light and high speed rail, and by a new bike sharing system. It will also help to reduce congestion, carbon emissions and runoff, which will improve the environmental and visual quality of the river corridor.
- Since 1996, the Trails and Open Space Partnership has been working with over 50 partners to complete a continuous land and water based trail, open space, and now alternative transportation system along the Mississippi River in the Twin Cities metro area. This coordinated effort has improved the visitors' recreational experience, the condition and connectivity of recreational facilities and greater awareness of the National Park. The partnership now hopes to complete the Mississippi River Trail by 2016, the National Park Service Centennial.
- The 2000 designation of the Mississippi River Trail as a National Millennium Trail and 2012 designation of the 72-mile NRRRA as a National Blueway will elevate the river experience and bring national attention to the recreational opportunities in the Mississippi NRRRA.

Park Infrastructure

- Initial restoration of the Coldwater unit from a Bureau of Mines office building campus to a park and open space was completed in August 2012. The NRRA is responsible for managing physical assets such as roads, trails and structures for the first time in the park's history.
- Through the demolition and restoration contract, the NRRA constructed a one-quarter mile handicap accessible trail to Coldwater Spring, with two bridge crossings, on a former road alignment, thereby reducing initial construction costs. The NRRA utilized the existing parking lot and entry roads to provide public vehicular access, also reducing construction costs. And, the NRRA salvaged the front entry steps and remnants of the main Bureau of Mines office walls to provide for additional interpretive opportunities representing the Bureau of Mines era at the site.
- After repairing the original Bureau of Mines entry monument, the NRRA is using it to brand the site with the NPS logo and Coldwater Spring's name.
- Under the demolition and restoration contract, the NRRA removed 8.5 acres of impervious surfaces, roads, parking lots and buildings during the demolition phase. In all, the NRRA recycled 13,000 cubic yards of concrete and stone material.

Chapter 4. Key Issues and Challenges for Consideration in Management Planning

Coldwater Spring and General Planning

- Since the Mississippi NRRA has no control over what enters the Mississippi and Minnesota rivers above the corridor, taking action to fix key problems facing the portions of these rivers in the corridor is a challenge.
- The ability of the NRRA to control what happens on the land within the park's 54,000-acres is limited. On the 64 acres owned by the park, the NRRA can actively pursue its mission and planning objectives, with public input. On the remaining lands, the NRRA has some authority to review and comment on projects tied to other federal lands and on projects using federal funding or requiring some federal oversight or approval. Where no federal tie exists, the NRRA must rely solely on the partnerships it has and is developing.
- Now that the Mississippi NRRA owns 29.5 acres at the Coldwater Spring unit and may soon oversee another 18 acres of Veterans Affairs land adjacent to it, the park has to determine how to prioritize staff time between the new property and the rest of the corridor.
 - From 2011 to 2012, Coldwater Spring demanded a large portion of the planning team's time and will continue to do so in 2013.
 - In 2012 Coldwater began demanding more time from the Education and Interpretation staff, and this will most likely increase in the coming years.
- The Mississippi NRRA has to consider the impact of its success. The park is increasingly sought after by others as an active player on key issues. Our education and interpretation programs and volunteer programs have reached new heights. We have reached our carrying capacity and are at the point of disappointing those we simply do not have the staff or time to help. The challenge will be to maintain our current level of engagement and outreach, while growing strategically.

Natural Resources

- Fish and Wildlife. The park does not currently have a good handle on numbers and condition of most fish and wildlife species in the corridor. Bioblitzes done within the corridor have given us snapshots of what is present in tightly defined areas, but comprehensive data are lacking. Many herptile populations are struggling, and White-nose syndrome is likely on the way for local bat populations. Between warming temperatures and increasing numbers of invasive species arriving, more and more native species are losing ground. The NRRA needs to find a way to quantify and address these issues.
- Water Quality. The park's water quality is impacted by both urban (largely permitted and regulated) and agricultural (largely unregulated) activities. River flow to and within the park has increased significantly over the past 30 years, which is an important driver of water quality. Significant water quality improvements have been seen where regulations have addressed polluting activities (e.g., dissolved oxygen). However, significant improvements remain to be made (e.g., sediment, phosphorus, and nitrate). These improvements will require changes in both upstream agricultural activities and nonpoint source urban runoff.
- Sediment and nutrients from the Minnesota River will continue to affect the water quality and habitat of the Mississippi River downstream from their joining. Our ability to influence this problem is limited.

- Contaminants of Emerging Concern. A number of chemicals and their byproducts are present in the river and its associated environment. These can come from industrial processes, pharmaceuticals, consumer products, pesticides and other sources. Many of these substances are not tracked in the same way that other contaminants are, making it difficult to know the extent of their presence, how they operate throughout the food chain and their potential cumulative impacts. The park participates in Minnesota's Contaminants of Emerging Concern roundtable and is working with partners to propose additional research. For now, we do not yet fully understand the risks and status of these compounds in the river environment.
- Invasive Species. Two invasive species threaten to change the ecosystem of the river and of the lands along it in the coming decades.
 - Emerald Ash Borer. Emerald Ash Borer was found at Fort Snelling, in the heart of the corridor, in 2012. The corridor's lands contain millions of ash trees, and there is no way to stop the pest.
 - Asian Carp. Silver, Bighead and Grass carp are poised to invade the corridor's southern reaches, if they have not already. The Mississippi NRRRA has played a lead role in trying to deal with this threat and will continue to do so, but staff time may be limited. These fish threaten the river's ecosystem, recreational and economic use of the river and the NRRRA education and interpretive programs, like the Urban Wilderness Canoe Adventure.

Cultural Resources

- Coldwater Spring. While three archeological surveys have been completed for the Coldwater Spring property, the lands immediately adjacent to it have not been surveyed. Camp Coldwater (1820–1840) extended into these lands and learning more about what is on them is essential to protecting the remaining archeological sites and to our interpretation and education at Coldwater.
- Archeological Sites. A comprehensive archeological survey is needed for the Mississippi NRRRA corridor but would be expensive. Currently and historically, most archeological sites are located as the result of development projects, which often leads to documentation and destruction of the sites.
- Historic Sites. While state and local entities have completed standing structure surveys for most of the corridor's communities, many of these are out of date. This makes it harder to protect historic sites and to educate people about them.
- Fort Snelling National Historic Landmark. This NHL, with its 27 standing buildings, is one of the most important cultural and historic resources in the NRRRA and is in serious condition. It needs adaptive reuses, which will cost millions of dollars. There is some hope that projects on the horizon may help save it.
- Cultural Landscapes and Ethnographic Sites. No one has conducted a survey for cultural landscapes or ethnographic sites in the corridor. Given the pace of urban expansion, we could lose sites fitting both categories before we know they exist.

Visitor Experience

- Park visibility remains a challenge, since the Mississippi NRRRA is not a significant land-owner within the corridor. Recreational visitation to the Mississippi River often leaves no impression that the visit has occurred in a national park.
- Recreational river use and access to the Mississippi is controlled by partners and their sites, requiring coordination with state and local parks, tour providers and marinas. Facility upgrades for canoe and kayak access and related amenities are desired but dependent on partner interest and capability.
- Visitor satisfaction at the park is often more a measure of partner sites and experiences, than of NRRRA-led experiences and facilities.
- Programmatic success at the park has led to increased expectations and pressure for more programs to serve more people, stressing staff resources and leaving disappointment for visitors, groups and partners we are unable to serve.
- The Mississippi NRRRA has no education center or facility of its own for use by school groups and other organized groups, but instead relies on partner-owned facilities. Use of such facilities is subject to availability and requires advance scheduling along with transportation of educational tools and materials to the sites.
- The exhibit at the park's visitor center, in the lobby of the Science Museum of Minnesota, was designed to work with the Mississippi River Gallery inside the museum. The museum, however, is slowly phasing out the large footprint of this gallery, thereby making the exhibit at the visitor center seem out of date. Other partner sites with exhibits are generally at local, regional or state parks, with interpretation focused on their own parks. Park orientation exhibits remain in the NRRRA-operated Mississippi River Visitor Center, a rented facility.
- Volunteer involvement must be coordinated with a complex array of local partners and often occurs on partner sites, requiring significant planning, coordination and formal agreements.

Park Infrastructure and Operations

- The Record of Decision in January 2010 placing the 27.32-acre Coldwater Spring property under the NRRRA's management ushered in a new era of park management responsibilities. Significant challenges exist, from developing the park's capability

to meet NPS reporting and management systems to managing limited fiscal resources for on-going maintenance to creating programs for monitoring the success of restoration efforts.

- The NRRRA did not receive a base funding increase with the addition of the Coldwater Unit and must carefully plan how it spends park funding on maintenance and repair of the roads, parking areas, trails and the Coldwater springhouse, reservoir and creek. To stretch limited resources, the park is working to develop relationships and working agreements with adjoining state and regional parks to address maintenance needs. Coordination with the St. Croix National Scenic Riverway's maintenance staff has been helpful but has limitations.
- The park does not have law enforcement or maintenance staff, both of which are required at the new Coldwater Spring property. The NRRRA is developing partnerships with local law enforcement units and with the St. Croix National Scenic Riverway that will help.
- The park's friends group—the Mississippi River Fund—has been essential assisting the NRRRA in looking for ways to lessen the burden on the park's staff. Volunteers organized by the park's volunteer coordinator and the friend's group have been instrumental in furthering natural resource projects and maintenance work.
- On-going monitoring and research of the effectiveness of restoration actions and techniques have been hampered by a lack of staff time to devote to scoping program needs and identifying potential funding sources and partnerships.
- Further development of the Coldwater Unit to address visitor use and enjoyment and resource protection, beyond the basics just completed, have been slowed by the lack of fiscal resources to complete the necessary planning, compliance and civic engagement processes and documents.
- The unique nature of Coldwater Spring, the cultural resources, and the significance many individuals and groups place upon the site and the water present unprecedented challenges for park to manage when conflicting viewpoints and attitudes exist.

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See the [State of the Park Report for Mississippi National River and Recreation Area website](#) for a more complete list of references to documents and data sets upon which the assessments in this State of the Park report are based. References for several of the key documents cited in this report are as follows:

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See Also:

[Collection of General References](#)

[Collection of Natural Resource-Related References](#)

[Collection of Cultural Resource-Related References](#)

[Collection of Visitor Experience-Related References](#)

[Other Park Infrastructure-Related References](#)

Glossary

See the [State of the Parks home page](#) for a link to a complete glossary of terms used in State of the Park reports. Definitions of key terms used in this report are as follows:

Americans with Disabilities Act (ADA)	Law enacted by the federal government that includes provisions to remove barriers that limit a disabled person's ability to engage in normal daily activity in the physical, public environment.
Archeological Sites Management Information System (ASMIS)	The National Park Service's standardized database for the basic registration and management of park prehistoric and historical archeological resources. ASMIS site records contain data on condition, threats and disturbances, site location, date of site discovery and documentation, description, proposed treatments, and management actions for known park archeological sites. It serves as a tool to support improved archeological resources preservation, protection, planning, and decision-making by parks, centers, regional offices, and the national program offices.
Baseline Documentation	Baseline documentation records the physical condition of a structure, object, or landscape at a specific point in time. A baseline provides a starting point against which future changes can be measured.

Carbon Footprint	Carbon footprint is generally defined as the total set of greenhouse gas emissions caused by an organization, event, product or person.
Climate Friendly Park	The NPS Climate Friendly Park designation requires meeting three milestones: completing an application; completing a comprehensive greenhouse gas (GHG) inventory; and completing a Climate Action Plan, which is the actions, policies, programs, and measures a park will put into place to reduce its GHG emissions.
Cultural Landscape Inventory (CLI)	A Cultural Landscapes Inventory describes historically significant landscapes within a park. The inventory identifies and documents each landscape’s location, size, physical development, condition, characteristics, and features, as well as other information useful to park management.
Curation	National parks are the stewards of numerous types of objects, field notes, publications, maps, artifacts, photographs, and more. The assemblage of these materials comprises a museum collection. Curation is the process of managing, preserving, and safeguarding a collection according to professional museum and archival practices.
Environmental Contaminants	Biological, chemical, physical, or radiological substance (normally absent in the environment) which, in sufficient concentration, can adversely affect living organisms through air, water, soil, and/or food.
Exotic Plant Management Team (EPMT)	One of the ways the NPS is combating invasive plants is through the Exotic Plant Management Program. The program supports 16 Exotic Plant Management Teams working in over 225 park units. EPMTs are led by individuals with specialized knowledge and experience in invasive plant management and control. Each field-based team operates over a wide geographic area and serves multiple parks.
Foundation Document	A park Foundation Document summarizes a park’s purpose, significance, resources and values, primary interpretive themes, and special mandates. The document identifies a park’s unique characteristics and what is most important about a park. The Foundation Document is fundamental to guiding park management and is an important component of a park’s General Management Plan.
Fundamental and Other Important Resources and Values	Fundamental resources and values are the particular systems, processes, experiences, scenery, sounds, and other features that are key to achieving the park’s purposes and maintaining its significance. Other important resources and values are those attributes that are determined to be particularly important to park management and planning, although they are not central to the park’s purpose and significance. These priority resources are identified in the Park Foundation Document and/or General Management Plan. The short-cut name that will be used for this will be Priority Resources.
Great Lakes Network (GLKN)	One of 32 I&M networks established as part of the NPS Inventory and Monitoring Program . The Great Lakes Network comprises nine parks in Indiana, Michigan, Minnesota, and Wisconsin.
Historic Integrity	Historic Integrity is the assemblage of physical values of a site, building, structure or object and is a key element in assessing historical value and significance. The assessment of integrity is required to determine the eligibility of a property for listing in the National Register.
Indicator of Condition	A selected subset of components or elements of a Priority Resource that are particularly “information rich” and that represent or “indicate” the overall condition of the Priority Resource. There may be one or several Indicators of Condition for a particular Priority Resource.

Interpretation	Interpretation is the explanation of the major features and significance of a park to visitors. Interpretation can include field trips, presentations, exhibits, and publications, as well as informal conversations with park visitors. A key feature of successful interpretation is allowing a person to form his or her own personal connection with the meaning and significance inherent in a resource.
Invasive Species	Invasive species are non-indigenous (or non-native) plants or animals that can spread widely and cause harm to an area, habitat or bioregion. Invasive species can dominate a region or habitat, out-compete native or beneficial species, and threaten biological diversity.
List of Classified Structures (LCS)	LCS is an inventory system that records and tracks the condition of the approximately 27,000 historic structures listed in the National Register of Historic Places that are the responsibility of NPS.
Museum Collection	NPS is the steward of the largest network of museums in the United States. NPS museum collections document American, tribal, and ethnic histories; park cultural and natural resources; park histories; and other aspects of human experience. Collections are managed by professionally-trained NPS staff, who ensure long-term maintenance of collections in specialized facilities.
Natural Resource Condition Assessment (NRCA)	A synthesis of existing scientific data and knowledge, from multiple sources, that helps answer the question: what are current conditions of important park natural resources? NRCAs provide a mix of new insights and useful scientific data about current park resource conditions and factors influencing those conditions. NRCAs have practical value to park managers and help them conduct formal planning and develop strategies on how to best protect or restore park resources.
Priority Resource or Value	This term refers to the Fundamental and Other Important Resources and Values of a park. These can include natural, cultural, and historic resources as well as opportunities for learning, discovery and enjoyment. Priority Resources or Values include features that have been identified in park Foundation Documents, as well as other park assets or values that have been developed or recognized over the course of park operations. Priority Resources or Values warrant primary consideration during park planning and management because they are critical to a park's purpose and significance.
Project Management Information System (PMIS)	A servicewide intranet application within the National Park Service to manage information about requests for project funding. It enables parks and NPS offices to submit project proposals to be reviewed, approved and prioritized at park units, regional directorates, and the Washington Office.
Resource Management	The term "resources" in NPS encompasses the many natural, cultural, historical, or sociological features and assets associated with parks. Resource management includes the knowledge, understanding, and long-term stewardship and preservation of these resources.
Specific Measure of Condition	One or more specific measurements used to quantify or qualitatively evaluate the condition of an Indicator at a particular place and time. There may be one or more Specific Measures of Condition for each Indicator of Condition.