

**INTRODUCTION
AMENDMENT
(June 20, 1996)**

As the Comprehensive Management Plan (CMP) for the Mississippi National River and Recreation Area (MNRRA) was being finalized in 1994, the Science Museum of Minnesota (SMM) announced its intention to build a new museum on the river in St. Paul. In response, the Mississippi River Coordinating Commission (MRCC) asked the staff of MNRRA to examine the relationship between a proposed National Park Service (NPS) Interpretive Center on Harriet Island in St. Paul and the new Science Museum that would be a neighbor.

In the last 18 months, as plans developed for the new Science Museum, staff from MNRRA and the SMM have worked with the City of St. Paul, other organizations, and the public to determine the educational role of MNRRA in St. Paul, and the relationship with its two major partners, the SMM and the City of St. Paul. This amendment is the product of those efforts. It changes the concept for a NPS Interpretive Center/Administrative Headquarters in St. Paul that was described in the MNRRA CMP.

KEY CHANGES

to the CMP in this amendment:

1. A partnership is forged between the NPS and the SMM. Instead of building a NPS Interpretive Center/Administrative Headquarters on Harriet Island in St. Paul, the partners will work together to achieve the following:

- Develop a 2,000 net square foot *Mississippi River National Center* located within the new Science Museum to be built on a river bluff in downtown St. Paul. Open to the public without charge, the *National Center* will serve people interested in finding out about the Mississippi River and its watershed. It will also provide information on all of the 369 units of the National Park System, including the Mississippi National River and Recreation Area.
- Develop a 5,000 net square foot *Mississippi River Exhibition Gallery*, located within the fee area of the new Science Museum, to interpret the Mississippi River Watershed with an emphasis on the area defined by the confluence of the Minnesota, the Mississippi, and the St. Croix rivers. An additional 1,000 square feet of outdoor exhibits will be located near the new Science Museum and accessible without charge.
- Develop a 6,700 net square foot *Mississippi River Education Center* located on Harriet Island within Harriet Island/Lilydale Regional Park that will support MNRRA, the SMM, St. Paul Parks and Recreation, and other organizations in their delivery of river-related and environmental programming to groups of school children, families, and adults.
- Enter into partnership with the City of St. Paul to plan, raise funds for, and develop expanded outdoor exhibits, classrooms, and programs on both sides of the Mississippi River. The outdoor exhibits will be located in River Park and at the Kellogg Boulevard River Overlook near the new Science Museum on the east side of the river, and in Harriet Island/Lilydale Regional Park on the west side of the river. Outdoor programs and classrooms will extend upstream as far as Crosby Farm–Hidden Falls Park.

Administrative headquarters for MNRRA will remain in leased space.

2. The one-time, National Park Service construction cost for this partnership is less than one half of the cost of building the Harriet Island Interpretive Center as proposed in the CMP.

These construction cost estimates are shown below as 1996 dollars that will need to be adjusted for inflation.

Develop the <i>Mississippi River National Center</i> (Opens December 31, 1999)	
Construction	\$393,734
Design	43,311
Contingency	39,373
NPS contract administration	19,687
Audio/visual equipment	75,000
Total	\$571,105
Develop the <i>Mississippi River Exhibition Gallery</i> (Opens December 31, 1999)	
Construction and Design	\$1,200,000
Develop the <i>Mississippi River Education Center</i> (Opens Spring, 2000)	
Net Construction	\$1,651,000
Furniture, fixtures, equip	125,000
Landscape development	350,000
Utility connections	35,000
Parking	80,000
Design	246,510
Contingency	224,100
Survey, soil testing, etc	40,000
Sub Total	\$2,751,610
NPS contract	
Administration	112,050
Audio/visual presentation	50,000
Audio/visual equipment	80,000
Total Construction costs	\$2,993,660
Grand Total Construction Costs	\$4,764,765

3. Educational staffing will increase slightly to serve an additional one million visitors that are expected to visit the *Mississippi National Center, Education Center, and Exhibition Gallery*. The Educational and Visitor Services staffing table that follows replaces the Division of Interpretation and Visitor Services staffing table on page 93 in the CMP.

Staffing of the *Mississippi River Education Center* would be provided by MNRRA, SMM, and other partners. MNRBA would staff the basic operation and administration of the center, approximately 1/2 of the programming, and would staff the center when open on weekends and during other heavy use periods for drop-in visitation. The SMM would provide staff for about 1/4 of the programming. St. Paul Parks and other partners would provide staff for the other 1/4 of the programming. Staffing for the *Mississippi River National Center* would be provided by the NPS and its cooperating association. Staffing for the *Mississippi River Exhibition Gallery* would be provided by the SMM.

4. The other recurring annual operational costs that are shown below in 1996 dollars that will need to be adjusted for inflation.

Lease of space for <i>Mississippi River National Center</i>	\$56,000
Annual change, updating, and maintenance of the <i>Mississippi River Exhibition Gallery</i> exhibits	\$50,000
Maintenance of the <i>Mississippi River Education Center</i>	\$92,000
Total for operational costs other than staffing	\$198,000

5. The Proposed Development (page 54) and Preliminary Partner Responsibilities (page 56) sections of the CMP will remain as shown with the Mississippi River Education Center substituted for the interpretive center/administrative headquarters, except as specified below:

- location of particular program areas within the building will be determined by future design work.

- Use of water as a unifying element in the building, and a plaza with a water feature will be determined by future design work.
- Parking will be provided for approximately 50 cars with provision for bus loading and parking. Large expanses of asphalt will be avoided. Location and number of lots will be determined by future design work.
- The City of St. Paul will provide docking space on the Harriet Island Park public dock as needed for programs being offered from Mississippi River Education Center. Details and schedules for the docking space will be negotiated.
- Since the partnership with the SMM and the City of St. Paul has been established to provide programming from the Mississippi River Education Center, the NPS will not actively seek a complementary interpretive facility on site or adjacent land. The NPS will continue to work with the City to encourage complementary development in the area of the Education Center.

6. This amendment adopts the details of this partnership as further described in the document attached to this amendment, "Mississippi River Educational Partnership," dated June 12, 1996.

LEGAL COMPLIANCE

NPS staff has determined that no additional environmental impact analysis is necessary as a result of this amendment to the MNRRA CMP. An environmental impact statement was prepared in association with the CMP that complies with requirements of the National Environmental Policy Act (NEPA) and its implementing regulations and guidelines. No additional analysis is needed for the following reasons:

- The Mississippi River Education Center would be constructed on the same footprint as the Harriet Island Interpretive Center described in the CMP. This smaller facility would have similar, but smaller environmental impacts (primarily during construction).
- Environmental impact analysis for construction of the new Science Museum will be conducted under applicable laws before construction begins. No adverse impacts over-and-above those for construction of the building are expected for development of the Mississippi River National Center and the Mississippi River Exhibition Gallery.
- Development of outdoor exhibits and classrooms is not expected to result in significant environmental impacts. If necessary, additional environmental impact analysis of these developments will be conducted when plans and sites become more defined.

The amendment complies with requirements of Section 7 of the Endangered Species Act. Since actions proposed in the amendment are materially similar to those proposed in the CMP, the environmental impact statement's findings that listed species will not be adversely affected remain valid.

The amendment also complies with requirements of Executive Orders 11988 (Floodplains) and 11990 (Wetlands). No National Park Service construction is proposed that would adversely affect floodplain or wetland values.

As a part of preparing this amendment, the NPS consulted with the Minnesota State Historic Preservation Office (SHPO). Based on the consultation, it was agreed that additional SHPO review of outdoor exhibit and outdoor classroom actions will be required after

additional details become available. It was further agreed that additional review would be necessary when more details become available on the design and construction of the Mississippi River Education Center.

Educational and Visitor Services Staffing					
National Park Service Positions	Grade	Salary (1)	Benefits (2)	Support	FTE
Existing Authorized Staff					
Division chief, park ranger	12	\$46,905	\$14,072	\$11,726	1
Interpretive specialist (volunteer development)	9	32,114	9,634	8,029	1
Park Interpreter	5/7/9	16,957	4,817	4,127	.5
Park Interpreter (temporary guides)	5	10,597	3,179	2,649	.5
Additional staff needed to operate the Mississippi River National Center					
Electronic media specialist (4)	11	38,854	11,656	34,714	1
Mississippi River Education Specialist	9	32,114	9,634	8,029	1
National Park Service Education Specialist	9	32,113	9,634	8,029	1
River Educator, temporary	5	42,388	12,716	10,597	2
Coordinator: Partnership, Volunteers, and Scheduling	7	26,251	7,875	6,563	1
Additional staff needed for other cooperative programs and facilities					
Heritage Education Specialist	11	38,854	11,656	9,714	1
Interpretive specialist (neighborhood outreach)	9	32,114	9,634	8,029	1
Interpretive specialist (special populations)	9	32,114	9,634	8,029	1
Park Interpreter	5/7/9	48,171	14,451	12,380	1.5
Park Interpreter (temporary guides)	5	31,791	9,537	7,948	15
Total	N/A	\$202,381	\$181,769	\$605,908	20
GRAND TOTAL NPS STAFFING COST	N/A	N/A	N/A	\$990,058	N/A
<p>1. For unfilled positions, salary shown at step 3 for full performance using salary levels effective January 1996</p> <p>2. Benefits approximated at 30% of base salary</p> <p>3. Support (supplies, materials, training, travel and other expenses) approximated at 25% of salary</p> <p>4. Includes \$25,000/year support costs for hardware and software development and maintenance</p> <p>5. Contract experts would highlight a different National Park or Mississippi River issue each week</p>					

**Mississippi River Educational Partnership
Science Museum of Minnesota
Mississippi National River and Recreation Area
June 12, 1996**

VISION

To bring together the Science Museum of Minnesota (SMM) and the Mississippi National River and Recreation Area (MNRRA) in a partnership that enhances the power of both to interpret the entire Mississippi River and its watershed, particularly the stretch in the Twin Cities metropolitan area.

The Science Museum of Minnesota brings:

- a great city location;
- a large established general audience;
- a research focus on riverine systems;
- first-quality exhibit development skills;
- a rich array of camps and classes serving schools and families; and
- the ability to raise funds from private sources.

The Mississippi National River and Recreation Area brings:

- a great river-side location near the Lilydale flood plain forest;
- standing connections to interpretive sites along 72 miles of the river plus three other units of the National Park System along the Mississippi (Effigy Mounds National Monument, Jefferson National Expansion Memorial and National Historic Site, Jean Lafitte National Historical Park and Preserve);
- the ability to raise funding from park service sources;
- a potential audience of adults and families interested in natural and cultural history and outdoor recreation; and
- its connection to the National Park Service with its world-wide reputation for quality educational programs & visitor experiences.

The SMM and MNKRA will form a partnership to create for the public a unique facility focusing on the Mississippi River featuring:

1. the only national center dedicated to interpreting the Mississippi River;
2. a one-stop information center for planning trips to places of interest along the Mississippi, to national parks; and to related sites world-wide;
3. a rich and wonderful exhibition gallery on the history, ecology, and economics of the Mississippi River and Watershed;
4. a shared, in-town, riverside, group programming center and trailhead;
5. connections with organizations and individuals throughout the United States that focus on the Mississippi River and its watershed;
6. increased political and financial potential for developing outdoor exhibits and programming
7. along the river (for instance, River Park); and
8. enhanced programming to serve families and other diverse audiences;

PARTNERSHIP

The SMM and MNRRA, part of the National Park Service, will collaborate to:

Develop a 2,000 net square foot Mississippi River National Center located within the new Science Museum to be built on a river bluff in downtown Saint Paul. Open to the public without charge, the Center will serve people interested in finding out about:

- the Mississippi National River and Recreation Area;
- regional and national organizations and programs that interpret the Mississippi River and its watershed;
- ongoing and recently completed scientific and environmental research on the watershed; and
- national parks and selected local, regional, and national public recreation areas;

Develop a 5,000 net square foot Mississippi River Exhibition Gallery located within the fee area of the planned new Science Museum to interpret the Mississippi River Watershed with an emphasis on the area defined by the confluence of the Minnesota, the Mississippi, and the St. Croix rivers. An additional 1000 square feet of exhibits will be outside the new Science Museum and accessible without charge.

Develop a 6,700 net square foot Mississippi River Education Center located on Harriet Island within Harriet Island/Lilydale Regional Park that will support MNRRA, SMM, Saint Paul Parks and Recreation, and other organizations in their delivery of river-related and environmental programming to groups of school children, families, and adults.

Enter into partnership with the City of St. Paul to plan, to raise funds for, and to develop expanded outdoor exhibits, classrooms, and programs on both sides of the Mississippi River, focusing on River Park and the Kellogg Boulevard River Overlook near the new SMM building on the east side and on Harriet Island/Lilydale Regional Park on the West Side.

Mississippi River National Center

Located on the lobby of the new Science Museum, the Mississippi River National Center, operated by the National Park Service and identified by its arrowhead logo, will provide a unique introduction and starting point for visitors interested in learning about and exploring the Mississippi River. The National Center will feature a wide range of experiences and materials that cover the entire river and its watershed, especially highlighting the section of the river flowing through the Twin Cities metropolitan area that was designated in 1988 as the Mississippi National River and Recreation Area. Most information and materials will be provided free of charge, books, maps, software, and other park- and river-related materials will be offered for sale.

Along with information about MNRRA, visitors will be able to collect materials and to learn about all 369 units of the National Park System. This unique opportunity will be offered nowhere else in the world! Uniformed National Park Rangers will assist visitors as they use the National Center. The latest technology will provide access to an incredible wealth of information about these resources.

Visitors will be able to choose from these resources within the National Center to gather information about the Mississippi River and National Parks.

Orientation This will be the starting point for visitors who want to learn about the Mississippi River. The range of experiences inside the Science Museum — the Mississippi River Exhibition Gallery, special programs and performances, and the National Center itself— will be promoted. Also highlighted will be an orientation to MNRRA and educational experiences about the river. Models will show the three rivers in the metro area and the entire Mississippi River watershed. Interactive stations will provide information about Mississippi River attractions and programs and about National Park areas. Educational experiences will be highlighted.

Trip Planning A full range of materials will provide information for those planning a trip through the watershed, to one or several units of the National Park System, or to other areas with a similar focus

world-wide. Visitors will be able to send an electronic inquiry to hundreds of sources of information. National Park Rangers will help visitors gather the resources they need to plan exciting adventures. Students can collect resources in this area to prepare reports on the Mississippi River and National Parks.

Take-home Materials Books will reveal the many aspects of the Mississippi and the diversity of the National Park System. Maps will guide the adventurer by foot, automobile, or watercraft. Videos and software will bring possibilities to life. Brochures from National Park areas, attractions, and river towns will provide site-specific details. Many of these materials will be provided free of charge, others will be available for purchase.

Guest Appearances Each week, the spotlight shines on a different river attraction, educational program, park, or resource. Experts on the subject give programs in the National Center, the Mississippi River Exhibition Gallery, or elsewhere in the museum. Associated with these programs are special exhibits, audiovisual presentations, and collections of resource materials. This area will tap expertise from across the country and, occasionally, from elsewhere in the world.

Twenty-first Century Library This resource area will focus on providing access to information about current river and park issues using the best technology available. It will highlight information for citizens wishing to become involved in caring for the river. Much of this information will also be placed on the World Wide Web. Students will be able to collect specific, up-to-the-minute data for in-depth study of the Mississippi and National Park System sites. They will also be able to communicate electronically with professionals managing these resources.

Resource Science Update This area will highlight current river and park research and provide a listing of opportunities for youth and adult science learning.

In summary, the Mississippi River National Center will be a dynamic place that provides up-to-date information using technology designed to serve the individual needs of visitors. As compared to more traditional National Park Service visitor centers, the Center will provide a more integrated, service-oriented approach. Up to date

information technology will serve visitors' individual needs. Each visit to the Center will be an immersion in the sights and sounds of the magnificent Mississippi River and our cherished National Parks.

Mississippi River Exhibition Gallery

It is easy to rely on superlatives to describe the Mississippi River. It is such a long, large, wide, deep river! But impressive statistics can just as readily obscure as illuminate the river that is the heart of the North American continent. The Mississippi River is an amazing mix of complexities and subtleties.

The Mississippi River is both an ancient and a young river. It has changed enormously over long lengths of geologic time, but change has never been so dramatic nor so abrupt as over the past 150 years. It has been a locus for human settlements and a conduit for human commerce for at least 12,000 years and now is part of a vast commercial network of global proportions. Reflecting its vast and varied watershed, it is home to a wealth of biological diversity and fecundity which presently suffers from the actions of the highly industrialized society that has greatly altered both the river and its basin.

The Mississippi River Exhibition Gallery is an exhibition designed to provide visitors with an intimate appreciation of this waterway. The subject matter is the whole river, but it will focus most on the Upper Mississippi River (above St Louis) and especially on the stretch of river directly outside the windows of the Gallery and within the Twin Cities metropolitan area. The exhibition will take advantage of its location between two major tributaries of the Upper Mississippi (the Minnesota and St Croix Rivers) to explore the concept of watersheds. Visitors will not only learn about the Mississippi River, but also use the river to explore the scientific techniques we use to study rivers everywhere.

A river seems a magic thing. A magic, moving, living part of the very earth itself —for it is from the soil, both from its depth and from its surface, that a river has its beginning.

Laura Gilpin, *The Rio Grande*. 1949.

Exhibition Location and Character The exhibition will be located in the 5,000 net square foot gallery that forms the entrance to the fee area of the new Science Museum. This gallery connects to a large outdoor terrace that overlooks the river and river valley. An additional 1000 net square feet of exhibits will be located in free

areas such as on the Kellogg Boulevard River Overlook and within River Park, a new public area located on the river bank in front of the new Science Museum.

The exhibition is planned to combine a high percentage of interactive components (that encourage visitors to learn actively through demonstration of phenomena and testing theories) within a rich environment of objects, photographs, and human stories. Over the ten-year lifespan of the exhibition, MNRRA and the SMM will implement regular changes to keep the exhibition content current with ongoing research on the Mississippi River and to provide new experiences for returning visitors.

Project Mission The Mississippi River Exhibition Gallery will connect visitors to the Mississippi River through the telling of its stories and through the use of the river to explore the science of rivers and watersheds. Through the integration of these two approaches, visitors will come to appreciate how people shape the river and how the river influences people's lives.

Project Themes The Gallery will address two overarching questions — "What is the Mississippi River?" and "What is the future of the Mississippi River? The first question will explore the many intricate and intermingled physical and human attributes that collectively constitute the Mississippi River. The second question will build on the insights derived from the first in an effort to define some of the trends, both positive and negative, that are likely to shape the character of the river for years to come. Key concepts and questions will expand on the project themes. They will be used to identify and delineate the particular exhibit components and programs that will comprise the Mississippi River Exhibition Gallery.

What Is The Mississippi River? Where Did the River Come From? How long has the Mississippi River existed? What were the geologic processes that brought it and its watershed about? How do Native Americans explain the origins and existence of the river? How has the river changed from pre-glacial to glacial to post-glacial times? Will there always be a Mississippi River?

- The Mississippi River and its watershed is a complex, changing, physical and biological system.

- The Mississippi River has been and continues to be a catalyst for human economic, social, and cultural activity.

Peoples of the Great River Archaeologists have found evidence of human occupancy along the Mississippi River going back at least 12,000 years. What is it about the Mississippi that has made it an attraction for human endeavors since people first set foot in North America? From Cahokia of 1100 AD to Minneapolis/Saint Paul of today, why do major cities tend to be found adjacent to waterways? How did peoples of the past use the Mississippi River and how do these activities contrast and compare to how we use the river today?

Mississippi River in Our Hearts and Minds The Mississippi River is the subject of a remarkable quantity of music, literature, art, and crafts. It is also an international icon. Why is the Mississippi River known around the world? Why does this river exert such a strong effect on the human imagination? What do these outpourings of human creativity reveal about what we think and feel about the river?

The Working River The present-day Mississippi River is a significant locus for human enterprise in the Upper Midwest. From Minneapolis to St Louis, thousands of barge tows every year ply their way along the nine-foot navigation channel. How does the river work as an artery for commerce? How do locks and dams work? What are the "rules of the road" on the Mississippi River? What are the commodities that move up and down the river and why is water the preferred way of transporting such commodities rather than highways, railways, or the air? In what ways does the Mississippi River connect the center of the United States to the rest of the world?

Drinking the River The Mississippi River is central to our lives not only for its commercial role but because for many of us it serves an absolutely vital need — a source of drinking water. Millions of Americans rely on the river for bathing, washing, cooking, drinking, and many other household needs. Keeping the river clean is not just a nice thing for the environment but is essential for the health of all of us who count on this water supply. How is Mississippi River water treated to make it potable?

What are the contamination threats to drinking water? What can be done to ameliorate them?

How Do Rivers Behave? It is easy to think of rivers merely as channels filled with water flowing downhill because of the pull of gravity, conduits that collect water and sediment shed from surrounding lands and then carry them away. In reality, rivers are remarkably complex because they have their own discrete set of physical conditions that vary over both time and space. The quantity of water being carried by a river, its velocity and sediment load, the composition of the river bed and banks, and many other factors influence the behavior of rivers. What are the mechanics of how rivers and their watersheds work? What are the causes of great river floods, what changes do they make in river forms and dynamics, and how does life along the Mississippi change with them?

A Biological Bounty Historical accounts tell of an incredible abundance of fish, mussels, waterfowl, and other animal life. What accounted for this astonishing productivity and diversity of life in the Mississippi River? The river was and continues to be a major route for the passage of animals north and south through the North American continent. Why and how does the river act as such a powerful ecological focal point? What are some of the ways in which the river and its watershed are linked to the ecological processes taking place hundreds and even thousands of miles away?

How Do We Know What We Know? How do we develop scientific understandings of the complex and ever-changing biological and physical interactions that are a river? What are the tools and methodologies applied by scientists to the study of rivers? Using case studies from the Mississippi River and other rivers in Minnesota, what are some of the major scientific investigations currently ongoing and what are some of the big unanswered questions about how rivers behave that are still waiting to be investigated?

What is the Future of the Mississippi River? Can I Eat the Fish? Fishing is a very popular recreational activity along the entire length of the Mississippi River. In many locations, unfortunately, fish consumption advisories have been posted, warning people about

the types and sizes of fish likely to contain elevated levels of contaminants, such as PCBs and mercury. Many of these contaminants are found in the water of the river itself in very small quantities. How can minute amounts of toxic substances become concentrated in the bodies of fish and other aquatic animals? What does this "bioaccumulation" reveal to us about how human contaminants migrate through ecosystems? What can be done to address this problem?

- Humans have become the dominate agent of change for the Mississippi River and its watershed.
- The character of the Mississippi River in the future largely will be the result of human decision making.

The Long Reach of the River In the early 1970s, scientists discovered an area in the Gulf of Mexico with very low concentrations of dissolved oxygen in the water. The Dead Zone (virtually devoid of fish, shrimp, and other aquatic life), has in recent summers covered over 6,000 square miles, an area 1.5 times the size of the nine-county Twin Cities metropolitan area. Scientific research indicates that the Dead Zone is the result of an ecological chain reaction set in motion by excessive nutrients spilling into the Gulf from the Mississippi River, the majority of which enter the river in the Upper Midwest. How are the health of the Mississippi River and the Gulf of Mexico dependent on one another? What is the role of the Upper Midwest in helping to address an environmental problem over 1,000 miles away?

Is the River Dying? Year by year, scientists are noting a steady decline in the biological diversity and productivity of the river, especially along portions of the Upper Mississippi River. Are these natural fluctuations or is the river ecosystem in danger of collapse because of human alterations of the river and its watershed? How significant are these changes to the continued ability of the river to sustain its complex ecosystem and maintain those qualities that make the river so appealing to people? What does it mean to say that the river is dying? Can a river really die?

What is the Future of the Mississippi? Humans are the most significant agent of change on the globe, and this is no less true in the watershed of the Mississippi River. The Mississippi River of the future will be a river largely shaped by human activity, either

inadvertently or by design. What kind of river do we want? The river is home to otters and eagles and is an international superhighway for agricultural commodities. How do we reconcile the diversity of visions for the river? How is society's ever-increasing scientific knowledge and technological prowess shaping the ways in which we envision the river's future?

Mississippi River Education Center

Located within Harriet Island/Lilydale Regional Park, the *Mississippi River Education Center* will offer a robust and varied collection of educational programs about the Mississippi River. Programs will be designed to combine indoor, structured learning with experiences on the river or in the many outdoor classrooms to be found in and around the park. The *Education Center* will include a water lab, wet room for water-oriented programming, computer stations, multipurpose program rooms, multipurpose auditorium, a multipurpose room for river-related community meetings and drop-in visitors, rest rooms, and storage and staff space. The *Education Center* will have access to docking space on the river.

The primary audiences of the *Education Center* will be schools and other organized groups. Programs will also be offered for youth and for the general public. Most programs will be offered by reservation only. The *Education Center* will be open to the general public on a drop-in basis during special events and during park high-use periods.

The *Education Center* will be built and operated by MNRRA. A professional staff of National Park Service educators will provide programming at the Center. The SMM will provide registration and booking services. The SMM and Saint Paul Parks and Recreation will be major programming partners. Other possible partners include commercial boat operators, educational institutions, and not-for-profit neighborhood groups. Programs will be offered individually by these groups or by two or more in partnership. The programs offered will all be educational programs relating to the Mississippi River and MNRRA's interpretive themes. Many programs will charge a fee, others will not. Another major use of the center will be for community meetings, workshops, conferences, and seminars related to the river.

Programs at the *Education Center* are generally aimed at combining indoor instruction with use of "classrooms" located outdoors along the river and in the parks. Since the focus is on the river, almost all of these programs will originate in the open water season between April and November. To enhance its identity as a site for *Mississippi River Education*, the *Education Center* should be connected to the greatest extent possible by proximity and line-of-sight with the

river. MNRRA education staff will be housed within the *Mississippi River Education Center* but the Administrative headquarters for MNRRA will continue in leased space.

Listed below are sample programs that could be offered at the *Education Center*.

Guided Programs on the Mississippi River Participants in these programs would explore different aspects of the river. Trips ranging from one hour to day-long would begin with orientation and instruction in the *Education Center* followed by on-river experiences from the Harriet Island/Lilydale Regional Park Dock. Transportation would be provided by commercial boat operators and other private boat owners.

Program hosts: MNRRA, SMH & other partners.

Guided Programs to Lilydale an urban wilderness At the *Education Center*, these programs would start with orientation and indoor instruction. They would then move to outdoor classrooms at the quarry, flood plain forest, and reclaimed residential area.

Program hosts: MNRRA, Saint Paul Parks, & other partners.

Mississippi River Science These two hour boat trips offer hands-on-learning experiences that will foster in student participants a sense of awareness of river ecosystems and connection with the river environment. Through interactive learning stations, students organized into cooperative groups will learn first hand about the geological origins of the Mississippi River, learn to identify the principal riverine ecosystems and some of the plants and animals that live in them, monitor the river's health, and learn about current issues related to the river and its watersheds and what we can do about them. Structured learning experiences in the *Education Center* complement the time on the river. For grades 4-8.

Program hosts: MNRRA, SMM, commercial boat operator, & other partners.

National Parks Educational Sampler A few of the best education programs from 369 National Park Areas would be offered at the *Education Center*. These programs would be related to the MNRRA

themes and would change yearly. This would offer participants a chance to learn about other National Park areas.

Program host: MNRRA.

Eye on the Mississippi The *Education Center* would be a staging area for this program that is connected to exhibits in the Mississippi River Gallery. Volunteers would take daily research trips on the river. The *Education Center* would be used as a place to process data collected, prepare samples, and store equipment.

Program host: SMM.

Urban Park Interpretation Program Urban students, particularly culturally diverse populations, have not traditionally had the opportunity to participate in environmental education, classes, and field trips. In this program, urban high school students would be trained to provide park-based environmental instruction for elementary school students in this park and in other parks in Saint Paul and Minneapolis. Besides receiving direct training on environmental issues, the high school students would be exposed to a variety of natural resource, horticulture, zoological, and other related professions often under represented within culturally diverse populations. Working with these professionals, students will participate actively in resource management and restoration programs within Harriet Island/Lilydale Regional Park and the other parks.

Program host: Saint Paul Parks.

Summer Science Day Camps One-week summer camps would be held at the *Education Center* as scheduling permits. Camps would have a strong environmental focus with river ecology and stewardship a principal theme. Each camp would accommodate a maximum of 45 participants who would pay a registration fee.

Program hosts: SMM, MNRRA, Saint Paul Parks, & other partners.

Overnight Mississippi Camp-ins A number of weekend evenings in the summer, fall and spring would be reserved for group or family camp-ins based at the *Education Center*. This fee-based program would focus on hands-on activities that introduce

participants to a broad range of river topics, including riparian and riverine environmental and ecological issues, river stories and music, as well as geology of the river valley.

Program host: SMM & MNNRA.

School Group Tours With over 170,000 school children visiting SMM annually and over 200,000 projected once the new SMM is opened, it is highly probable that a portion of those school groups would be interested in spending up to several hours at the MNNRA education facility for a Mississippi River program. Fees could be charged.

Program host: SMM, MNNRA, & Saint Paul Park.

Teacher Workshop Series An annual series of quarterly one-day workshops for elementary teachers would be offered that cover a wide range of river topics. These would be seasonal workshops that focus on specific themes that have broad application in the K-6 curriculum. This quarter of workshops would serve as a core set offered each year for a limited number of teachers (25-30 per workshop). Along with the workshop, SMM and MNNRA would develop some classroom materials and activities that teachers would incorporate in their ongoing curriculum. These workshops would be developed to stimulate a cadre of trained teachers to use the river as a theme throughout their classroom activities. The workshop series would be a fee-based program.

Program hosts: SMM, MNNRA, Saint Paul Parka, & other partners.

Week-long Science Residencies The Investigators' Club Program at the Science Museum offers academic-day enrichment programs to gifted and talented youth from area schools. Investigators' Club classes are 10 hours long with focused inquiry activities around a specific topic. Classes would be taught by museum teaching staff team teaching with National Park Service educators. A classroom facility on the river would offer a superb opportunity to explore the Mississippi River through laboratory and field exercises — an opportunity not offered in our metro area. A class would address the questions about river health, ecology, the source and impact of pollution, the river and the growth of the city, fish and their ability to thrive in the river. It would provide hands-on training in the use

of equipment techniques, and principles that are fundamental to both freshwater and marine ecology. The Investigators Club would be a fee-based program.

Program hosts: SMM & MNRRA.

Weekend Youth and Family Workshops/Field Trips Each weekend, special family programs would be offered at the *Education Center* that would incorporate the broad range of river topics of interest to the general public. Sample programs include "Fossil Findings for Families," "Mississippi River Tales," and "Ancient Peoples of the Mississippi — An Archaeological Field Trip." These would be fee-based programs.

Program hosts: SMM & MNRRA.

Mississippi River Institute for Teachers This two-week, graduate level, institute would bring together environmental educators, university researchers, and elementary/middle school teachers for a summer institute to explore river-based curricular materials, current environmental/ecological research and issues impacting the Mississippi and other river systems, as well as river studies drawn from literature and the arts. The River Institute would be based at the education facility with field trips to research sites and other educational/laboratory facilities as needed. National funding would be sought for this project.

Program hosts: SMM, MNRRA, SL one or more institutional partners, including Hamline University's Center for Global Environmental Education and the University of St Thomas.

Tri-Rivers Leadership Development Camp This three-week youth camp would enable young people in Minnesota to learn about and develop educational projects focusing on the ecological and environmental issues and concerns regarding the St Croix, the Mississippi, and the Minnesota rivers. The camp would foster increased and active youth stewardship of Minnesota river systems through involving its participants in experiential environmental education activities related to these, three river systems. For three weeks each summer up to 30 high school students from throughout Minnesota (perhaps the region) would camp and learn together in various locations around the state using the three rivers as "outdoor

laboratories." Camp participants would study the natural and current physical conditions of these three water resources and would be trained in water monitoring techniques. Rural and urban site visits to industries (agriculture, business, and recreation) that are dependent upon and influence each of the three watersheds would also be at the core of the daily programming. The camp would use the *Mississippi River Education Center* for its base and would spend approximately one of the three weeks around or at the *Education Center*. The camp would be developed and offered initially through a grant, but would be structured to become a self-supporting camp.

Program hosts: SMH, MNRRA, & other partners.

Riverboat Rendezvous This summer event aims to reveal the economics and lifestyle of river commerce. Towboats, barges, paddle wheelers, and other boats would converge on Harriet Island/Lilydale Regional Park. The public would get a chance to meet and talk with pilots and deckhands during a visit. Many of the boats would be open for a tour, exhibits would link the boat to the economy of the river. Programs of river music, skills, and stories would be provided. The *Education Center* would be open to the public with special exhibits and programs.

Program hosts: MNRRA, SMM, Saint Paul Parks, commercial boat operators, & other partners and sponsors.

Summer River Fest Each summer SMM and MNRRA would plan and host a major river festival that would span both sides of the Mississippi. The Celebration Plaza at the riverfront museum would be one performing stage with the *Education Center* offering a variety of drop-in mini classes, lectures, demonstrations, and exhibits.

Program hosts: SMM, MNRRA, City of Saint Paul, & other partners and sponsors.

Outdoor Exhibits and Programs

MNRRRA and the SMM will join with the City of Saint Paul to plan and to raise funds over the next ten years for the development of expanded outdoor exhibits, outdoor classrooms, and outdoor programs about the Mississippi River and the Mississippi Watershed for pedestrians and park users. The exhibits will be concentrated in three areas: on the Kellogg Boulevard River Overlook near the new Science Museum, within River Park the parcel of land lying between the relocated Shepherd Road and the Mississippi River stretching from Head House down river and to the South of the Science Museum, and within Harriet Island/Lilydale Regional Park. The outdoor classrooms will be concentrated within Crosby Farm–Hidden Falls Park and Harriet Island/Lilydale Regional Park. The outdoor programs will be concentrated within River Park and within Harriet Island/Lilydale Regional Park.

Kellogg Boulevard River Overlook Exhibits located off Kellogg Boulevard near the new Science Museum will orient pedestrians to the river scene they see spread out before them and introduce them to some of the natural and human activity going on there. For instance, a three–dimensional map of the river valley might be used to help users identify both landforms and landmarks. An illustration might show the site when the channel of the great River Warren covered much of the land between the river bluffs. A large windmill/weather vane might identify prevailing wind patterns in the river valley and along the bluffs.

River Park Occupying a large wedge–shaped piece of land bounded by the relocated Shepard Road and the bank of the Mississippi, River Park is the terminus of a public causeway leading from the city center, linked by bicycle and walking paths to Crosby Farm–Hidden Falls Park and Minneapolis upstream and Pigs Eye Lake and the metro waste water treatment plant downstream.

The goal of River Park will be to provide linkages, new connections between the City of Saint Paul and the river that is its reason for existence. These linkages will connect the historical industries that lined the rivers edge and the neighborhoods that grew up around them. They will also connect park visitors and the full meaning of the place that they are exploring.

River Park will bring visitors almost to the point of getting their feet wet in the river, a series of scale maps and relief's might help visitors see that they are standing on the river's flood plain, on America's middle coast, on a northern bank of a river that unites Minnesota to the Gulf of Mexico, on a vast watershed that drains more than half of the land mass of the United States. An armillary sphere (a kind of celestial sun dial) could help them understand that they stand at 45° North, exactly midway between the equator and the north pole, almost twice as far north as the spot where the sun pauses at the summer solstice and begins its journey south again. Interpretive gardens of native wetland, flood plain, prairie, and savannah species could help them see that they are part of an extended and varied web of life nourished by the river.

Head House is an historic structure on the river bank that once weighed grain stored in a great array of elevators and discharged it into waiting barges. Head House could be renovated as a site for visitor experiments on the physics and biology of the river and presentations on the site's industrial history. The tower could become a high vantage point for Saint Paul visitors to observe the sweep of the river's course, the high bluffs that marked the edges of the prehistoric River Warren, and the commercial traffic that still moves along the river.

Harriet Island/Lilydale Regional Park and Crosby Farm Regional Park The regional parks on both sides of the Mississippi River in Saint Paul offer an exceedingly rich environment for the exploration of river dynamics, river ecology, and the ecology of the flood plain. They are full of natural outdoor "classrooms" in which groups may meet for investigation, study, and discussion. They are linked with a network of walking, hiking, and bicycle trails to important physical reminders of Saint Paul's past and present — from the Lilydale brick yard to the NSP High Bridge electricity plant to Pigs Eye sewage plant. They provide opportunities to learn through recreation and to enjoy a near wilderness within an urban setting.

Saint Paul Parks, MNRRA, and the SMM will collaborate in developing exhibits and support facilities that help interpret this wealth. A series of trailhead kiosks can point out environmental features to be found on local walks. Markers can help interpret both the industrial archaeology along the river and the artifacts of current commerce. Supporting infrastructure can be developed to

make the outdoor classrooms easier to use and more accessible to all visitors. And care can be taken to preserve the wildness of the natural environment while helping the curious experience its nature.

MNRRRA COSTS AND ATTENDANCE

The table below summarizes estimated NPS construction, staffing, operating costs, and attendance for the Mississippi River Educational Partnership. These are rough estimates developed by the NPS that will need to be revised after additional design work is completed. The attendance estimates for the Mississippi River Education Center were made by comparing it to similar facilities in the Twin Cities and in other NPS areas. Attendance estimates for the Mississippi River National Center and for the Mississippi River Exhibition Galley were provided by the SMM based on past attendance at SMM.

Cost* and Attendance of MNRRA components of the partnership with the SMM					
Component	Size in net square feet	Construction Cost	Operating Cost/year	Staffing cost/year	Estimated Attendance /year
Mississippi River National Center	2,000	\$571,105	\$56,000	\$275,479	300,000- 400,000
Mississippi River Exhibition Gallery exhibits	3,000	\$1,200,000	\$50,000	0	1,000,000
Mississippi River Education Center	6,700	\$2,993,660	\$92,000	\$266,617	28,000-40,000
Totals	11,700	\$4,764,765	\$198,000	\$542,096	1,328,000- 1,440,000
Grand Totals MNRRA Cost		\$4,764,765	\$740,096		
*All costs are in 1996 figures and will need to be adjusted for inflation.					

A Walk through the Mississippi River Exhibition Gallery

The face of the water, in time, became a wonderful book—a book that was a dead language to the uneducated passenger, but which told its mind to me without reserve, delivering its most cherished secrets as clearly as if it leered them with a voice. And it was not a book to be read once and thrown aside, for it had a new story to tell every day.

Mark Twain. *Life on the Mississippi*. 1883.

The brief description below is intended to provide a sense of the experiences that you, the visitor, might enjoy while wandering through the indoor portion of the future *Mississippi River Exhibition Gallery*. This hypothetical walk-through is not meant to describe the specific components that will appear in the exhibit because these will change as planning for the hall advances. It is rather to provide an impression of the rich mix of learning opportunities that the new gallery will provide its estimated 1,000,000 annual visitors.

After visiting the *Mississippi River National Center*, you decide to learn more about the river by exploring the nearby *Mississippi River Exhibition Gallery*. As you walk toward the Gallery, you notice that this 5,000 net square foot hall holds the unique position of being the only exhibition space on the main floor of the new museum. This gallery dedicated to the Mississippi River is the first exhibit experience museum visitors have. At the entrance to the Gallery, you notice that its prime location is further enhanced by walls of windows on three sides that offer outstanding panoramic views of the Mississippi River as it winds past downtown Saint Paul. You take a moment to peruse a quick introduction that helps you grasp the overall organizing concepts of the hall before entering.

Upon entering the Gallery you are drawn to a large mask reminiscent of a Mardi Gras float. Stepping closer, you realize that it is a mask created to embody the "strong brown river god" from a T.S. Eliot poem. Near the poem is a large scroll. It is a recreated portion of Henry Lewis' continuous 1840 panoramic painting of the river from Fort Snelling to New Orleans. You turn a handle that allows you to scroll through the painting and then notice a video monitor to the side of the panorama. The video is a documentation of a revisiting of some of the sites that Lewis painted with a team of

artists and scientists. Around this area are exhibit pieces the team created showing how selected sites along the river have changed in the 150 years since Lewis did his painting.

You next enter the pilothouse of a tug. Peering through the pilothouse window, you take your best shot at piloting your full tow of barges utilizing virtual reality techniques. Watch out for that bridge! Next to the pilothouse is a large capstan and rope used to tie up barges. Large piles of grain, fertilizer and other products help tell the story of the huge role commerce plays on Mississippi River.

Near the pilothouse is the large lock and dam model where you and others get to do more role playing. Someone needs to pilot the barge, someone must steer the houseboat, and of course someone has to operate the lock and dam. Do you all know enough about river navigation to ensure safe and swift movement of boat traffic up and down the river?

Also around the pilothouse are other boats. An old birch bark canoe helps tell the story of the archaeological sites along the Upper Mississippi and what we have come to know about the people who lived in this area as long 12,000 years ago. You rummage through the beaver pelts and other items in the belly of a voyageur canoe and ponder the role of the river in the fur trade that first brought Europeans to this part of the country. A portion of a keelboat helps tell the story of European migration and displacement of native peoples in this part of the country.

You see a large crowd gathering over at the River Lab and stroll over. A volunteer river monitor has just arrived from her morning survey of the Mississippi River in downtown Saint Paul in the Sums lab boat, The River Eye., She begins to set out the things she collected: A sample of beaver musk – she asks how many knew that beavers swim the river here in downtown Saint Paul? Video footage of a Great Blue Heron flying overhead – how many are aware of the large heron rookery only two miles away? A water sample from a storm sewer outflow – how many realize what happens to the water that runs down their streets after a rain? People crowd in to touch, smell, and see all that she has to offer.

At another lab window, you try your hand at purifying Mississippi River water. Taking a fresh sample of river water, you pass it

through various filters and mix in appropriate chemicals. The end product is a cup of clear water for you to drink. Is it safe to drink? What contaminants are easy for conventional water treatment to remove, which are more difficult? You take a sip as you contemplate all the millions of people that depend on this river for all of their household water needs.

After your encounter with the River Lab, you decide to discover more about the forces that shaped the Mississippi River. In particular, you are intrigued by a computer simulation that allows you to move freely back and forth through the past 10,000 years in Saint Paul to see how the river channel has responded to changing geologic and climatic forces. Then you roll up your sleeves and try your hands at shaping a river in a stream table. Increase or decrease the flow of water, raise or lower the slope of the topography, install and/or remove dams and levees – under what circumstances do rivers meander, what are flood plains, where is the fastest water in a river channel?

Near the stream table is an incredibly detailed large satellite image of the watershed of the Upper Mississippi River. With the aid of an associated computer program, you get an opportunity to really grapple with the concept of what is a watershed. With the click of a mouse, you can fly over the entire watershed and visit particular points of interest. You can make it rain over a portion of the watershed and watch the water run off the land and begin its journey downstream. You realize that even though you live on land all your actions eventually have an effect on the river.

After the stream, table and watershed map, you realize that hydrology does not need to be inscrutable and actually is fun, but now it is time to discover more about Mississippi River ecology. Along the windows with their panoramic views of the river are several luxuriant grow boxes. One grow box highlights native prairie plants as would have been found on the bluff lands above the river. A series of grow boxes recreate the cyclical life of a river backwater and the importance of varying water levels on the riverine ecology. As you stand over the grow boxes, you wonder what the area outside the windows once looked like and turn your attention to a flip book in front of one of the windows. Maps, old photographs, historical first person accounts allows you to flip through time.

You hear the sound of bird songs and decide to investigate. Nearby under the canopy of a flood plain forest in the spring, you look up and notice songbird species that move up the Mississippi River Valley during their annual northward migration. Around this glen are other stories about animals that rely on the river. An aquarium holds an Atlantic eel and tell the story of how eels migrate all the way up the Mississippi River from their starting point in the distant Sargasso Sea. Another aquarium holds the endangered skipjack herring and reveals why it no longer is found in Minnesota. Tanks of freshwater mussels tell the story of how these unusual creatures are integral to the ecological well-being of the Mississippi River.

You walk over to a nearby wall where a net is filled with enormous fish such as paddle fish, sturgeon, and catfish. You can have your picture taken next to a replica of one of the giants that was pulled from the river. You hear stories from fishers, see historic photos, and read about life histories of these remarkable animals. You are dismayed to discover that certain species and sizes of fish are not recommended for human consumption along many stretches of the river. An exhibit component reveals to you how extremely small concentrations of toxic substances, such as PCBs and mercury, can accumulate as they move through the food chain.

A large wall of water in the shape of a question mark catches your attention. Upon walking over, you discover that this part of the gallery examines the future of the river and poses the question, Is the River Dying? Video clips allow you to see and hear people with varying experiences talking about their points of view on the health of the river. The story of the ecological collapse of the Illinois River is told and parallels are drawn between the Illinois and the Mississippi. Another component allows you to manipulate a simulation model being developed by scientists to help them better understand the complex behavior of the Upper Mississippi River.

You are drawn to a video monitor showing underwater views of the Dead Zone, an area in the Gulf of Mexico virtually devoid of fish, shrimp, and other sea animals because of pollution from the Mississippi river. You are surprised and dismayed to discover that pollutants from the Upper Midwest bear a significant responsibility for this situation. It is amazing that what happens to the river in Minnesota can matter 1,000 miles away in the Gulf of Mexico.

You notice that in a number of places you are encouraged to record your opinions or vote electronically on various issues. It is interesting to compare your thoughts with the range of views entered by other visitors to the Gallery.

There is still much to see in the Gallery, but the day is beautiful so it is difficult not to want to be outside. You decide to go through the door from the Gallery out onto the 2,000 square-foot plaza immediately adjacent to the hall. The view inside was great but the panorama outside is fantastic. The river in a great ribbon sweeps by in front of you. Telescopes, audio feed from riverboat, radios, and a TV monitor with river traffic information allow you to identify vessels that ply the river, what companies they work for, and what commodities they are carrying. Binoculars, bird books, and other nature guides allow you to observe the birds flying overhead and feeding at nearby stations. You pull a chair up to the railing. You realize that you can learn as much outdoors as in.