CHAPTER 6

Master Plan Recommendations

Overview

The Mississippi Gorge Regional Park Master Plan is a guide for future park improvements and capital investments within the regional park. The proposed park improvements strive to balance the needs of the area's delicate natural resources and the unique river ecology with park programs and healthy recreational activity. Master planning concepts proposed in this plan build on decades of gorge-related planning by neighborhood groups, advocacy groups, watershed districts, and federal, state, and local agencies. The planning concepts are in concert with the plan's vision and guiding principles, reflect community values and desires, and provide specific recommendations intended to fulfill park goals and objectives. This chapter is organized to provide information on park improvements and recommendations using three planning scales (overall master plan approach, focus area recommendations, and parkway and trail recommendations), and are coupled with design guidelines, and public art and interpretation, in later chapters.

Overall Master Plan

This section lays out key components of the master plan's recommendations and addresses the river's character at a high level with and without dams and how these two river futures affect the regional park.

Focus Area Recommendations

This section provides more specific planning concepts for several areas located within the park. These framework plans address park facilities, access and connectivity, natural resources, ecology, interpretation and education, river views and access, amongst other initiatives.

Parkway and Trail Recommendations

This section provides recommendations for parkway improvements and initiatives, including the roadway, medians and boulevards, the adjacent paved trails and sidewalks, and the natural surface trails throughout the park.

Overall Master Plan

Mississippi Gorge Regional Park is a unique and treasured landscape in the heart of Minneapolis and a central feature of the Minneapolis park system and the historic Grand Rounds. It provides valuable habitat for wildlife and recreational opportunities for all residents and visitors to enjoy. Park and recreation opportunities must be appropriately balanced with the protection, preservation, and restoration of the park's natural resources and sensitive river ecology. At a foundational level, the Master Plan for MGRP supports the following MPRB guiding principles and themes from its *2007-2020 Comprehensive Plan*:

- *Urban forests, natural areas, and waters that endure and captivate*
- *Recreation that inspires personal growth, healthy lifestyles, and a sense of community*
- *Dynamic parks that shape city character and meet diverse community needs*
- *A safe place to play, celebrate, contemplate, and recreate*

The master plan also lives up to and reflects the goals, identity, and partnerships created by the overlaid Mississippi National River and Recreation Area of the National Park Service. MGRP's identity should be reflected through the quality of its facilities and programs throughout the regional park. That identity begins by officially naming this regional park. The CAC recommends the MPRB officially name the park as it is commonly known – "Mississippi Gorge Regional Park." It was determined that several other natural areas in the park may also require official naming, including areas commonly known as "Southeast Flats," "Longfellow Flats," and the "Oak Savanna." Throughout this plan these areas are referred to by their commonly used names, but do not suggest their commonly used names are made official. Any name changes or name adoptions will be performed according to the naming policy of the MPRB.

The plan addresses park user needs and values by reflecting community input received throughout the planning process. For instance, the CAC and community has made it clear that the plan must protect, preserve, and restore natural resources throughout the river gorge, including restoration efforts and removal of invasive plant species. More specific natural resource and ecological recommendations will be coordinated with MPRB's *Ecological System Plan and Natural Areas Management Plan*. This master plan also proposes new park facilities and programs that address park user requests, including community gathering spaces, like the outdoor amphitheater and Welcome Center proposed at Bohemian Flats, the labyrinth/peace garden proposed at Riverside Park, and additional picnic facilities at East River Flats. It proposes ways to improve access and connectivity to, from, and within the park, addressing ADA accessible picnic areas and proposed restoration of the historic WPA staircase at Annie Young Meadow, and the entryways to "Southeast Flats" and "Longfellow Flats."

The master plan considers two possible futures for the regional park: with and without the nearby dams. Each future offers different circumstances for the river's character, ecology, and recreational opportunities. These different futures are discussed more on the following pages.

The future of the Mississippi River gorge remains relatively unknown. The United States Army Corps of Engineers (USACE) is currently weighing the costs and benefits associated with maintaining the lock and dams under a no change scenario, disposing of the properties partially, or fully disposing of the properties through their disposition process. Section 1168 of the Water Resources Development Act of 2018 requires that all Corps disposition studies consider removal of structures that no longer fulfill an authorized Federal purpose. Currently, only the Upper St. Anthony Falls Lock and

Dam are going through the disposition study process. Lower St. Anthony Falls Lock and Dam and Lock and Dam No. 1 will be studied in the future. Regardless of the decision, the Mississippi River gorge will remain an aesthetic, recreational, and natural resource amenity within the core of the Twin Cities. The gorge will also continue to provide valuable habitat for urban wildlife and native plant communities. The following section will explore the potential future scenarios, discuss some of the changes that can be expected, identify unknowns, and suggest next steps.

Master Plan Alternatives with Dams

River Character

The geomorphology of the gorge will remain in its current state as an impounded river reach as long as the dams are in place, the most significant change being that the impoundments will continue to fill with sediment. The floodplains, banks, and beaches are expected to remain as they are. Historically, the USACE maintained a navigational channel through the gorge by dredging material out of the river. The navigation channel is no longer dredged upstream of Upper St. Anthony Falls. Both Lower St. Anthony Falls Lock and Dam and Lock and Dam No. 1 are open to navigation, with limited hours of locking operation. A future with dams and without dredging however, would lead to further deposition and accumulation of fine sediment upstream of Lock and Dam No. 1. Long term, sediment deposition may result in island formation upstream of the dams and expansion of some bank areas which may result in changes to the hydrology, ecology, and hydraulics within the gorge upstream of the current location of Lock and Dam No. 1.

Ecology

With the dams remaining, the ecology of the river is expected to remain in its current state. The forested riparian areas within the gorge will continue to be a refuge for urban wildlife and a critical migration corridor for hundreds of species of wildlife and birds. The reach, with a series of impoundments, will continue to sustain the impacts of increased water temperature, decreased water quality, nutrient loading, fine sediment deposition, and habitat degradation, and the dams will continue to be barriers to aquatic organism passage. The river will remain better suited for lake and large river fish species (including invasive Asian carp). Mussels will continue to live in the gorge but will have a difficult time thriving with fine sediment and fish passage barriers. Invasive species will continue to be a management concern.

Recreation

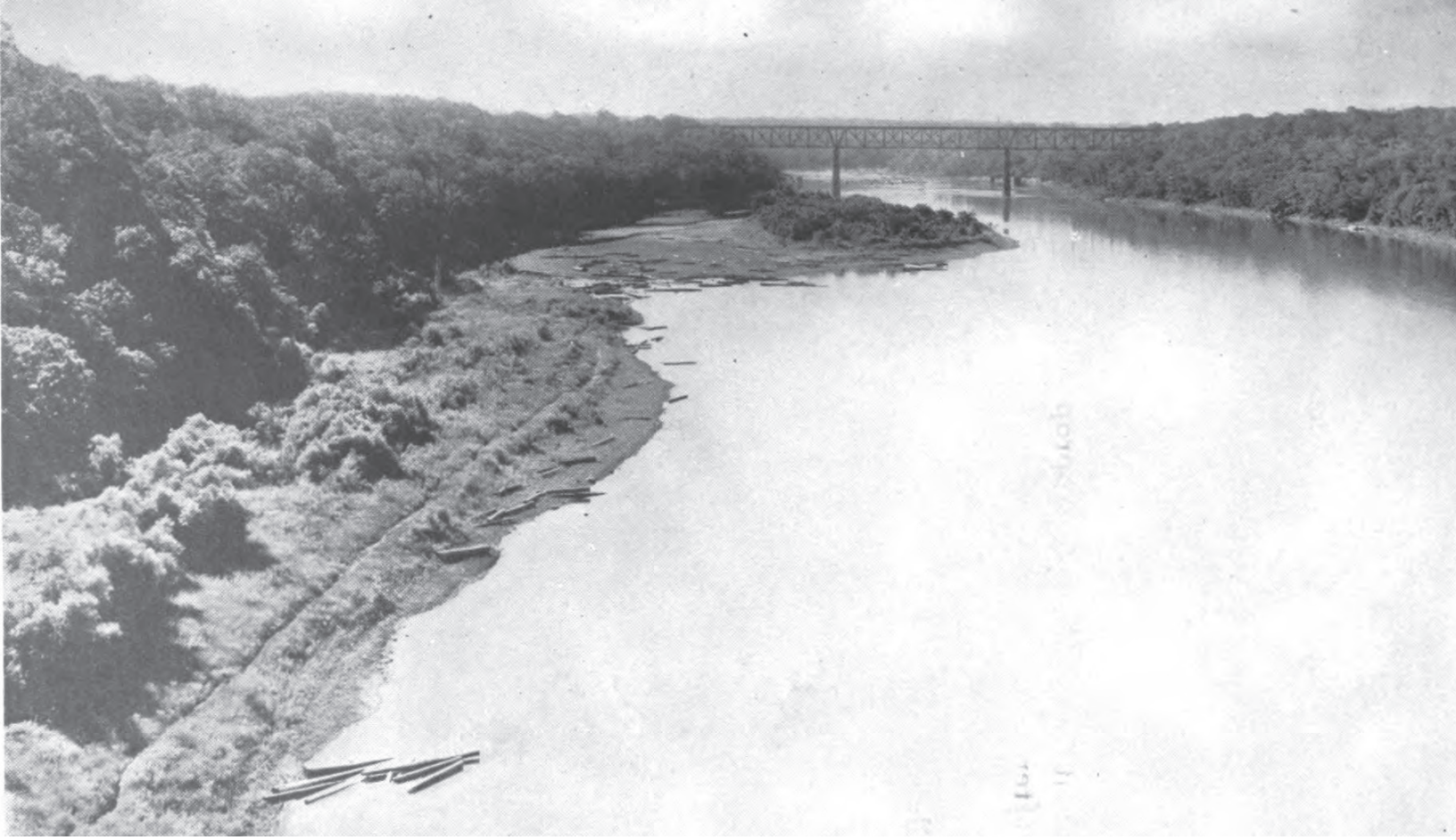
Recreational opportunities along the riparian corridor will be sustained and improved. People will continue to enjoy hiking, cycling, bird watching, rowing and paddling, and fishing. Current recreational boating opportunities will likely remain relatively unchanged for the next decade. Long term, and without dredging, sediment deposition will decrease water depths along depositional segments and riparian wetland vegetation may encroach on boating space especially for the commercial riverboats currently in operation at Bohemian Flats, or decrease water depths, limiting access to certain areas. There will still be natural education opportunities within the park.

Recommended Next Steps

In a future with the dams maintained the following actions are recommended with collaboration between applicable agencies and partners:

» Development of a sediment management plan if the USACE ceases dredging operations upstream of Lock and Dam No. 1
» Invasive species management:
  - Invasive plants (e.g. garlic mustard, honeysuckle, reed canary grass, and buckthorn)
  - Invasive aquatic plants (e.g. Eurasian watermilfoil)
  - Invasive fish species (e.g. Asian carp)
» Riparian corridor improvements - Hardscaped bank treatments (concrete walls, riprap) can be evaluated for replacement by bioengineering alternatives where appropriate.
» Recreational programs and facilities should be maintained and improved throughout the park, with new programs and facilities introduced to respond to changing park user needs.
» Stormwater outfall enhancement.

Figure 6-1. Master Plan Alternatives without Dams



Mississippi River Gorge (Source: Minnesota Historical Society)

Master Plan Alternatives without Dams

River Character

If the dams are removed, the Mississippi River within the gorge will look much different than it does today. More detailed studies would need to be completed to accurately predict the ecological and riverine changes to the gorge, post-dam removals, but anticipated changes based on other dam removals may include:

- The average velocity of the river flow will increase and the average water depth will decrease.
- Impounded sediment management and subsequent exposure of buried geomorphic features such as riffles (rapids), pools, islands, backwater channels, floodplain wetlands and bedrock outcrops , and other items below the surface of the water.
- Historic riffles (rapids) and pools will be exposed as the fine material is carried downstream or removed by mechanical methods. Figure 6-2 shows the Carver Rapids on the Minnesota River, which gives an idea of what some sections of the river might look like post dam removal.
- Historic islands may also be uncovered or formed. Figure 6-3 shows the potential river geomorphology with islands.
- Figure 6-1 shows the historic shoreline from 1895 and what a future shoreline may look like.

Figure 6-2. An example of what the river could potentially resemble if the dams are removed. (Source: earthscienceguy.com)

Figure 6-3. Mississippi River from Marshall Avenue Bridge looking South pre-dam (Source: Minnesota Historical Society)

Sturgeon (Acipenser fluvescens) (Source: United States Fish and Wildlife Service)

Paddling beneath the Ford Parkway bridge (Source: Wikimedia Commons)

Ecology

Based on similar projects completed around the country, the overall ecological health of the Mississippi River through the gorge would be expected to improve with the removal of the dams. The process would require restoration efforts after the removal of the dams to restore and stabilize the newly exposed river banks and manage sediment deposition. Though the river will likely change to a quicker and more turbulent flow, there will still be large amounts of road pollution and trash that will enter the river from stormsewer outfalls during rain events. Anticipated improvements to the ecological health of the river may include:

- Improved water quality (increased dissolved oxygen, decreased biological oxygen demand, reduced water temperatures).
- Restoration of natural geomorphic habitat forming processes (sediment evacuation, exposure of riverine features).
- Improved fish passage through the gorge
- Conversion from stagnant lake habitat to dynamic river habitat (riffles, pools, islands, backwater channels).
- Improved habitat for less tolerant macroinvertebrate species - some mayfly, caddisfly, and stonefly bug species would be able to occupy the gorge again with the presence of shallow oxygenated water.
- Improved mussel habitat and passage of mussel host fish.
- Increased vegetated island habitat area – Improved conditions for native plants, birds, mammals, reptiles, and amphibians.
- Increased natural riparian area – The lowered water levels would expose former wetlands, forested floodplain areas and river banks, which are all important corridor spaces for migrating birds and wildlife, including bald eagles and fishing raptors.

Recreation

Removal of the dams will have an impact on some recreational opportunities. Anticipated changes may include:

- Rowing would likely be eliminated given the activity's spatial needs and maximum water velocity limitations.
- Existing beaches will be farther from the river and at a higher elevation. New beach areas may need to be established within existing park spaces.
- Angling by boat may be limited, but wading fishing opportunities will increase. Fish species will transition to communities resembling those downstream of Lock and Dam No. 1.
- Nature education opportunities will increase within the newly formed natural areas. There will be greater habitat complexity and education opportunities tied to the river's restoration.
- More diverse canoe and kayak opportunities will include some steeper riffle reaches and potential whitewater segments. Paddlers may be able to access new islands exposed following removal of the dams.
- Bird watching opportunities will increase with increased riparian areas and island habitat.
- Natural surface hiking trail space could increase with exposed riverine floodplain area. Existing trails will remain unaffected by the removals.
- River boat cruises and other deep hulled motorized boats will likely no longer remain on this stretch of river.

Recommended Investigation and Studies

Even with historical maps, photographs, and descriptions- suggesting a post dam removal condition of the river, it will require additional data collection and analysis. The following aspects require more field investigation and study to ascertain the anticipated conditions following dam removals. It is important to note that this list and the recommendations that follow would not be the sole responsibility of MPRB, as river management is not within their jurisdiction. Rather, this list captures topics that would likely be in shared interest of multiple agencies and organizations to explore in partnership/ or as a coordinated effort.

» Probing and sediment coring to determine exactly where the historical channel was located.
» Probing of impounded sediment depths and coring of historic surfaces to determine the quantity of sediment that has built up behind the dams.
» Coring and analysis of sediments to determine the character and extent (if any) of contaminants in the impounded sediment.
» Modeling of existing hydrology and proposed hydraulics and geomorphology to determine an appropriate channel size that fits the modern, altered hydrology of the river.
» Determining the extent and composition of the submerged Meeker Dam structure.
» Surveying of all properties, amenities, stormsewer outfalls, power, water, electrical, fiberoptic, and other infrastructure to quantify any engineering needs to protect or move affected infrastructure.

Initial recommended first-steps in the investigation process:

» Dam Removal Feasibility Study
  • Bathymetric and topographic surveying.
  • Hydrologic and hydraulic modeling of proposed conditions.
  • Develop sediment management plan:
    - Estimate volume of impounded sediment that needs to be removed
    - Determine fate of impounded sediment released downstream
    - Sediment transport modeling
    - Sediment contaminate testing
  • Historical Condition Assessment – Includes cultural resources investigation into potential impacts of historical and archeological sites.
  • Existing infrastructure (bridges, stormwater outfalls, roadways, buildings, etc.) survey to identify potential impacts of dam removal.
  • Natural resource impact assessment to quantify potential changes in wetland, riparian, and riverine habitats.
  • Concept level design and cost estimates.
  • Public meetings and coordination with stakeholder groups.
» Engineering design – Engineering includes detailed plans and specifications for access and staging, water control or diversion, demolition and dam removal, sediment management and river restoration, along with any associated park and infrastructure changes required as a result of the dam removals.
  • Permitting – As part of the engineering design process, meetings with regulatory agencies and permit filings are an important part of the dam removal process. This includes zoning, disposal, sediment management, in-water work, erosion control, stormwater, environmental quality, and cultural resource permitting.
» Implementation – includes contracting, dam removal demolition, sediment management, and river restoration construction.
» Invasive species management:
  • Invasive plants (e.g. garlic mustard, honeysuckle, reed canary grass, and buckthorn).
  • Invasive aquatic plants (e.g. Eurasian watermilfoil).
  • Invasive fish species (e.g. Asian carp).

Lock and Dam No. 1

Near Bohemian Flats

Focus Area Recommendations

The 5.5 mile-long Mississippi Gorge Regional Park consists of natural areas, parkways, paved and unpaved trail corridors, and urban park spaces. The natural areas and park spaces within MGRP provide destinations for community gathering, passive and active recreation, nature hikes, and bird watching, among other activities. Several destinations in the park were identified during the planning process as areas requiring focused planning efforts for future park improvements and capital investments. The focus areas include:

- Bohemian Flats Park (with and without dams)
- Riverside Park and Annie Young Meadow
- "Longfellow Flats" and Minneapolis Rowing Club Boathouse Area
- "Oak Savanna" Area
- East River Flats Park
- "Southeast Flats" Area
- Lower Gorge Islands (without dams)

The following pages provide recommendations for park improvements and natural resource protection and preservation in each of the focus areas. Park improvements proposed in the focus areas address park facilities, river and riparian ecology, wildlife habitat, natural resources, site amenities, access and connectivity, safety and security, park identity, and features intended to make MGRP more welcoming to people of all ages, abilities, income levels, and backgrounds. Linear park areas outside the focus area boundaries are addressed in the Parkway and Trail Recommendations section.

Bohemian Flats Park

Annie Young Meadow

Riverside Park and Annie Young Meadow

Riverside Park and Annie Young Meadow (formerly Lower Riverside Park), located south of Bohemian Flats on the west side of the river, combine to provide MGRP visitors with a more active, urban, neighborhood park on top of the river gorge bluff (Riverside Park) and a more passive park located near the river's edge (Annie Young Meadow). The plan proposes to better connect these two parks by restoring the existing WPA staircase in Annie Young Meadow and providing accessible pathways between the two areas of the park, thereby creating a more unified park from the neighborhood to the river's edge.

Other improvements proposed at Riverside and Annie Young Meadow include new park facilities requested by park users and adjacent park neighbors, including restored volleyball courts, picnic areas, restrooms, a labyrinth, pollinator garden, two full-size basketball courts, and a nature play area. Annie Young Meadow will receive new ADA accessible picnic facilities, a trail kiosk, restroom, and improved connections across West River Parkway. Parking at Riverside Park is challenging today, warranting further study to resolve parking issues. Nearby uses such as the hospital and a university that are not park-related, attract people parking along the streets that line Riverside Park, creating conflicts with park users and neighbors.

The plan calls for bluff restoration to remove invasive plant species and overgrown vegetation. Maintenance of the wooded bluff should include maintaining views and overlooks near established and future seating/picnic areas and active bluff habitat management. New picnic areas located near the bluff edge and a trail to access them is proposed in Riverside Park. The following pages provide a proposed plan view of Riverside Park and Annie Young Meadow and more specific park recommendations.

Figure 6-6. Riverside Park and Annie Young Meadow

Riverside Park and Annie Young Meadow

Park Recommendations:

A. Pollinator plantings with picnic opportunity

B. New trail along edge of park with clearing of invasive plant species for views of the river

C. Picnic opportunity within pollinator garden

D. Additional picnic locations with views of river and consistent MPRB furnishings: picnic tables with concrete pads, lighting, grills, benches

E. Revitalize volleyball courts

G. Two full-size basketball courts

H. Improved and enlarged picnic location with consistent MPRB furnishings: picnic pavilion, picnic tables with concrete pads,shade structures lighting, grills, drinking fountain, benches

I. Rehabilitated play area location with added play elements and shaded seating

J. Wading pool enhanced with added shaded seating

K. Improved soccer field--biochar opportunity for improved soil quality and carbon absorption near freeway

L. Renovated existing restroom building

M. Recommended parking study area

N. Mid-level terrace nature play/picnic area in glen area between Riverside Park and Annie Young Meadow - intensive invasive species removal

O. Restored historic staircase to Annie Young Meadow

P. Convenient and contextually sensitive pedestrian connections to Annie Young Meadow

Q. Picnic/BBQ area including shelter/shade structure

R. Improved connection with raised crossing table, pavers, and park entry with trailhead kiosk

S. Restroom facility and interpretive signage, bike parking, and ADA accessible paved area

T. Widened walkway - provide police car access; possible permeable paver opportunity

U. Potential future accessible route/connection between Riverside Park and Annie Young Meadow

V. Sidewalk along river wall eliminated and replaced with rain garden

W. Peace garden / labyrinth

***Bolded text identifies community prioritization items**

Precedent Images

Sand volleyball courts precedent example