Kingsbury Bay-Grassy Point Habitat Restoration: A Health Impact Assessment

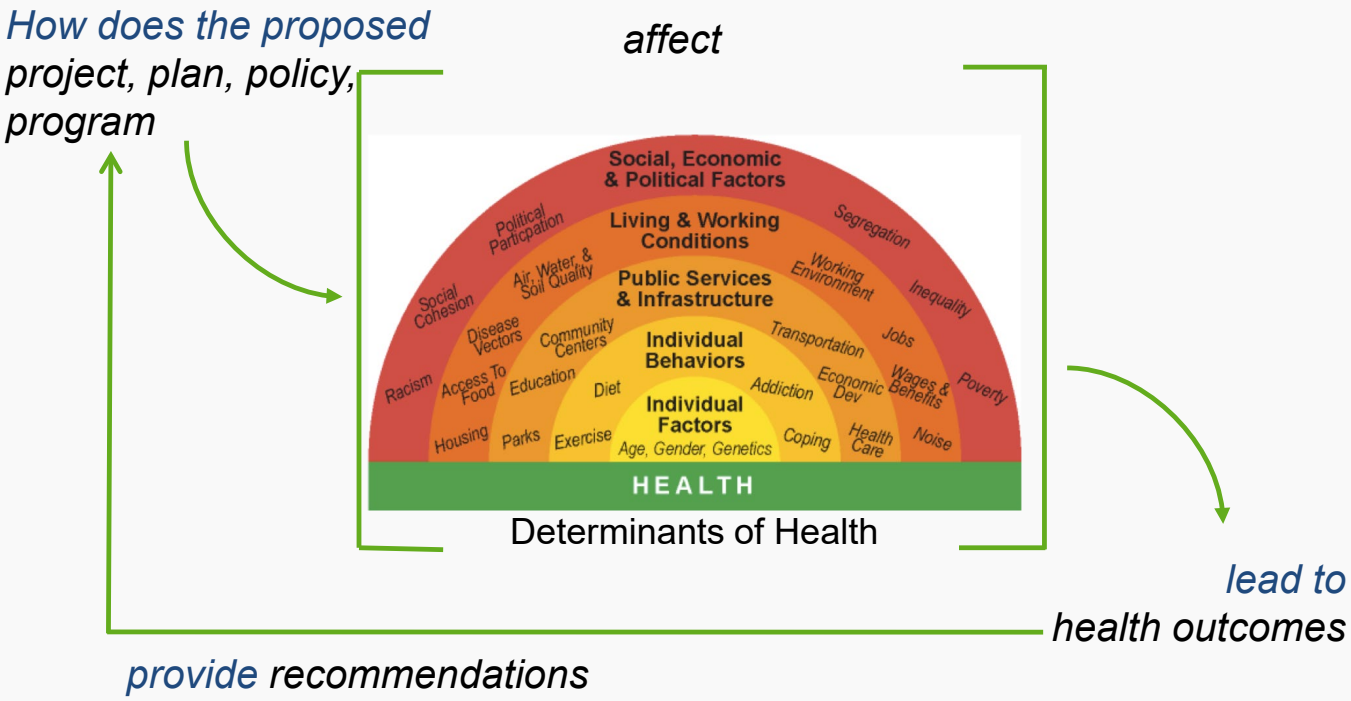
Findings and Recommendations for Grassy Point Habitat Restoration

Grassy Point Restoration Site Team
November 20,2019

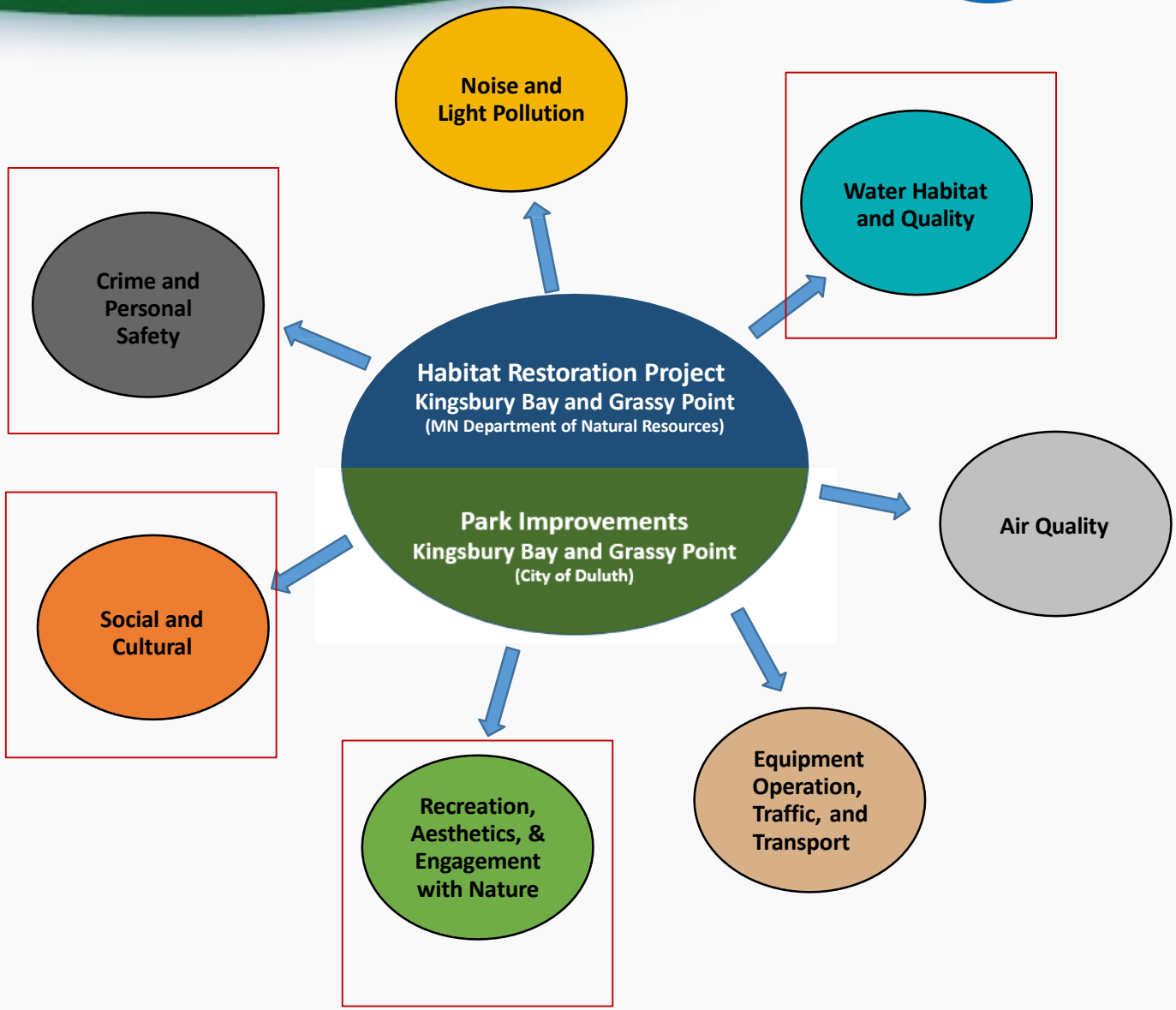
What is HIA?

"A systematic process that uses an array of data sources and analytic methods and considers input from stakeholders to determine the potential effects of a proposed policy, plan, program, or project on the health of a population and the distribution of those effects within the population. HIA provides recommendations on monitoring and managing those effects."

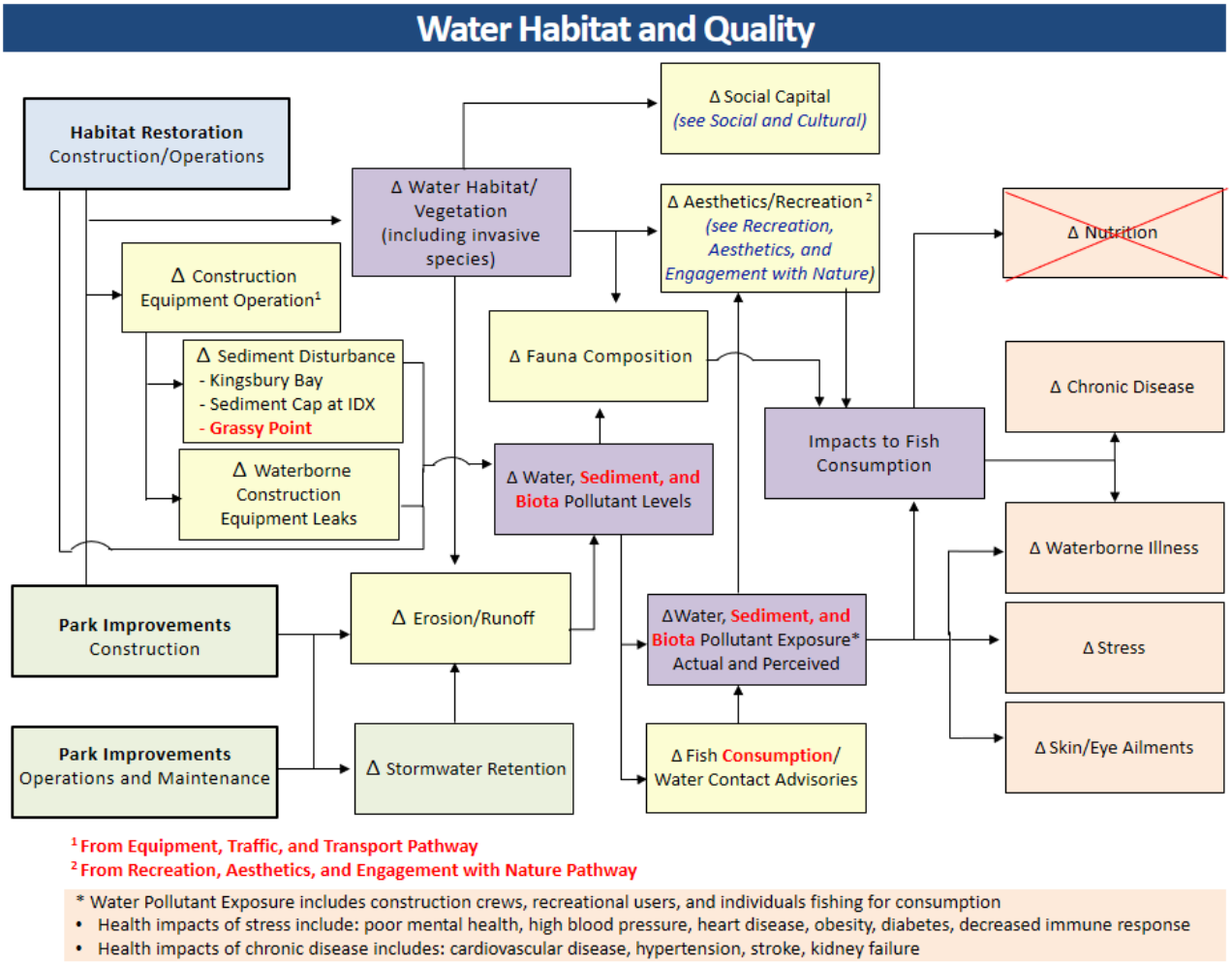
- National Research Council. 2011. *Improving Health in the United States: The Role of Health Impact Assessment*.



Kingsbury Bay-Grassy Point HIA Pathways



WATER HABITAT AND QUALITY



What's the connection to health?

Improving water, sediment and habitat quality can potentially improve nutrition and decrease disease incidence in anglers, as well as decrease illness and skin and eye ailments in swimmers. Broadly, it can reduce stress, as well as improve social capital and recreational opportunities. Habitat restoration can contribute to health through the overall improvement in water, sediment, and habitat quality. Park improvements can contribute to health by providing amenities such as boat launches, fishing piers, and swimming beaches to encourage safe access to and use of the river by the community.

Potential Impact on Health

The project is highly likely to substantially improve the quality of wetland and aquatic habitat, which will produce recreational, spiritual and cultural health benefits (see related pathways).

There is limited evidence that the project will improve water quality and reduce the abundance of waterborne pathogens. The construction of a swimming beach will provide numerous health benefits (see recreational pathway), but also present a limited risk of exposure to waterborne pathogens.

The project is likely to improve sediment quality, which over years would likely moderately reduce the concentrations of dioxins and PCBs in the tissue of resident fish such as yellow perch and sunfish. This would have a modest health benefit, especially for vulnerable populations such as racial and ethnic minorities, as well as subsistence anglers.

Photo credits. Top - Richard Hamilton Smith via The Nature Conservancy; Middle – Zenith City Press; Bottom – gameandfishmag.com

Change in Habitat Quality I

The project *will increase* mid-density submerged aquatic vegetation (25% - 75% cover)

- **Net gain 26 acres**
- Increase 14% at Grassy Point to 57 acres
- Increase 293% at Kingsbury Bay to 28 acres

The project *will slightly increase* floating leaf vegetation (>50% probability of occurrence)

- **Net gain ~1 acre**
- Increase by 31% at Grassy Point to 23 acres
- Decrease by 13% at Kingsbury Bay to 31 acres

The project *will increase* aquatic habitat. It will increase aquatic habitat >6 ft depth and decrease aquatic habitat 0-2 ft depth.

- **Net gain of 130** acres of aquatic habitat (-8 acres at Grassy Point, +138 acres at Kingsbury Bay)
- Net gain of 45 acres of habitat >6 ft (11 acres at Grassy Point, 34 acres at Kingsbury Bay)
- Net loss of -153 acres of habitat 0-2 ft (-96 acres at Grassy Point, -57 acres at Kingsbury Bay)

The project will increase habitat for migratory waterfowl by increasing aquatic habitat. The quality of the site for nesting birds will depend on the riparian vegetation post-restoration.

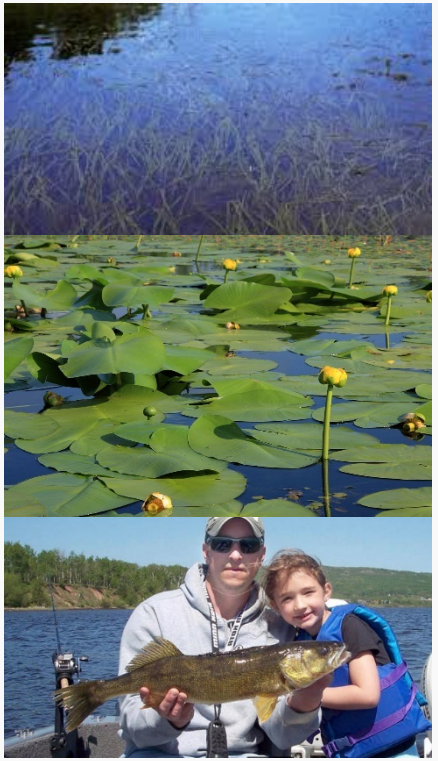


Photo credits. Top and middle – Wikipedia; Bottom – Duluthnewstribute.com

Change in Sediment Quality

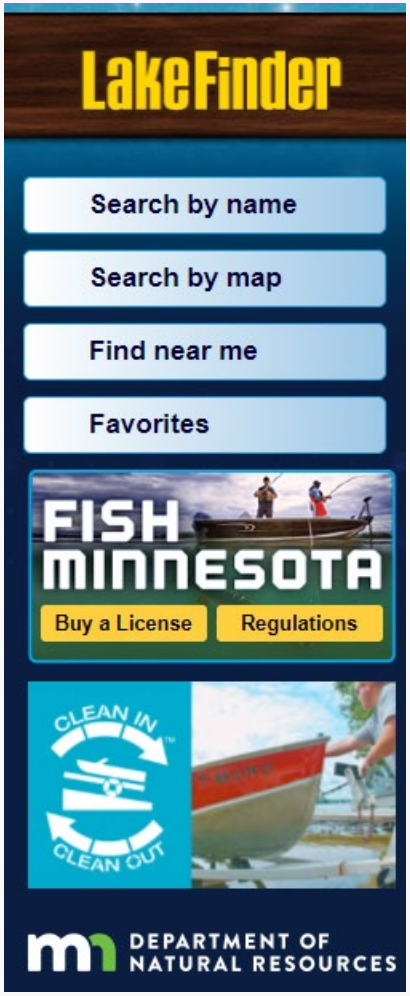
The project will *potentially decrease* surface sediment concentrations of PCBs and dioxins in the project area

- Surface sediment concentrations of both PCBs and dioxins are relatively low
- Moving sediment from the Kingsbury Bay delta to Grassy Point may reduce sediment concentrations of PCBs and dioxins because the delta is largely comprised of clean, upland sediment.
- Moving sediment from the mouth of Kingsbury Bay to Grassy Point will likely not affect current surface concentrations of PCBs and dioxins

The project will *likely decrease* the bioavailability of PCBs and dioxins in the project area by increasing wetland habitat; the future change in mercury methylation or mercury bioavailability is not known

- Wetlands reduce the bioavailability of contaminants by increasing the carbon content of the sediments
- Legacy mercury appears to be present in sediment cores sampled near Grassy Point, but scientific studies are too incomplete to infer information about the sites.

The project will likely cause concentrations of PCBs and dioxins in *resident fish* such as yellow perch and sunfish *to decline*; however, it will have *very limited impact* on *migratory fish* such as walleye and channel catfish because they feed throughout the river, where these pollutants remain a problem.



Change In Swimming, Fishing Access

The project will *provide safe swimming access* at Kingsbury Bay.

- There will be a **new swimming beach** at the mouth of Kingsbury Bay
- This will increase health and quality of life in the community (see Recreation pathway).

The project will *increase access* for both shore fishing and boat fishing, providing *greater opportunity* to catch both resident and migratory fish species.

- There will be **four new shore fishing locations** at Grassy Point, including a fishing pier with deep access on the large island. The existing pier at Kingsbury Bay will be moved to the inside of the bay.
- **Net gain of 12 acres** of kayak and canoe access.
- **Net gain of 46 acres** of recreational boating access.

The project will likely increase consumption of fish capture at the project sites. St. Louis River anglers target black crappie, yellow perch, sunfish, northern pike, and walleye for consumption.

Many anglers do not heed consumption advisories.

WATER HABITAT AND QUALITY

Major Findings	Associated Recommendations
The project will substantially increase aquatic habitat and replace non-native aquatic plants with native aquatic plants. The project will have the greatest benefit for submerged aquatic vegetation and fish that prefer either vegetated or deep water habitat.	▪ Develop a long-term, non-native species management plan for both Grassy Point and Kingsbury Bay ▪ To sustain the ecological integrity of the site, provide interpretative signage that provides information on wetland habitat types and the benefits each habitat provides for fish, reptiles, birds, and people ▪ Identify upland habitats within the site suitable for trees, and develop goals for the upland plant community that takes into account future changes in invasive species, water level, and climate ▪ Where compatible with project goals, protect existing high-quality native aquatic plants at Kingsbury Bay ▪ Develop habitat plans for marsh birds, wading birds, and migratory waterfowl

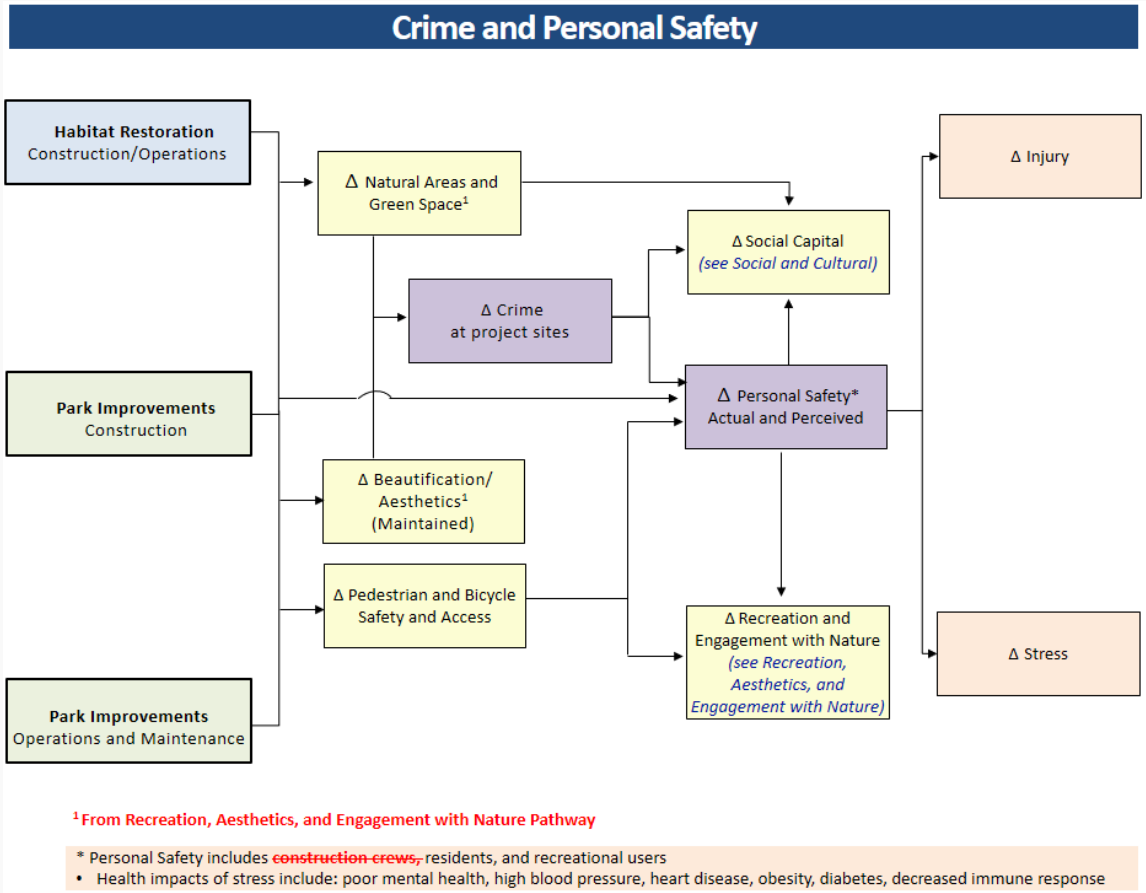
WATER HABITAT AND QUALITY

Major Findings	Associated Recommendations
Capping area of greatest contamination with clean sediment or adding organic carbon to sediments will reduce contaminant concentrations in fish and the associated cancer risk related to consumption of those fish; however, there is limited confidence in the magnitude of change. The project will have an unknown effect on mercury in resident fish.	▪ Develop sediment remediation target protective of human health based on surface-weighted area concentration, especially for dioxins ▪ Implement a fish monitoring program that includes mercury, dioxins, and PCBs, and targets both resident and migratory fish species
Improving fishing access will likely generate more angler activity at the sites; an unknown number of these anglers will consume fish captured in the project areas.	▪ Provide culturally-appropriate communication on consumption-related risk that addresses specific-contaminant risk as well as fish species and size ▪ Conduct creel surveys focused on fishing within the AOC, and include information on race, ethnicity, and fish consumption habits ▪ Should contaminant concentrations of certain fish species or sizes at the project sites meet human health guidelines, promote the consumption of local fish due to its health benefits

WATER HABITAT AND QUALITY

Major Findings	Associated Recommendations
The project will likely improve water quality at both sites, but have little impact on waterborne pathogens. Adding a swimming beach to the area potentially increases exposure to waterborne illness, but also will provide a variety of health benefits.	▪ Follow best-practices for storm water management, erosion and runoff, and equipment leaks during the construction phases and implement mitigations, as necessary. ▪ Design the storm water pond identified in the concept plan to intercept storm water to maximize its ability to protect Kingsbury Bay water quality ▪ Identify regional storm water outfalls and implement additional storm water management practices to reduce potential impact of combined sewer overflows (CSOs) at the swimming beach at Kingsbury Bay ▪ Implement routine beach monitoring at the future Kingsbury Bay beach

CRIME AND SAFETY



What's the connection to health?

Restoration of damaged habitats and improvements to these landscapes can provide concomitant benefits to the environment and human health. An established body of research suggest that these benefits can often shape community attitudes and behaviors towards crime and safety. While it's not difficult to support the idea of crime as a threat to the health of individuals, negative perceptions of green spaces can often translate directly to poorer health outcomes, such as decreased physical activity, poorer mental health, and increased risk of cardiovascular and chronic disease.

CRIME AND SAFETY

Potential Impact on Health

The project is *highly likely* to improve aesthetics and existing infrastructure at Grassy Point and along with it, personal safety and perception of safety and security. Natural green space has also been shown to facilitate reductions in crime and violence by improving attitudes and behaviors.

However, safe access to the sites must be established to maximize the potential health benefit of the restored sites and park amenities. This includes safe access by both pedestrians and bicyclists.

CRIME AND SAFETY

Current Conditions

- Habitat degredation is extensive within the project sites and visible along their existing, multi-purpose trails.
- When asked about current uses of both sites, in addition to the opportunities for birdwatching and walking, community members (especially the elderly), didn't feel safe walking through the number of small under-road tunnels and neglected walking paths to get to Grassy Point, cited illicit drug use, and overall, expressed a sense of fear and lack of safety.

"I tried to go to Grassy Point with my mother and my grandchildren and I was scared. The boardwalk was underwater. It wasn't safe"

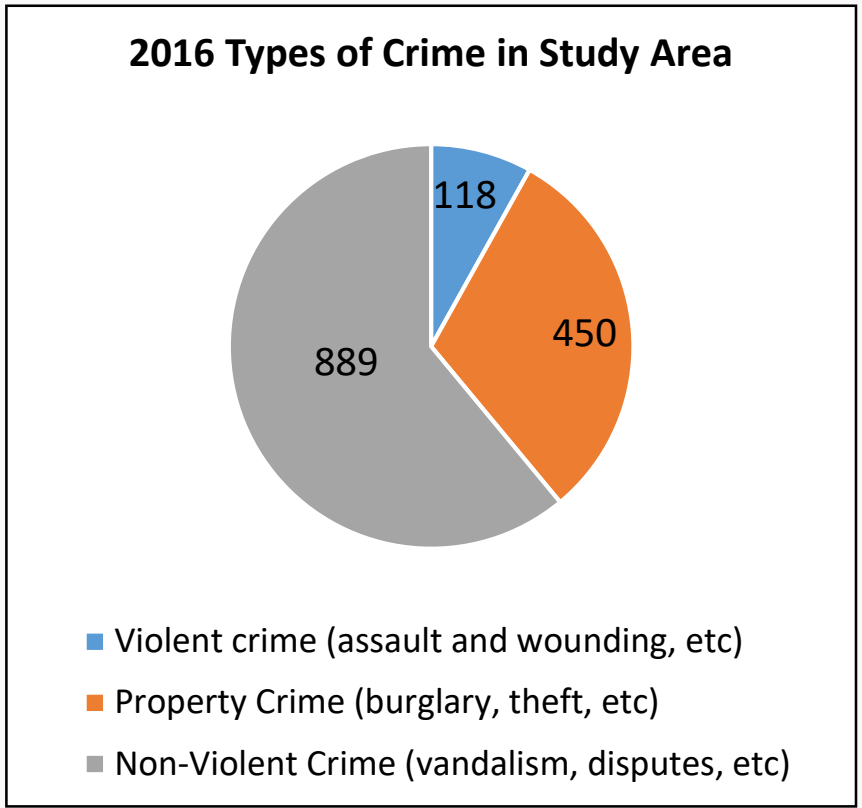
" I have gone down to Grassy Point and there's a car of boys just sitting there and I don't feel safe and just leave."

"I feel fear when walking on the Grassy Point Trail. Fear of the people there and of the condition of the trail."

CRIME AND SAFETY

Current Conditions

- The overall crime rate of all types for 2016 in the study area is **231 cases per 1,000**. In contrast, the average crime rate in all of City of Duluth is **121 cases per 1,000**.
- Violent crime is **20.4 per 1,000** in the study area.



Current Conditions

Walkability/Bikeability

- Sidewalk conditions vary throughout the study area. In some places, the condition of sidewalks is poor, making it impassible for potential users in wheelchairs.
- Most intersections have pedestrian curb ramps, but most are not American Disability Act (ADA)-compliant.
- Within the HIA study area, 59th Street, Raleigh Street, 63rd Street, Grand Avenue and Central Avenue are designated on-street bicycle routes.
- A portion of the Grassy Point Trail has an on-street segment along Waseca Industrial Road. Of those on-street bicycle routes, only the route along Waseca Industrial Road includes pavement markings and signage for a designated bike lane.

Photo Credit: Western Port Area Neighborhoods Transportation Analysis Report

Potential Impacts on Crime and Personal Safety

Habitat Restoration

- Project sites will be aesthetically improved as graffiti is removed; accumulated sediment, wood waste, and monotypic vegetation stands are removed; wetland habitats are restored to a more diverse and natural condition; and deteriorated infrastructure such as boardwalks are replaced.
- Numerous studies position natural green space as a facilitator in decreasing crime and violence by improving attitudes and behaviors.
- There is evidence that the presence of green space can lead to reductions in specific crimes, particularly non-violent crimes (e.g. property crime and nuisance crimes) which represents the majority of crimes around the study sites in 2016.

Potential Impacts on Crime and Personal Safety

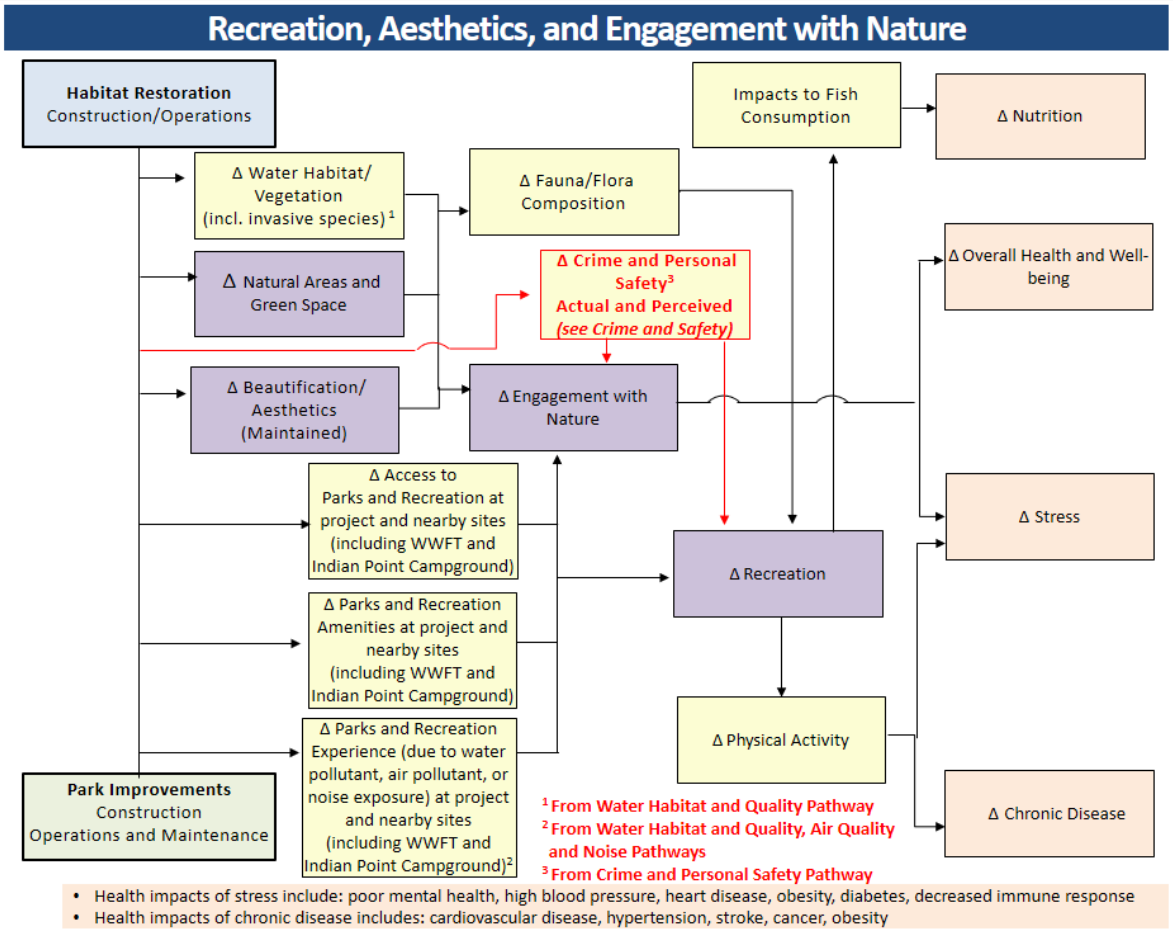
Park Improvements

- Improved projects at Grassy Point and Kingsbury Bay, will have expanded trails and will provide public access to the enhanced scenic views of the St. Louis River that are important for outdoor recreation.
- Park improvement plans for future trails and access to recreational opportunities directly reduce the risk of crime by supporting healthy behaviors and providing an engaging, natural landscape.
- Evidence suggests that one of the most common fears in the context of crime and safety is the presence of structures and vegetation that impede visibility and appear to limit one's ability to escape, which can lead to communities limiting their use of the space altogether and thus worsen health outcomes.

CRIME AND SAFETY

Major Findings	Associated Recommendations
Design and maintenance of green spaces and natural elements can facilitate a reduction in crime and improvements in perceived safety and/or security.	▪ Communicate the improvements being made to Grassy Point to alleviate existing perceptions of crime and personal safety issues and encourage utilization of the space post-restoration ▪ Follow Crime Prevention through Environmental Design (CPTED) guidelines, including lighting and planting configurations.
Improvements to aesthetics and existing infrastructure at Grassy Point will improve personal safety and perception of safety and/or security.	▪ Construction activities that alter existing routes and access points should have clear signs and barriers to minimize the potential for trespassers. ▪ Lighting should be improved and police surveillance may be considered to reduce crime and the perception of risk at these sites.
The new parks and amenities need to be able to be safely accessed by pedestrians, bicyclists, and access routes should be Americans with Disability Act (ADA)-compliant.	▪ Provide clear signage and maps for pedestrian and bicyclist access to the parks. ▪ Consider using NHTSA's Walkability and Bikeability Checklist to inform design of trails within the parks and leading to the parks. ▪ Improve pedestrian and bicycle access to Grassy Point from the Irving neighborhood. Current access is by footpath or walking/biking along Waseca Industrial North Street. ▪ Make trails and water access ADA-compliant.

RECREATION, AESTHETICS, AND ENGAGEMENT WITH NATURE



What's the connection to health?

Access to outdoor recreation areas is an important component to individual and community mental and physical well-being. Parks provide opportunities for physical activity, which is known to reduce stress, cardiovascular disease, obesity, and other chronic disease. Activities such as fishing can further impact health through consumption of the catch.

Parks and aesthetically pleasant green spaces also promote engagement with nature, which has been shown to reduce stress and improve mental and overall health and well-being. The value of these spaces can be a product of ongoing contact with them.

RECREATION, AESTHETICS, AND ENGAGEMENT WITH NATURE

Potential impacts on health

Short-term

- Health will likely be negatively impacted in the short term:
  - Overall health and well-being will be negatively impacted because there will be fewer opportunities for physical activity
  - Stress will be increased because of disruption during construction
  - Stress will also be increased because landscape change which may impact place identity and attachment
  - Nutrition for subsistence fishers may be negatively impacted because there will be fewer opportunities for fishing due to construction

Long-term

- Health will be positively impacted in the long-term:
  - Overall health and well-being will be positively impacted because of increased amounts of green space will provide additional opportunities for physical activity
  - The impacts on stress and overall health and well-being will positive as biodiversity increases and the landscape becomes more familiar
  - Nutrition will likely be positively impacted by an increased opportunity for fishing because of more fish habitat

Potential negative health impacts short and long-term (increase in stress):

- Residents fear duplication of services and the subsequent neglect of existing parks
- There is high value placed on the existing amenities and changing them could cause distress

Potential Impacts on Recreation and Engagement with Nature

Changes in swimming and fishing access	Impact on existing resources
New swimming beach at the mouth of Kingsbury Bay	Swimming beach will be located along the Western Waterfront Trail and Indian Point Campground, which may impact the current use of or access to Indian Point Campground
Four new shore fishing locations at Grassy Point (one with deep water access)	Additional fishing opportunities at Grassy Point, boardwalks and trails will facilitate access to Big Island and the pier
The existing pier at Kingsbury Bay will move inside the bay on the other side of Indian Point Campground	The current fishing pier will move from the western edge of IPC to the tip of the point
Net gain of 12 acres of kayak and canoe access	Removing the delta in Kingsbury Bay and deepening channels at Grassy Point will create human-powered boat access and additional launches
Net gain of 46 acres of recreational boating access	Removing the delta in Kingsbury Bay and deepening channels at Grassy Point will create deeper water for other types of boats

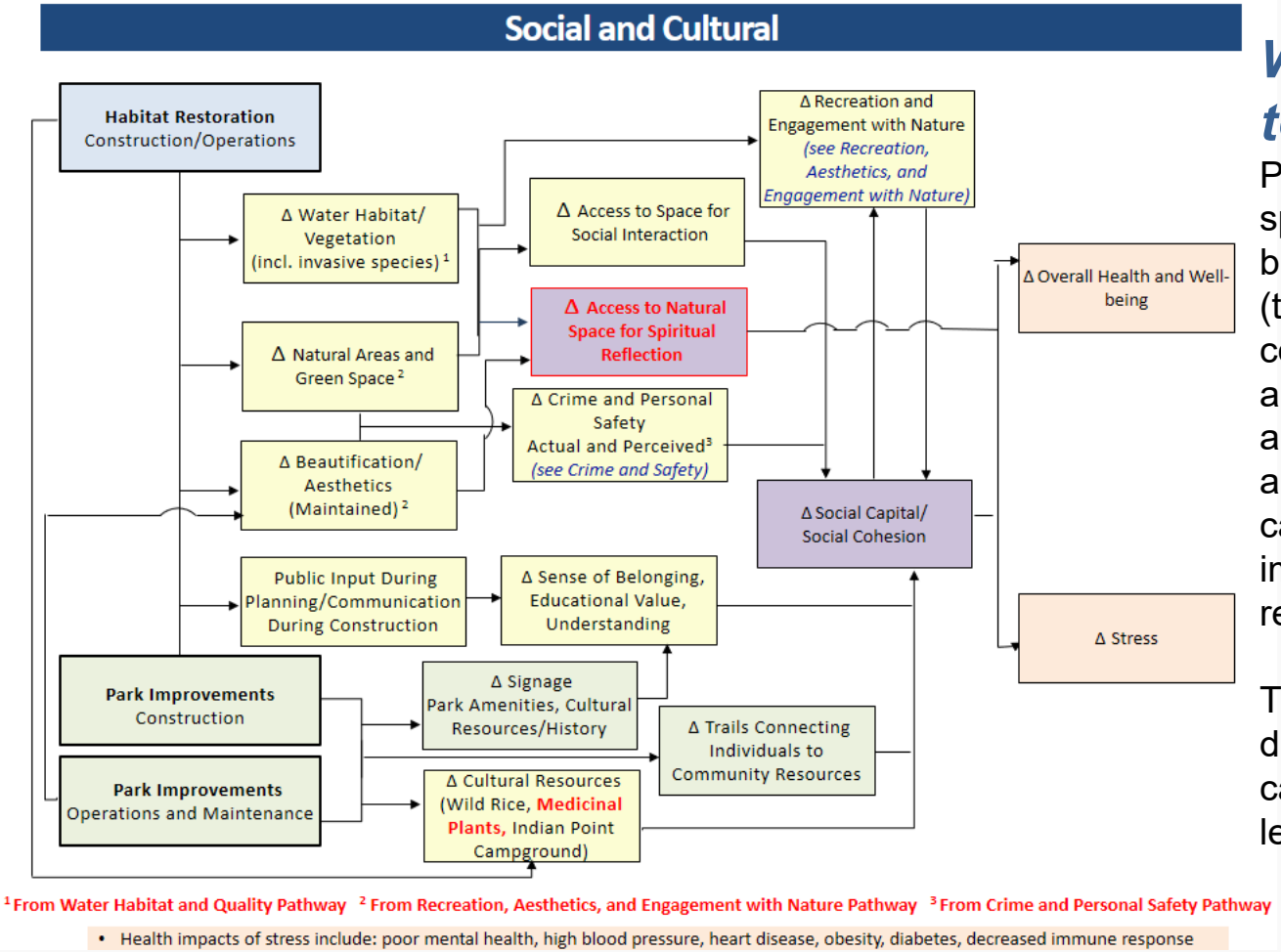
RECREATION, AESTHETICS, AND ENGAGEMENT WITH NATURE

Major Findings	Associated Recommendations
Well-maintained spaces with diverse recreational options will enhance opportunities for recreation and overall health. *Both Grassy Point and Indian Point Campground, like most parks in the HIA study area, have maintenance challenges and more limited opportunities for recreation (i.e., Indian Point Campground is a special use area and not open for public recreation).*	▪ Offer diverse opportunities for recreation at both sites, including publically-accessible gathering spaces, fishing piers, access to the water for water-based recreation, and trails, taking into account maintenance requirements of installed features ▪ Preserve and enhance fishing opportunities, with more formal locations (e.g., piers) and social gathering opportunities adjacent to those locations. The creation of Big Island at Grassy Point would provide an opportunity for a fishing pier and access to a fishery with more biodiversity; a bridge would be needed to access Big Island ▪ Create a higher upland area on Big Island to form a more sheltered bay, providing safer harbor for kayaks and canoes ▪ All swimming areas should include measures to enhance safety and minimize potential for user conflict. Measures should include signage about the availability of lifeguards and current water quality status. Buoys should separate swimming and boating areas ▪ In advance of construction, clearly communicate to recreational users through multiple media sources disruptions to the Western Waterfront Trail and walkability and accessibility to both project sites ▪ Provide additional parking to increase access to and utilization of the restored Kingsbury Bay and Grassy Point sites ▪ Perform wetland restoration at the mouth of Kingsbury Creek to preserve the cold water habitat for trout and provide deeper water for kayak and canoe access ▪ Create opportunities for social gatherings in close proximity to the additional planned fishing piers, especially at Grassy Point, similar to improvements at Chambers Grove Park.
Recreational fishing improves nutrition and overall health. Different populations fish for different reasons: subsistence, recreation, and as a social activity. *However, there are currently limited opportunities for shore and boat-based fishing in the study area.*	

RECREATION, AESTHETICS, AND ENGAGEMENT WITH NATURE

Major Findings	Associated Recommendations
Well-maintained spaces with diverse recreational options will enhance opportunities for recreation and overall health. *In spite of perceived condition, the recreational spaces around Grassy Point and Kingsbury Bay are well utilized for hiking, birding and camping.*	▪ Because recreational amenities are enjoyed by residents, any plans for future changes should include recognition of the value placed by residents who use the resources frequently. ▪ Preserve and enhance current birding locations, as well as enhance access to newly created birding habitat. Upland plant communities should be restored to maximize potential for pollinator, including bird, habitat. ▪ Recognizing the value placed on the existing resources, any changes to park amenities could add new features to existing parks and green spaces.
Well-maintained spaces with diverse recreational options will enhance opportunities for recreation and overall health. *Partnerships with volunteer organizations may help support park maintenance.*	▪ In all project phases, clearly communicate to recreational users and neighborhood members through multiple media sources disruptions to the Western Waterfront Trail and walkability and accessibility to both project sites. ▪ Research and develop co-management models, where neighborhood organizations have more formal responsibility for park management. Co-management arrangements could empower the neighborhood and ease the maintenance burden on the City of Duluth.

SOCIAL AND CULTURAL



[1] From Water Habitat and Quality Pathway [2] From Recreation, Aesthetics, and Engagement with Nature Pathway [3] From Crime and Personal Safety Pathway

- Health impacts of stress include: poor mental health, high blood pressure, heart disease, obesity, diabetes, decreased immune response

What's the connection to health?

Parks and green spaces provide space for socialization, which builds social capital and cohesion (the formation of social bonds and connections),spiritual reflection, and cultural resource use. The ability of the public to enjoy parks and green spaces in these capacities has been shown to improve health and well-being and reduce stress.

The opportunity for public input during the planning of these spaces can also build social capital and lead to improved community health.

SOCIAL AND CULTURAL

Potential Impact on Health

- Construction will **temporarily and minimally negatively impact health** by limiting access to these green spaces for social and cultural use.
- Once construction is complete, the natural space will **benefit health** by providing an opportunity for the public to enjoy the area as a site for:
  - ***social interaction***, through recreation and social events;
  - ***spiritual reflection***, and
  - ***cultural resources***, such as the restoration of wild rice and other medicinal plants
- By preserving, promoting, and respecting the cultural, social, and religious significance of these natural spaces and the species and conditions that support them, the decision-makers can build social capital and further improve the overall health and well-being of the residents and neighboring indigenous communities.

Existing Conditions – Park Use

- The public uses these sites for birding, for walking their dogs, and some use of the recreational facilities.
- Duluth has approximately three times more green space than other cities of similar size.
- The citizens of Duluth find green space to be very valuable to the city and considers engagement with nature to be a defining characteristic of Duluth.
- When citizens were asked about the amount of green space in Duluth, most resident felt there was already enough parks in the city.
- The parks in the HIA study serve as a focal point for social relations and opportunities to build social capital. Both Irving Park and Norton Park have community clubs that use and support the parks. The Irving Park Community Club (IPCC) is an anchor and "voice of the Irving Neighborhood in West Duluth."
- The Kingsbury Bay and Grassy Point natural areas have traditionally provided space for spiritual reflection and other tribal uses for the Native American communities in the area.

SOCIAL AND CULTURAL

Major Findings	Associated Recommendations
Parks are places of social and cultural value and sites for spiritual reflection. Social cohesion, spiritual reflection, and the ability to participate in culturally-significant behavior are all positively correlated with health. As part of the St. Louis River, this place has special significance to the Anishinaabe people. These aspects should be considered in the development of the construction and habitat restoration plans.	▪ Planners should conduct stakeholder meetings to the extent possible to better understand the social significance of these parks ▪ Make the public aware of construction activities in advance, the period of time for which construction will occur, and the planned changes, so they can plan when to visit and anticipate the improved resources ▪ Consult with 1854 Treaty Authority and Fond du Lac Band resource managers to identify significant sites for any use and determine the best approach to preserve, enhance or interpret resources.

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