



# Human Communities Can Benefit From Improving Fish Habitat

*Joel Hoffman and Kathleen Williams*

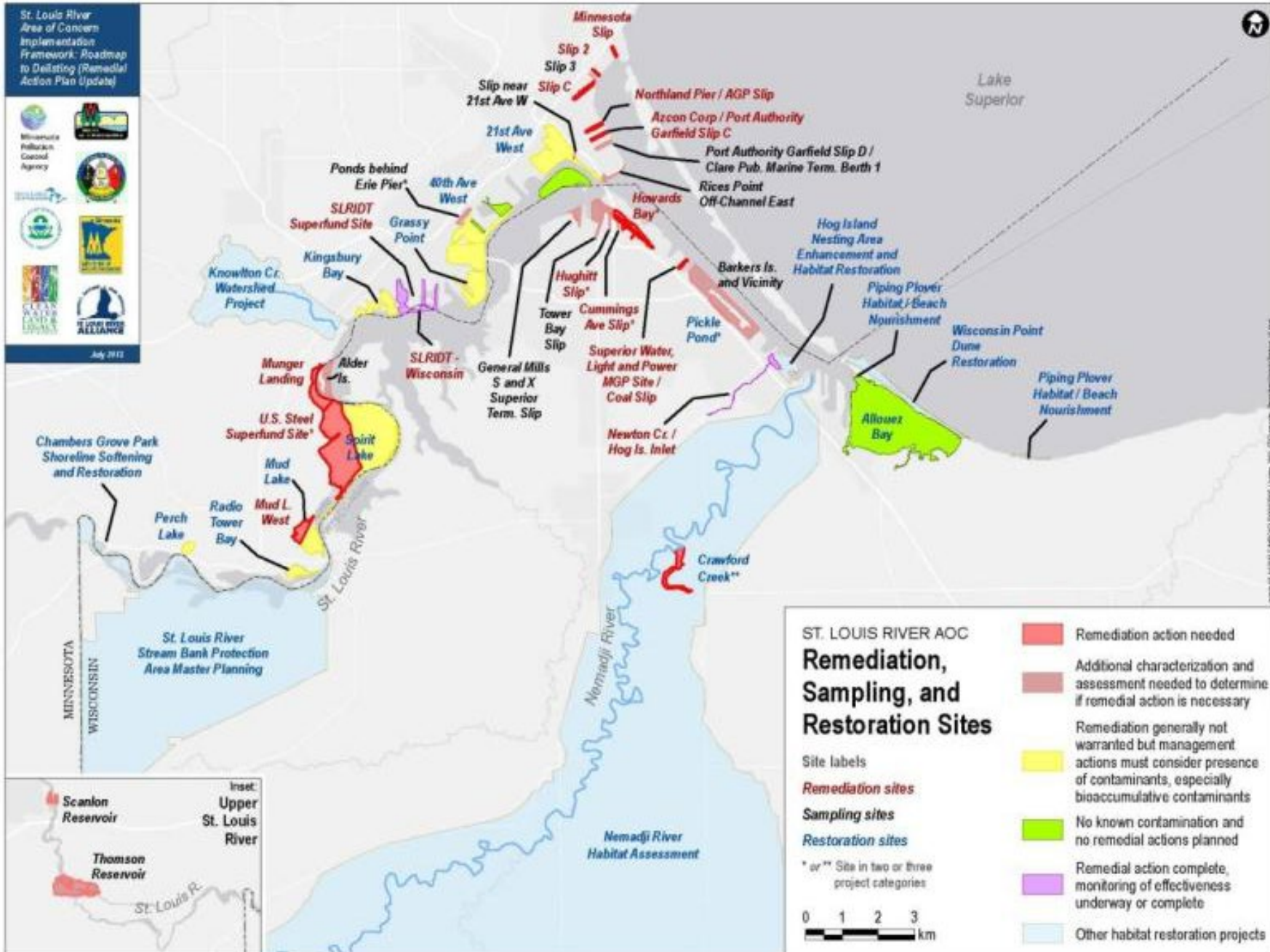
EPA Office of Research and Development

**Minnesota Chapter of the American Fisheries Society  
Annual Meeting, Feb 10-12, 2020**

## St. Louis River

- Largest US trib to Lake Superior (2<sup>nd</sup> largest to lake)
- Length 192 miles
- Daily mean discharge 2,377 cfs
- Watershed 3,634 square miles
- Largest freshwater estuary in the Great Lakes
  - 12,000 acres
  - Historically prominent fishery
  - High biodiversity
  - High abundance coastal wetlands
  - Bi-directional river flow







# Grassy Point Habitat Restoration



# Kingsbury Bay Habitat Restoration





# Grassy Point Restoration Project

## St. Louis River AOC, MN

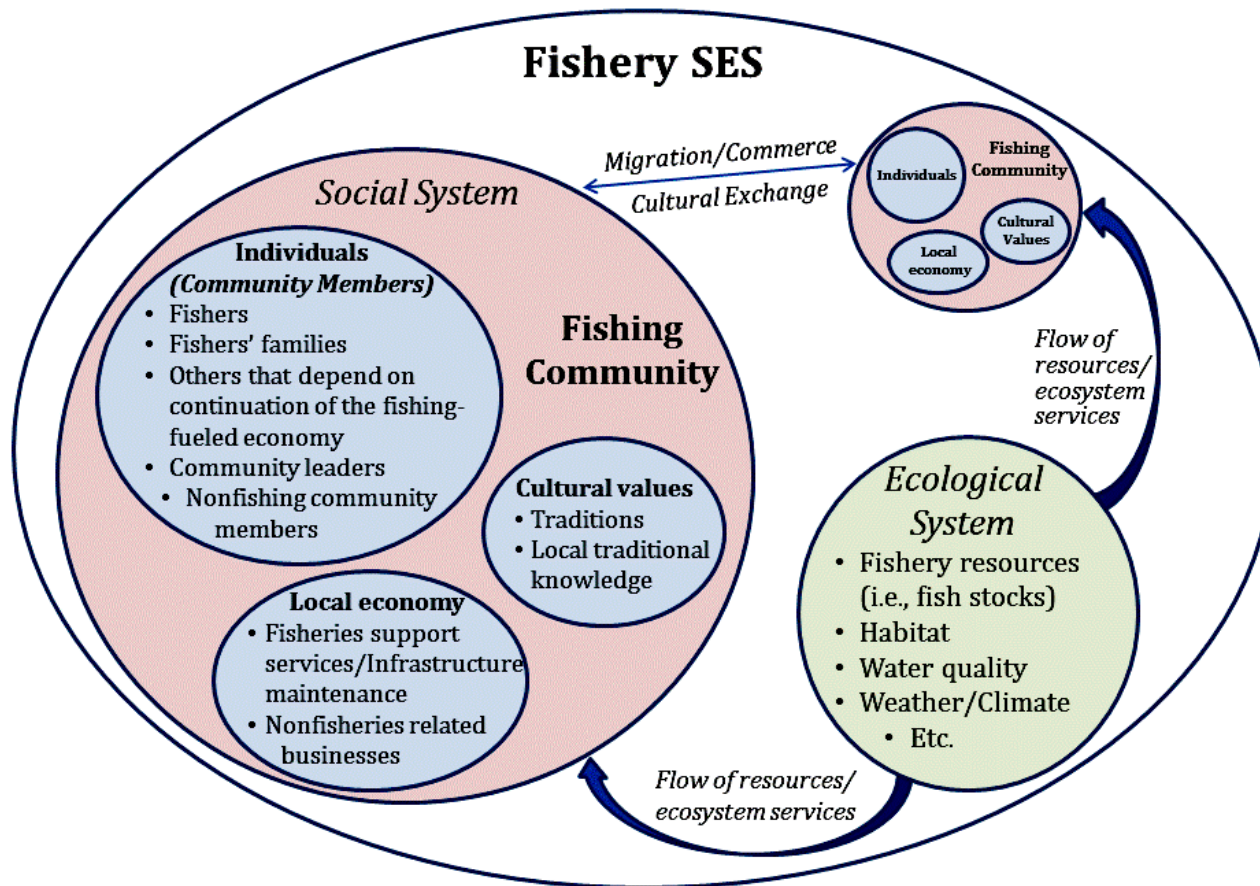


# *The R<sup>3</sup> Paradigm: “Its not just sediment remediation”*



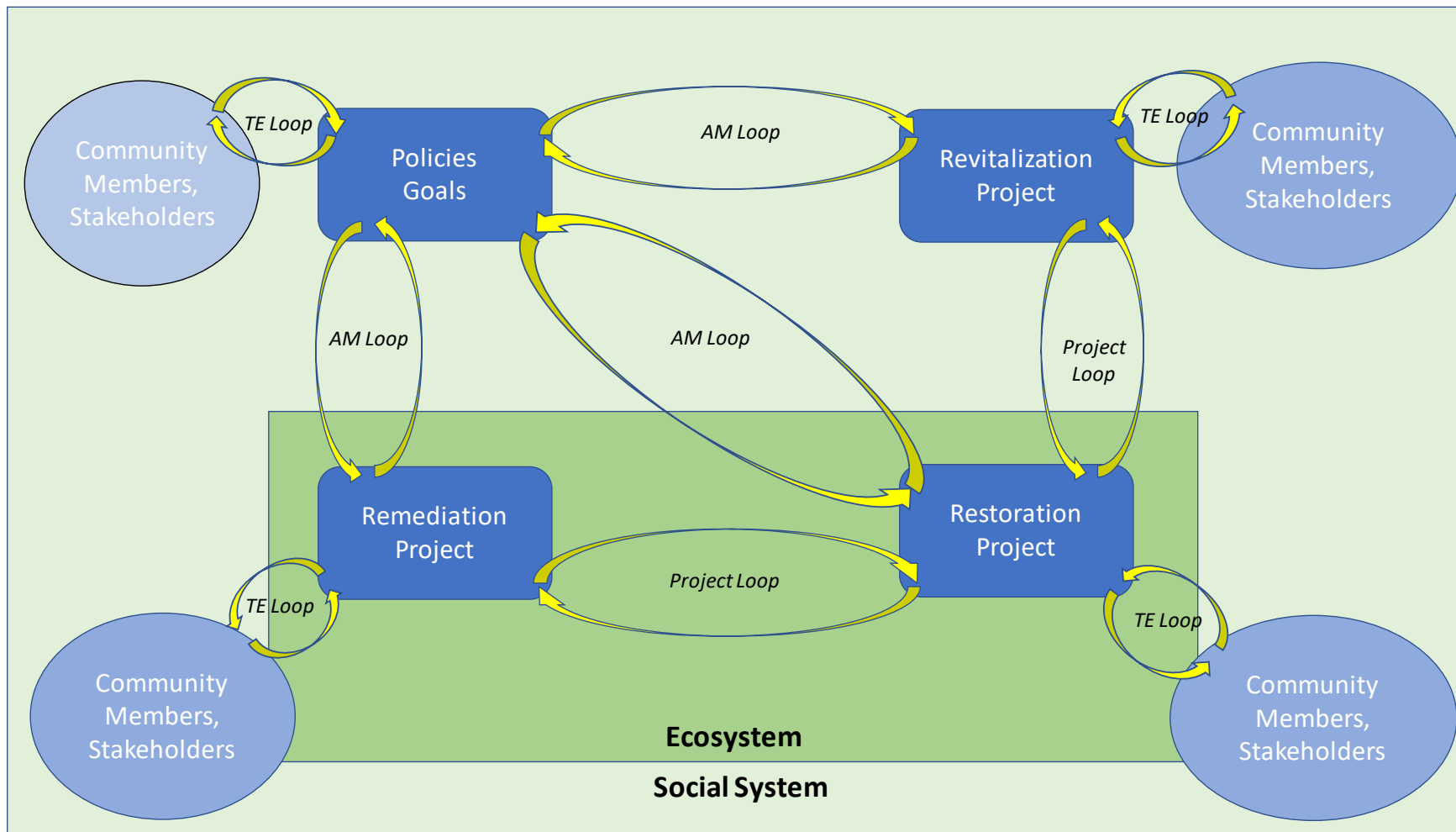


## Social-Ecological Systems (SES)

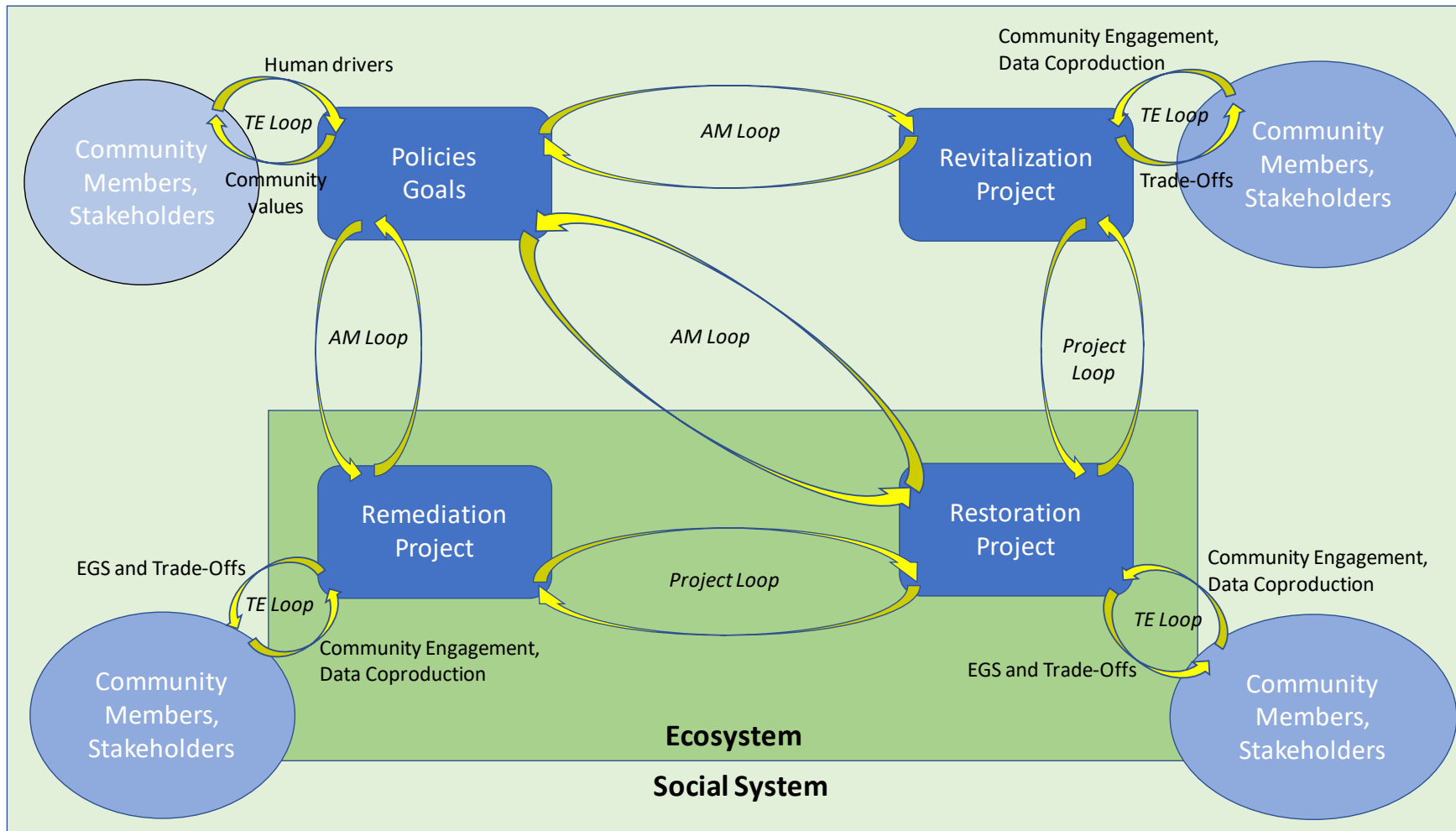




## The R2R2R Framework – Feedback Loops



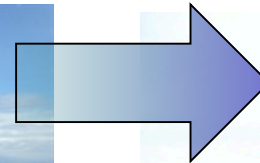
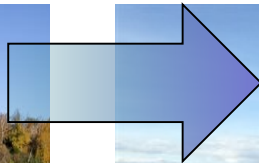
# The R2R2R Framework – Translational Ecology Loop





## Research Goals

- By what means would the Kingsbury Bay-Grassy Point Restoration affect community health and well-being?
- How big are those effects?
- How likely are those effects?



# Health Impact Assessment (HIA)

HIA is a process that uses  
*scientific data, health expertise and public input*  
to factor public health considerations into the  
decision-making process

HIAs give decision-makers the information they need to consider health in pending programs, policies, plans, and projects:

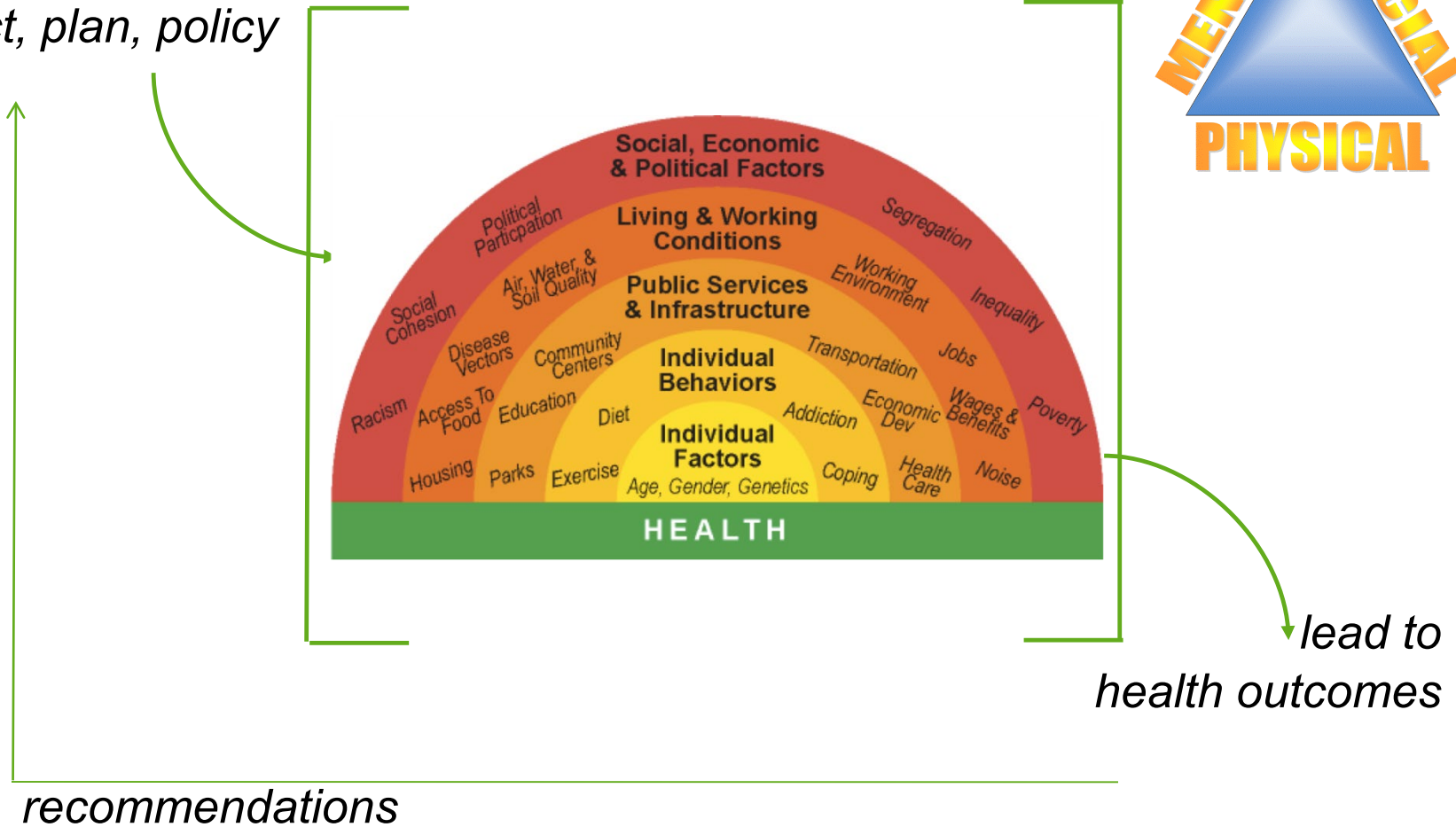
- *In advance* of a decision
- Identifies *public health* consequences
- Provides *recommendations*
- Health protection **and** health promotion





*How does the proposed  
project, plan, policy*

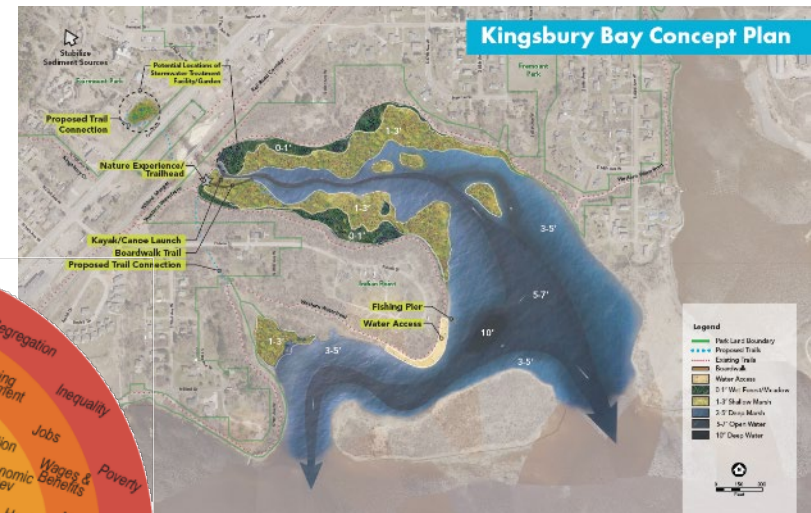
*affect*



Health determinants = factors that lead to health outcomes

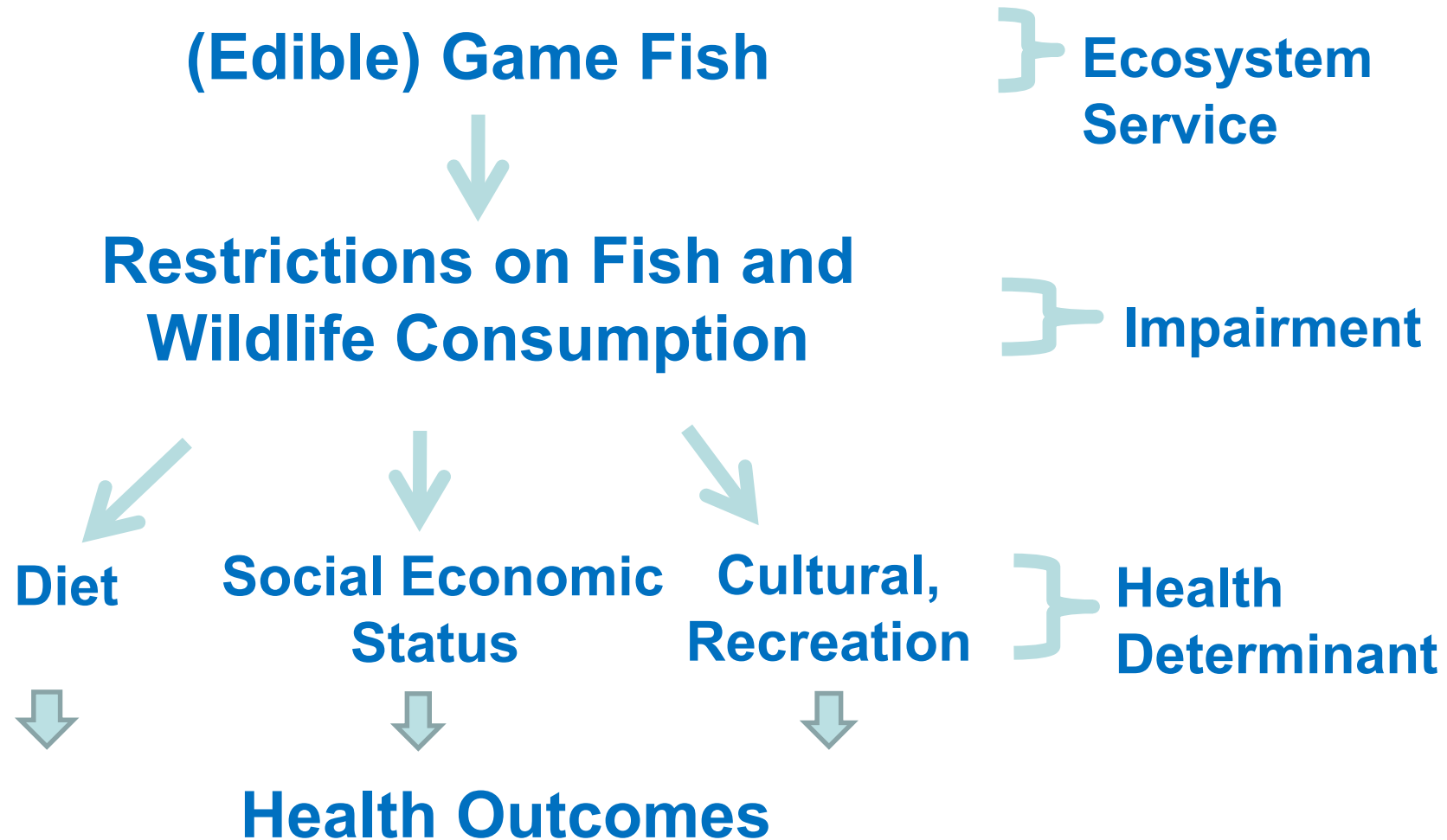
# Kingsbury Bay-Grassy Point Habitat Restoration Project Health Impact Assessment

- Health Impact Assessment at St. Louis River AOC (FY17-FY19)
  - Grassy Point-Kingsbury Bay Projects
  - 200 acres, 350K cy sediment, \$14M
- Work with AOC timeline
  - Conducted in a series of workshops
  - Start in JAN 2017; final design FEB 2018
- Needs from AOC partners
  - Project scopes/plans/options
  - Contribute throughout the process
  - Listen and respond





## Connections to Fish and Fishing...



# Community Engagement

HIA began with knowledge co-production

- Participatory mapping for HIA
- Engage in conversation around the restoration sites
- Used maps to capture different types of knowledge based on relationships to the river
  - Traditional
  - Professional
  - Local
  - Scientific





# HEALTH PATHWAYS



**Ecosystem Services: Water Habitat and Quality**

**Ecosystem Services: Recreation, Aesthetics, and Engagement with Nature**

**Ecosystem Services: Social and Cultural**

**Ecosystem Services: Air Quality**

**Equipment Operation, Traffic, and Transport**

**Noise and Light Pollution**

**Crime and Safety**

## Ecological Research

Ecological Modelling  
Aquatic vegetation models  
Bioaccumulation model (PCBs, PCDDs)  
Habitat Classification  
Time-Series Analysis (*E. coli*)



## Health Pathway

Ecosystem Services:  
Water Habitat and Quality

Ecosystem service models  
Fish habitat suitability models  
Wild rice habitat model  
Boating models (power, kayak)  
Fishing model  
Ecosystem service valuation  
Community use and value studies

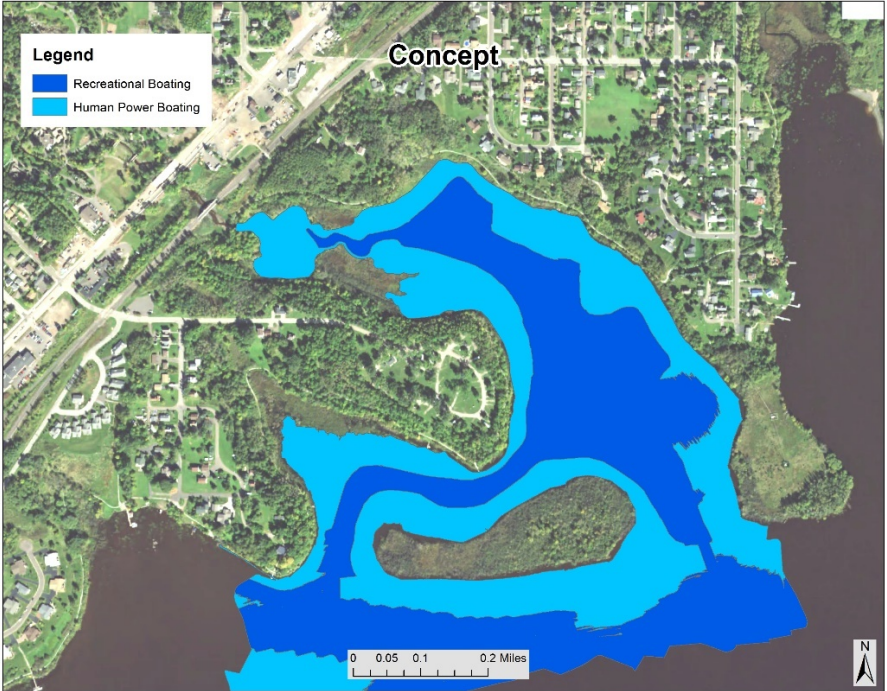


Ecosystem Services:  
Recreation, Aesthetics,  
and Engagement with  
Nature

Ecosystem service models  
Wild rice habitat model  
Ecosystem service valuation  
Community use and value studies



Ecosystem Services:  
Social and Cultural

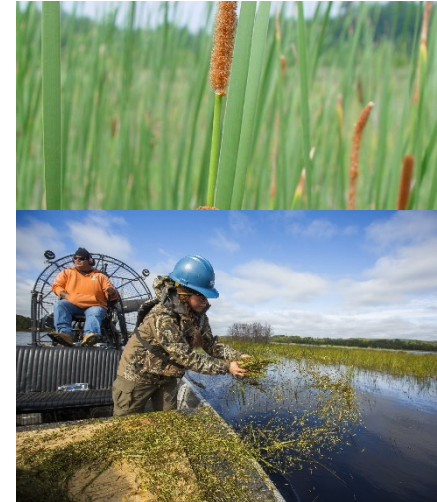
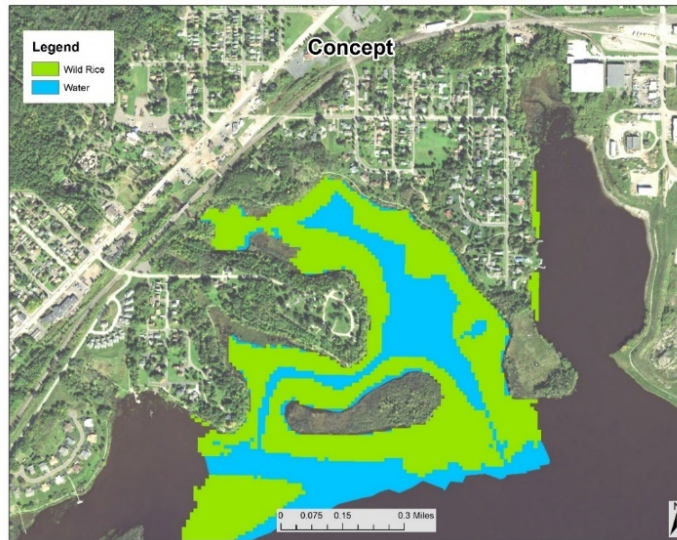




## Change in Habitat Quality

The project will increase the area with wild rice through habitat restoration actions

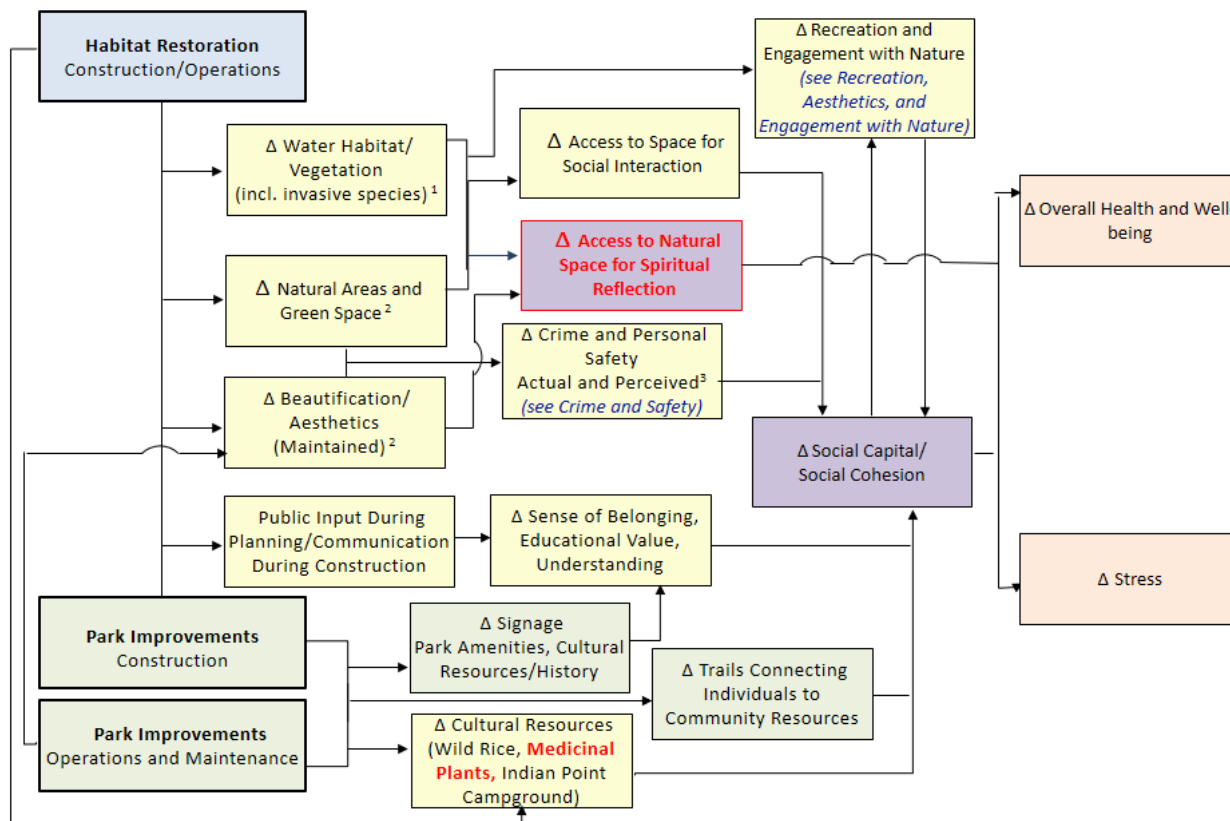
- **Net gain of 13 acres** at Kingsbury Bay that will be suitable habitat
- Wild rice can increase health because it has both high nutritional and cultural value (see Social and Cultural Pathway)



# TE as Decision Support Health Impact Assessment



## Social and Cultural



## 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.

<sup>1</sup> From Water Habitat and Quality Pathway <sup>2</sup> From Recreation, Aesthetics, and Engagement with Nature Pathway <sup>3</sup> From Crime and Personal Safety Pathway



# RECREATION, AESTHETICS, AND ENGAGEMENT WITH NATURE

## Major Findings

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).*

**Recreational fishing improves nutrition and overall health.**

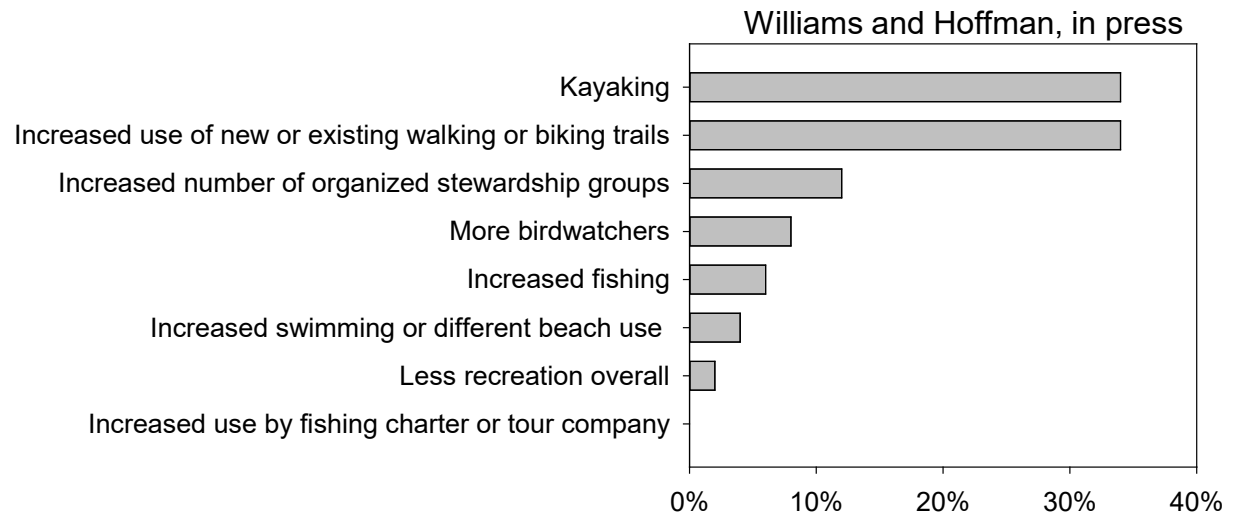
Different populations fish for different reasons: subsistence, recreation, and as a social activity. *However, there are currently limited opportunities for shore and boat-based fishing in the study area.*

## Associated Recommendations

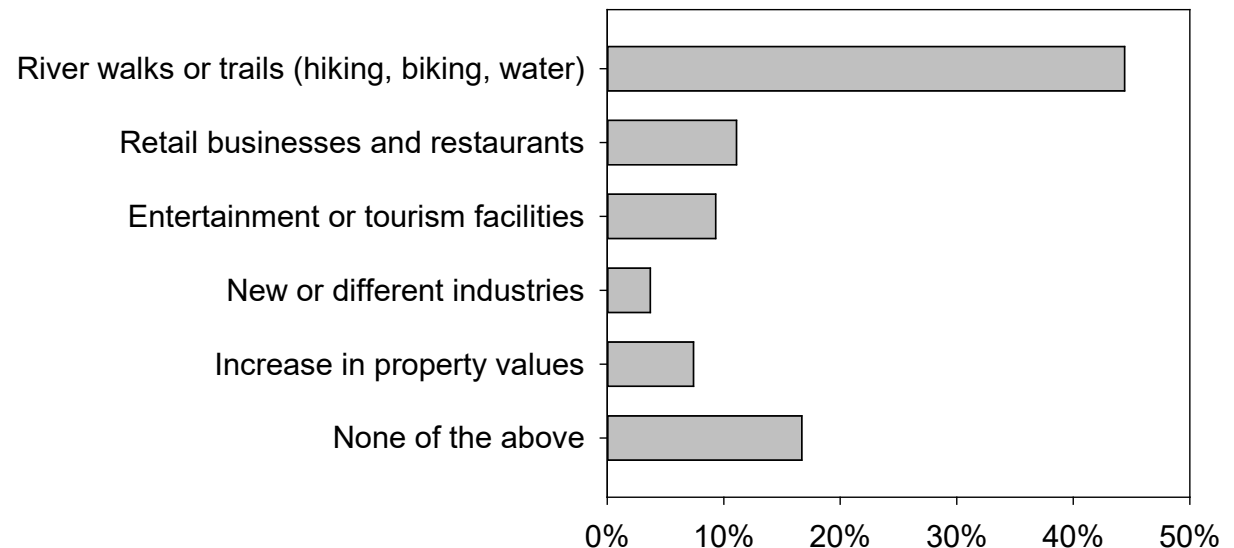
- Offer diverse opportunities for recreation at both sites, including publically-accessible gathering spaces, **fishing piers**, **access to the water for water-based recreation**, and trails, taking into account maintenance requirements of installed features
- **Preserve and enhance fishing opportunities, 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



## TE as Learning



What changes in recreational use have you noticed in your AOC? (n=50, two responses allowed)

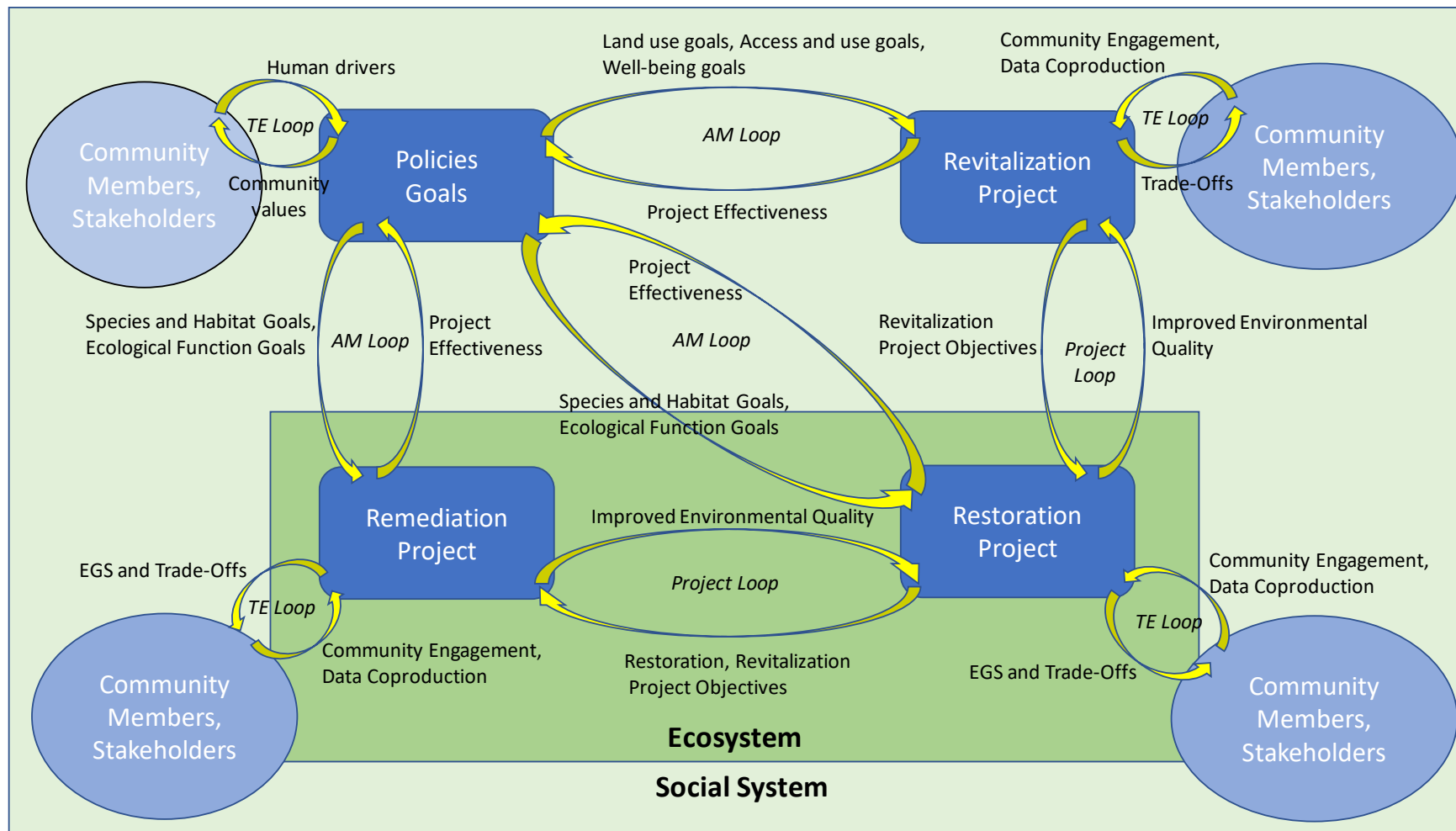


What changes have you witnessed in the land use adjacent to your AOC? (n=54, two responses allowed)

- Impacts
  - Findings positively affected project development, permitting
  - Near-term: Basis for city Park Master Plans
  - Long term: Endorsed by interagency-city partnership for future process
- Research must be translated to impact formal decision-making
- Boundary spanners are key, the team should include natural scientists and social scientists
- A designed process is fundamental; it must be built around two-way communication, building trust, and equity
- The process should be integrated into the decision context and developed with stakeholders; this will take extra time
- It is worth it.



# The R2R2R Framework





# Remediation to Restoration to Revitalization (R2R2R)

To help transform remediation projects into sustainable revitalization of the surrounding community by maximizing the positive societal and environmental outcomes

## Restoration & Revitalization



**Managing Contamination**  
Partnering companies purchased a 19-acre parcel in Ashabula Township for a Sediment Consolidation Facility, where contaminated sediments from the riverbed would be stored. This facility was completed in 2006.

State and federal agencies implemented dredging of the Ashabula River between 2006 and 2011, removing over 700,000 cubic yards of contaminated sediment from the river and reopening it for commercial shipping and recreational boating. The contaminated material was pumped into a specifically designed landfill and isolated from the environment.



**Restoring the River**  
Restoration of the Ashabula River began in 2008. About 2,500 feet of fish shelves and a total of 10.5 acres of river, wetland, and upland habitat were created, providing a home for mammals, birds, and fish.

Through the efforts of many, the Hush-tah-hah River is returning to its former glory as a "river of many fish."






Using funds from the US EPA, USACE, industry and the State of Ohio, approximately 750,000 cubic yards of sediment and debris were removed from the river between 2006 and 2011, pumped up through a 2.5 mile pipeline to a sediment treatment facility and into gravel pits. This helps that separate contaminated sediment from the river water.

The Ashabula River Partnership: A model approach to environmental cleanup

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