# 1 INTRODUCTION

This case study provides an example of when local ecological knowledge (LEK) data was appropriately acquired and used to provide insight into recent events that affect land-use planning.

Environmental decision-making can be a technical process from which local knowledge may be excluded. This case study of the collection and application of local knowledge in environmental decision-making demonstrates how a participatory research method, such as a health impact assessment (HIA), can create conditions to include local knowledge in a decision context at a time when it is actionable for decision makers.

# 2 THE VALUE OF A CAUSEWAY IN A RIVER EMBAYMENT

The City of Duluth, Minnesota, has been revitalizing access to public parks and trails on the western side of the city, near the St. Louis River, through the St. Louis River Corridor Initiative (City of Duluth 2021). One of the projects was the extension of the Waabizheshikana: The Marten Trail (formerly known as the Western Waterfront Trail). The trail will extend south and west along the St. Louis River from the Irving neighborhood (north) to Jay Cooke State Park (south) (City of Duluth 2021). A causeway that crosses a bay on the river, known as Mud Lake, was slated to be eliminated in an early version of the plan. Neighborhood residents and a volunteer-run railroad organized to save the causeway.

# 3 HEALTH IMPACT ASSESSMENT AND SOCIAL DETERMINANTS OF HEALTH TO COMMUNICATE LOCAL VALUES

To better understand the meaning of the causeway to the community, the City of Duluth invited the U.S. Environmental Protection Agency (USEPA) to conduct a community values assessment. The USEPA Office of Research and Development Team at the Great Lakes Toxicology and Ecology Division in Duluth, Minnesota, used an HIA type of approach to conduct the analysis. A stakeholder meeting was held on March 4, 2019 at the Goodfellowship Community Center in the Morgan Park neighborhood to identify the social and environmental determinants of health most valued by the community. Twenty-nine people attended the meeting representing environmental nonprofit organizations, community groups, natural resource agencies, and businesses (USEPA 2019). Community members shared their experiences on sticky notes placed on maps of each of the design alternatives. There was also a group discussion during which input was collected on a flip chart. The experiences and flip chart notes were transcribed. [1] The initial notes were shared with the meeting participants to ensure contributions were captured correctly. To maintain contact, the results were shared with the community at a subsequent meeting.

Because raw input without analysis may not provide adequate insight into what a resource provides to a community, the team analyzed the data to identify the underlying values. The comments collected through stakeholder input exercises were analyzed using the neighborhood model (City of Duluth and Barr Engineering 2019) to identify what services Mud Lake provides to the participants and what Mud Lake means to them (Table 1). Several potential Mud Lake user groups were identified that were not in attendance at the meeting, including organized outdoor recreation groups. It was important to identify the values of this group of users because they too will be impacted by the city's decision. To fill this gap, a content analysis was conducted of Duluth news articles related to outdoor recreation (Table 2).

**Table 1. Themes identified through the analysis of input and discussion gathered at the stakeholder meeting on March 4, 2019.**

| **Social and Cultural (Number of Comments = 157)** |
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| • Identity and place attachment (Personal, social, and organizational attachment to Mud Lake; more comments coded to this node than any other)<br>• Governance (Focus on decisions made by the City of Duluth about Mud Lake; participants thought changes would impact the resource)<br>• Participation and self-determination (Desire to participate in the decision; advocating for a win-win or keep the causeway and build a trail)<br>• Social cohesion (Collective action taken by community; the collective "we") |
| **Water Quality and Habitat (Number of Comments = 80)** |

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| • Biophysical environment (Observation and appreciation of wildlife; physical environment; movement of water)<br>• Safety (Perception of contamination; fear removing causeway would release contamination into the river) |
| **Recreation, Aesthetics, and Engagement with Nature (Number of Comments = 48)** |
| • Accessibility (Train provides access to Mud Lake)<br>• Sustainability (Current uses of the natural features of Mud Lake: berry picking, kayaking, fishing)<br>• Parks and trails (Causeway currently serves as an unofficial trail)<br>• Aesthetics (Beauty associated with Mud Lake; appreciation for Mud Lake as it is) |
| Note: The numbers in parenthesis indicate the number of comments received related to each theme. Many comments reflected more than one theme, so results should be interpreted as representing a pattern of the relative importance or significance of each theme for those stakeholders who participated. |

**Table 2. Themes identified through an analysis of Duluth media articles about the organization of stakeholder groups and development of an outdoor recreation economy in Duluth.**

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| **Social and Cultural (Number of Comments = 157)** |
| • Identity and place attachment (Duluth as a "real" outdoor recreation city; the outdoor recreation economy; down-to-earth; enjoy outdoors)<br>• Participation and self-determination (Actions and measures taken to influence decision-making; voice opinion on topics)<br>• Social cohesion (Groups or individuals coming together to advocate for a decision)<br>• Governance (Decisions made by City of Duluth that impact the city and natural spaces) |
| **Water Quality and Habitat (Number of Comments = 80)** |
| • Biophysical environment (Presence of green space in the environment; feasibility of new mountain bike trails) |
| **Recreation, Aesthetics, and Engagement with Nature (Number of Comments = 48)** |
| • Parks and trails (Parks, trails, and outdoor recreation; future outdoor recreation spots) |
| Note: The articles examined are related to the outdoor economy, not Mud Lake specifically. The numbers in parenthesis indicate the number of statements found related to each theme. Results should be interpreted as representing a pattern of the relative importance or significance of each theme. |

The analyzed data were organized by the health impact pathways identified and characterized in the document Kingsbury Bay and Grassy Point: A Health Impact Assessment (USEPA 2021). This organization was important to characterize the impacts in the changes in ecosystem services and determinants of health that would result from the habitat restoration design alternatives.

The HIA-type approach was a valuable method to identify impacted populations and conflicting environmental values and illustrates the processes outlined in the Acquiring TEK and Managing TEK subtopic sheets. The analysis of community input allowed for the greater consideration of values that are often left out of environmental assessments.

The full technical memo outlining this project can be found at Technical Brief Mud Lake Future Alternatives Community Values and Health Impact Analysis.

# 4 REFERENCES AND ACRONYMS

The references cited in this fact sheet, and the other ITRC EDM Best Practices fact sheets, are included in one combined list that is available on the ITRC web site. The combined acronyms list is also available on the ITRC web site.

[1] The sticky notes are maintained as data on the maps. The sticky notes are reinforced with tape and numbered to maintain data integrity. All notes were transcribed into meeting notes that included attendees and organizations, a summary of the presentation, and all notes according to the map or chart where they were collected.