



NWT Environmental

Research Bulletin (NERB)



NWT Cumulative Impact Monitoring Program (NWT CIMP)

A source of environmental monitoring and research in the NWT. The program coordinates, conducts and funds the collection, analysis and reporting of information related to environmental conditions in the NWT.

NWT Environmental Research Bulletin (NERB)

A series of brief plain language summaries of various environmental research findings in the Northwest Territories. If you're conducting environmental research in the NWT, consider sharing your information with northern residents in a bulletin. These research summaries are also of use to northern resource decision-makers.

Patterns of Fish Habitat Use and Migration in the Slave River System: Using Traditional, Local and Scientific Knowledge

NWT community members located near the Slave River and Delta continue to voice concerns about the health of ecosystems due to potential impacts of upstream resource and hydroelectric development, and global climate change. Using traditional knowledge (TK), local knowledge and scientific data to understand habitat use and migration patterns of fish in the Slave River and Delta extends monitoring programs beyond short time scales. In this project, a 'two-eyed seeing' approach was used where scientists and local people shared equally important information.

Why is this research important?

Several local communities depend on commercial and subsistence harvesting of fish. There is much interest in knowing about how fish behaviours, such as their spawning routines, may change because of changes in the ecosystem.

What did we do?

We conducted interviews with community members, sampled fish and used existing published information to find out where fish live, migrate and spawn. We gained information about which fish were very important to local and Aboriginal people, and how patterns of fish movement and distribution have changed.

By using different information sources, we learned the strengths of each approach and how they complement each other. This allowed us to make recommendations to better design community-based monitoring programs that collect key information on fish.

We developed a map of important historical and contemporary habitat areas for inconnu and walleye, species identified respectively as at-risk and sensitive by the Working Group on the General Status of NWT Species. This map can be a valuable tool for communities and managers and can contribute to decisions about habitat preservation and remediation (Figure 1).

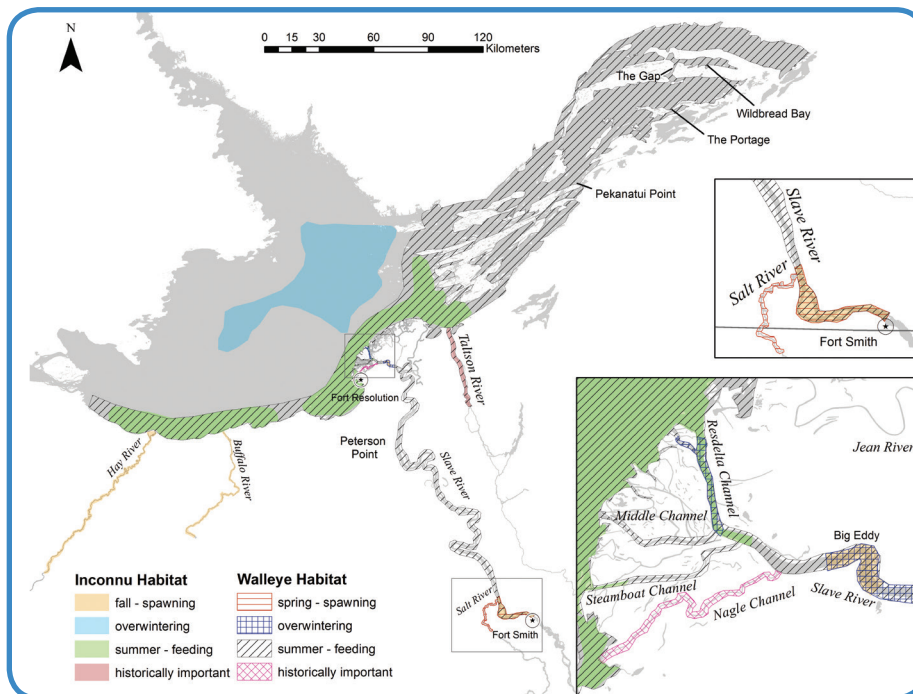


Figure 1. Inconnu and walleye habitat areas in the Slave River Delta region, identified by science, TK and local knowledge. (Baldwin et al., accepted).

What did we find?

TK, local knowledge and science all reported species-specific habitat use for seven common species. TK provided understanding of historically important habitat areas, and showed connections between populations of different rivers. Both TK and local knowledge provided historical information on fish distribution, spawning and feeding habitat use, and abundance, that can be used as a baseline for assessing environmental change.

Identifying changes to historically important habitat areas and migration routes was another valuable outcome and helped us identify the relative importance of different spawning and rearing areas. Community members observed changes in water levels over time that is supported by science, and reported this affects movement of fish and the livelihoods of people supporting themselves by fishing and harvesting.

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NWT Cumulative Impact
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What does this mean?

Using TK, local knowledge and science improves our overall understanding of spawning and migration patterns of fish in the Slave River system, including:

- baseline data for assessing environmental change
- priority areas for protection
- information to support the protection of sensitive species
- indicators for monitoring

What do we do next?

Information on historical baseline condition, impacts and changes over time can be used to help understand the aquatic health of the Slave River region. Insights gained in this project expand our understanding of the synergies and differences between TK, local knowledge and science, and encourage their use in management decision-making by communities, regulatory boards and government agencies in other watersheds and contexts.



Shawn McKay with Tim Jardine in the Slave River Delta (Credit: M. Carr)

References and Recommended Reading

<http://www.integrativescience.ca/Principles/TwoEyedSeeing/>

Baldwin, C., Bradford, L., Carr, M.K., Doig, L., Jardine, T.D., Jones, P.D., Bharadwaj, L., and K-E. Lindenschmidt. (accepted). Ecological patterns of fish distribution as relayed by Traditional Knowledge and Western Science. International Journal of Water Resources Development. <http://dx.doi.org/10.1080/07900627.2017.1298516>