

What are herring gull eggs telling us about contaminants in the Dinàgà Wek'èhodì?

Contaminants are released by human activities and can be transported through the air over long distances. The Dinàgà Wek'èhodì Candidate Protected Area in the North Arm of Great Slave Lake is being monitored for levels and types of contaminants accumulating in the aquatic food web. Herring gulls feed on local fish and breed in the Dinàgà Wek'èhodì; their eggs provide a useful indicator of bioaccumulated contaminants.

Why is the monitoring important?

Herring gull eggs have been collected from breeding sites on Great Slave Lake since the 1990s. Repeated measurement of contaminants in eggs allows us to track changes in levels and types of contaminants over time. This information supports long-term environmental management of the Dinàgà Wek'èhodì. Other sites across Canada are also being monitored by Environment and Climate Change Canada for contaminants in gull eggs. We can then use that information to better understand the transport of contaminants to the Northwest Territories.



Who is involved?

Since 2021, herring gull egg monitoring in the Dinàgà Wek'èhodì has been a partnership between the Government of the Northwest Territories, the Tlicho Government, the North Slave Metis Alliance, the Yellowknives Dene First Nation, and Environment and Climate Change Canada.

What have we done?

Community-based collections of herring gull eggs have been completed annually in June from islands in the Dinàgà Wek'èhodì since 2021. Earlier collections of herring gull eggs from 2010 to 2017 on Great Slave Lake provide additional information for comparison of contaminant trends.

After collection, the eggs are shipped to the National Wildlife Research Centre in Ottawa for chemical analysis. Once the laboratory analyses are completed, the remaining egg material is stored at the facility for possible future use such as to measure additional chemicals.

Different types of contaminants are measured in the eggs including organic chemicals and inorganic elements. The organic chemicals are produced by humans and do not occur naturally in the environment. Two examples are brominated flame retardants (PBDEs) and per and polyfluoralkly substances (PFAS), which are applied to a variety of commercial products. Inorganic elements such as mercury, other metals, and rare earth elements are naturally occurring, but human activities have increased their release into the environment. Rare earth elements are used in a variety of commercial products including magnets and new technologies such as cell phones.

What are we finding?

- The monitored organic chemicals, PFAS and PBDEs, have been found at low levels in herring gull eggs from the Dinàgà Wek'èhodì. The levels of those contaminants are either declining or stable since 2010, and they are lower than levels found in gull eggs at sites in southern Canada.
- Metals such as cadmium and lead are at low levels in the herring gull eggs.
- Rare earth elements in the herring gull eggs are at low levels in comparison to gull eggs at sites in southern Canada.
- Mercury levels in herring gull eggs from the Dinàgà Wek'èhodì are higher than most sites in southern Canada. Levels are highly variable between years but have not increased in the last decade. It remains unclear what environmental processes are influencing the mercury trends.
- Mercury in the eggs is unlikely to pose a risk to the health of the herring gulls.

What does this mean?

With the exception of mercury, the monitored contaminants in herring gulls show limited bioaccumulation in the aquatic food web of the Dinàgà Wek'èhodì. These observations partially reflect the long distance of the site from emission sources in southern Canada.

What's next?

Our goal is to continue annual community-based collections of herring gull eggs from the Dinàgà Wek'èhodì to monitor changes in bioaccumulated contaminants over time. This monitoring initiative will contribute to environmental stewardship of the area. Additional activities may be developed such as the

installation of trail cameras to determine the arrival and departure of birds at the breeding sites.

Mahsi Cho!

We thank the many people who have contributed to the herring gull egg monitoring initiative since 2021 including Tas-Tsi Catholique, Natisha Drygeese, Catherine Fauvelle, Claudia Haas, Jess Hurtubise, Jamiee L'Hereux, William Lines, Tonya Makletzoff, Jackie Moore-Tsetta, Mark Poskitt, Moise Rabesca, Phoebe Rabesca, Jessica Smart, Shane de Solla, Kelly Stein, and Ian Ziemann.

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