

NovaTox

Detailed Quantitative Ecological Risk Assessment, 5 Wing Goose Bay, Newfoundland and Labrador

Client

Defence Construction
Canada

Location

Happy Valley–Goose Bay,
Newfoundland and Labrador

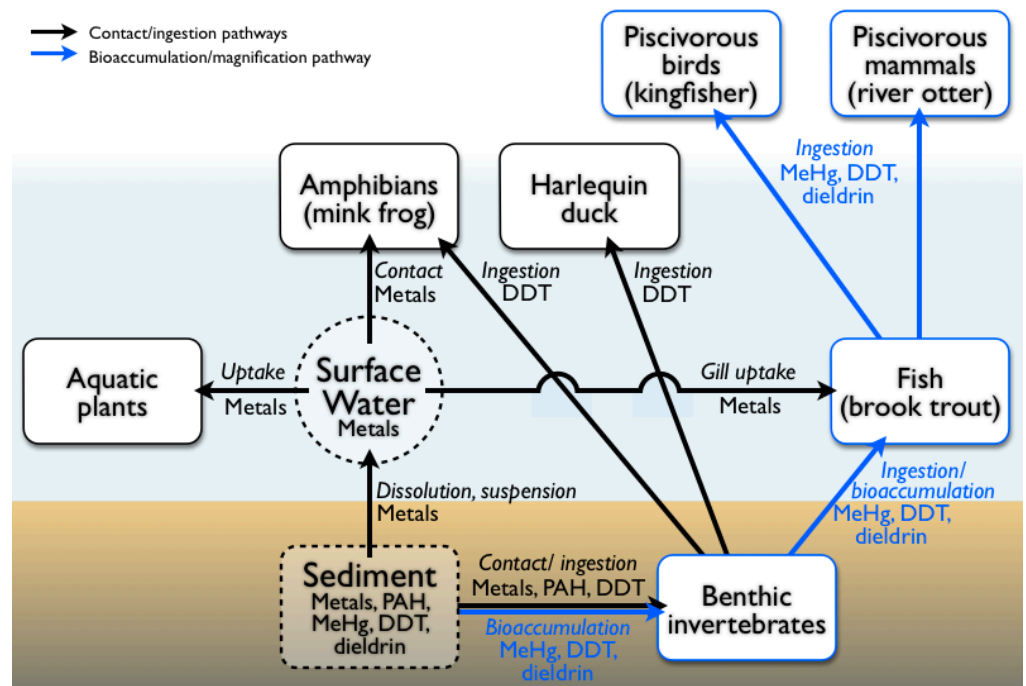
Date Completed

2009

NovaTox staff completed a Detailed Quantitative Risk Assessment for Alexander Lake, part of 5 Wing Goose Bay, NL. Historical evidence and previous Environmental Site Assessments had indicated sediments in Alexander Lake, a recreation area on Base property, were contaminated with elevated levels of metals, methyl mercury, petroleum hydrocarbons, PAHs, PCBs, DDT, and organochlorine pesticides. As a result, DND required a detailed quantitative human health and ecological risk assessment of the lake. The ERA was conducted in accordance with the requirements of the *DND Risk Assessment Procedures Guide* and the framework outlined by the Canadian Council of Ministers of the Environment.

The Ecological Risk Assessment was conducted as a detailed desktop exercise incorporating results of two decades of surface water, sediment, and fish tissue monitoring studies conducted at Alexander Lake. Because of the bioaccumulating potential of the primary contaminant, DDT, the ecological food web model included upper avian and mammalian predators likely to feed on the brook trout. Risks to plants, benthos, amphibians, fish, and piscivorous wildlife from elevated concentrations of metals and pesticides in sediment were evaluated using a food web exposure model. Two main exposure pathways were evaluated: direct contact pathways (i.e., contact with contaminated sediment and/or surface water); and bioaccumulation pathways (ingestion of food/prey with elevated tissue concentrations of contaminants). Similar to the HHRA, a hazard ratio approach was used to evaluate potential risks to ecological receptors.

The findings of the ERA indicated aquatic receptors and wildlife at Alexander Lake are potentially at risk from direct contact with DDT and metals in contaminated sediments and surface water, and the accumulation of DDT, dieldrin, and methyl mercury in biota within the lake. The results of the DQRA informed several recommendations, including an expanded sediment and surface water monitoring program, a sediment toxicity testing program, fish and wildlife surveys, and restrictions on consumption of fish from Alexander Lake.



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