Thunder Bay Area of Concern Beneficial Use Impairment Redesignation

Bird or Animal Deformities or Reproduction Problems

January, 2017

The attached technical report “Assessment of the Wildlife Reproduction and Deformities Beneficial Use Impairment in the Thunder Bay Area of Concern” sets out that the status of the BUI: Bird or Animal Deformities or Reproduction Problems should be redesignated to NOT IMPAIRED. This is a positive change from the initial designation of REQUIRES FURTHER ASSESSMENT, as sufficient research and monitoring has been carried out to make conclusions about the health of colonial waterbird populations in the AOC.

Based on various contaminant, health effect and population studies from 1989 to 2007 and a further three years (2012, 2014 & 2015) of focused study by the Ecotoxicology & Wildlife Health Division of Environment and Climate Change Canada (ECCC), there is no evidence of deformities or reproduction problems in colonial waterbirds attributable to local contamination effects within the Thunder Bay AOC. The approach used here has been implemented in the St. Marys River (Ontario) and Hamilton Harbour AOCs for similar assessments of this BUI.

The technical report details the methods, field and laboratory analysis, results, discussion, and conclusions of the three year focused study. Deformities, reproduction and development were examined in herring gulls (Larus argentatus) by collecting freshly-laid eggs from two colonies within the AOC and one reference colony outside the AOC, in 2012, 2014 and 2015. The double-crested cormorant (Phalacrocorax auritus) was also included for assessment of contaminant burdens in these years.

Key findings include:

• No evidence of contaminant-induced impairment of reproduction within the Thunder Bay AOC
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- Zero percent deformity rate of herring gull embryos in the lab or chicks at study sites
- Limited differences in contaminant concentrations between AOC and reference colonies and TEQs lowest across Great Lakes
- Current contaminant concentrations are below thresholds established for impairment of reproduction and protection of avian fish-eating wildlife

The study results were presented and discussed with the AOC’s Public Advisory Committee in March 2016. The committee voiced positive response to the conclusions and supported the proposal to redesignate the beneficial use impairment to NOT IMPAIRED.

When Thunder Bay was listed as an AOC, discharges of pollutants from local pulp and paper industries and wastewater treatment plants, as well as atmospheric deposition and urban runoff, had impaired water quality and ecosystem health. At the time, contaminants of concern included dioxins and furans, mercury, and polychlorinated biphenyls (PCBs), which the Stage 1 Remedial Action Plan (1991) noted as a potential risk for causing deformities and reproduction problems in birds and animals. Since no formal study had been conducted, the beneficial use impairment was designated as “requires further assessment”. In the years following the Stage 1 Remedial Action Plan, observations suggested that waterfowl populations were at normal levels and there were no reports of bird or animal deformities in the AOC. The BUI status was changed to “not impaired” in the Stage 2 Remedial Action Plan (2004). When study results from 2000 and 2001 subsequently showed possible health effects compared to a non AOC site, the RAP team decided that further assessment was still required to have a clear understanding of the health of colonial waterbirds in the AOC (Thunder Bay Remedial Action Plan Update, 2012). In 2012, ECCC initiated the BUI focused, three-year study attached here. This study concluded there is no evidence of deformities or reproduction problems in colonial waterbirds attributable to local contamination effects within the Thunder Bay AOC. As a result of this robust and thorough study of this impairment, the RAP Team recommends the status of the Bird or Animal deformities or reproduction problem BUI be changed from REQUIRES FURTHER ASSESSMENT to NOT IMPAIRED.

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