

Dear Province Lake Association,

As part of its statewide monitoring of contaminants in loon eggs, the Loon Preservation Committee tested an unhatched, abandoned loon egg collected from Province Lake last summer. We have just received the final results for this egg and they are concerning.

- Total PCBs for the Province Lake egg were 58,574 parts per billion (ppb), although this is an estimated minimum result because levels in the egg exceeded what the laboratory method/instrumentation were able to fully quantify. By way of comparison, mean total PCB levels for loon eggs in New Hampshire from 1993-2021 were 1,818 ppb, with a maximum of 12,849 ppb. The levels seen in the Province Lake egg were only slightly lower than levels seen in New Hampshire loon eggs in the mid-1970s, when documented PCB contamination in the environment was at its highest.
- The most toxic PCBs are known as “dioxin-like PCBs” because they function like dioxins/furans in terms of toxicity within an organism. Dioxins, furans, and dioxin-like PCBs are measured in terms of a “toxic equivalency quotient” (TEQ) so their levels can be compared based on how toxic each type of chemical contaminant is and are typically measured in parts per trillion (ppt). The TEQ for the dioxin-like PCBs from the Province Lake egg was 1,139 ppt. For comparison, although we only have a small subset of eggs tested for dioxin-like PCBs from around the state, the mean TEQ level for these eggs was 64.9 ppt with a maximum of 248 ppt.
- Dioxins and furans in the Province Lake egg were 62 ppt TEQ, compared with a statewide mean of 18.5 ppt TEQ and a maximum of 55.5. The majority (89%) of the dioxins/furans in the Province Lake egg were of a type often associated with impurities from technical PCB mixtures.
- The Province Lake egg was also notably high for chlordane, at 673 ppb. Most of this was oxychlordane (645 ppb), which is an estimated maximum concentration. For comparison, mean levels of total chlordane elsewhere in the state (1993-2021) were 42 ppb (max = 131 ppb) and levels in New Hampshire from the early 1980s were 240 ppb.

This is certainly concerning for loons: levels of PCBs in the Province Lake egg were 8.4 times the levels shown to impact the health and reproductive success of other bird species and levels of dioxin-like compounds (i.e., dioxins, furans, and dioxin-like PCBs) were 8.8 times that level. Effects levels of chlordane in eggs are unclear, but the Province Lake egg is below a hypothesized threshold level. Loons are excellent indicators of contaminants in the environment because, as fish-eaters, they are high on the aquatic food web. The contaminants in their eggs come primarily from the fish they eat on the lakes they are resident on in the weeks preceding egg-laying. Of course, these results are only from a single egg and further testing would be important to confirm these levels are consistently seen in Province Lake loon eggs, and testing of fish from the lake would be needed to ascertain any possible risks to human health from consumption of fish from the lake. It was very good news that the other egg from this clutch hatched and the chick fledged, but this does not lessen the concern raised by the results of this egg and underscores the need for additional data from Province Lake to understand contaminant levels and exposure.

We shared preliminary results with NH Department of Environmental Services, and they are looking into whether funding for fish testing may be available. We will let you know when we hear from them whether funding would be available, but we wanted to make you aware of this situation as soon as we received final results from the lab. Please share this information with the PLA Board, as well as with the lake community in whatever way you think is most appropriate. I apologize for the timing on this, but I will be away from the office until May 20th and will be happy to answer any questions you may have upon my return. Otherwise, we will be in touch once we hear further from DES.

Best,

Tiffany

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Tiffany Grade
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Loon Preservation Committee