

Impaired chick survival in Black-throated Loon and Red-throated Loon in parts of Sweden

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Surveys of the breeding performance by Black-throated Loon (*Gavia arctica*) and Red-throated Loon (*Gavia stellata*) indicate that the percentage of broods with two chicks has decreased (for both species) since the mid-1990s in parts of Sweden. As the chicks' survival primarily is dependent on the parent's ability to provide food, this result might indicate impaired foraging conditions. Three (not necessarily exclusive) explanations are discussed:

Reduced abundance of fish: Less likely, as concluded from results from gill-net fishing.

Reduced light penetration due to increased levels of humus: Humus concentration has increased in lakes in southern Sweden and Norway during recent decades. Having in mind that loons are visual feeders, this might have made fish prey more difficult to detect. In lakes used for breeding or foraging by loons in South Sweden, light penetration has decreased by 17-18 % since mid-1990s, coincident with a decreased percentage of 2-chick broods, for both species. But for Black-throated Loon, a decreased percentage of 2-chick broods was recorded also further northwards, where no reduced light penetration has been noticed.

Thus, there is no perfect evidence of any link between impaired light penetration and the decreased percentage of 2-chick broods.

Increased contents of mercury in prey fish: No direct evidence; no eggs collected after 1997 have been analysed. But indirect evidence so far as Hg-contents in freshwater fish has increased since 1990s, and median contents in *Perca fluviatilis* correspond to levels where a productivity drop by 50 % cannot be excluded, with reference to findings for *Gavia immer* in North America.

The increased exposure to methylized mercury is related to leakage of mercury from terrestrial habitats in the catchment area to nutrient-poor freshwater lakes. Using reference values for total phosphorus (<0.03 mg/l), pH (< 6.0) and alkalinity (<0.10 meq/l) proposed for environmental monitoring in North America, it is assumed that around 10 % of the breeding (and foraging) lakes used by Black-throated Loons and 30 % of the lakes used for foraging by Red-throated Loons in Sweden may be at risk.

Definitely, the risk of exposure to methylized mercury must not be neglected, but to be further investigated.