

# Using Nestling Feathers to Assess Spatial and Temporal Concentrations of Mercury in Bald Eagles at Voyageurs National Park, Minnesota

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*Abstract:* Bald eagles (*Haliaeetus leucocephalus*) have been utilized as a biosentinel of aquatic ecosystem health in the Great Lakes Region since the early 1960s. Bald eagle populations have been monitored at Voyageurs National Park (VNP), Minnesota, since 1973. For the past 20 years, researchers have collected feathers from nestling bald eagles to assess their dietary exposure to mercury (Hg) on Rainy, Kabetogama, and Namakan lakes in VNP. Current geometric mean concentrations have declined by 77.4% since 1989 at VNP. While all samples from 1985 to 1989 had detectable concentrations of Hg, 10% of current samples had concentrations below the reportable detection limit (0.001 mg/kg DW, n = 180). The major lakes at VNP are impounded, and Hg concentrations also declined greatly after the lake level stabilization order by the International Joint Commission was implemented in 1999. Mercury concentrations in feathers of nestling bald eagles from 1989 to 2010 ranged from ND (<0.001) to 34.97 mg/kg DW. The highest single concentration of mercury in a nestling was from Namakan Lake in 2010. The five-year geometric means for Rainy, Kabetogama, and Namakan lakes for 2006–2010 were 6.08, 1.07, and 5.56 mg/kg DW (n = 28, n = 32, n = 27) respectively. Although Hg concentrations in feathers of nestlings greatly declined after the change in water level management in 1999 and are lower than 1989 concentrations, recent samples suggest a gradual increase.

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