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

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Abstract: Bald eagles (*Haliaeetus leucocephalus*) are a sentinel species used to monitor concentrations of environmental contaminants such as polychlorinated biphenyls (PCBs) and organochlorine pesticides (OCs) in North America. Bald eagles were very slow to recover after the ban of PCBs and OCs because of their environmental persistence. The bald eagle population at Voyageurs National Park (VNP) provides an opportunity to assess temporal and spatial trends of persistent environmental contaminants. Nestling bald eagle plasma samples were analyzed for PCBs and OCs for the past 14 years. Total PCBs, total DDTs, 4,4'-DDE, and dieldrin are reported here since >50% of nestling plasma samples had detectable concentrations. Total PCBs, total DDTs, and 4,4'-DDE concentrations all decreased (26.09%, 24.09%, and 40.92% respectively). Concentrations of dieldren increased which lead to the need for a NOAEC for plasma to be calculated for this study (NOAEC=0.4 μg/kg). This NOAEC was below the reportable detection limits for the method used, suggesting that all observable concentration of dieldren were of potential risk. In this study 61.1% of all nestlings sampled from all areas of the park had detectable concentrations of dihedron. In conclusion, concentration of total PCBs, total DDTs, and 4,4'-DDE decreased while dieldren concentrations increased 50.25%.

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