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Poster Presentation – Wildlife

Title: PCBs, DDE, mercury, selenium and lead residues in livers of bald eagle from Maine

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Abstract: Fifty-one livers were extracted from bald eagle carcasses recovered in Maine between 2001 and 2007. Approximately 50% of the birds were collected during the spring months (March – May) with the remaining carcasses being recovered equally among the other three seasons. Causes of death included electrocution, collisions, gunshot, lightning, and starvation; but the majority died of undetermined causes. Qualitative estimates of body condition based on muscle mass and subcutaneous and intra-abdominal fat content suggested that 69% of the birds were in poor physical condition. Total PCB (27.32 ± 90.40 $\mu\text{g/g}$ wet weight, max. 570 $\mu\text{g/g}$ ww) and DDE (3.46 ± 9.66 $\mu\text{g/g}$ ww, max. 64.2 $\mu\text{g/g}$ ww) were detected in all samples. Average concentrations by month of collection appeared similar for both compounds with the highest levels recorded in May and September. Fourteen birds had PCB levels in the range of sublethal effects. Three eagles had PCB liver levels indicative of acute toxicity (> 100 $\mu\text{g/g}$ ww). DDE liver levels did not approach acute toxicity thresholds. Three birds had DDE concentrations in the sublethal effect range. Mercury (Hg, 23.04 ± 30.45 $\mu\text{g/g}$ dry weight), lead (Pb, 13.21 ± 32.96 $\mu\text{g/g}$ dw), and selenium (Se, 10.37 ± 9.28 $\mu\text{g/g}$ dw) were also detected in all samples. Thirty-three livers had low Hg levels (< 20 $\mu\text{g/g}$ dw), 16 had moderately elevated Hg levels ($20 - 80$ $\mu\text{g/g}$ dw) and two had toxic Hg levels (> 80 $\mu\text{g/g}$ dw) including one with 191 $\mu\text{g Hg/g}$ dw. Liver Hg varied by month with no apparent pattern among season of collection. Forty-three liver samples exhibited low Pb levels (≤ 6 $\mu\text{g/g}$ dw), but eight had concentrations indicative of Pb poisoning (> 30 $\mu\text{g/g}$ dw). Two livers had Pb levels in excess of 130 $\mu\text{g/g}$ dw. The highest Pb concentrations were detected in birds recovered during the winter and spring months. Over a third of the liver samples contained Se at concentrations associated with biological risk (> 10 $\mu\text{g/g}$ dw) and two had concentrations associated with deformities (> 30 $\mu\text{g/g}$ dw). Selenium liver levels varied by month and there was no apparent pattern among season of collection. Although the bald eagle has been removed from the U.S. and some state endangered species lists, environmental contaminants may still be pose a threat and accumulate to toxic levels in some birds. The USFWS post-delisting monitoring strategy encourages periodic evaluations of trends in bald eagle abundance and contaminants exposure in vulnerable regions.