

**30th Annual Meeting of the Society of Environmental Toxicology and Chemistry
November 19 – 24, 2009
New Orleans, Louisiana**

Poster Presentation - #SP226

Title: Liver Contaminants in Bald Eagle Carcasses 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, traps, lightning, starvation, and euthanasia after treatment, 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. Livers were analyzed for trace metals, organochlorine compounds, and percent lipid.

Total Hg (mean $23.04 \pm$ standard deviation $30.45 \mu\text{g/g}$ dry weight) and Pb ($13.21 \pm 32.96 \mu\text{g/g}$ dw) were measured in all samples. Thirty-three livers had low Hg levels ($< 20 \mu\text{g/g}$ dw), 16 livers had moderately elevated Hg levels ($20 - 80 \mu\text{g/g}$ dw) and two livers had toxic Hg levels ($> 80 \mu\text{g/g}$ dw) including one with $191 \mu\text{g Hg/g}$ dw. Forty-three liver samples exhibited low Pb levels ($\leq 6 \mu\text{g/g}$ dw), but eight of 50 livers 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. Other metals detected in all livers included Cd ($0.47 \pm 0.38 \mu\text{g/g}$ dw), Cu ($29.12 \pm 30.23 \mu\text{g/g}$ dw), Se ($10.37 \pm 9.28 \mu\text{g/g}$ dw), and Sr ($1.21 \pm 2.35 \mu\text{g/g}$ dw).

In 51 livers, mean p,p'-DDE was $3.46 \pm 9.66 \mu\text{g/g}$ wet weight (max. $64.2 \mu\text{g/g}$ ww) and mean total PCB was $27.32 \pm 90.40 \mu\text{g/g}$ ww (max. $570 \mu\text{g/g}$ ww). Other organochlorine compounds detected in all livers included *cis*-nonachlor ($0.036 \pm 0.050 \mu\text{g/g}$ ww), *trans*-nonachlor ($0.222 \pm 0.507 \mu\text{g/g}$ ww) oxychlorane ($0.121 \pm 0.347 \mu\text{g/g}$ ww), dieldrin ($0.063 \pm 0.131 \mu\text{g/g}$ ww), mirex ($0.115 \pm 0.320 \mu\text{g/g}$ ww) and HCB ($0.018 \pm 0.020 \mu\text{g/g}$ ww). Although the bald eagle has been removed from the U.S. and some state endangered species lists, environmental contaminants still 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.