

BIOACCUMULATION OF RADIOCESIUM AND MERCURY IN DIVING AND DABBING DUCKS ON FOUR-MILE CREEK AT THE SAVANNAH RIVER SITE

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Environmental contaminants, such as radiocesium (¹³⁷Cs) and mercury (Hg), are of growing concern for human and wildlife health due to their global distribution, their ability to bioaccumulate within organisms, and negative effects associated with exposure. Accumulation of contaminants in migratory game species, such as waterfowl, is of particular concern because they have the ability to transport contaminants far from a contaminated source, and are consumed by hunters and their families. An inter-specific difference in contaminant uptake likely exists among waterfowl species due to varying foraging strategies and other behavioral traits. In this study, we investigated accumulation rates of ¹³⁷Cs and Hg in two species of waterfowl with different foraging strategies, Mallard (*Anas platyrhynchos*) and Ring-necked Ducks (*Aythya collaris*). In December 2015-January 2016, we obtained uncontaminated birds of these two species, rendered them flightless, and released them onto Fourmile Beaver Pond, a known ¹³⁷Cs and Hg contaminated waterbody on the SRS. Birds were later lethally collected between

9 and 94 days after release to elucidate contaminant accumulation rates. We collected samples to determine ¹³⁷Cs and Hg burdens for each individual. Some individuals, mainly Mallards, reached burdens of ¹³⁷Cs higher than recommendation for human consumption based on the European Economic Community (EEC; 0.6Bq/g) after approximately 25 days. Data revealed that Mallards accumulated more ¹³⁷Cs, peaking at approximately 1.2 Bq/g whole-body after 65 days compared to Ring-necked Ducks, peaking at approximately 0.3 Bq/g after 40 days. Additionally, Mallards accumulated up to 0.7 ppm Hg in the liver up until day 94, while Ring-necked Ducks peaked at approximately 0.3 ppm Hg after 35 days. These contaminant burden differences are likely a result of the different foraging strategies and habitat use exhibited between these species. This should be considered in risk assessment for human consumption of wild waterfowl species, and other mobile game species.



Sarah in the lab.