

Sea Duck Joint Venture
Annual Project Summary for Endorsed Projects
FY 2005 – (October 1, 2004 to Sept 30, 2005)
Reporting Deadline: October 1, 2005

Project Title: No. 35: Wintering Ground Effects on Vital Rates of White-winged Scoters at Redberry Lake, Saskatchewan

Principal Investigators: Cindy J. Swoboda
Department of Biology, University of Saskatchewan,
Saskatoon, SK S7N 5E2; cindy.swoboda@ec.gc.ca;
Ray T. Alisauskas Canadian Wildlife Service, Prairie
and Northern Region, Saskatoon, SK S7K 0X4;
ray.alisauskas@ec.gc.ca



Partners: Institute for Wetlands and Waterfowl Research, Ducks Unlimited Canada, Sea Duck Joint Venture, Canadian Wildlife Service, University of Saskatchewan

Project Description: North American White-winged scoter populations have declined markedly in the prairie parklands and boreal forests of Canada in the last four decades, raising concern and exposing the need to address specific priorities that include: estimation of survival and production rates, population delineation, and linkage of wintering areas to breeding areas. The causes for decline are uncertain, but likely involve a complexity of events occurring on both the wintering and breeding grounds. As events on these areas are not mutually exclusive, it is important to link breeding and wintering areas to address conservation issues. Stable isotope markers have been successfully used for this purpose in other avian species. We will use stable isotope analysis techniques to examine potential differences in vital rates of a nesting population of White-winged scoters in relation to winter origin at Redberry Lake, Saskatchewan. This site has the highest known density of breeding White-winged scoters and is considered a migrational divide as band recoveries from Redberry Lake have occurred on both the Atlantic and Pacific coasts. Nests are located on the islands in Redberry Lake and revisited every 7-10 days to determine fate and to band ducklings at hatch. Females were captured on the nest during mid-incubation during which time they were measured, nasal-marked, banded and sampled for blood and feathers.

Objectives: 1) Delineate wintering populations of White-winged scoters using stable isotope analysis of feathers collected from known wintering locations, 2) Examine population structure by determining the proportion from both wintering grounds that nest at Redberry Lake, 3) Determine the degree of winter site philopatry using stable isotope analysis of feathers from recaptures in successive years, and 4) Determine cross seasonal effects on adult female survival, body condition, clutch size, nest success and blood contaminant loads (cadmium, mercury, lead and selenium) of females nesting at Redberry Lake in relation to winter origin.

Preliminary Results: Analyses of isotope levels of $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ in feathers from coastal wintering scoters show this technique is useful in delineating East and West coast scoter populations and provides the reference samples needed to stratify the Redberry Lake breeding population. This methodology determined that approximately 75% of the nesting females wintered on the Pacific and only 25% wintered on the Atlantic coast for 2002 and 2003, however in 2004, the proportion that wintered on the west coast was much higher (89% Pacific, 11% Atlantic). Of 61 females captured during 2002, 2003 and 2004 field seasons, most (n=56) apparently returned to the same coast to winter as in a previous year, but 5 females may have switched between western and eastern wintering areas among years. Mean nest initiation date was earlier for birds wintering in the west. Body size is larger and levels of selenium, lead, and cadmium are higher for eastern wintering birds.

Project Status: Collection of coastal samples and isotope analysis to determine winter origin of birds nesting at Redberry Lake has been completed. Analysis of data and thesis preparation to be completed by early 2006. Efforts to capture and mark adult females and ducklings continued in 2005 for long term study on population demography and collection of age-specific data.

