

**Sea Duck Joint Venture**  
**Annual Project Summary for Endorsed and Funded Projects**  
**FY 2005 (October 1, 2005 – September 30, 2005)**  
**Reporting Deadline: October 1, 2005**

**Project Title: No. 42:** Comparative Reproductive Strategies Between Long-tailed Ducks and King Eiders at Karrak Lake, Nunavut: use of energy reserves during the nesting season.

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*Female Long-tailed Duck*



*Female King Eider*

**Partners:** Sea Duck Joint Venture, Canadian Wildlife Service, Northern Scientific Training Program (Department of Northern and Indian Affairs, Government of Canada), Polar Continental Shelf Project (Natural Resources, Government of Canada), University of Saskatchewan

**Project Description:** During the last four decades, populations of North American Long-tailed Ducks and King Eiders have been declining. Reasons for these declines are uncertain, but may be attributed to a number of factors on both wintering and breeding grounds. We are investigating life history strategies of Long-tailed Ducks and King Eiders on a shared breeding ground in the central Canadian Arctic, where long term research has been conducted on King Eiders and Long-tailed Ducks since 1995 and 1998 respectively. This project began in June 2004, at the Karrak Lake Research Station in the Queen Maud Gulf Bird Sanctuary, Nunavut Canada. We placed remote temperature sensors in nests to provide information about incubation constancy for both species. Stable isotope techniques were used to investigate the role, reliance and allocation of nutrient reserves in egg production of Long-tailed Ducks and King Eiders as well as wintering locations of Long-tailed Ducks breeding at this central Canadian arctic location (as has been done successfully for King Eiders at this area). Islands in the Karrak and Adventure Lake systems were searched for nests and nest checks were conducted every 7 – 10 days to determine nest fate, egg attrition and hatch date. Females were captured during mid to late incubation and were measured, banded, weighed and feathers of Long-tailed Ducks were collected.

**Objectives:** The primary objectives of this project are to 1) quantify incubation recess frequencies taken by Long-tailed Ducks and King Eiders, 2) measure and compare mass loss of female Long-tailed Ducks and King Eiders during incubation, 3) measure the allocation of endogenous and exogenous energy reserves in eggs laid by Long-tailed Ducks and King Eiders

and 4) to determine wintering areas of individual Long-tailed Ducks breeding at Karrak Lake, Nunavut and study possible movements among winter populations.

## **Preliminary Results:**

### *Nest Searching and Monitoring*

Nest searching for Long-tailed Ducks and King Eiders at Karrak and Adventure Lakes was conducted from mid-June to mid-July 2004. Nest searching focused on islands in Karrak and Adventure Lakes, as they are known to have high nesting densities of both King Eiders and Long-tailed Ducks. Over 200 nests of Long-tailed and King Eiders were found and monitored during the 2004

### *Egg Production*

Eggs of both Long-tailed Ducks and King Eiders were collected early in the 2004 breeding season from active, failed and abandoned nests at Karrak, Adventure and Simpson Lakes. Analysis of stable carbon and nitrogen isotopes ( $\delta^{13}\text{C}$ ,  $\delta^{15}\text{N}$ ) of egg components (albumen, whole yolk, and lipid-free yolk) were used to determine dietary information and to link metabolic pathways to body stores (endogenous and exogenous) and nutrient sources, from marine versus freshwater habitats. Results indicate Long-tailed Ducks and King Eiders, at these

### *Breeding & Wintering Ground Connectivity*

We developed a methodology based on stable carbon and nitrogen ( $\delta^{13}\text{C}$ ,  $\delta^{15}\text{N}$ ) ratios in Long-tailed Duck feathers to delineate wintering populations from the Pacific and Atlantic coasts and Lake Ontario. Feather samples were collected at Karrak Lake, Nunavut during 2003-2005 breeding seasons and from harvested Long-tailed Ducks and other sea duck research projects throughout North America at known wintering areas throughout North America 2003 and 2004. Head feathers were the most successful at classifying Long-tailed Ducks from Pacific and Atlantic

season. Remote temperature probes (Hobo XT, Onset Computer Corporation) were placed in 25 of both Long-tailed Duck and King Eider nests to record recess frequency, duration and timing taken by incubating females. A combined ninety-eight incubating females of both species were caught using mist nets between day 12 and final days of incubation/hatching (23 days KIEI; 26 days LTDU). Two hundred-twenty-two ducklings were also banded during the 2004 field season.

breeding areas, utilize predominantly exogenous (freshwater breeding ground food sources) resources for egg production.



*Long-tailed Duck nest 2004*

coasts and Lake Ontario and were used to assign Long-tailed Ducks breeding at Karrak Lake to respective wintering areas. Results show Long-tailed Duck females breeding at Karrak Lake are coming from western and eastern coasts and Lake Ontario region.



*Long-tailed Duck feather collection*  
● = summer    ● = winter

**Project Status:** Analysis of incubation frequency data and weight loss is currently underway and will be finished in the next few months. Stable isotope analysis of both eggs and feathers has been conducted and findings are currently being written.