Sea Duck Joint Venture
Annual Project Summary for Endorsed Projects
FY 2008 – (October 1, 2007 to September 29, 2008)

Project Title: Ecological and behavioural monitoring of American Common Eiders during the annual cycle (SDJV # 71; Year 3 of 3)

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Partners: Sea Duck Joint Venture ; Canadian Wildlife Service (Quebec Region); Université du Québec à Rimouski (UQAR)

Project Description

In this project, we applied a recent technique for the study of sea ducks that enables an investigator to monitor the behavior and energy expenditure of an individual during a full annual cycle. The American race of Common Eiders is facing increasing environmental pressure from harvesting of coastal resources, hunting, oil spills and soon, offshore wind parks. Our main goal is to link together the various biological phases (post-hatching, molting, pre-laying, etc.) of the annual cycle by understanding the relationships between habitat use, energy expenditure, food demand and migratory movements.

Our objectives are 1) to quantify the timing and duration of annual phases, 2) to quantify habitat use (depth), energy expenditure, time spent diving and body condition of post-reproductive females, 3) to use depth, daily diving and bottom time to estimate feeding efficiency and foraging effort throughout the annual cycle, 4) to estimate the duration of the pre-laying period based on the timing of spring migration and relate these (individual) estimates to energy expenditure, foraging behavior and laying date.

Preliminary results - summary 3 years (2006, 2007 and 2008)

Our objectives required to deploy data loggers (DLS), to monitor breeding biology and assess body condition of post-hatching females. We conducted our study at Pointe Mitis (47°34' N; 70°12' W) and deployed a total of 28 DLSs during spring 2006 and 2007. This colony was chosen based on its low number of breeding females and easy access. Because our study required the deployment of DLS a first year and catching back of the same females one year later, our main concern was to maximize our chances to catch instrumented females. We designed nest boxes that we are able to close at 500 feet distance using a remote control. Overall, of 28 DLS deployed, only (11) 39 % of the experimental females came back, one of which was eaten by a predator leaving one DLS on the ground. Eight other females, that were seen nearby the colony at the time of laying, did not breed in spring 2008. Concomitantly, we caught two red foxes in the vicinity of the colony in 2008 and we believe that the presence of foxes explain the low return rate of our experimental females. Overall during the three years of study, 33 specimens were collected during post-reproduction around île Bicquette, île Saint-Barnabé and Rivière Tartigou near Rimouski. Body organs were dissected and weighed. Hemoglobin concentration was determined and fresh blood was analyzed using enzyme essays. The ratio DNA/RNA were also measured and will provide an index of protein turnover and growth of tissues.

LAYING DATES AND HATCHING SUCCESS OF FEMALES IN 2008: Seventy (70) nest boxes were installed in spring 2008 and the great majority (65) of these were used by breeding eiders. Among the nest boxes used, 22 (34 %) females hatched eggs, 2 (3 %) nests were predated and 41 (63 %) were deserted. The median date of laying was 19th May. The high number of deserted nests was most probably caused by our capture/re-capture work at the colony. Indeed, we visited our experimental colony 4 times during the incubation period, to catch, weight, ring and mark the females.

RETURN RATE AND RETRIEVAL OF DLSs in 2008

Of the total number of females banded and present on the colony in 2007, only 27 (45 %) came back nesting on our experimental colony in 2008. Twenty-two loggers were implanted on as many females in 2007 and 15 females were seen on or around the colony at the time of pre-laying/incubation giving a return rate of (68 %). However,

only seven instrumented females actually nested on the colony (actual return rate of 32 %). During our first visit at the colony to install the nest boxes, we found one data logger on the ground with a nearby carcass suggesting that a fox could have visited the island. For this reason, we hired a professional trapper who installed traps on the mainland adjacent to the colony and two adult foxes were caught around May 14th, that is 5 days before the median of laying in the colony (see above). We believe that the presence of foxes discouraged the first incoming females to nest, explaining the low return rate observed in 2008.

ENERGY BALANCE AND ORGAN MASS: Our objective in 2008 was to estimate the body mass at hatching of several females nesting on the colony and recapture these females when offshore in order to quantify the rate of body mass recovery of breeding females. We marked 57 incubating females with wing tags and color tapes. Only one female was caught back during post-reproduction although five attempts of finding and collecting such females were conducted. Finally, 8 post-hatching females ranging in body mass between 1200-1800 were plucked, their wings removed and homogenized in an industrial blender. Triplicate samples of each specimens were prepared for chemical (water, protein and fat) analysis and sent to a commercial lab.

Project status

We are satisfied with data collection and lab analysis of the project although our efforts to estimate the rate of mass gain at the intra-individual level were almost nil (1 female caught for 57 marked females). However, our estimate of the mass gain rate at the inter-individual level is robust and will be presented together with organ mass and DNA/RNA ratios at the next SDJV meeting in Québec city.

We are not satisfied with the return rate of instrumented females in 2008 and this is why we wrote one year proposal entitled “Maximising the return rate of instrumented female Common Eiders breeding on a small island”.