Sea Duck Joint Venture

Annual Project Summary for Endorsed Projects

FY 2004 – (October 1, 2003 to Sept 30, 2004)

DETERMINATION OF SPECIES COMPOSITION, NUMBERS AND MOULT CHRONOLOGY OF SCOTERS ALONG THE LABRADOR COAST (Project No. 49)

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Project Description: Reproduction, moulting and migration constitute the major energy expenditures in migratory birds (King 1974). In Anseriformes, all flight feathers are moulted simultaneously and they are usually flightless for up to one month (29-36 days; Balat 1970, various authors). Thus moulting waterfowl must rely on resources available in a restricted area while they are flightless. Very little is known about scoter behaviour, or their food, habitat requirements and energetic requirements during moult. Generally, waterfowl are thought to seek remote areas which are free from predators and disturbance for their moult. Acquisition of a high quality plumage is likely key to subsequent success in migration, condition and reproduction (Robertson 1999).

Disturbance of birds during moult may increase their risk to predation, reduce time available for foraging, increase energy expenditure. Nothing is known about the behaviour of surf scoter during moult and the effect of disturbance on moulting scoters has not been described. Impacts of disturbances has on bird behaviour has been observed in other sea duck species. For example, Frimer (1994) concluded than an undisturbed habitat was critical for king eiders, particularly during the latter part of the moulting season. Frimer (1994) observed that moulting king eiders responded to the distant engine sounds, birds ceased feeding and swam offshore when an airplane passed several km overhead. When boats passed close to feeding areas the birds took flight or escaped by diving and swimming.

Abundance and Distribution -- We proposed to do aerial surveys to determine the distribution, abundance, timing, and species, sex and age composition of scoters moulting in central Labrador. Sites used by moulting scoters were to be identified, and use of these sites monitored within and across years. The area of interest was large, covering the Labrador coastline from about 56º to 57º latitude. We proposed this area be surveyed by fixed-wing aircraft, on approximately 10 day intervals, from mid-July to late-September (about 8 flights). Investigators were not successful in obtaining funds through the SDJV as such the aerial component of the project had to be dropped.

Species, Age and Sex Composition, and Affiliations with Breeding and Wintering Areas - We proposed to capture moulting birds using moult drive techniques (King 1963) or using techniques using helicopters developed by R. Milton for catching moulting eiders. All birds were to be sexed using plumage/bill characteristics or by cloacal examination, aged by characteristics of the bursa, and marked with standard USFWS metal bands.

Objectives: Our objectives were to assess temporal and spatial distribution of scoters moulting in the study area, and obtain information on the species, sex and age composition of flocks, and the affiliations of the moult site with wintering and breeding areas.

Preliminary Results: We developed methodology for drive-trapping moulting scoters. Flocks of scoters were located by patrolling the coastline in areas where scoters were thought to moult. Once a flock was located it was herded towards shore using two boats, while a third boat set a gill net in front of the flock. The net was set perpendicular to the shore, and curved back towards the flock. All nets had 90 mm mesh size and were 4 m deep. We tested nets varying in length from 180 to 365 m. Single scoter decoys were attached to each end of the net with swordfish snaps, and two strings of six decoys were attached to the nets' float line about a third the length of the net from the near shore end. Once the net was deployed the third boat joined the drive and birds were herded towards the net. When the birds were 2-5 m from the net they were forced to dive by firing 1-3 cracker shells over the birds. Birds were also hazed into the net using air horns and by banging sticks on the sides of the boat.

From 8 to 17 August we made 29 sets and caught 661 birds (mean±sd bird caught per set was 22.8±15.6; see Fig. 1 for set locations). The overall species composition was 95.6% Surf Scoter, 3% White-winged Scoter, 1.5 % Common Eider and <1% Razorbill Auk. The majority of birds were male Surf Scoters (Table 1), and sex composition appeared to be consistent over our capture period (Fig. 2).

We observed three plumages classes for male Surf Scoters: 1) complete development of adult plumage and bill ornaments, opaque white eye iris, and crimson legs, 2) incomplete development of adult plumage and bill ornaments, milky white iris, tawny legs, and presences of juvenile breast feathers, and 3) same as 2, but no juvenile breast feathers. We suspect that plumage class 1 were ASY birds, and classes 2 and 3 were SY birds; however we used the more conservative age class AHY for plumage types 1 and 3. Age composition is summarized in Table 2.

Moult--. We estimated moult initiation dates from ninth primary lengths. Assuming the ninth primary growth rate of male Surf Scoters are similar to male Barrows Goldeneye (4.04±0.05 mm/day; van de Wetering and Cooke 2000), mean ninth primary shedding occurred on July 24±6.7 days(±SD, n=397). One adult male was caught with a 140 mm old intact ninth primary, suggesting a grow out period of about 35 days.

The body mass of male Surf Scoters decreased significantly as primary length increased ($p=0.048$). We did not detect any difference between the slopes for AHY and SY males, hence males lost an estimated 0.29 g per 1 mm increase in primary length (Fig. 4).

Project Status: We did not complete the survey component of the project because of inadequate funds. We developed an effective capture technique for moulting Surf Scoters and the number of captures exceeded our expectations. We have submitted an expanded project proposal for FY-2005 (see attached).

Literature Cited:

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Table 1. Sex composition of waterfowl caught in moult drives, Nain, Labrador, August 2004.

	Species (%)		
Sex	COEI (n=5)	SUSC (n=631)	WWSC (n=20)
Female	40.0	5.9	10.0
Male	60.0	94.1	90.0

Table 2. Age composition by species of waterfowl caught in moult drives, Nain, Labrador, August 2004.

	Species (%)		
Age[1]	COEI (n=9)	SUSC (n=631)	WWSC (n-20)
AHY	0	90.0	60
ASY	22.2	0	0
L	66.7	0	0
SY	11.1	10.0	40

1. AHY= after hatch year, ASY= after second year, L=Local, SY= Second year.

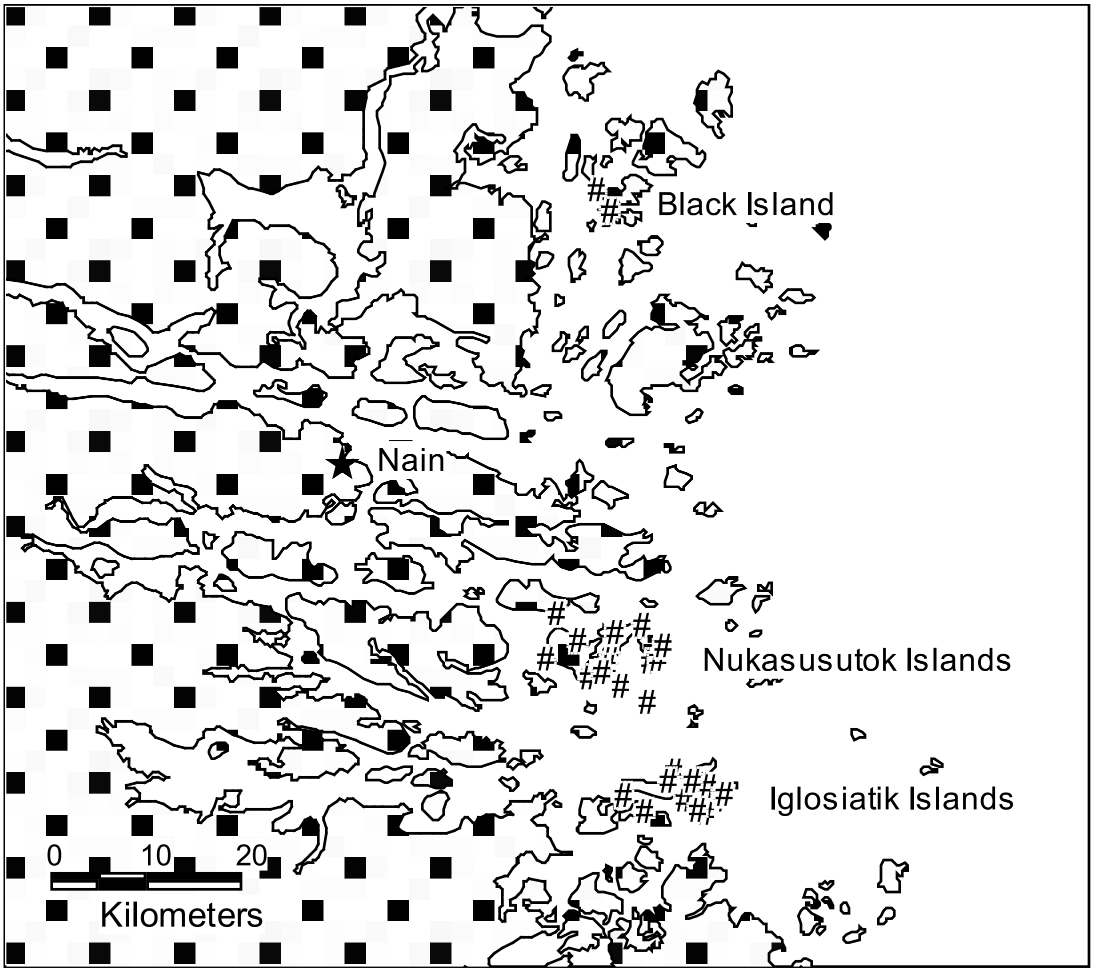

Fig. 1. Locations of banding sets, Labrador, August 2004.

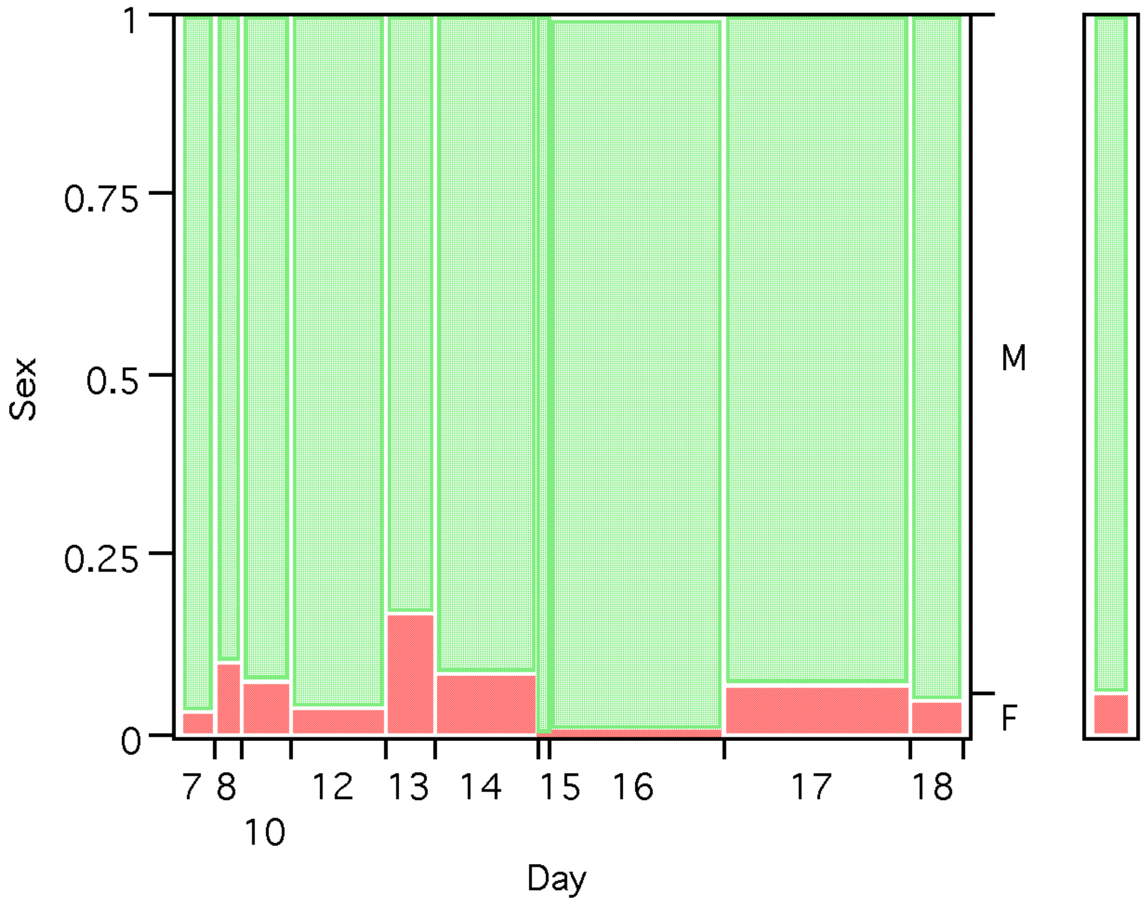

Fig. 2. Sex composition of Surf Scoters by day, Nain Labrador, August 2004 (n=631)

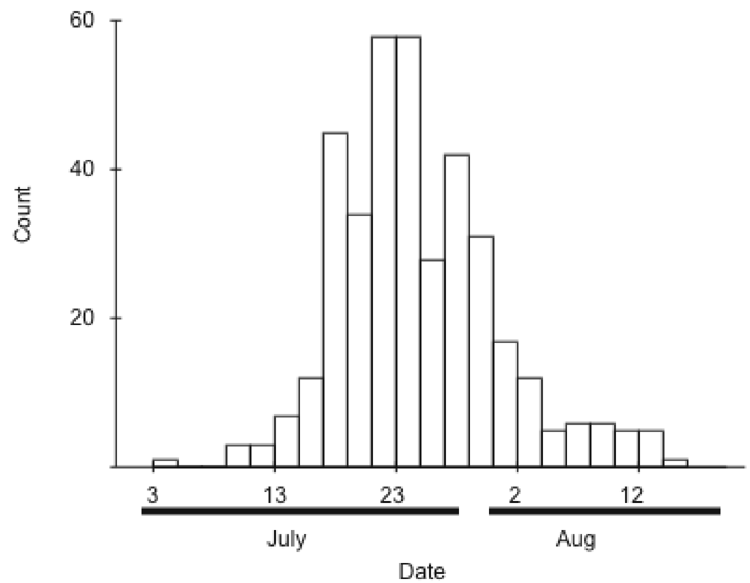

Fig. 3. Estimated ninth primary shedding dates for Surf Scoters moulting near Nain Labrador, 2004.

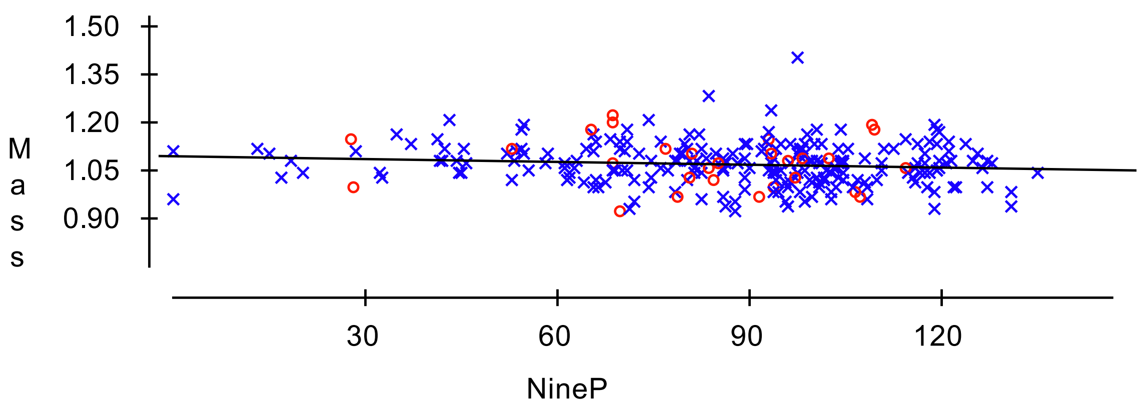

Fig. 4. Body mass (kg) vs. ninth primary length (mm) of male Surf Scoters (n=263). Red circles represent SY males and blue Xs AHY males.