

**Sea Duck Joint Venture - Annual Project Summary (Project endorsed by SDJV)
FY02 – (October 1 to September 30)**

Project Title: No. 21: Spatial and temporal patterns of movement by male Black Scoters on the Yukon-Kuskokwim Delta, Alaska. (conducted in conjunction with study on black scoter breeding ecology)

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Partners: Region 7 USFWS, Migratory Bird Management

Project Description: Within Alaska, Black Scoters (*Melanitta nigra*) principally breed on the Yukon-Kuskokwim Delta (Y-K Delta), or in the Bristol Bay lowlands. Count indices of scoters from the North American Waterfowl Breeding Pair Survey have declined at an average rate of 2.2% per year in the strata Black Scoters predominate (USFWS 1999). Assuming constancy, this rate results in a 67% decline in population size over the 37-year survey period. Very little is known about the life history and ecology of Black Scoters, leaving potential causes for this decline unknown. Accordingly, Region 7 of the U.S. Fish and Wildlife Service has identified Black Scoters as a ‘*species at risk*’.

Breeding chronology of Black Scoters is later than most waterfowl; therefore, nests are rarely encountered during studies of other waterfowl species. In 2001, a study of the ecology of breeding Black Scoters was initiated at Aropuk Lake on the Y-K Delta, Alaska. Initial results indicate that Black Scoter females initiate nesting in mid-June, with peak incubation occurring in early to mid-July. In contrast to other species of waterfowl, pairs did not appear to establish and maintain territories; therefore, there was no discernable association between the distribution of Black Scoter pairs during egg laying and the ultimate distribution of nests. Further, pairs appeared to dissolve in late June and single males were rarely observed on the study area. Thus, the utility of data collected in conjunction with aerial surveys designed for other species of ducks is questionable for indexing population size and breeding distribution of Black Scoters. Finally, recent studies attempting to link wintering populations of Surf and White-winged Scoters with breeding locations using satellite telemetry have documented very high mortality of scoters fitted with implanted transmitters. It is unclear if the high mortality experienced in these studies is associated with timing of marking (i.e., winter) or if something unique about the morphology of scoters precludes the use of implanted transmitters.

We examined the spatial and temporal patterns of movement of male Black Scoters captured and implanted with intra-abdominal VHF radio transmitters at Aropuk Lake. Additionally, we monitored survival of implanted individuals to assess the impact of surgical procedures and determine the feasibility of future satellite transmitter use in Black Scoters. We captured males opportunistically on Aropuk Lake and large satellite lake complexes during the pre-nesting period in early June using a floating mist-net and decoy approach. Captured individuals were transported back to camp and a wildlife veterinarian surgically implanted intra-abdominal VHF transmitters, which mimicked the design of satellite transmitters. Timing of movement and locations of males were monitored regularly using aerial and ground based telemetry.

Objectives: The goals outlined for this study are as follows:

- 1. Determine timing and patterns of movement of breeding Black Scoter males to allow interpretation of aerial survey data relative to population size and breeding phenology.
- 2. Assess the impact of surgical procedures and implanted transmitters on the survival of male Black Scoters during the breeding season. This information will be applied to future decision-making concerning use of satellite transmitters in this species.

Information relating to population dynamics of Black Scoters is listed as a high priority by The Sea Duck Joint Venture.

Preliminary Results: We captured three paired Black Scoter males in early June that were subsequently implanted with transmitters. Two of the three individuals departed the study area immediately following surgery; the third individual remained paired on Aropuk Lake until late June. None of the males appeared to be associated with a female that nested within the Aropuk Lake study area, thus we were not able to establish timing of departure of males from a known breeding site relative to breeding phenology. However, all three males were located repeatedly during the brood rearing period in late-July and early August at a site approximately 112 km from Aropuk Lake where molting sea ducks are known to concentrate.

Project Status: Although based on a very small sample, results indicate that surgical procedures and presence of intra-abdominal transmitters does not impact survival of male Black Scoters throughout the breeding season. Results also suggest that males move to local molting areas following departure from breeding locations. We were not able to characterize the timing of movement of males, regarding breeding phenology, to these areas. We attribute our low capture success, and thus our small sample size, to localized spring subsistence harvest altering the behavior of scoters. We plan to implant 30 Black Scoters concentrating at known spring staging area, with satellite and conventional intra-abdominal transmitters in April 2003, enabling us to collect information throughout an annual cycle.