Sea Duck Joint Venture
Annual Project Summary for Funded Project
FY 03 – (October 1, 2002 to Sept 30, 2003)

Project Title: No. 4. Atlantic Seaduck Study: Movements, Habitat Use, and Feeding Ecology of Seaducks in Chesapeake Bay and Other Atlantic Coastal Areas

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Partners: USFWS and CWS

Project Description: The migrational pathways and critical habitats used by seaducks in the Atlantic Flyway are in need of further research. In particular more research is needed to determine the breeding and molting areas of surf scoters (*Melanitta perspicillata*) and black scoters (*Melanitta nigra*).

During March-April 2001, 2002, and 2003 surf scoters were live-captured in Chesapeake Bay, MD, USA. Initial work with floating mist nets and night-lighting was unsuccessful in capturing scoters in Chesapeake Bay. A net gun (Coda, Inc.) fired from a fast-moving boat at a distance of approximately 5-10 meters from the boat captured all surf scoters. Standard night-lighting procedures were used on the Restigouche River in New Brunswick to capture black scoters during May 2002 and 2003. Night-lighting techniques use hand nets to capture ducks from the bow of a slowly moving boat with the aid of bright lights powered by batteries or generators.

Males and females were used for the telemetry aspect of this study as both sexes go to the breeding areas, although males leave shortly after initiation of incubation and go to molting areas. Within 24 hours after capture, each scoter underwent an intra-abdominal surgery to implant PTT 100 satellite transmitters (39 g) manufactured by Microwave, Inc., Columbia, Maryland. The transmitter's configuration included an external antenna (percutaneous) that was passed through the back of the duck using a surgical catheter. Initially, each duck was held post-surgery for 3-9 days, but during 2003 ducks were released within 24 hours of instrumentation. All ducks were released at the site of capture.

Objectives: The study attempted to determine the current distribution of surf and black scoters on their breeding and molting areas. Delineating these populations and establishing the affinities among staging, breeding, and molting grounds will assist in future population monitoring and management. Specific objectives were:

1. Determine migrational route and breeding ground of surf scoters, when they leave Chesapeake Bay in the late-winter, and black scoters, when they leave Restigouche River in June.
2. Conduct habitat analyses using detailed maps to provide data on the hydrology and geomorphology of these remote scoter breeding areas and the important biotic and abiotic factors influencing nest site selection.

Preliminary Results: A total of 14 surf scoters have been instrumented during three years (2001, 2002, and 2003) of satellite telemetry studies and 22 black scoters have been instrumented during two years (2002 and 2003). Males and females have been instrumented during this study. By instrumenting male scoters we have been able to get information of their movements to breeding areas, but then also obtain information about their movements to molting areas. Males only remain on the breeding area for approximately 2-3 weeks, so by instrumenting females we can obtain more information about breeding areas and possible movement with young. Updated information from the ARGOS Systems aboard the NOAA satellites on scoter movements was made accessible on the Patuxent Website: http://www.pwrc.usgs.gov/resshow/perry/scoters/.

Males that remain on nesting areas for a minimum of 2 weeks and females that remain on nesting areas for a minimum of 4 weeks were considered to be breeding adults and received more intense study. During 2002, three male black scoters migrated to nesting areas in Quebec and one female black scoter migrated to Manitoba. Three male surf scoters were tracked to their nesting areas in Quebec and Labrador in 2001 and 2002, and two female surf scoters migrated to Quebec and Northwest Territories for nesting in 2003. Other instrumented ducks remained on staging areas of the Saint Lawrence or went directly to molting areas.

Exact locations of the potential nest sites were determined using GIS (Geographic Information System) and then the coordinates were manually plotted on a topographic map. This map was then analyzed to determine the vegetation and water cover types of each nesting location. Nesting habitat for black and surf scoters based on telemetry locations in remote areas indicated that black scoters were nesting in open habitat (41.3%) and surf scoters in forested areas (55.5%). Black scoters had a greater amount of their habitat classified as marsh and swamp than surf, although the percent of lake habitat was similar for the two species.

Water quality and classification data were collected on other nesting lakes in Quebec (Lac Malbaie and Hydro-Quebec areas) and Labrador (Goose Bay area) that were more accessible to researchers. We examined whether a correlation existed among characteristics of lakes used by scoter breeding pairs compared to the characteristics of lakes not used by scoters. The following parameters were measured: dissolved oxygen, carbon dioxide, pH, minerals, nitrate, phosphate, and secchi disk light penetration. Aquatic vegetation, sediment type, benthic invertebrates, size and shape of lake, presence of islands, water sources (marsh, lake, river, etc.) were also determined. Dissolved oxygen and pH were the only parameters that significantly differed among the lakes examined. The mean depth of lakes, the presence of islands, and the presence of predatory fish are potential factors controlling selection of nesting habitat for black and surf scoters in northeastern North America, and more research is necessary to determine the importance of these factors. This information will be useful to resource managers in the future who are responsible for the remote habitats of these scoter species.

Satellite telemetry determined that James Bay was the major molting area for male black and surf scoters, although a few males molted along the coast of Labrador-

Newfoundland. Black scoters that were instrumented on the Restigouche River, which is a major staging area, were widely distributed along the Atlantic Coast from Cape Cod to Georgia during winter. Major wintering areas for black scoters were Cape Cod (Martha's Vineyard and Nantucket Island), Long Island, and New Jersey.

Only one of the 36 scoters that were instrumented died during migration and this was a male black scoter that was legally shot in December 2002 near Atlantic City, New Jersey. Surf scoters instrumented in Chesapeake Bay in late winter showed a strong tendency to return to Chesapeake Bay for the following winter after they had migrated to and from breeding areas in Quebec.

Project Status: During 2003 we had difficulty with the batteries within the transmitters of the nine black scoters and unfortunately little data were obtained from these ducks. We did obtain good movement data from black scoters during the previous year and some ducks were tracked for a full year, which involved movements to and from the breeding areas. We hope future work with 5 female surf and 10 female black scoters will avoid some of the past problems and provide new data about the movements of these scoter species and the habitat they use during migration and on wintering breeding and molting areas.

Project Funding Sources (US$):

SDJV (USFWS) Contribution	Other U.S. federal contributions	U.S. non-federal contributions	Canadian federal contributions	Canadian non-federal contributions	Source of funding (agency or organization)
$20,000					
	$25,000				USGS
	$60,000				USGS (in kind)
			$9,500		CWS (in kind)
	$2,500				USFWS

Total Expenditures by Category (US$):

ACTIVITY	BREEDING	MOLTING	MIGRATION	WINTERING	TOTAL
Banding					
Surveys					
Research	11700	11700	70,200	23400	$117,000
Communication					
Coordination					