

**Sea Duck Joint Venture**  
**Annual Project Summary for Endorsed Projects**  
**FY 2005 – (October 1, 2004 to September 30, 2005)**  
**Reporting Deadline: October 1, 2005**

**Project Title:** Estimating Distribution and Abundance of Wintering Sea Ducks in Nantucket Sound, #57

**Principal Investigators:**

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**Partners:** N/A

**Project Description:** Mass Audubon has proposed to develop accurate estimates of the relative abundance of wintering sea ducks in Nantucket Sound, Massachusetts. Reliable estimates of variation in relative abundance and distribution of sea ducks on their winter range are needed to assess the impacts of existing and proposed development on these species (e.g., NAWMP, 1998).

**Objectives:** Our primary objective is to conduct multiple aerial surveys along a defined transect grid in Nantucket Sound during the winter months in order to estimate the relative abundance and distribution of wintering ducks and seabirds in Nantucket Sound (e.g., Figure 1) and annual and/or seasonal variation of abundance and distribution. We have several questions about sea duck seasonal abundance and distribution, which we intend to answer with the results from our three years of surveys. 1) Does the relative abundance of the different duck species significantly fluctuate from year to year; 2) Does the location of duck rafts shift annually throughout the Sound or do rafts occur in similar locations in consecutive years; and 3) Are the seasonal patterns of waterfowl relative abundance consistent from year to year? Three years is the minimum level of sampling recommended by the U. S. Fish and Wildlife Service to begin to estimate the annual variability in the use of a habitat by birds. Surveys in Year Two and Year Three will be conducted with identical techniques to Year One.

**Preliminary Results:**

**Project Status:** We have completed two years of surveys during the winter season and we are seeking additional funding to complete the third year of surveys. We will also expand our surveys to areas outside Nantucket Sound by systematically conducting aerial surveys along a defined survey route encompassing the waters off the south shore of Martha's Vineyard and the island of Nantucket.

Ten complete aerial surveys, and two partial surveys, were conducted between November 18 and April 18.

#### *Waterfowl abundance and densities*

We counted a total of 512,758 waterfowl and 19 species of sea ducks and other waterbirds in the 12 aerial surveys. Scoters, all three species combined, were the most abundant; the total of all scoter species combined over the entire winter season was 280,671 representing 54.7% of all recorded waterfowl. The eider total of 277,177 represented 39.8% of the total waterfowl numbers, and the Long-tailed Duck total of 33,379 represented 6.5% of all waterfowl counted. The highest single-day waterfowl count was made on November 30, 2005, when a total of 112,604 ducks were counted. The following table summarizes the average number per aerial survey and standard deviation for eiders, scoters (all 3 species), and Long-tailed Ducks observed during ten aerial surveys conducted between November 2004 and March 2005. We will be subdividing estimates of scoter relative abundance by species in later reports.

<b>Species</b>	<b>Mean</b>	<b>Standard Deviation</b>
Common Eider	17,402	14,329
Long-Tailed Ducks	2,699	1,417
Scoter (all species)	27,702	31,388

#### *Waterfowl distribution*

Most of the recorded waterfowl were highly clustered within relatively few, discrete areas, and this apparent non-random distributional pattern remained more or less stable throughout the field season. Seventy-four percent of all waterfowl were recorded within 2.1% the study area.

#### *Comparisons between first two field seasons*

The most conspicuous difference between the first two study seasons was the spatial distribution of waterfowl. In the first year, this pattern was highly variable; in year two, waterfowl distribution remained relatively stable. This difference was most notable among scoters (Figure 1).

**Project Funding Sources:**

SDJV (USFWS) Contribution	Other U. S. Federal Contributions	U.S. non- federal contributions	Canadian federal contributions	Canadian non-federal contributions	Sources of funding
\$10,000					
		\$40,000			Island Foundation
		\$3,400			MAS In- kind

**Total Expenditures by Category (US\$):**

Activity	Breeding	Molting	Migration	Wintering	Total
Banding					
Surveys				\$53,400	\$53,400
Research					
Communication					
Coordination					

Figure 1. Within-season changes in distribution and abundance of scoters (all species) in Nantucket Sound, Massachusetts for season 1 (2003-2004) vs. season 2 (2004-2005).

