

Sea Duck Joint Venture
Annual Project Summary
FY 2017 – (October 1, 2016 to Sept 30, 2017)

Project Title: SDJV Project #130): POPULATION DELINEATION AND WINTER HABITAT ASSOCIATIONS OF LONG-TAILED DUCKS AND WHITE-WINGED SCOTERS WINTERING IN SOUTHERN NEW ENGLAND (Agreement F16AC00145)

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Project Description (issue being addressed, location, general methodology):

The Sea Duck Joint Venture (SDJV) has identified population delineation (linkages between key wintering areas, molt areas, breeding areas) as one of the top priorities. Southern New England is known to be a key wintering area for White-winged Scoters (hereafter WWSC) and Long-tailed Ducks (hereafter LTDU; Zipkin et al. 2012), yet prior research efforts have been unable to track enough individuals of each species that winter in southern New England to accurately delineate this population. Thus, supplementing existing satellite telemetry data sets for WWSC and LTDU is necessary to meet current population delineation objectives. We recently investigated winter resource use and movement patterns of Black Scoters (Loring et al. 2014) and Common Eider (Beuth 2013) in southern New England and proposed to use a similar modelling approach to characterize resource use and movement patterns of WWSC and LTDU during winter.

Winter habitat use of sea ducks in New England and elsewhere on the Atlantic and Pacific coasts is one of the key issues requiring further study due to the potential for offshore wind

energy development. Given recent permitting of windfarms in New England, there is a pressing need to gain a clearer understanding of key winter habitats used by sea ducks (specifically WWSC and LTDU) in this region. The information gathered from this project could be used for marine spatial planning efforts in the region that would address key resource areas for sea ducks in the region to minimize potential threats posed by offshore wind energy developments. This additional work on WWSC and LTDU will provide a much more complete picture of the ecology and movements of the most common wintering sea duck species in this region where the development of offshore wind facilities is imminent.

Satellite-based Platform Transmitter Terminals (PTTs) were surgically implanted in the abdominal cavity of each duck by a qualified wildlife veterinarian, with sea duck surgery experience, following the technique described by Korschgen et al. (1996). All transmitters were wrapped in a sterile mesh material which adheres to the body wall and helps anchor the PTT within the bird. Radio-tagged birds were held in captivity for 1-2 hours post-surgery, monitored for health, and then released at the capture site.

Captures took place in Cape Cod Bay for WWSC in October/November 2015 and Nantucket Sound for LTDU in December 2015. Additional deployments took place in Long Island Sound in March 2016 for both WWSC and LTDU. Follow-up WWSC deployments took place in Forestville, QC along the St. Lawrence River estuary during August 2016. Final captures for LTDU took place in Nantucket Sound in December 2016 (Figure 1).

Objectives (*should identify how the project addresses SDJV priorities*):

As part of the Sea Duck Joint Venture's Atlantic and Great Lakes Sea Duck Migration Study, our primary objectives were to:

- 1) Determine the population linkages among wintering, breeding, and molting areas for adult female WWSC and LTDU that winter in southern New England
- 2) Determine resource use and movement patterns of adult female WWSC and LTDU wintering in southern New England, compare aspects of their ecology with that of black scoter (BLSC) and common eider (COEI), and assess the associated risks to sea ducks of proposed offshore wind energy development.

Preliminary Results (*include maps, photos, figures/tables as appropriate*):

Capture efforts in Cape Cod Bay during October and November 2015 were highly successful. We deployed 22 transmitters in adult female WWSC and banded roughly 320 sea ducks in total. There are currently no birds alive and providing consistent data after four confirmed mortalities and 18 PTTs that have stopped transmitting (Table 1).

Of the 14 WWSC that survived and provided data through spring migration, all but one went to suspected breeding locations in Canada spanning from eastern Manitoba to the Northwest Territories. One such bird appears to have migrated further west than any WWSC from the eastern wintering population, as confirmed by satellite telemetry. Interestingly, birds used four distinct pathways during their spring migration to breeding areas. The one apparent non-breeder migrated directly from Cape Cod Bay to the Gulf of St. Lawrence estuary.

Capture efforts for LTDU in Nantucket Sound were also highly successful. In total, 15 PTTs were deployed on female LTDU. There are currently no birds alive and providing data after

two confirmed mortalities and thirteen PTTs that have stopped transmitting (Table 1). All LTDU remained in Nantucket Sound for the duration of transmissions.

After initial capture efforts took place in Cape Cod Bay and Nantucket Sound in the fall/winter of 2015, we were left with 24 WWSC transmitters (2 Telonics, 22 Microwave) and 13 LTDU transmitters (GeoTrak) that needed to be deployed. All transmitters were proposed for deployment in Long Island Sound during March 2016 using floating mist net capture methods (Loring et al. 2014, Beuth 2013). Failure to deploy all transmitters during this capture session led to a supplemental effort on the Gulf of St. Lawrence Estuary in August 2016 where molting birds were captured using a submerged gill net technique (adapted from Breault and Cheng 1989).

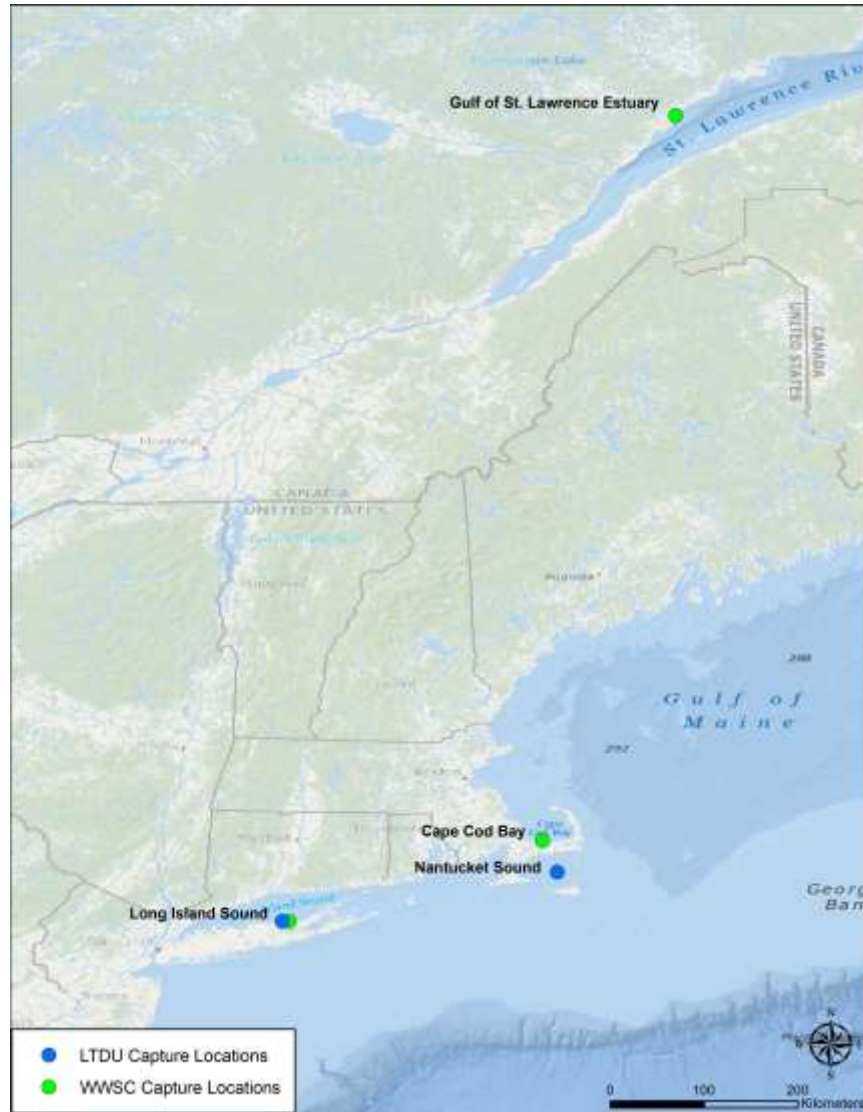


Figure 1. Capture locations of White-winged scoters and Long-tailed Ducks in 2015 and 2016

Capture efforts in Long Island Sound during March 2016 were only moderately successful due to inclement weather during the majority of the field session. Four WWSC transmitters were deployed during this effort, none of which are currently alive and providing data. Two birds were confirmed dead, while the other two stopped transmitting (One on the wintering grounds, the other while molting in James Bay). As most of this capture effort was dedicated

to WWSC deployments, only one additional LTDU transmitter was deployed. While no mortality could be confirmed, this bird only provided data until 31 May 2016 after having migrated to the lower Hudson Bay islands.

Capture efforts in the Gulf of St. Lawrence estuary were highly successful. In total, 26 PTTs (including 7 Telonics transmitters inherited from crews in the Great Lakes) were deployed on female WWSC. There are currently 16 birds alive and providing data after three confirmed mortalities and seven PTTs that have stopped transmitting (Table 1).

We deployed 22 PTTs (10 Telonics, 12 GeoTrak) in adult female LTDU in Nantucket Sound during December 2016. There is currently only one bird alive and transmitting after 10 confirmed mortalities and 11 suspected transmitter failures (Table 1). This bird is currently in the Gulf of St. Lawrence estuary. Prior to transmitter failure, we were able to track four individuals that migrated to suspected breeding locations throughout northern Quebec and Nunavut.

Throughout this study we have been able to identify key breeding, molting, and wintering areas, as well as varied migration strategies of White-winged Scoters (Figure 2). Breeding locations spanned nearly the entire known breeding range for the species, with individuals migrating to areas from northern Quebec west to the Northwest Territories. Nearly all individuals that migrated to suspected breeding locations molted in James Bay or Hudson Bay, with the exception of one bird that molted close to the breeding location, and one bird that molted in the Gulf of St. Lawrence post-breeding. Females that didn't migrate to suspected breeding locations exclusively molted in the Gulf of St. Lawrence. Scoters appeared to use four distinct spring migration pathways: a direct overland route from the wintering grounds to the breeding area, a coastal route through the Canadian Maritimes and west to breeding areas, a route stopping over on Lake Ontario, and an overland route from the wintering areas with a stopover in James Bay before continuing to breeding locations. Fall migration routes were less varied, with almost all birds migrating through James Bay to molt and stage before making a direct overland flight to the wintering grounds. Most birds wintered throughout the southern New England area between Cape Cod and Long Island. However, some birds wintered in coastal Maine and Nova Scotia, as well as Lake Ontario.

Table 1. Total number of PTTs deployed during 2015 and 2016 in adult female White-winged Scoters and Long-tailed Ducks in Cape Cod Bay, Long Island Sound, Nantucket Sound, and the Gulf of St. Lawrence Estuary.

Species	# Deployed	Currently Alive*	Confirmed Mortalities	PTT not transmitting [†]
WWSC	52	16	19	27
LTDU	38	1	12	25

*As of 2 November 2017

[†]Most are suspected radio failures, with the exception of some WWSC units from Cape Cod 2015 that were approaching the end of expected battery life (n = 5)

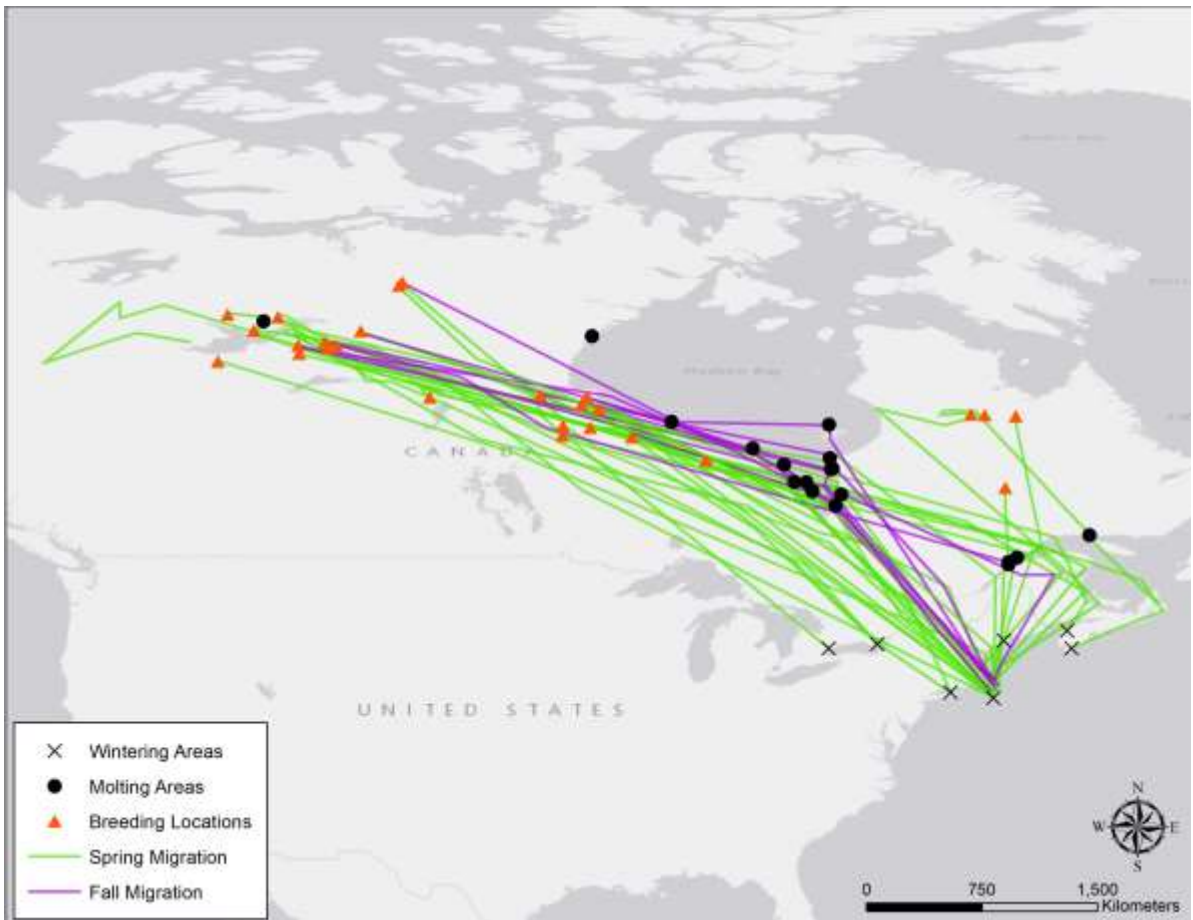


Figure 2. Spring and fall migration routes, suspected breeding locations, molting areas, and wintering areas of White-winged Scoters captured in Cape Cod Bay, Long Island Sound, and the Gulf of St. Lawrence Estuary, QC between 2015 and 2016. Lines do not necessarily represent direct flight paths.

Project Status (e.g., did you accomplish objectives, encounter any obstacles, what are your plans for the future?)

We were successful in reaching our objective in deploying a sufficient sample size of WWSC transmitters. Data collection and analyses are currently underway and no further WWSC capture attempts are planned at this time.

We were also successful in deploying 22 PTTs in LTDU in Nantucket Sound during December 2016. We were left with two PTTs at the end of the capture effort that have since been redirected to other projects. No further LTDU capture attempts are planned at this time.

Data analyses are currently in progress and manuscripts highlighting winter resource selection and population delineation in WWSC are in preparation.

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 (name of agency or organization)
\$55,871					SDJV
		\$8,500			BRI

		\$93,246			RI DEM
		\$55,568			URI

Total Expenditures by Category (SDJV plus all partner contributions; US\$).

ACTIVITY	BREEDING	MOLTING	MIGRATION	WINTERING	TOTAL
Banding (include only if this was a major element of study)					
Surveys (include only if this was a major element of study)					
Research	21,319	21,319	21,319	\$149,229	\$213,185

Literature Cited

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