

2008 Atlantic Coast Wintering Sea Duck Survey

Emily Silverman, Population & Habitat Assessment Branch
Mark Koneff, Population & Habitat Assessment Branch
Kathy Fleming, Population & Habitat Assessment Branch
James Wortham, Migratory Bird Surveys Branch

Division of Migratory Bird Management, U.S. Fish & Wildlife Service, 11510 American Holly
Dr., Laurel, MD 20708

Project Description: The 2008 Atlantic Coast Wintering Sea Duck Survey represented the first of three prerequisite survey years aimed at developing an operational survey to monitor sea ducks wintering along the Atlantic & Gulf coasts of the U.S. and Canada.

Five fixed-wing aircraft were flown at 100 knots and 200 ft between Cape Cod, MA (42°06'N) and Palm Beach, FL (26°56'N), while an observer and pilot-observer counted sea ducks and other aquatic birds within 400m-width strip transects. The survey was conducted between Feb 4th and 25th. Three planes flew a total of 3,712 nm of east-west transects spaced every 5 nm. These transects extended east from the coastline with pairs alternating distances of (i) 8 nm (the average distance to 6m depth) and (ii) the greater of 14 nm (the average distance to 15m depth) and the distance to 15m depth (Fig 1). Two additional crews flew two transects running parallel to the coast at ¼ and ½ mile offshore (Fig 2). These parallel tracks were designed to monitor possible north-south shifts in sea duck distributions over the course of the survey and replicated the Atlantic flyway sea duck survey, which was conducted between 1991 and 2002.

Objectives: The primary objective of the survey is to estimate population sizes of wintering sea ducks, assess yearly variation and trends, and determine habitat associations and areas of special significance. The survey will also provide information on the distributions of seabirds and near shore aquatic birds.

Preliminary Results: Black and Surf scoters (*Melanitta nigra americana* and *M. perspicillata*) and Long-tailed ducks (*Clangula hyemalis*) were the most abundant sea ducks counted on the survey. Table 1 lists the density of each species (number per survey mile) by region for the east-west transects, with raw total counts reported at the bottom. Preliminary estimates of total ducks by species and region are included in Table 2. The east-west transects totaled 4,300 nm, covering almost 20,000 nm² of ocean. The 74,500 birds recorded represent an estimate of approximately 1.5 million sea ducks, 76% of which were scoters.

No sea ducks were counted south of 30° latitude (approximately at St. Augustine, FL, Table 3). Black scoters were distributed throughout the survey area; Surf scoters were seen primarily in the northern half of the surveyed coastline and concentrated within the major bays. Long-tailed ducks were present in large numbers around Nantucket and Cape Cod, but some were also seen quite far to the south (Table 3, Fig 3).

Weather delays prevented crews from flying the northern transects in Chesapeake Bay and planned replicates of survey lines, although repeated surveys around the Nantucket shoals and southern coastline showed little change in the locations of peak abundance (Figs 4 and 5). These results suggest that the birds were relatively site-faithful during the course of the survey.

Project Status: The first season of prerequisite surveys was completed successfully and the resulting data are guiding plans for a second year of surveying. Analyses of the 2008 data are ongoing. The initial design, which was extremely ambitious, called for $\frac{1}{4}$ of the east-west transects to be flown twice and $\frac{1}{4}$ to be flown three times. The two coastline tracks were also intended to be flown twice. Due to weather delays and other logistical issues, however, only the southern coastal track and four transects over the Nantucket shoals were replicated. Plans for the second year of prerequisite surveying include shorter east-west lines with increased replication. The data from 2008 will be used to stratify the coastline and concentrate efforts in higher density areas. As observers recorded a large number of Black Scoters (over 3000) east of the survey lines between approximately 31-33°N, we plan also to survey this area in more detail. Survey execution will depend on obtaining funds from the SDJV and ACJV, and will be supplemented with support from PHAB and MBSB.

Table 1: Sea ducks recorded per mile for the major survey regions. Regions and species are ordered by the estimated totals from Table 2. Red font indicates the region of highest density for each species. Nantucket shoals was represented by the five transects south of Nantucket. “Nantucket” represents the area between Nantucket, Martha’s Vineyard, and Cape Cod. Northern Cape Cod is the area surveyed by the five northern-most transects to the west of the cape’s N-S arm. Pamlico Sound includes all transects within the Outer Banks; the “Offshore transects” are all east-west transect lines not within one of the other regions.

Region	SUSC	BLSC	SCOT	LTDU	BUFF	COEI	MERG	WWSC	COGO
Chesapeake Bay	57.6	12.5	18.8	2.7	2.4		0.6	2.2	0.01
Delaware Bay	21.2	51.9	63.8				0.5		
Nantucket Shoals	0.02	0.2	2.1	29.6		0.4		0.3	
Pamlico Sound	1.4	0.1	1.7		7.8		3.5		0.1
Nantucket	0.4	0.2	1.7	4.6	0.5	9.8	0.1	0.6	0.5
Long Island Sound	0.7	0.3	3.5	0.2	0.1		0.2	0.1	0.5
Long Island, south shore	4.1	4.8	0.9	0.2	0.8	0.01	2.7	0.01	0.02
Northern Cape Cod	0.03	0.01	0.6	0.3	0.3	0.2		0.3	0.2
Offshore transects	1.6	3.1	1.0	0.7	0.1	0.1	0.1		0.05
Total count	15,452	16,642	16,425	18,785	2,505	2,012	1,570	612	475

Table 2: Estimated total sea ducks recorded for the major survey regions and square nautical miles covered in each area. The nine northern transects in the Chesapeake Bay were not flown, due to time constraints: the flown area represented 33% of the planned coverage for the Chesapeake Bay. Estimates are rounded to 100s of birds, so individual columns do not sum exactly to the reported totals.

Region	Transect coverage area (NM ²)	SUSC	BLSC	SCOT	LTDU	BUFF	COEI	MERG	WWSC	COGO	Total by region
Chesapeake Bay	850	225,500	48,900	73,700	10,700	9,300		2,400	8,600	60	379,100
Delaware Bay	560	55,500	135,800	166,800				1,200			359,400
Nantucket Shoals	1,130	90	1,000	11,100	154,500		2,000		1,400		170,200
Pamlico Sound	1,060	7,000	400	8,500		38,600		17,200		600	72,300
Nantucket	620	1,200	500	4,700	13,200	1,500	28,000	400	1,700	1,300	52,500
Long Island Sound	1,980	6,800	3,100	31,900	2,200	1,000		2,000	800	4,900	52,200
Long Island, south shore	400	7,600	9,000	1,700	400	1,500	20	5,000	20	30	25,200
Northern Cape Cod	580	80	20	1,500	700	900	500		800	500	5,000
Offshore transects	12,610	94,300	181,400	58,100	42,000	4,400	7,400	5,800	50	3,200	396,700
Total by species		398,100	380,300	358,026	223,700	57,200	38,000	34,000	13,400	10,500	

Table 3. Sea ducks/mile by degree latitude. No sea ducks were counted south of 30°.

°Lat	SUSC	BLSC	SCOT	LTDU	BUFF	COEI	MERG	WWSC	COGO
42			0.1	0.1		0.02		0.01	
41	0.4	0.2	1.5	3.1	0.1		0.1	0.1	0.1
40	1.1	1.6	3.2	34.1	0.2		0.8	0.4	0.3
39	10.8	27.1	34.3	1.4	0.01		0.3		0.6
38	1.7	5.5	5.7						
37	49.4	32.0	14.6	1.7	1.5		0.3	1.4	0.01
36	6.4	3.8	6.1				0.3	0.01	
35	0.8	0.05	1.0	0.3	4.6		2.0		0.1
34		0.03			0.9		1.0		
33		0.03		0.02					
32		1.0							
31		0.1							
30		7.4							

Atlantic Coast Wintering Sea Duck Survey, 2008
Latitudinal transects

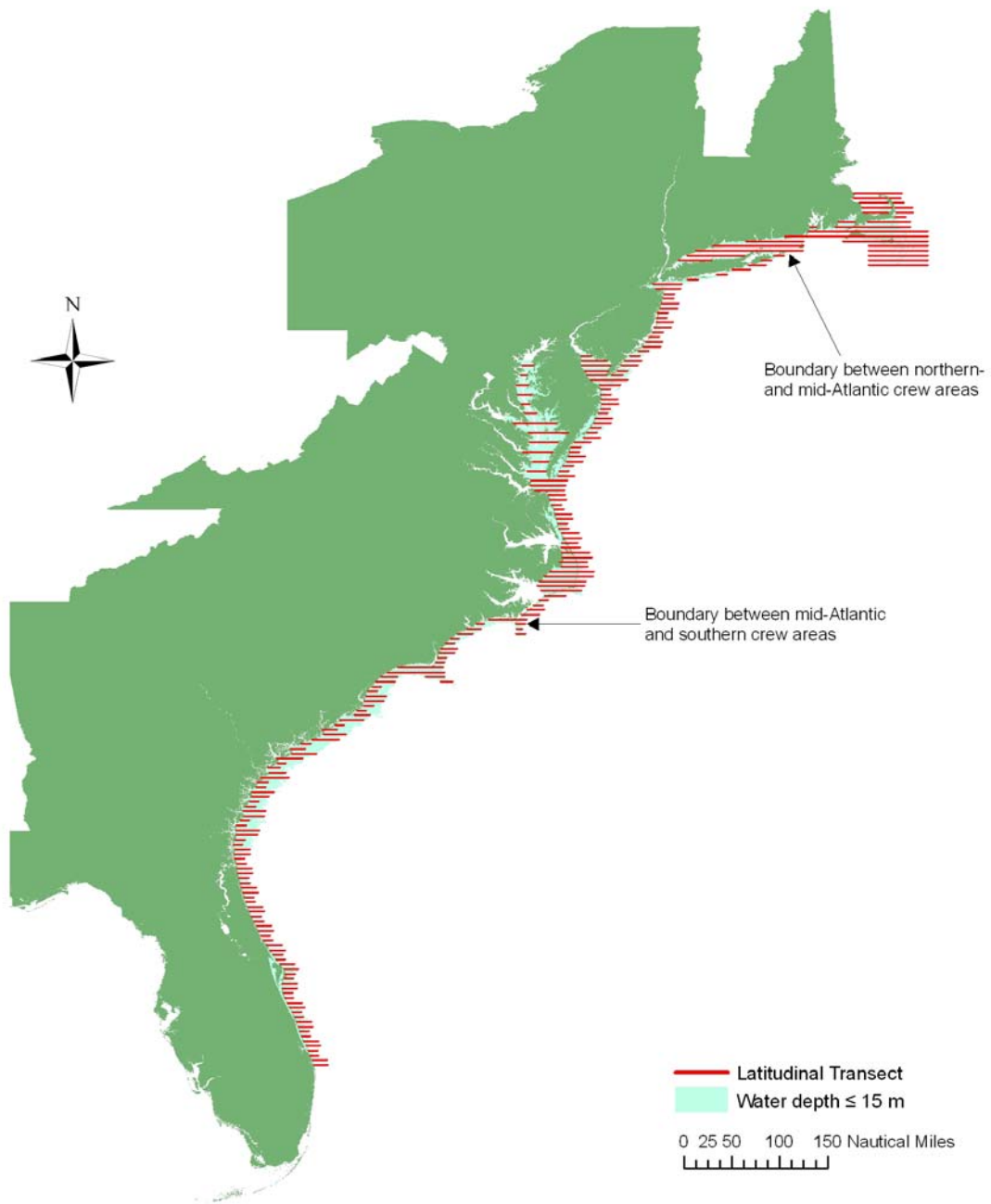


Figure 1: Map of east-west transects and crew areas. The northern transects in Chesapeake Bay were not flown.

Atlantic Coast Wintering Sea Duck Survey, 2008
Coastal survey transects

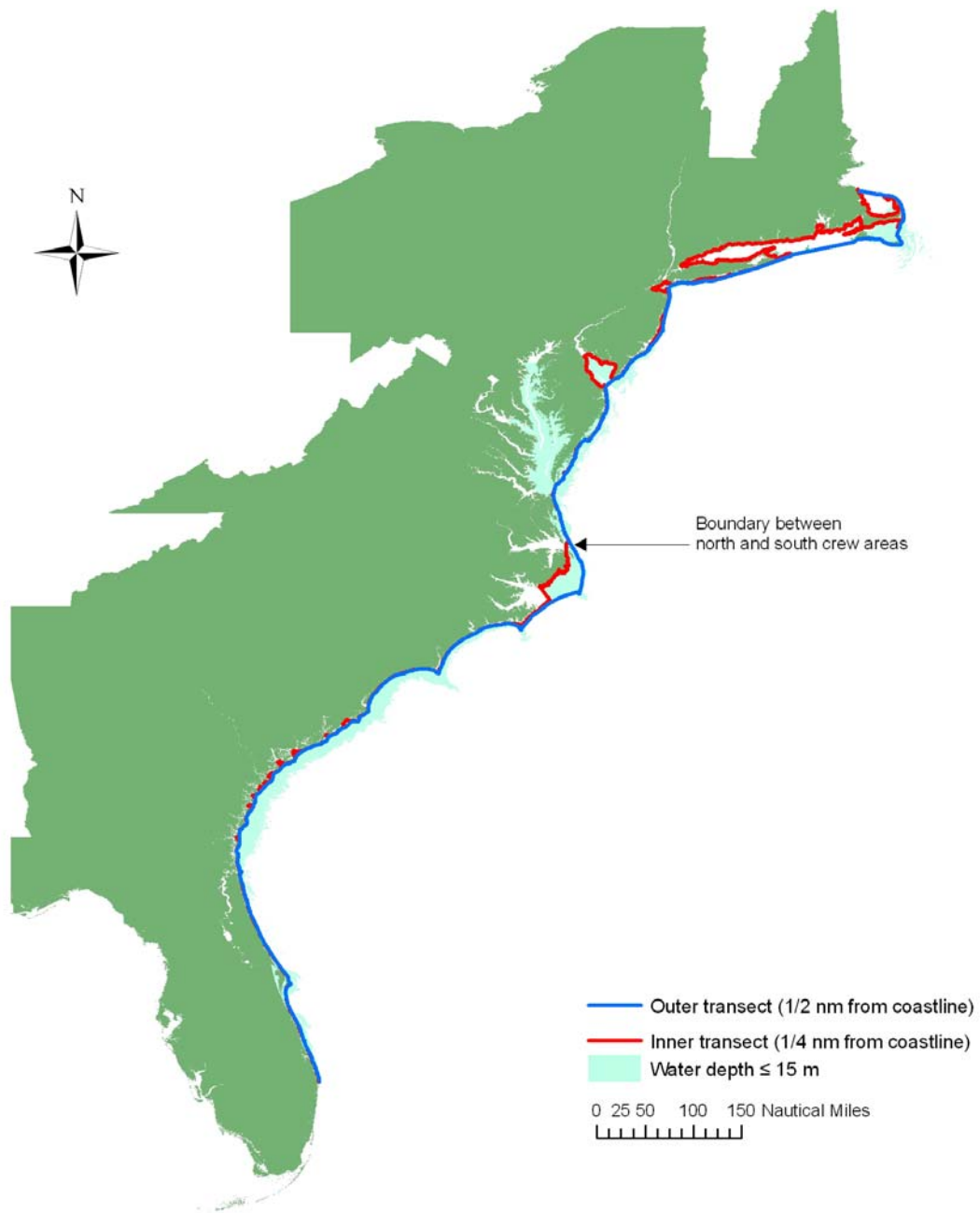


Figure 2: Coastal transects. Along some sections of the coast, the 1/2 mile transect was diverted further offshore or around other coastal features (e.g., NC's Outer Banks). This was done to (i) cover critical coastal areas, and (ii) to shorten the route, because of funding and time constraints.

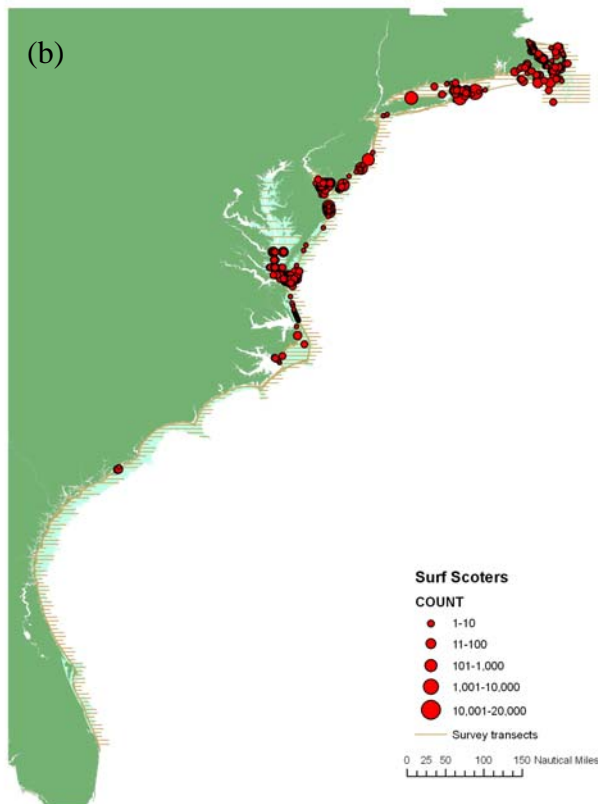
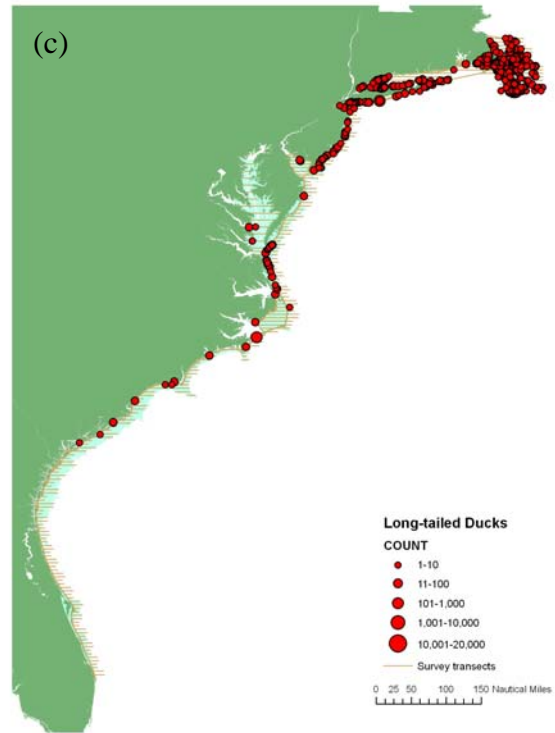
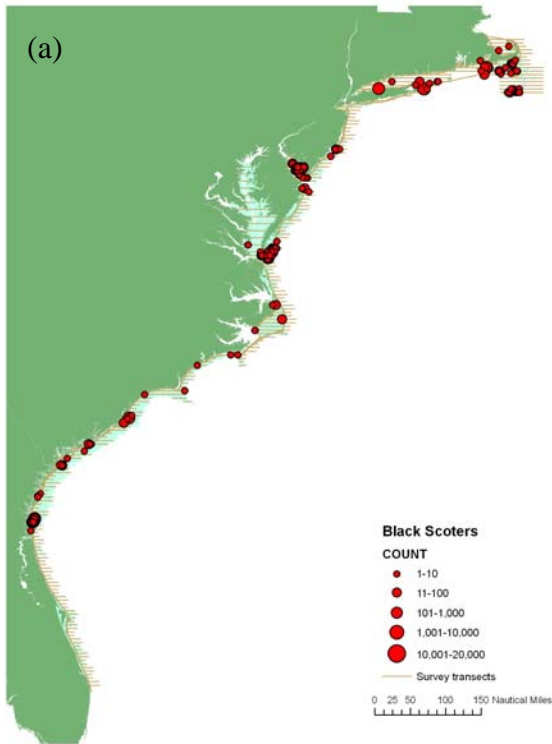


Figure 3. Distribution of (a) Black Scoters, (b) Surf Scoters, and (c) Long-tailed ducks. Maps represent all birds observed on both east-west and nearshore transects, including birds seen offline.

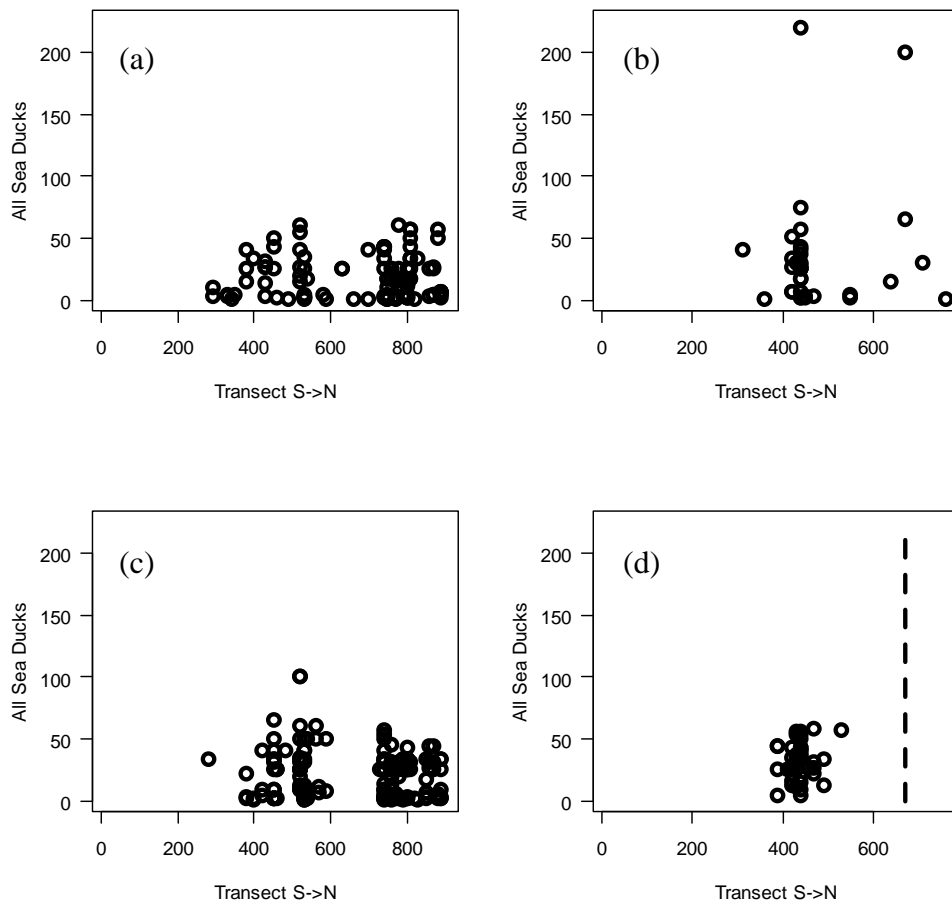


Figure 4. (a) 1/4 mile transect counts, replicate 1, (b) 1/2 mile transect counts, replicate 1, (c) 1/4 mile transect counts, replicate 2, (d) 1/2 mile transect counts, replicate 2. Data from the northernmost portion of the second 1/2 mile transect (right of the dashed line) were lost.

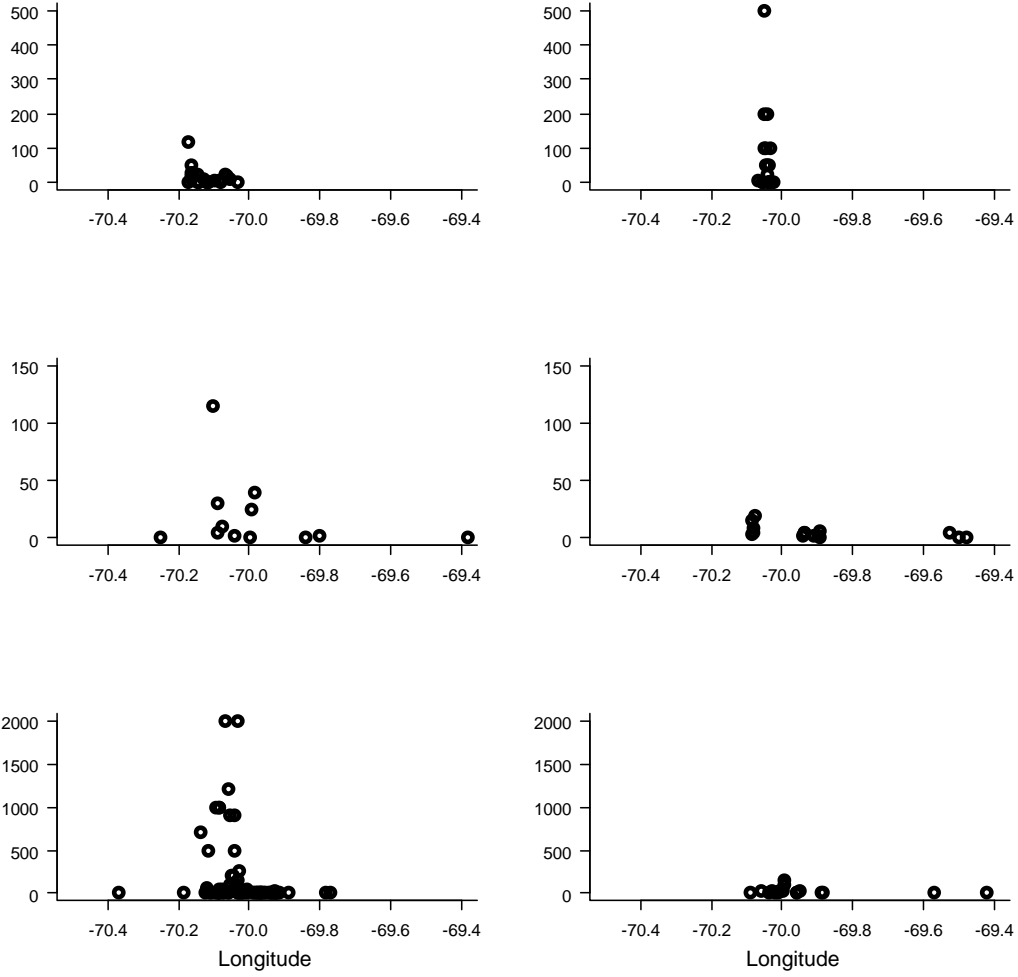


Figure 5. Long-tailed duck counts on three replicated Nantucket Shoals transects. Top to bottom: transects along $40^{\circ} 51'$, $40^{\circ} 56'$, $41^{\circ} 01'$. Left column = first replicate and Right column = second replicate.

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)
\$48,000.00					
	\$24,452.78				U.S.FWS, Division of Migratory Bird Management, Branch of Population & Habitat Assessment
	\$20,000.00				U.S. FWS employees and observers (FWS, USGS, academic) time – In Kind

In kind is estimated using \$75/hour for pilot time, \$40/hour for GIS and analysis, \$20/hour for observers and accounting only for airtime for the pilots and observers.

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

ACTIVITY	BREEDING	MOLTING	MIGRATION	WINTERING	TOTAL
Surveys					\$87,452.78
Research (Design & GIS work, Data processing & analysis)					\$5,000.00