

# **New Jersey Department of Environmental Protection Baseline Studies**

## **January – March 2008 Quarterly Report**



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## INTRODUCTION

This quarterly progress report provides an overview of avian, marine mammal, sea turtle, and pinniped studies conducted for the New Jersey Department of Environmental Protection Baseline Studies Project from January through March 2008. Survey effort and a brief overview of survey results are presented for avian, marine mammals, sea turtles, and pinnipeds. We also discuss the deployment of the acoustic monitoring. Dates for the occurrence of each field task are presented in **Table 1.1**.

**Table 1.1**  
**Dates and Status of Tasks Conducted during this Reporting Period**

<b>Task</b>	<b>January 2008</b>	<b>February 2008</b>	<b>March 2008</b>
Ship Offshore Avian Survey	12-13/15-18	12 (cancelled)	07/10-14
Ship Offshore Mammal Survey	12-13/15-18	12 (cancelled)	07/10-14
Aerial Avian Survey	Not scheduled	Not scheduled	Postponed until April
Aerial Mammal Survey	Cancelled due to high winds	02 – high winds 03 – fog – 9 lines 03 – 8 lines	04 – high winds no survey 05 – high winds no survey 06 – survey completed
Coastal Avian Survey	23	cancelled	23
Radar Sites			#1: 15-21 #7: 22-27
Thermal Sites			#1: multiplexer problems #7: TI images recorded, new multiplexer delayed due to weather
Acoustic Surveys			26 – deployed 5 pop-up bouys
Oceanographic Surveys	07/08/13/15-18	12-13	03-07/10-14

### 1.0 QUALITY ASSURANCE WORK PLAN

The draft Quality Assurance Work Plan (QAWP) was submitted on October 24, 2007. NJDEP comments on the draft were addressed and a revised QAWP submitted on January 4, 2008 prior to the initiation of field work. Additional comments were addressed and a revised QAWP submitted on February 8, 2008. Any subsequent changes and comments will be addressed and a revised QAWP submitted in the next quarter.

### 2.0 LITERATURE REVIEW

We pulled all of the literature within the GMI library that pertains to marine mammals, sea turtles, fisheries, habitats, oceanography and other marine resources for the northeast Atlantic and are currently evaluating all the literature for specific application to New Jersey. Searches for additional relevant scientific literature and data will be conducted during the next quarter. As literature and data are identified it obtained in hard or electronic format and reviewed, key-worded, and catalogued in EndNote. This is an on going process and will continue throughout the project.

### 3.0 DIGITAL DATA COMPILATION

The Principal Investigator for this task, Peter Gehring, has begun to compile digital data from GMI data banks and geospatial data from numerous sources. These data are currently under review for applicability for this project. We will provide a list of data and geospatial data that we have obtained in the next quarterly report.

#### **4.0 AVIAN PREDICTIVE/PROBABILITY MODEL**

No work has been conducted on the task.

#### **5.0 BASELINE SURVEYS**

##### **5.1 SHIPBOARD OFFSHORE SURVEYS**

###### *5.1.1 Avian*

###### *5.1.1.1 Survey Effort*

Shipboard avian survey lines for the January and March surveys differ from marine mammal/sea turtle lines due to varying sea state conditions/requirements.

###### *5.1.1.1.1 January 2008*

Ship avian surveys were initiated on 12 January. After a day long delay on 14 January because of poor weather conditions, the ship survey was reinitiated on 15 January and concluded on 18 January. The ship transects covered 306 nm (568 km; **Figure 5.1-1**).

###### *5.1.1.1.2 February 2008*

Ship avian surveys were started on 12 February and suspended on the same night because of poor weather conditions. Poor survey weather conditions persisted for the remainder of the week and a decision was made to cancel the February ship surveys. The ship surveys on 12 February covered 82 nm (152 km; **Figure 5.1-2**).

###### *5.1.1.1.3 March 2008*

Ship avian surveys commenced on 07 March but suspended during the afternoon as a result of inclement weather conditions. The surveys resumed on 10 March and were completed on 14 March. The ship transects covered 516 nm (957 km; **Figure 5.1-3**).

###### *5.1.1.2 Survey Results*

###### *5.1.1.2.1 Avian species occurrence*

All survey data that were collected are presented in (**Table 5.1-1**). Fourteen species were observed during January, 11 during February, and 20 during March. Birds that were not identifiable due to weather/sea state conditions or behavior were identified to the lowest identifiable taxon (genus, family, or unknown). Several species (e.g., Dunlin and American oystercatcher) were observed on or over land when the ship was nearshore. No federal or state avian endangered or threatened species were observed.

###### *5.1.1.2.2 Avian abundance and composition*

The total monthly number of individuals observed increased from January (1,592) to March (9,265; **Table 5.1-2**). This increase is probably due to the arrival of spring migrants from the south. Loons, gannets, scoters, dunlins, and gulls comprised the majority of the increase in numbers from January to March.

Northern gannet was the most abundance species observed during January and March (see **Table 5.1-2**). Loons, sea ducks, and gull species were the 2<sup>nd</sup> to 5<sup>th</sup> most abundant species during January and March. February data was limited to a single survey day, and therefore, no comparisons can be made between January and March data.

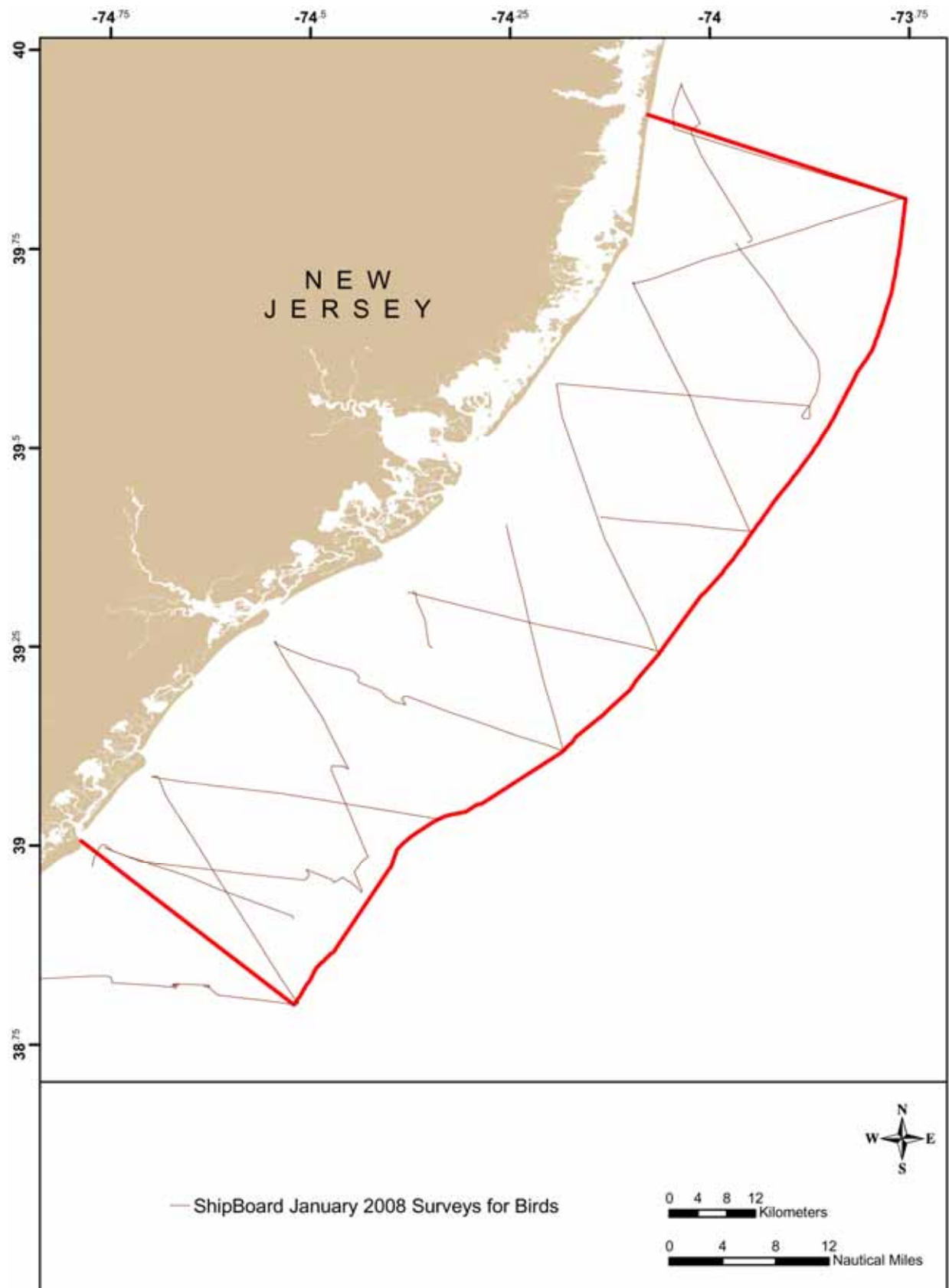


Figure 5.1-1. Shipboard Avian Survey Tracklines for January 2008.

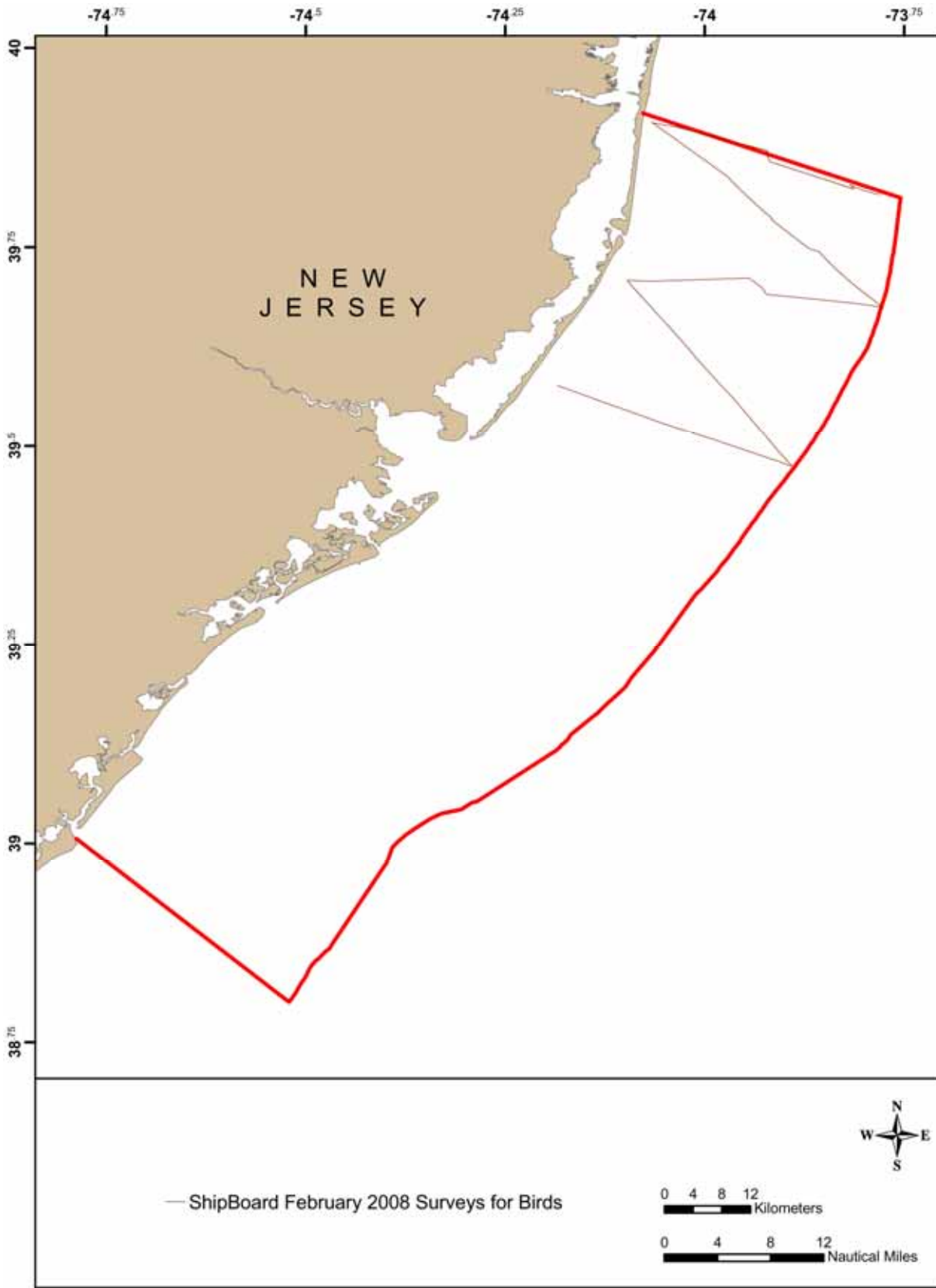


Figure 5.1-2. Shipboard Avian Survey Tracklines for February 2008.

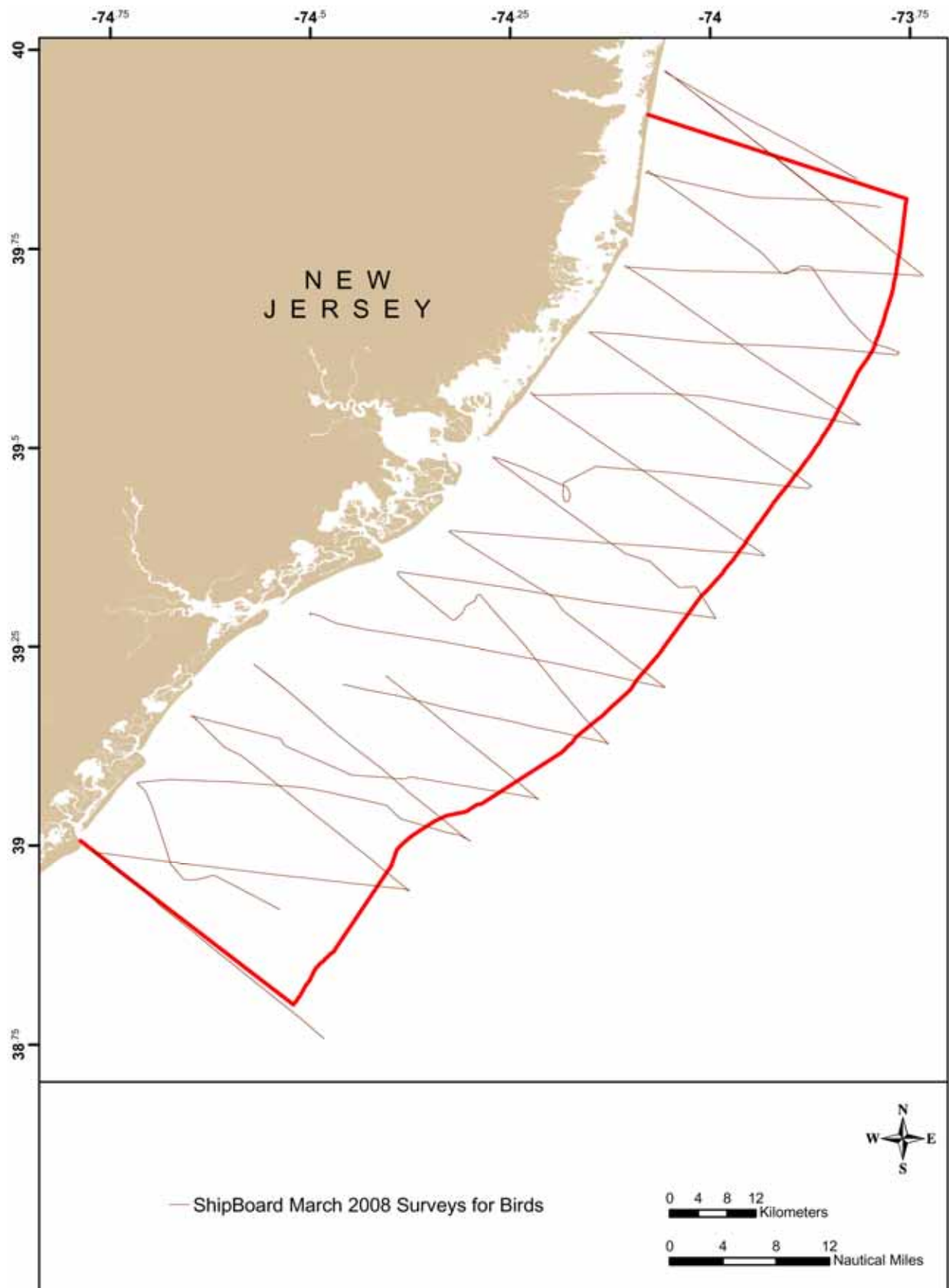


Figure 5.1-3. Shipboard Avian Survey Tracklines for March 2008.



**Table 5.1-1**  
**Avian Species\* Observed during January through March 2008 Shipboard Surveys**

Family <i>Common Name, Scientific name</i>	Jan	Feb	Mar
<b>Gaviidae</b> (loons)			
Red-throated loon, <i>Gavia stellata</i>	X	X	X
Common loon, <i>Gavia immer</i>	X	X	X
Loon spp., <i>Gavia</i> spp.	X		X
<b>Podicipedidae</b> (grebes)			
Red-necked grebe, <i>Podiceps grisgena</i>		X	X
<b>Sulidae</b> (gannets)			
Northern gannet, <i>Morus bassanus</i>	X	X	X
<b>Anatidae</b> (geese, ducks)			
Atlantic brant, <i>Branta bernicla</i>	X		
Canada goose, <i>Branta canadensis</i>			X
American black duck, <i>Anas rubripes</i>			X
Surf scoter, <i>Melanitta perspicillata</i>	X	X	X
White-winged scoter, <i>Melanitta fusca</i>	X	X	X
Black scoter, <i>Melanitta nigra</i>	X	X	X
Scoter (dark-winged), <i>Melanitta</i> spp.	X	X	X
Scoter spp., <i>Melanitta</i> spp.	X		X
Long-tailed duck, <i>Clangula hyemalis</i>	X	X	X
Red-breasted merganser, <i>Mergus serrator</i>			X
<b>Haematopodidae</b> (oystercatchers)			
American oystercatcher, <i>Haematopus palliatus</i>			X
<b>Scolopacidae</b> (sandpipers)			
Dunlin, <i>Calidris alpina</i>			X
Red phalarope, <i>Phalaropus fulicaria</i>			X
<b>Laridae</b> (gulls)			
Laughing gull, <i>Larus atricilla</i>			X
Bonaparte's gull, <i>Larus philadelphia</i>	X		X
Ring-billed gull, <i>Larus delawarensis</i>			X
Herring gull, <i>Larus argentatus</i>	X	X	X
Great black-backed gull, <i>Larus marinus</i>	X	X	X
Black-legged kittiwake, <i>Rissa tridactyla</i>	X		
Gull (large), <i>Larus</i> spp.	X	X	X
<b>Alcidae</b> (alcids)			
Dovekie, <i>Alle alle</i>	X		
Razorbill, <i>Alca torda</i>	X	X	X
Alcid spp.	X	X	X

\* All avian data recorded during shipboard surveys was included

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**Table 5.1-2**  
**Abundance and Percent Composition\* of Avian Species Observed during January through March 2008 Shipboard Surveys**

Family <i>Common Name, Scientific name</i>	Jan		Feb		Mar	
	Number	% Composition	Number	% Composition	Number	% Composition
<b>Gaviidae</b> (loons)						
Red-throated loon, <i>Gavia stellata</i>	135	8.48	16	2.73	710	7.66
Common loon, <i>Gavia immer</i>	93	5.84	97	16.52	204	2.20
Loon spp., <i>Gavia</i> spp.	1	0.06			1	
<b>Podicipedidae</b> (grebes)						
Red-necked grebe, <i>Podiceps grisgenae</i>			1	0.17	2	0.02
<b>Sulidae</b> (gannets)						
Northern gannet, <i>Morus bassanus</i>	887	55.72	49	8.35	3736	40.32
<b>Anatidae</b> (geese, ducks)						
Atlantic brant, <i>Branta bernicla</i>	9	0.57				
Canada goose, <i>Branta canadensis</i>					4	0.04
American black duck, <i>Anas rubripes</i>					7	0.08
Surf scoter, <i>Melanitta perspicillata</i>	6	0.38	18	3.07	535	5.77
White-winged scoter, <i>Melanitta fusca</i>	43	2.70	20	3.41	70	0.76
Black scoter, <i>Melanitta nigra</i>	119	7.48	187	31.86	230	2.48
Scoter (dark-winged), <i>Melanitta</i> spp.	7	0.44	2	0.34	1414	15.26
Scoter spp., <i>Melanitta</i> spp.	3	0.19			189	2.04
Long-tailed duck, <i>Clangula hyemalis</i>	43	2.70	82	13.97	489	5.28
Red-breasted merganser					7	0.08
<b>Haematopodidae</b> (oystercatchers)						
American oystercatcher, <i>Haematopus palliatus</i>					2	0.02
<b>Scolopacidae</b> (sandpipers)						
Dunlin, <i>Calidris alpina</i>					350	3.78
Red phalarope, <i>Phalaropus fulicaria</i>					1	0.01
<b>Laridae</b> (gulls)						
Laughing gull, <i>Larus atricilla</i>					12	0.13
Bonaparte's gull, <i>Larus philadelphia</i>	7	0.44			14	0.15
Ring-billed gull, <i>Larus delawarensis</i>					4	0.04
Herring gull, <i>Larus argentatus</i>	89	5.59	61	10.39	950	10.25
Great black-backed gull, <i>Larus marinus</i>	53	3.33	25	4.26	110	1.19
Black-legged kittiwake, <i>Rissa tridactyla</i>	5	0.31				
Gull (large), <i>Larus</i> spp.	11	0.69	9	1.53	143	1.54
<b>Alcidae</b> (alcids)						
Dovekie, <i>Alle alle</i>	22	1.38				
Razorbill, <i>Alca torda</i>	37	2.32	11	1.87	29	0.31
Alcid spp.	19	1.19	2	0.34	2	0.02
Unknown spp.	3	0.19	7	1.19	1	0.01
Unidentified (others)					49	0.53
<b>TOTAL</b>	<b>1592</b>		<b>587</b>		<b>9265</b>	

\* All avian data recorded during shipboard surveys was used to determine percent composition

5.1.2 *Marine Mammals, Sea Turtles, and Pinnipeds*

5.1.2.1 Survey Effort

Shipboard marine mammal/sea turtle survey lines for the January and March surveys differ from avian lines due to varying sea state conditions/requirements.

5.1.2.1.1 *January 2008*

Marine mammal shipboard surveys were initiated on 12 January. After a day long delay on 14 January because of poor weather conditions (seas exceeded Beaufort Sea State [BSS] = 6 and winds >20 knots [kt]), the ship survey was reinitiated on 15 January and concluded on 18 January. The survey covered 451 km of on-effort trackline (**Figure 5.1-4**).

5.1.2.1.2 *February 2008*

Marine mammal shipboard surveys were initiated on 12 February and suspended on the same night because of poor weather conditions (seas exceeded BSS = 6 and winds >20 kt). Poor survey weather conditions persisted for the remainder of the week and were projected to be poor for the next week; therefore, a decision was made to cancel the February ship surveys. The survey covered 117 km on-effort trackline (**Figure 5.1-5**).

5.1.2.1.3 *March 2008*

Marine mammal shipboard surveys were initiated on 07 March but suspended during the afternoon as a result of inclement weather conditions (seas exceeded BSS = 6 and winds >20 kt). The surveys resumed on 10 March and were completed on 14 March. The survey covered 683 km of on-effort trackline (**Figure 5.1-6**).

5.1.2.2 Survey Results

There were six species observed during the first quarter of the ship surveys along with other cetaceans which could not be delineated to species. All marine mammal species sighted during the first quarter are summarized in **Table 5.1.3**.

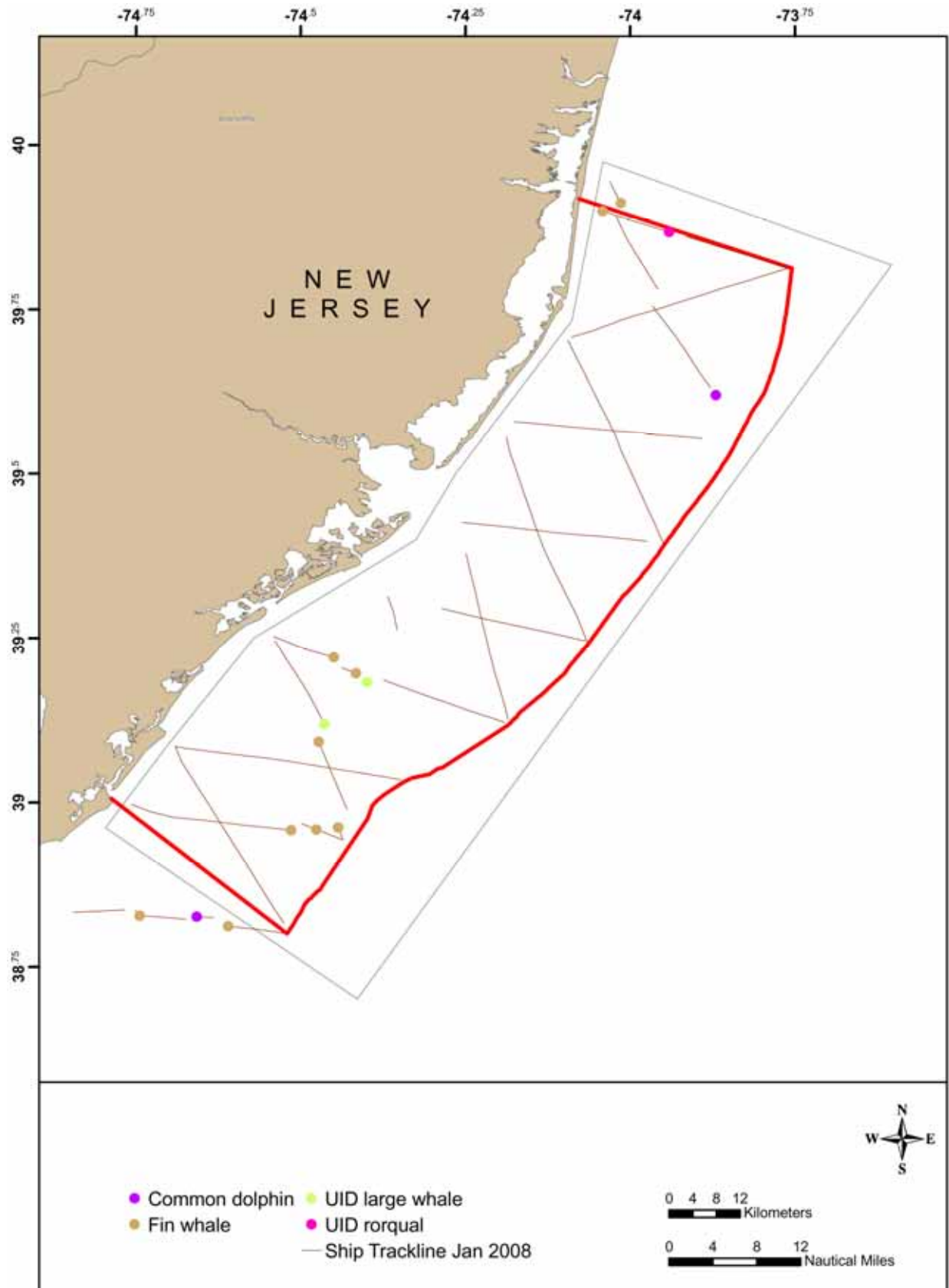


Figure 5.1-4. Shipboard Marine Mammal Survey for January 2008.

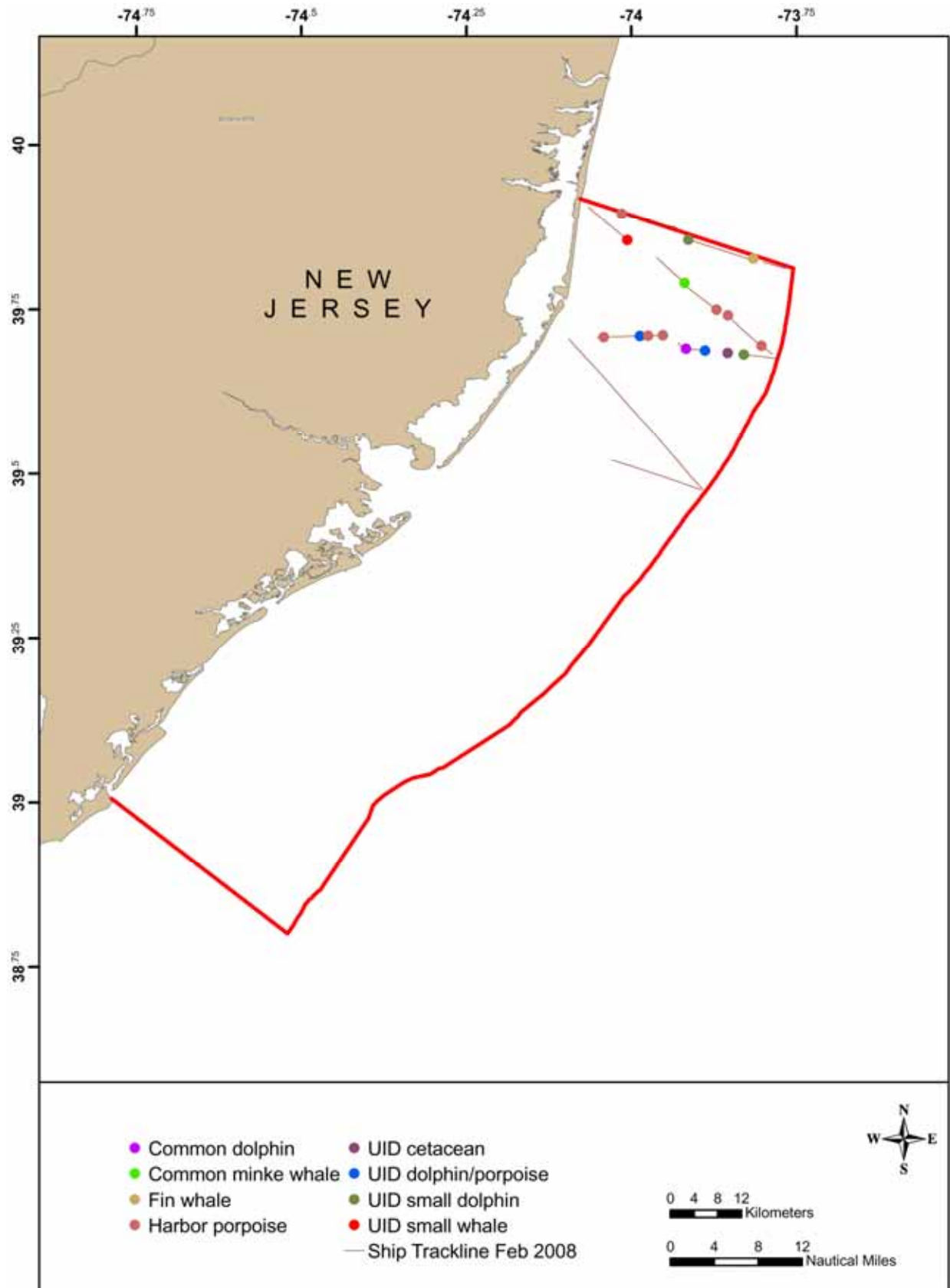


Figure 5.1-5. Shipboard Marine Mammal Survey for February 2008.

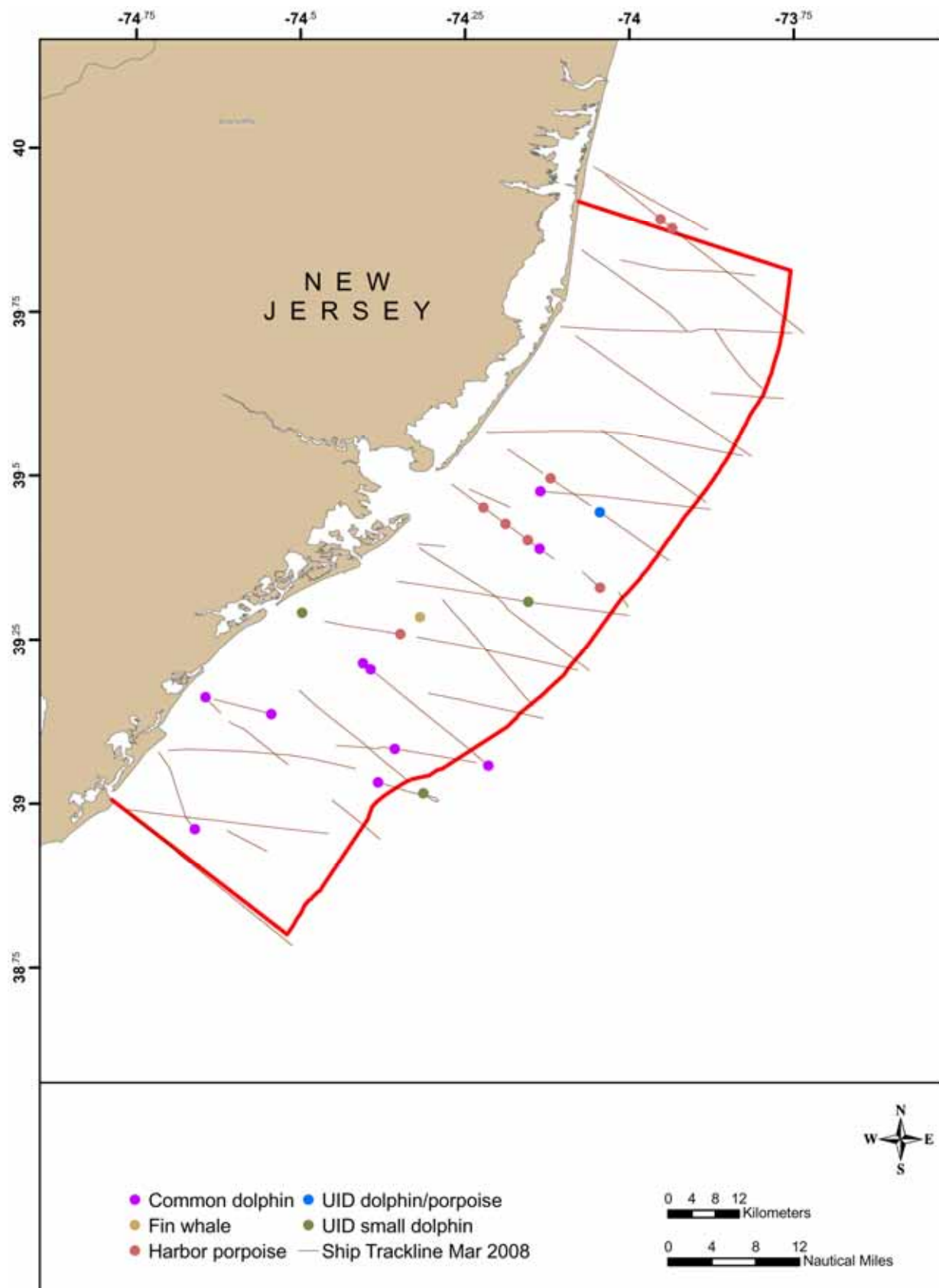


Figure 5.1-6. Shipboard Marine Mammal Survey for March 2008.

**Table 5.1-3**  
**Summary of Marine Mammal Sightings from the Shipboard Surveys from January through March 2008**

Common Name, <i>Scientific Name</i>	Sightings by Month		
	January	February	March
Humpback whale, <i>Megaptera novaeangliae</i> *	0	0	0
Fin whale, <i>Balaenoptera physalus</i> *	10	1	1
Minke whale, <i>Balaenoptera acutorostrata</i>	0	1	0
Common dolphin, <i>Delphinus delphis</i>	2	1	10
Common Bottlenose dolphin, <i>Tursiops truncatus</i>	0	0	1
Harbor porpoise, <i>Phocena phocena</i>	0	7	9
<i>Balaenoptera</i> spp.	1	0	0
unidentified cetacean	0	2	0
unid. dolphin	0	2	1
unid. small delphinid	0	2	3
unid. small whale	0	1	1
unid. large whale	2	0	0
Harbor seal, <i>Phoca vitulina</i>	0	0	3

\* ESA species

January Weather Delays: Seas exceeded BSS = 6 and winds >20 kt

February Weather Delays: Seas exceeded BSS = 6 and winds >20 kt

March Weather Delays: Seas exceeded BSS = 6 and winds >20 kt

## 5.2 AERIAL SURVEYS

### 5.2.1 Avian

Avian aerial surveys were initially scheduled for 03-04 March; however, regulators recommended a later survey date in March. Surveys were re-scheduled for 20-21 March. Weather conditions on both dates did not meet the survey protocols, therefore surveys were rescheduled for 02-03 April.

### 5.2.2 Marine Mammals, Sea Turtles, and Pinnipeds

#### 5.2.2.1 January 2008

Weather was too rough to conduct an aerial survey during the month of January. Winds exceeded 20 kt for five days straight during the window that the aircraft and staff were available.

#### 5.2.2.2 February 2008

Marine mammal aerial surveys were attempted on 02 February but due to high winds could not be completed. Surveys were completed for 9 lines on 03 February and 8 lines were completed on 04 February. High winds and fog delayed surveys during this period. The entire survey area was covered and all tracklines were completed including a shoreline flight for pinnipeds (**Figure 5.2-1**). There were three species sighted, humpback whale, common dolphin, and harbor seal (**Table 5.2-1**).

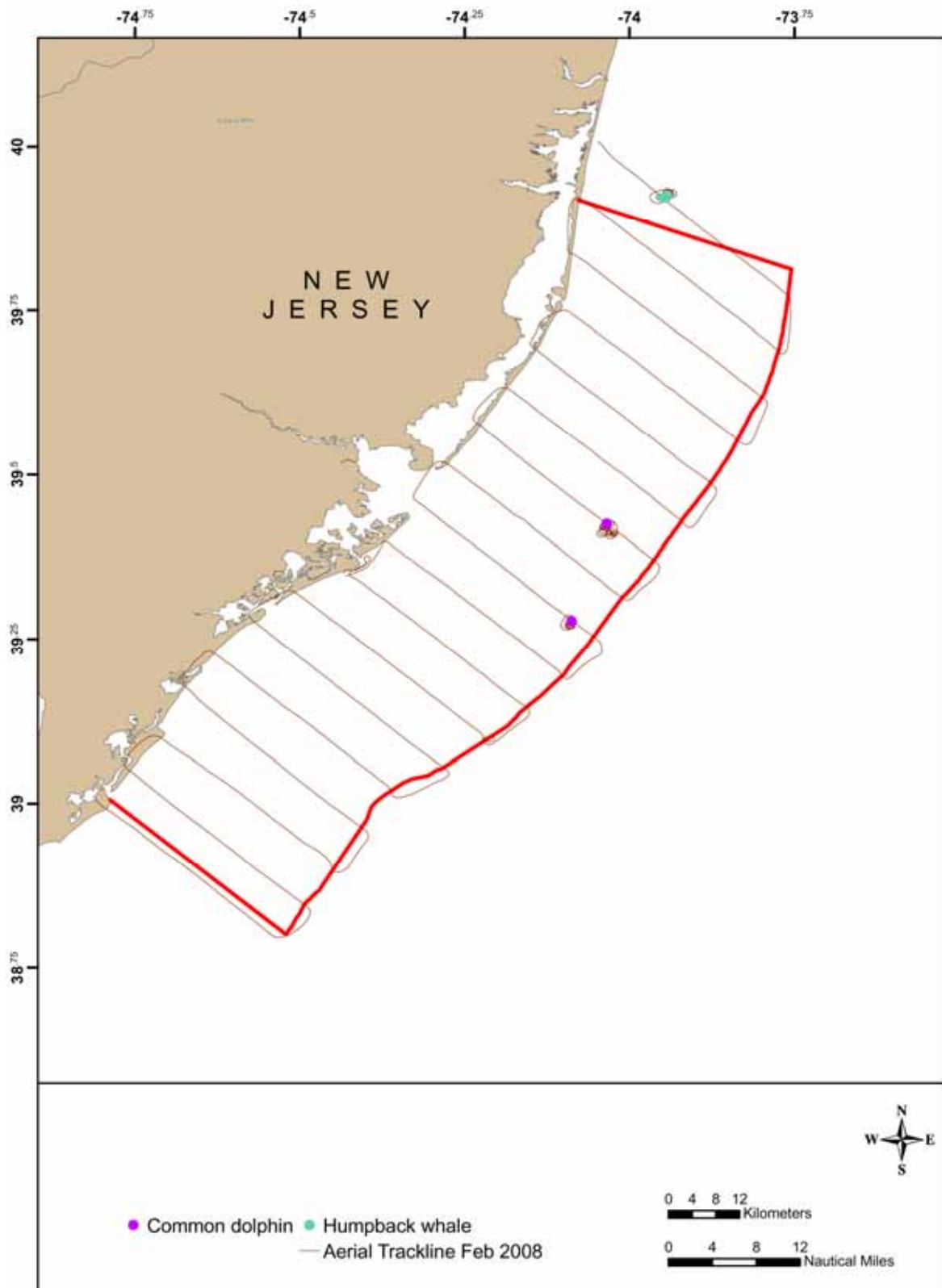


Figure 5.2-1. Aerial Marine Mammal Survey for February 2008.



**Table 5.2-1**  
**Summary of Marine Mammal Sightings from the Aerial Surveys from February 2008**

Common Name, <i>Scientific Name</i>	Sightings by Month		
	January	February	March
Humpback whale, <i>Megaptera novaeangliae</i> *	0	4	0
Common dolphin, <i>Delphinus delphis</i>	0	2	3
Common Bottlenose dolphin, <i>Tursiops truncatus</i>	0	0	1
Harbor porpoise, <i>Phocena phocena</i>	0	0	6
unidentified cetacean	0	0	1
Harbor seal, <i>Phoca vitulina</i>	0	3	0

\* ESA species

January Weather Delays: Seas exceeded BSS = 4 and winds >20 kts

February Weather Delays: none

March Weather Delays: none

### 5.2.2.3 March 2008

Marine mammal aerial surveys were attempted on 04-06 March. High winds on the 4<sup>th</sup> and 5<sup>th</sup> grounded the aircraft. On 06 February all survey lines were completed with the new transect protocol following National Oceanic and Atmospheric Administration (NOAA) survey methodology. The entire survey area was covered once and the majority of the tracklines were completed (**Figure 5.2-2**). Survey lines in the northern region were not completed due to lack of daylight; however, the area was adequately covered. A shore line survey for pinnipeds was not completed due to the wrong tidal cycle (low tide midday). Four species were seen including common dolphin, harbor porpoise, common bottlenose dolphin, and humpback whale (**Table 5.2-1**).

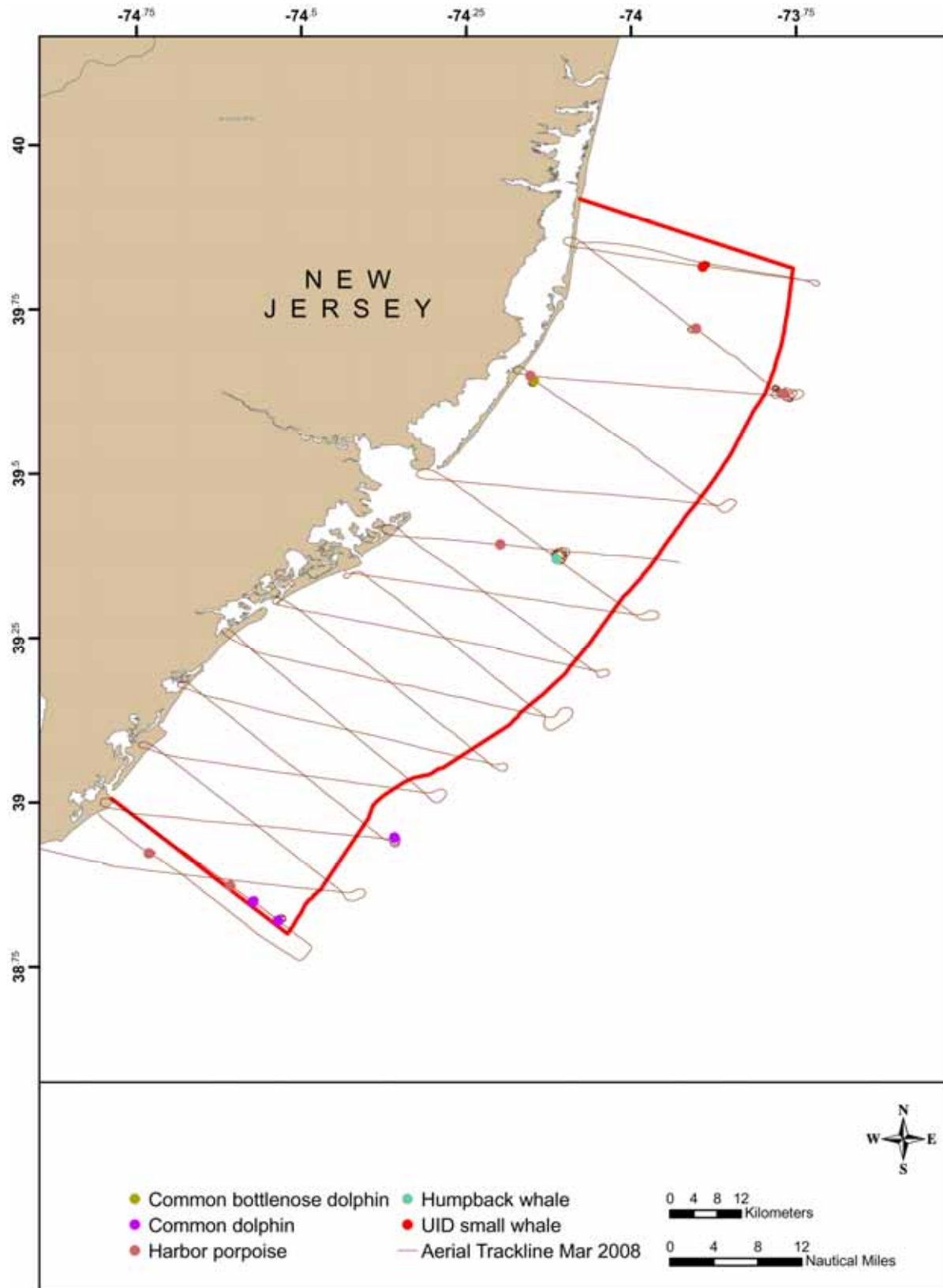


Figure 5.2-2. Aerial Marine Mammal Survey for March 2008.

### **5.3 SMALL BOAT COASTAL SURVEYS**

#### *5.3.1 Survey Effort*

##### *5.3.1.1 January 2008*

The January coastal surveys were conducted on 23 January. The small boat transects covered 69 nautical miles (nm) (129 kilometers [km]; **Figure 5.3-1**). Survey effort was continuous; the total daily effort was 7.23 hours (hr).

##### *5.3.1.2 February 2008*

Coastal surveys were canceled in February. Ship coastal waypoints, which determine the coastal survey waypoints (trackline) were not completed in February because the ship did not complete its February survey (**Figure 5.1-5**). The ship did not complete its February survey because of poor weather conditions: Wind >20 kt out of the east creating sea conditions of BSS >5; Seas were 8-10 feet (ft).

##### *5.3.1.3 March 2008*

The small boat coastal surveys were conducted on 21 March. Twenty-four survey transects were completed (**Figure 5.3-2**). The small boat survey route traveled 71 nm (131 km). Survey effort was continuous; the total daily effort was 6.82 hr.

#### *5.3.2 Survey Results*

##### *5.3.2.1 Avian Species Occurrence*

A total of 18 species were sighted during January; 25 species were observed during March (**Table 5.3-1**). Birds that were not identifiable due to weather/sea state conditions or behavior were identified to the lowest identifiable taxon (genus, family, or unknown). One state listed avian species (bald eagle) was observed during the surveys.

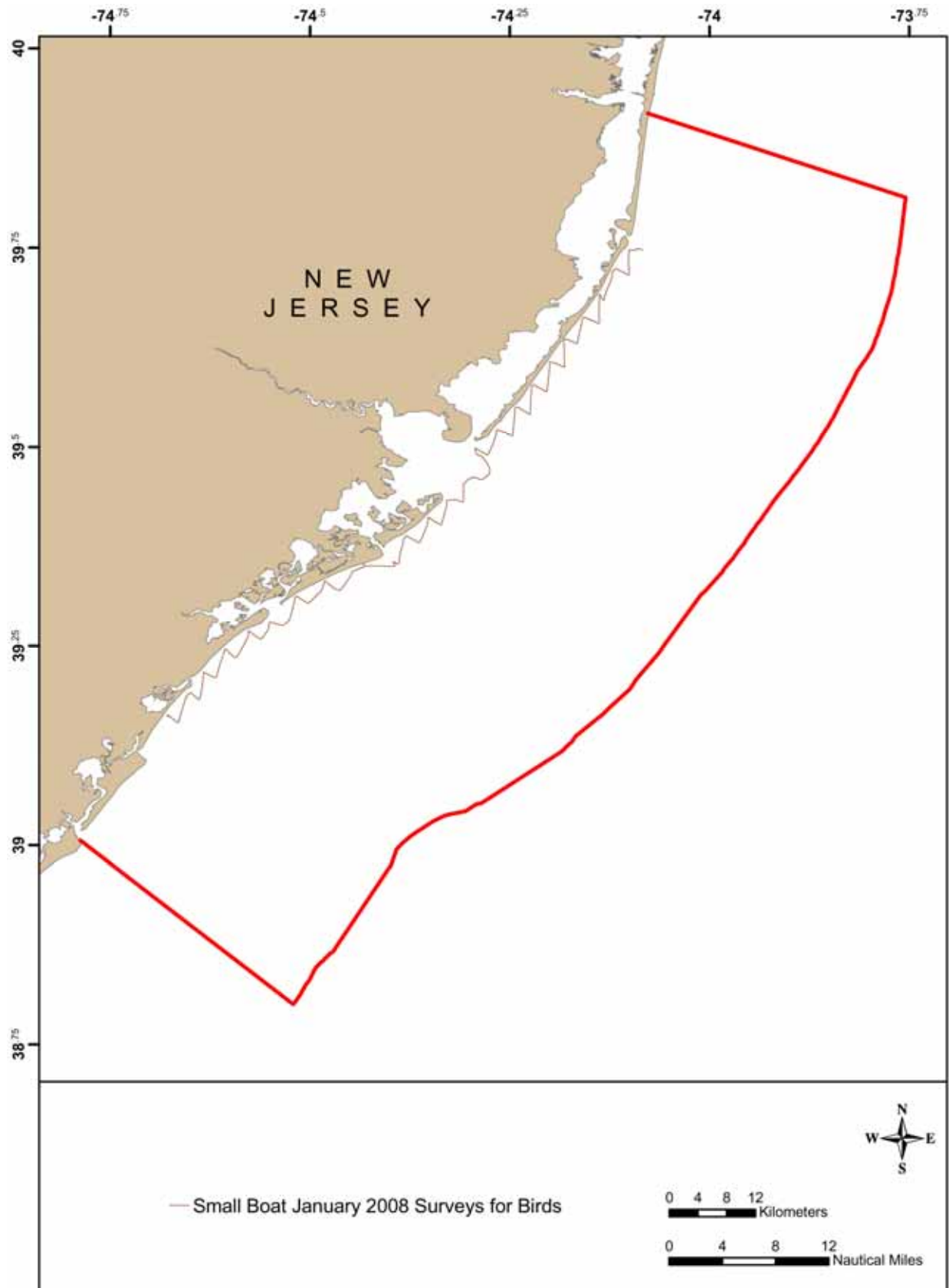


Figure 5.3-1. Small Boat Coastal Survey Tracklines for January 2008.

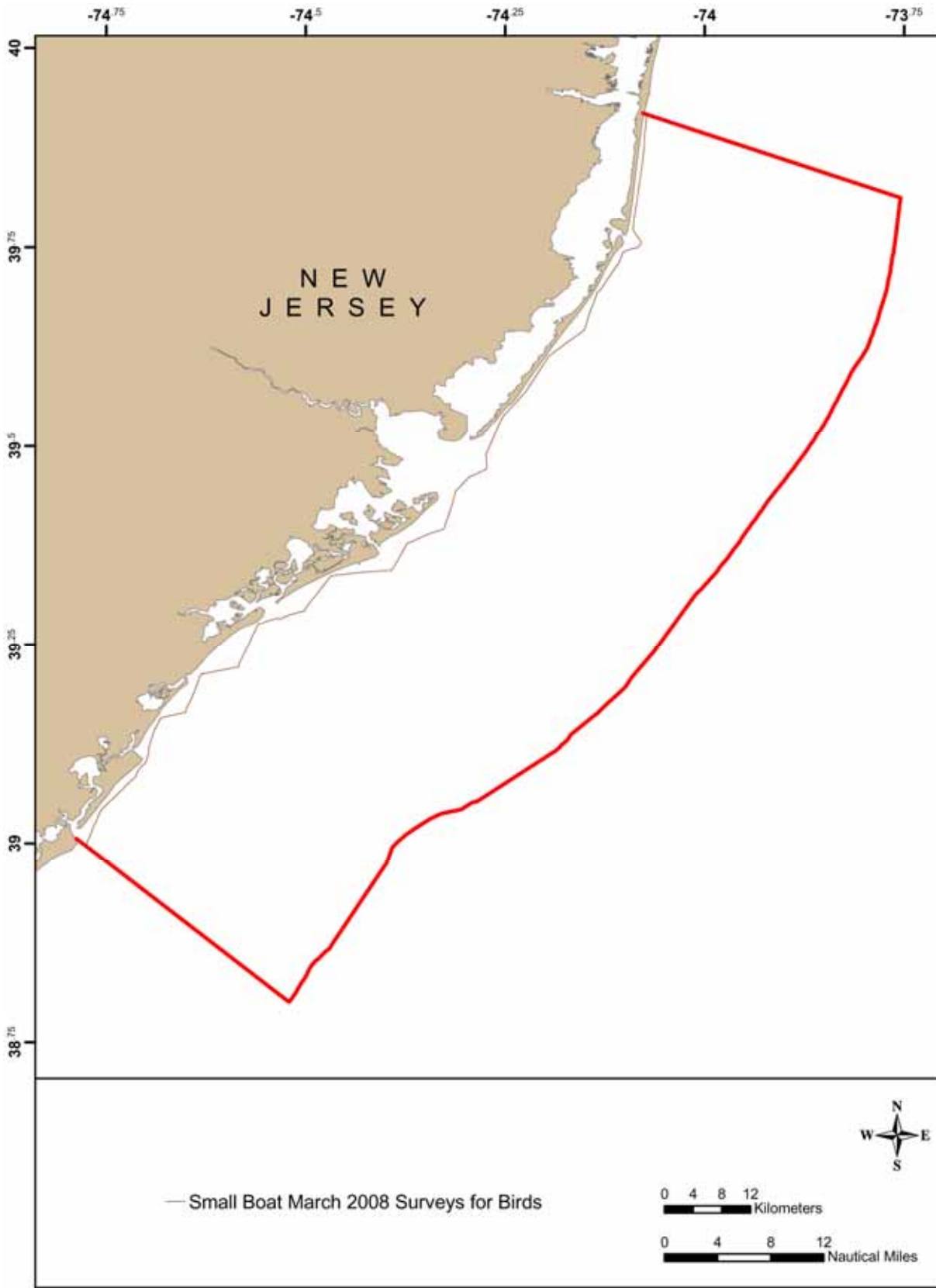


Figure 5.3-2. Small Boat Coastal Survey Tracklines for March 2008.

**Table 5.3-1**  
**Avian Species\* Observed during January and March 2008 Coastal Boat Surveys**

Family <i>Common Name, Scientific name</i>	Jan	Mar
<b>Gaviidae</b> (loons)		
Red-throated loon, <i>Gavia stellata</i>	X	X
Common loon, <i>Gavia immer</i>	X	X
Loon spp., <i>Gavia</i> spp.		X
<b>Phalacrocoracidae</b> (cormorants)		
Great cormorant, <i>Phalacrocorax carbo</i>		X
Cormorant sp., <i>Phalacrocorax</i> spp.		X
<b>Sulidae</b> (gannets)		
Northern gannet, <i>Morus bassanus</i>	X	X
<b>Anatidae</b> (geese, ducks)		
Atlantic brant, <i>Branta bernicla</i>		X
Canada goose, <i>Branta canadensis</i>		X
Northern Shoveler, <i>Anas clypeata</i>		X
Northern pintail, <i>Anas acuta</i>		X
Scaup spp., <i>Aythya</i> spp.	X	
Surf scoter, <i>Melanitta perspicillata</i>	X	X
White-winged scoter, <i>Melanitta fusca</i>		X
Black scoter, <i>Melanitta nigra</i>	X	X
Scoter (dark-winged), <i>Melanitta</i> spp.		X
Scoter spp., <i>Melanitta</i> spp.		X
Long-tailed duck, <i>Clangula hyemalis</i>	X	X
Bufflehead, <i>Bucephala albeola</i>	X	
Common goldeneye, <i>Bucephala clangula</i>	X	X
Red-breasted merganser, <i>Mergus serrator</i>	X	
<b>Accipitridae</b> (eagles, hawks)		
Bald eagle, <i>Haliaeetus leucocephalus</i> <sup>1</sup>	X	
<b>Haematopodidae</b> (oystercatchers)		
American oystercatcher, <i>Haematopus palliatus</i>	X	X
<b>Scolopacidae</b> (sandpipers)		
Sanderling, <i>Calidris alba</i>	X	X
Dunlin, <i>Calidris alpina</i>		X
Purple sandpiper, <i>Calidris maritima</i>		X
Shorebird (small)	X	
Red phalarope, <i>Phalaropus fulicaria</i>		X
<b>Laridae</b> (gulls)		
Laughing gull, <i>Larus atricilla</i>		X
Bonaparte's gull, <i>Larus philadelphia</i>	X	
Ring-billed gull, <i>Larus delawarensis</i>	X	X
Herring gull, <i>Larus argentatus</i>	X	X
Lesser black-backed gull, <i>Larus fuscus</i>		X
Great black-backed gull, <i>Larus marinus</i>	X	X
Black-legged kittiwake, <i>Rissa tridactyla</i>		
Gull (large), <i>Larus</i> spp.		X
<b>Alcidae</b> (alcids)		
Razorbill, <i>Alca torda</i>	X	X

\* All avian data recorded during shipboard surveys was included

<sup>1</sup> State listed as endangered during breeding season and threatened during non-breeding seasons.  
Status given for BR/NB species.

#### 5.3.2.2 Avian Abundance and Percent Composition

Black scoter, herring gull, scaup species (lesser scaup [*Aythya marila*]/greater scaup [*A. affinis*]), ring-billed gull, and long-tailed duck were the five most abundant species during January; herring gull, surf scoter, northern gannet, large gulls, and great black-backed gull were the most abundant species during March (**Table 5.3-2**).

The total number of individuals increased from January (4,912) to March (8,153; **Table 5.3-2**). As discussed in **Section 5.1.1.2.2**, the numerical increase is probably the result of spring migrants arriving in the Study Area.

#### 5.3.3 Discussion

Coastal bird abundance was greater than offshore bird abundance in January and March. Species composition varied between coastal and offshore survey areas.

During the January offshore (ship) survey, the average daily number of birds observed was 318; 1,592 birds were sighted on the one day January coastal survey (**Table 5.3-3**). The five most abundant bird species on the January offshore survey were northern gannet, red-throated loon, black scoter, common loon, and herring gull. The five most abundant species on the January coastal survey were black scoter, herring gull, scaup species, ring-billed gull, and long-tailed duck.

During the March offshore survey, an average of 1,544 birds was sighted daily; 8,153 birds were recorded during the one day coastal survey (**Table 5.3-4**). The five most abundant species on the offshore survey were northern gannet, scoter species (dark-winged), herring gull, red-throated loon, and surf scoter. On the coastal survey, the five most abundant species recorded were herring gull, surf scoter, northern gannet, gull species (large), and great black-backed gull.

**Table 5.3-2**  
**Abundance and Percent Composition of Avian Species Observed during January and March 2008**  
**Small Boat Coastal Surveys**

Family <i>Common Name, Scientific name</i>	Jan		Mar	
	Number	% Composition	Number	% Composition
<b>Gaviidae</b> (loons)				
Red-throated loon, <i>Gavia stellata</i>	108	2.20	81	0.99
Common loon, <i>Gavia immer</i>	71	1.45	71	0.87
Loon spp., <i>Gavia</i> spp.			1	0.01
<b>Podicipedidae</b> (grebes)				
Horned grebe, <i>Podiceps auritus</i>			8	0.10
Red-necked grebe, <i>Podiceps grisgena</i>				
<b>Sulidae</b> (boobies, gannets)				
Northern gannet, <i>Morus bassanus</i>	11	0.22	1238	15.19
<b>Phalacrocoracidae</b> (cormorants)				
Great cormorant, <i>Phalacrocorax carbo</i>			1	0.01
Cormorant spp., <i>Phalacrocorax</i> spp.			1	0.01
<b>Anatidae</b> (geese, ducks)				
Atlantic brant, <i>Branta bernicla</i>			1	0.01
Canada goose, <i>Branta canadensis</i>			1	0.01
Northern shoveler, <i>Anas clypeata</i>			7	0.09
Northern pintail, <i>Anas acuta</i>			1	0.01
Scaup spp., <i>Aythya</i> spp.	750	15.27		
Surf scoter, <i>Melanitta perspicillata</i>	52	1.06	1646	20.19
White-winged scoter, <i>Melanitta fusca</i>	22	0.45	47	0.58
Black scoter, <i>Melanitta nigra</i>	1250	25.45	148	1.82
Scoter (dark-winged), <i>Melanitta</i> spp.			108	1.32
Scoter spp., <i>Melanitta</i> spp.			7	0.09
Long-tailed duck, <i>Clangula hyemalis</i>	560	11.40	263	3.23
Bufflehead, <i>Bucephala albeola</i>	4	0.08		
Common goldeneye, <i>Bucephala clangula</i>	6	0.12	2	0.02
Red-breasted merganser, <i>Mergus serrator</i>	1	0.02		
<b>Accipitridae</b> (eagles, hawks)				
Bald Eagle, <i>Haliaeetus leucocephalus</i>	1	0.02		
<b>Haematopodidae</b> (oystercatchers)				
American oystercatcher, <i>Haematopus palliatus</i>	63	1.28	2	0.02
<b>Scolopacidae</b> (sandpipers)				
Sanderling, <i>Calidris alba</i>	206	4.19	449	5.51
Purple sandpiper, <i>Calidris maritima</i>			12	0.15
Dunlin, <i>Calidris alpine</i>			120	1.47
Shorebird (small)	13	0.26	25	0.31
Red phalarope, <i>Phalaropus fulicaria</i>				
<b>Laridae</b> (gulls)				
Laughing gull, <i>Larus atricilla</i>			24	0.29
Bonaparte's gull, <i>Larus philadelphia</i>	66	1.34		
Ring-billed gull, <i>Larus delawarensis</i>	570	11.60	20	0.25
Herring gull, <i>Larus argentatus</i>	1069	21.76	2693	33.03
Lesser black-backed gull, <i>Larus fuscus</i>			1	0.01
Great black-backed gull, <i>Larus marinus</i>	72	1.47	485	5.95
Gull (large), <i>Larus</i> spp.			689	8.45
<b>Alcidae</b> (alcids)				
Razorbill, <i>Alca torda</i>	15	0.31	1	0.01
Unknown spp.	1	0.02		
Unidentified (others)	1	0.02		
<b>TOTAL</b>	<b>4912</b>		<b>8153</b>	

\* All avian data recorded during the coastal and offshore surveys was used to calculate percent composition



**Table 5.3-3**  
**Abundance and Percent Composition of Avian Species Observed during January Coastal and Offshore Surveys**

Family <i>Common Name, Scientific name</i>	Coastal		Offshore	
	Number	% Composition	Number	% Composition
<b>Gaviidae</b> (loons)				
Red-throated loon, <i>Gavia stellata</i>	108	2.20	135	8.48
Common loon, <i>Gavia immer</i>	71	1.45	93	5.84
Loon spp., <i>Gavia</i> spp.			1	0.06
<b>Podicipedidae</b> (grebes)				
Horned grebe, <i>Podiceps auritus</i>				
Red-necked grebe, <i>Podiceps grisgenae</i>				
<b>Sulidae</b> (boobies, gannets)				
Northern gannet, <i>Morus bassanus</i>	11	0.22	887	55.72
<b>Phalacrocoracidae</b> (cormorants)				
Great cormorant, <i>Phalacrocorax carbo</i>				
Cormorant spp., <i>Phalacrocorax</i> spp.				
<b>Anatidae</b> (geese, ducks)				
Atlantic brant, <i>Branta bernicla</i>			9	0.57
Canada goose, <i>Branta canadensis</i>				
Northern shoveler, <i>Anas clypeata</i>				
Northern pintail, <i>Anas acuta</i>				
Scaup spp., <i>Aythya</i> spp.	750	15.27		
Surf scoter, <i>Melanitta perspicillata</i>	52	1.06	6	0.38
White-winged scoter, <i>Melanitta fusca</i>	22	0.45	43	2.70
Black scoter, <i>Melanitta nigra</i>	1250	25.45	119	7.47
Scoter (dark-winged), <i>Melanitta</i> spp.			7	0.44
Scoter spp., <i>Melanitta</i> spp.			3	0.19
Long-tailed duck, <i>Clangula hyemalis</i>	560	11.40	43	2.70
Bufflehead, <i>Bucephala albeola</i>	4	0.08		
Common goldeneye, <i>Bucephala clangula</i>	6	0.12		
Red-breasted merganser, <i>Mergus serrator</i>	1	0.02		
<b>Accipitridae</b> (eagles, hawks)				
Bald Eagle, <i>Haliaeetus leucocephalus</i>	1	0.02		
<b>Haematopodidae</b> (oystercatchers)				
American oystercatcher, <i>Haematopus palliatus</i>	63	1.28		
<b>Scolopacidae</b> (sandpipers)				
Sanderling, <i>Calidris alba</i>	206	4.19		
Purple sandpiper, <i>Calidris maritima</i>				
Dunlin, <i>Calidris alpina</i>				
Shorebird (small)	13	0.26		
Red phalarope, <i>Phalaropus fulicaria</i>				
<b>Laridae</b> (gulls)				
Laughing gull, <i>Larus atricilla</i>				
Bonaparte's gull, <i>Larus philadelphia</i>	66	1.34	7	0.44
Ring-billed gull, <i>Larus delawarensis</i>	570	11.60		
Herring gull, <i>Larus argentatus</i>	1069	21.76	89	5.59
Lesser black-backed gull, <i>Larus fuscus</i>				
Great black-backed gull, <i>Larus marinus</i>	72	1.47	53	3.33
Black-legged kittiwake, <i>Rissa tridactyla</i>			5	0.31
Gull (large), <i>Larus</i> spp.			11	0.69
<b>Alcidae</b> (alcids)				
Dovekie, <i>Alle alle</i>			22	1.38
Razorbill, <i>Alca torda</i>	15	0.31	37	2.32
Alcid spp.			19	1.19
Unknown spp.	1	0.02	3	0.19
Unidentified (others)	1	0.02		
<b>TOTAL</b>	<b>4912</b>		<b>1592</b>	

\* All avian data recorded during the coastal and offshore surveys was used to calculate percent composition

**Table 5.3-4**  
**Abundance and Percent Composition of Avian Species Observed during March Coastal and Offshore Surveys**

Family <i>Common Name, Scientific name</i>	Coastal		Offshore	
	Number	% Composition	Number	% Composition
<b>Gaviidae</b> (loons)				
Red-throated loon, <i>Gavia stellata</i>	81	0.99	710	7.66
Common loon, <i>Gavia immer</i>	71	0.87	204	2.20
Loon spp., <i>Gavia</i> spp.	1	0.01	1	0.01
<b>Podicipedidae</b> (grebes)				
Horned grebe, <i>Podiceps auritus</i>	8	0.10		
Red-necked grebe, <i>Podiceps grisgena</i>			2	0.02
<b>Sulidae</b> (boobies, gannets)				
Northern gannet, <i>Morus bassanus</i>	1238	15.18	3736	40.32
<b>Phalacrocoracidae</b> (cormorants)				
Great cormorant, <i>Phalacrocorax carbo</i>	1	0.01		
Cormorant spp., <i>Phalacrocorax</i> spp.	1	0.01		
<b>Anatidae</b> (geese, ducks)				
Atlantic brant, <i>Branta bernicla</i>	1	0.01		
Canada goose, <i>Branta canadensis</i>	1	0.01	4	0.04
American black duck, <i>Anas rubripes</i>			7	0.08
Northern shoveler, <i>Anas clypeata</i>	7	0.09		
Northern pintail, <i>Anas acuta</i>	1	0.01		
Surf scoter, <i>Melanitta perspicillata</i>	1646	20.19	535	5.77
White-winged scoter, <i>Melanitta fusca</i>	47	0.58	70	0.76
Black scoter, <i>Melanitta nigra</i>	148	1.82	230	2.48
Scoter (dark-winged), <i>Melanitta</i> spp.	108	1.32	1414	15.26
Scoter spp., <i>Melanitta</i> spp.	7	0.09	189	2.04
Long-tailed duck, <i>Clangula hyemalis</i>	263	3.23	489	5.28
Common goldeneye, <i>Bucephala clangula</i>	2	0.02		
Red-breasted merganser, <i>Mergus serrator</i>			7	0.08
<b>Haematopodidae</b> (oystercatchers)				
American oystercatcher, <i>Haematopus palliatus</i>	2	0.02	2	0.02
<b>Scolopacidae</b> (sandpipers)				
Sanderling, <i>Calidris alba</i>	449	5.51		
Purple sandpiper, <i>Calidris maritima</i>	12	0.15		
Dunlin, <i>Calidris alpina</i>	120	1.47	350	3.78
Shorebird (small)	25	0.31		
Red phalarope, <i>Phalaropus fulicaria</i>			1	0.01
<b>Laridae</b> (gulls)				
Laughing gull, <i>Larus atricilla</i>	24	0.29	12	0.13
Bonaparte's gull, <i>Larus philadelphia</i>			14	0.15
Ring-billed gull, <i>Larus delawarensis</i>	20	0.25	4	0.04
Herring gull, <i>Larus argentatus</i>	2693	33.03	950	10.25
Lesser black-backed gull, <i>Larus fuscus</i>	1	0.01		
Great black-backed gull, <i>Larus marinus</i>	485	5.95	110	1.19
Gull (large), <i>Larus</i> spp.	689	8.45	143	1.54
<b>Alcidae</b> (alcids)				
Razorbill, <i>Alca torda</i>	1	0.01	29	0.31
Alcid spp.			2	0.02
Unknown spp.			1	0.01
Unidentified (others)			49	0.53
<b>TOTAL</b>	<b>8153</b>		<b>9265</b>	

\* All avian data recorded during the coastal and offshore surveys was used to calculate percent composition

#### **5.4 RADAR SURVEYS**

The avian radar system, which was mounted on a jack-up barge, was deployed 14 March and on station at Site 1 the same night (**Figure 5.4-1**). Initial set up and ground truthing occurred on 15 March; avian radar surveys commenced the same day and continued until barge demobilization on 21 March.

The barge was relocated to Site 2 on 21 March. Set up and ground truthing occurred on 22 March and radar surveys continued until 27 March. The barge was then moved on 27 March due to inclement weather. The barge headed towards Site 3 (grid cell #13 location) on 27 March, waited for 2 hr, and then navigated to port in Atlantic City, New Jersey, as it was unable to jack down due to sea state conditions. Radar surveys are scheduled to begin again when weather conditions allow for safe barge mobilization.

Aqua Survey Inc. (ASI) created alternative barge site locations based on barge access with respect to bathymetry, tidal activity, and weather conditions; these alternate site locations will help determine avian activity (spatially and temporally) variation during the various seasons in an effort to return to the precise location(s) for successive surveys.

There are no results to report at this time.

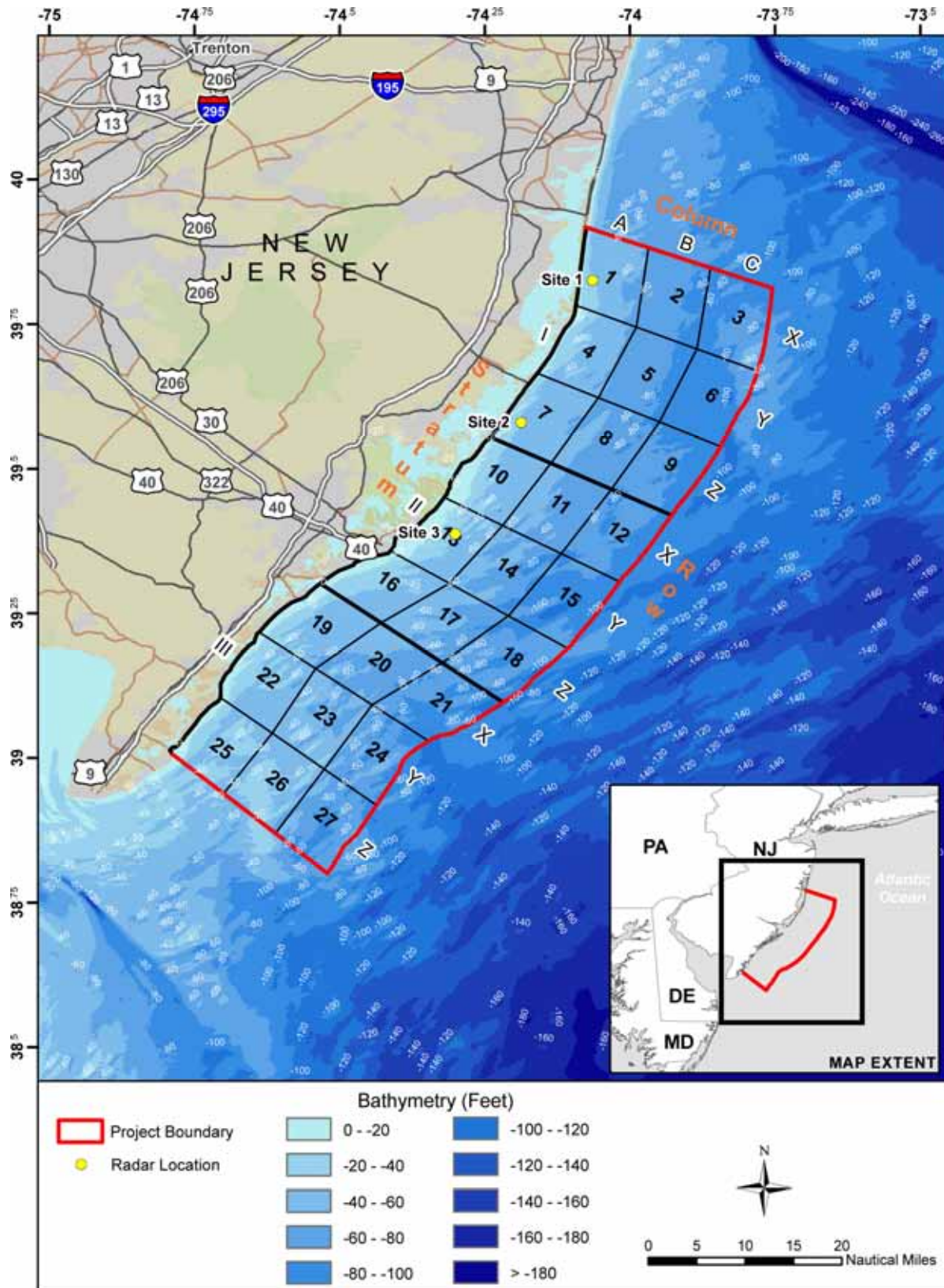


Figure 5.4-1. Radar Grid and Site Locations for March 2008.

## **5.5 THERMAL SURVEYS**

Thermal Imaging surveys began at the time of the first deployment to the radar. Dr. Sid Gauthreaux set up and tested thermal imager during the first deployment. During the first deployment Dr. Sid Gauthreaux determined that a modification of the thermal imaging (TI)/vertically pointing radar (VPR) methodology was appropriate to reduce radar operator fatigue. Per recommendations, the methodology was amended to: record 4 hr, off 4 r, record 4 hr, off 16 hr, and repeat. This is adequate to cover all 24 hr at a site.

After ground-truthing at Site 1 (Grid 1) on 15 March, DVD recording of the TI/VPR began. Equipment problems with the multiplexer prevented simultaneous recording of both camera and radar systems, preventing the intended functionality of the system. A new multiplexer was ordered and arrived in New Jersey approximately one week later.

Weather conditions prevented transport of the new multiplexer to Site 2 (Grid 7). The new multiplexer was installed in the radar system when the barge had to return to port due to sea conditions on 27 March.

Only TI images could be recorded at Grids 1 and 7, not VPR images. Due to bad weather and the inability to record VPR images (and thus not analyze TI images with VPR images), TI images were recorded to DVD only at times of high target activity in the VerCat radar. Ten DVDs (20 hr) of TI images were recorded at Grids 1 and 7.

Upon arrival of the barge in port on 27 March, the new multiplexer was installed. Upon deployment at the next Grid, recording of TI/VPR images on DVD will resumed on the 4 on/4 off/4 on/16 off schedule, weather permitting.

There are no results to report at this time.

## **5.6 ACOUSTIC SURVEYS**

GMI scientists have deployed five acoustic pop up buoys (provided by Cornell University) off the coast of New Jersey on 26 March (**Figure 5.6-1**). All buoys were placed within 100 ft of the proposed locations. Prior to deployment, GMI contacted local commercial fisherman by email, phone, and conducted in person discussions to ensure no buoys were located in regions of trawl fishing activities. None of the sites proposed were found to be in areas of high fishing activity.

GMI also participated in several training courses offered by Cornell's Acoustic Research Laboratories to ensure all participants were current on buoy technologies and operation. The first training involved a course covering the deployment, refurbishment, maintenance, and recovery training of the pop up buoys in the field. The second course covered the use of the XBAT Matlab application, call detectors, software analysis tools to detect the presence of marine mammals in the vicinity of the buoy.

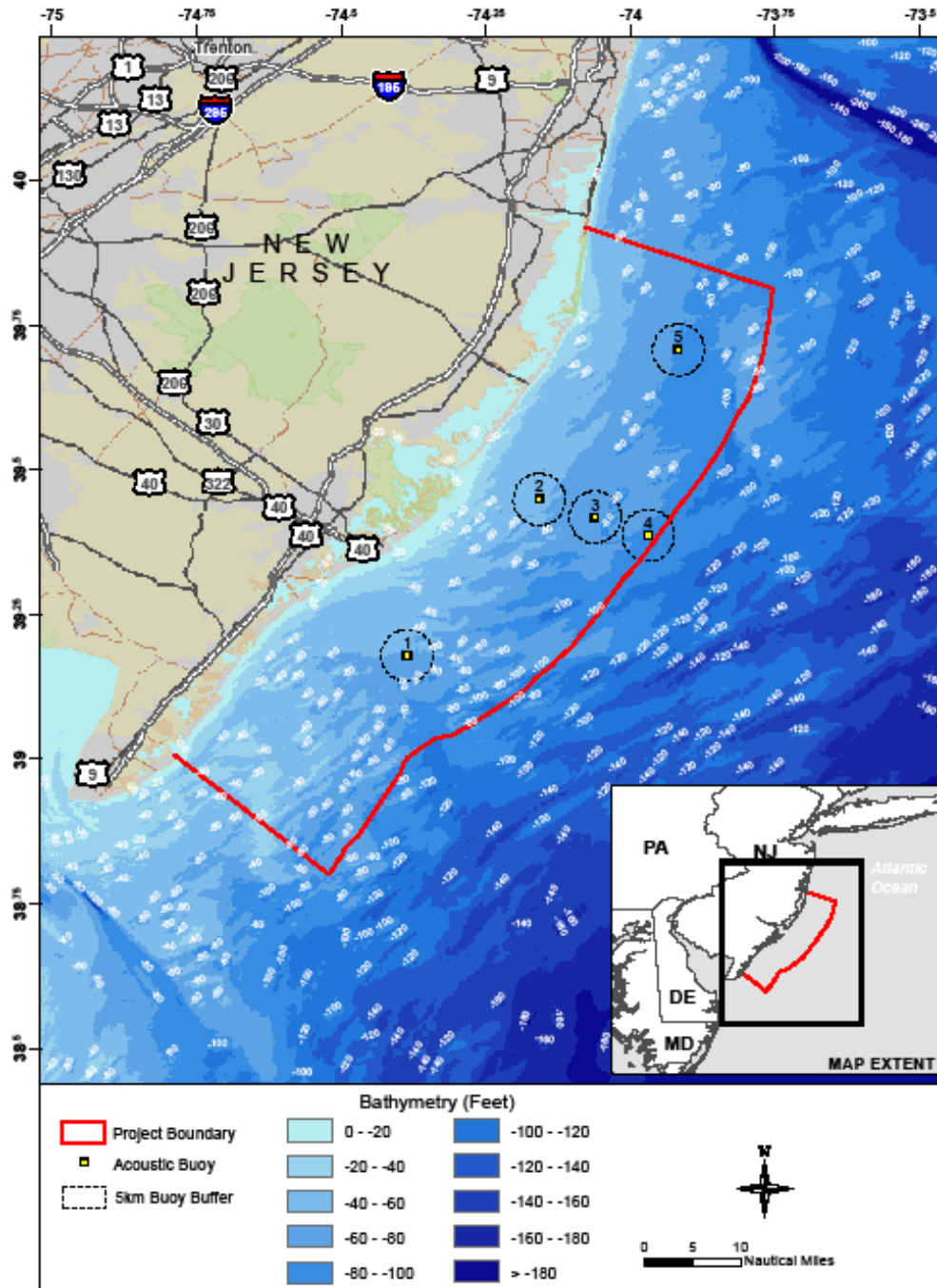


Figure 5.6-1. Deployment Sites for the Five Acoustic Pop Up Buoys off the Coast of New Jersey.

## **5.7 OCEANOGRAPHIC SURVEYS**

Surface Mapping System (SMS), Conductivity-Depth-Temperature (CTD), and Acoustic Doppler Current Profiler (ADCP) measurements were conducted in the NJDEP Study Area off the coast of New Jersey during the first quarter (January-March) of 2008 (**Figures 5.7-1 through 5.7-4**).

### **5.7.1 Surface Mapping System (SMS)**

For the SMS, measured static parameters include the measurement date and time, water depth (m), and longitude-latitude location. Measured climatic parameters include wind speed (kt), wind direction (degree), air temperature (°C), relative humidity (%), and atmospheric barometric pressure (mbar). Measured dynamic oceanographic parameters include water temperature (SST, °C), salinity (PSU), fluorometric chlorophyll and CDOM (Turner raw), and PAR (quanta sec<sup>-1</sup>).

SMS measurements were conducted and recorded every 10 seconds on the following dates:

07, 08, 13, 15-18 January 2008.

12-13 February 2008.

03-07, 10-14 March 2008.

Samples recorded followed the tracklines of the R/V Sharp during the periods the marine mammal and avian visual surveys were on and off effort (**Figures 5.7-1 through 5.7-3**).

### **5.7.2 ADCP Measurements**

In addition ADCP measurements were conducted while the vessel was underway to profile the physical oceanographic parameters. ADCP data have been collected for analysis of current speed/direction. ADCP data was been collected on the shipboard surveys conducted in January, February, and March (**Figures 5.7-1 through 5.7-3**).

### **5.7.3 CTD Measurements**

In addition to water surface properties and current profiles, water depth profiles (extending from the surface down to the sea floor) were generated for water temperature (°C), salinity (PSU), dissolved oxygen (mg/l), and conductivity (voltage) using CTD instrumentation. Depth profiles of these four parameters were combined into a single graphical plot (**Figure 5.7-4**).

CTD measurements were conducted at 20 sites in January, 6 sites in February, and 32 sites in March. The enclosed map shows the longitude-latitude locations of the sites of the CTD casts at which data collection occurred.

## **6.0 INITIAL ASSESSMENT OF POTENTIAL ENVIRONMENTAL IMPACTS FROM OFFSHORE WIND POWER FACILITIES**

No activity was initiated on this task during this reporting period

## **7.0 REPORTING**

A Quarterly report was prepared during this period. Responses to comments on the draft QAWP were prepared.



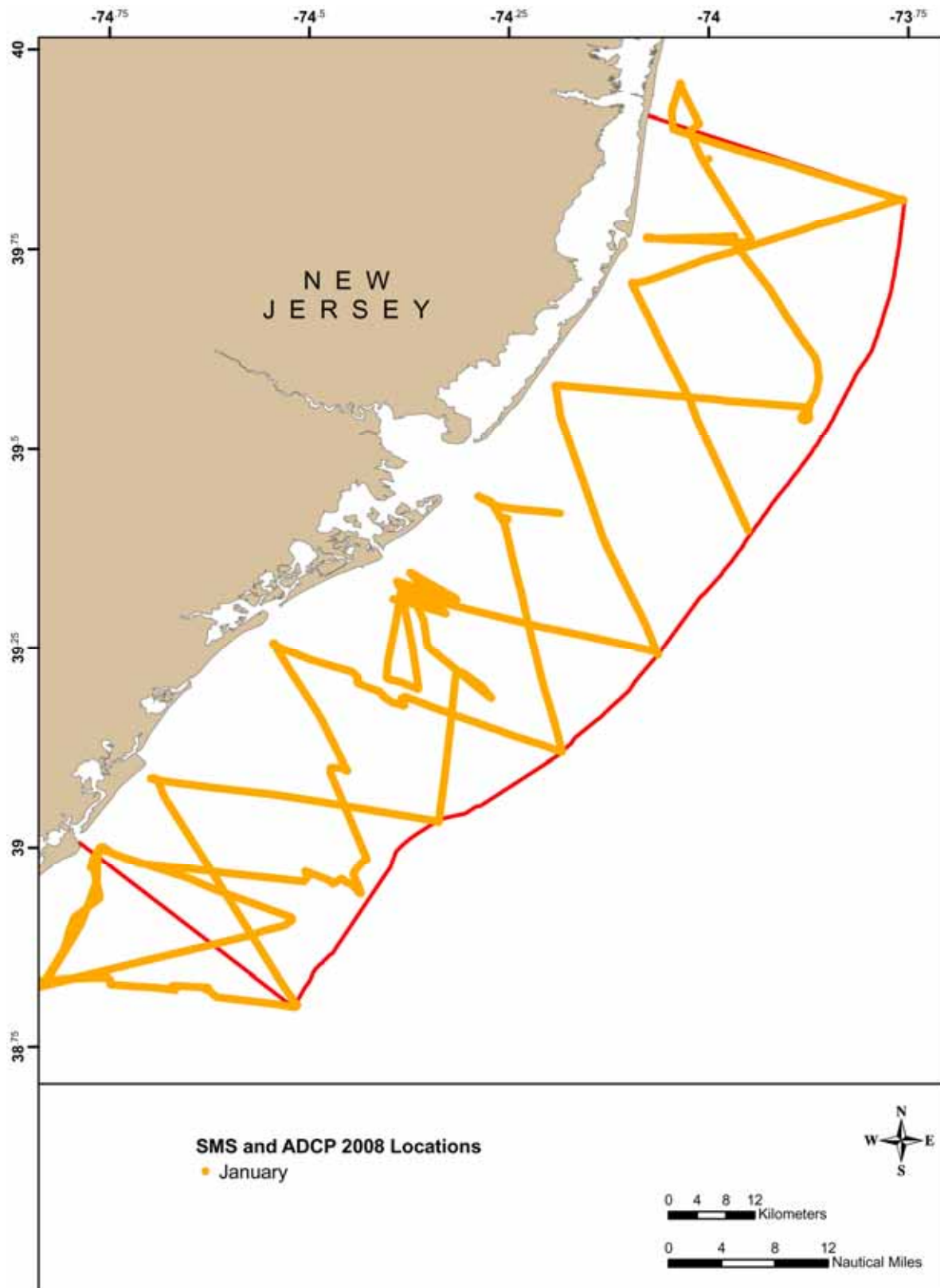


Figure 5.7-1. SMS and ADCP Measurements Conducted during Shipboard Surveys in the NJDEP Study Area off the Coast of New Jersey in January 2008.



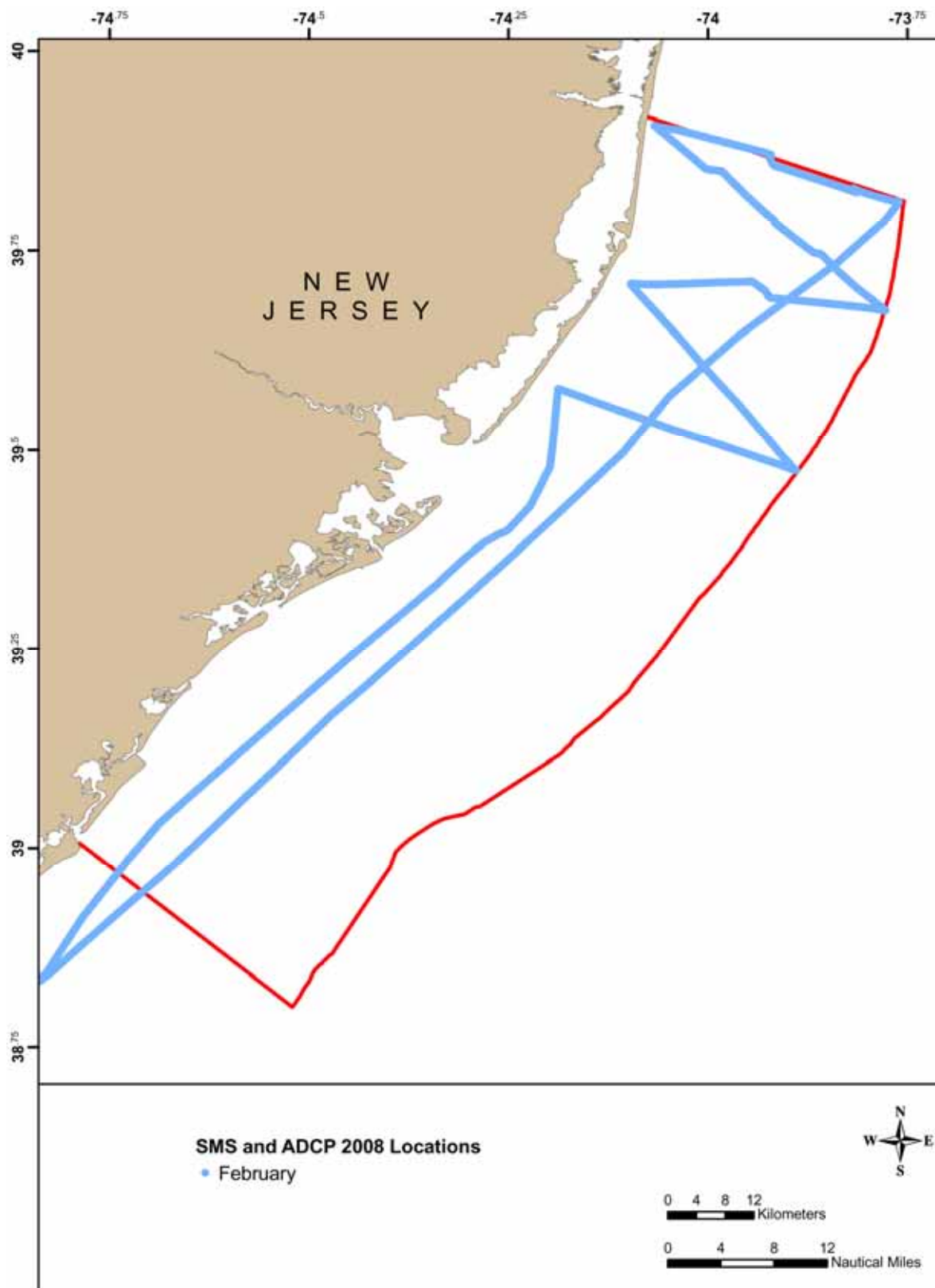


Figure 5.7-2. SMS and ADCP Measurements Conducted during Shipboard Surveys in the NJDEP Study Area off the Coast of New Jersey in February 2008.

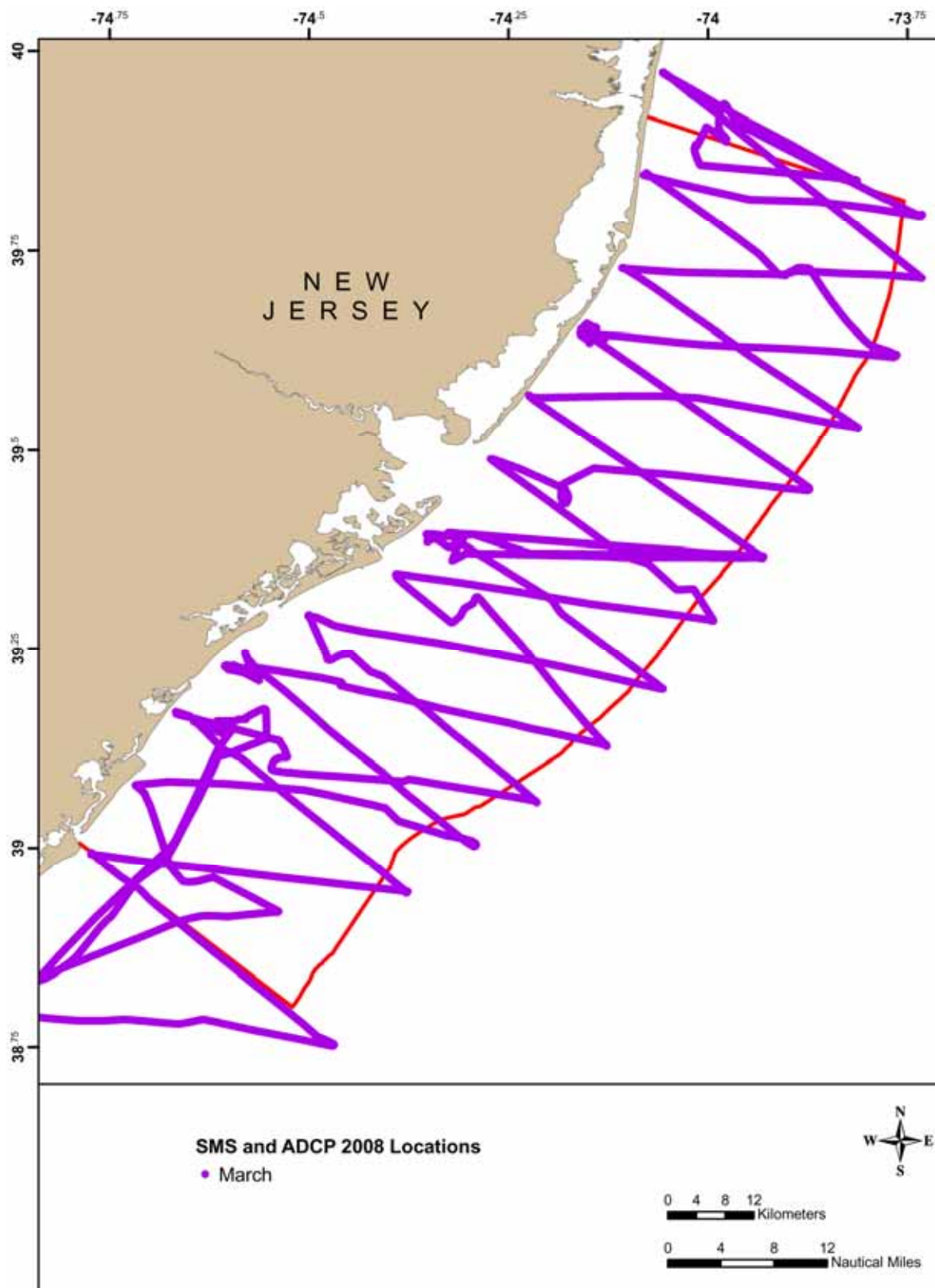


Figure 5.7-3. SMS and ADCP Measurements Conducted during Shipboard Surveys in the NJDEP Study Area off the Coast of New Jersey in March 2008.

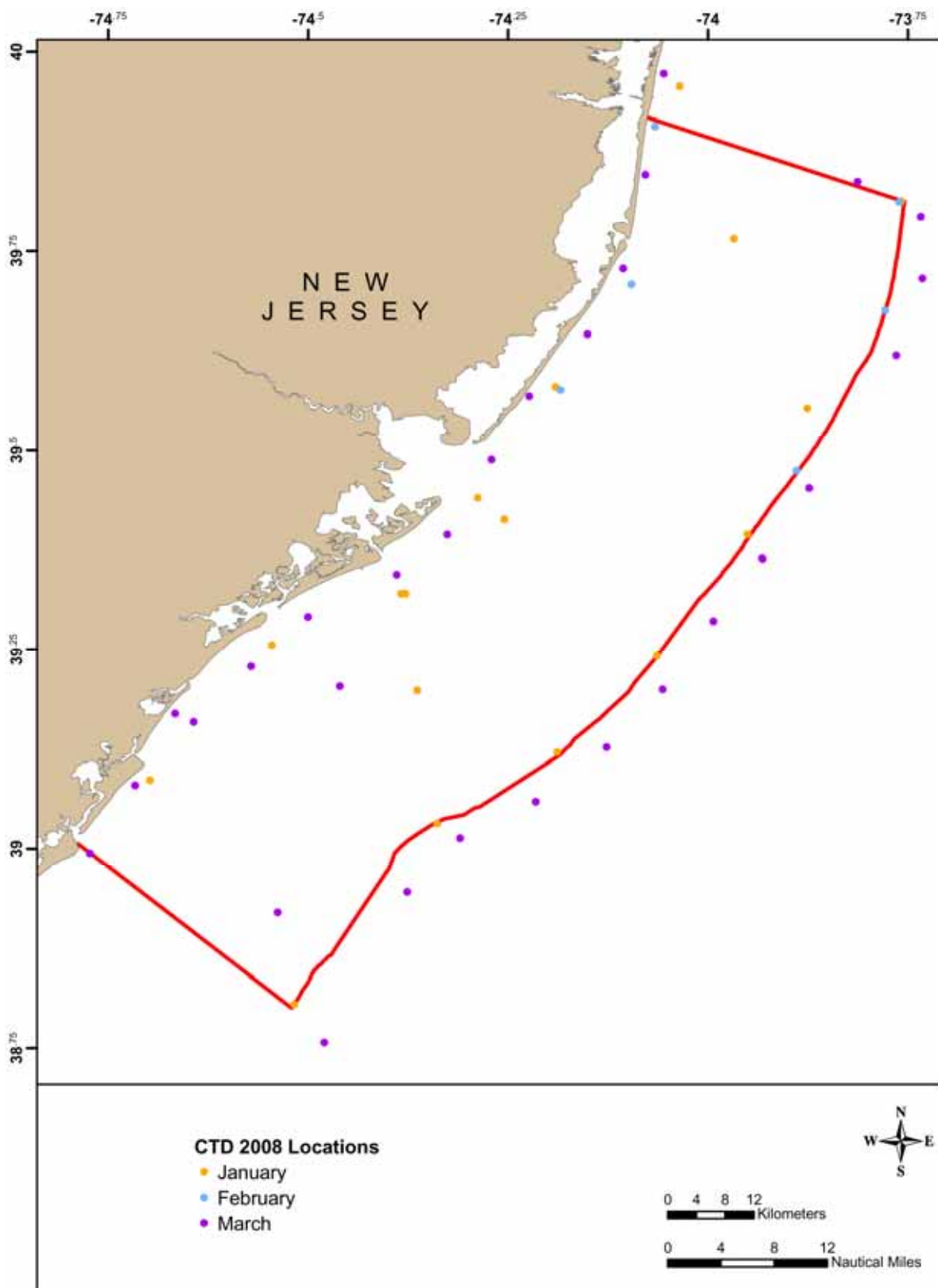


Figure 5.7-4. CTD Measurements Conducted at Point Locations in the NJDEP Study Area off the Coast of New Jersey from January through March 2008.