APPENDIX I

SUPPLEMENTAL SURVEYS

Recent discussions with the U.S. Fish and Wildlife Service have identified the need for additional avian data to supplement the ongoing baseline studies. Avian data needs include: 1) the identification of avian foraging locations; 2) avian use of fishing locations, and 3) Northern gannet roosting locations. Supplemental avian surveys will be scheduled, when practical, during the final 7 months of the study to collect avian data relating to the identified data needs. The specific goals of the supplemental avian surveys negate use of the collected data in the avian predictive model.

Identification of Avian Foraging Locations

Monthly avian boat surveys of shoal areas will be conducted to determine avian shoal use in the Study Area. Survey methods are discussed below.

Methods

The station count method (Gould and Forsell 1989) will be modified to survey shoal areas. The survey area will consist of two concentric circles with the observer as the center of the circle. The radius of the first circle (A) will range from 0 to 300 meters (m); the radius of the second circle (B) will range from 301 to 600 m.

Shoal area maps will be generated with a geographic information system (GIS) and numbered sequentially from north to south. Shoal size varies greatly in the Study Area; small shoals may require only one station; larger shoals may have numerous stations. All shoal stations will be located a minimum of 1 km apart.

When the boat is on station, the start time, station number, station location global positioning system (GPS) coordinates will be recorded on a field data sheet (**Exhibit 1**). Weather data will be recorded at the beginning, middle, and end of the survey day on the standard weather data sheet currently being used to conduct avian boat surveys for the study. Weather changes will be noted on the data sheet.

Within the survey area (two concentric circles), all birds will be identified and counted during a circular five- (5-) minute survey. Concentrations of out of zone birds (>50 birds) will be recorded on the incidental observations data sheet (**Exhibit 1**). After the modified station count is completed, the observer will record dive altitudes and submersion times of foraging birds (gannets, pelicans, terns) within the survey area for a period of 5 minutes. If time is available, data will be collected for diving ducks and gulls.

This survey sequence will be repeated three (3) times. If bird foraging activity is low (<25 birds), the survey will be terminated and the boat will proceed to the next shoal station. If moderate to high bird foraging activity (>25 birds) is present at the end of the 30-minute period, a second 30-minute survey period will be completed. If time is available, each shoal station will be visited twice daily to document temporal variation in utilization.

Two days of avian boat surveys will be scheduled twice monthly to survey shoal areas. Shoal survey sequence will be reversed during the second monthly survey to document temporal variation in utilization. Shoals throughout the study area will be surveyed.

Avian Use of Fishing Locations

An avian survey will be conducted from a recreational fishing boat to document avian species attracted to fishing boats and to gather data on fishing locations in the Study Area. Survey methods are discussed below.

Methods

Reservations will be made on fishing boat charters to conduct the avian survey. During the trip from the dock to fishing grounds and between fishing grounds the boat often travels well above speeds used to conduct avian transect surveys (10 knots); however, the avian observer will record incidental observations of foraging birds (identity and number) and record location coordinates of the boat at the time of the sighting on the incidental observations data sheet (**Exhibit 1**).

When the fishing boat is anchored on station, the start time, station number, station location GPS coordinates will be recorded on a field data sheet along with the start time (**Exhibit 1**). Weather data will be recorded at the beginning, middle, and end of the survey day on the standard weather data sheet currently being used to conduct avian boat surveys for the study. Weather changes will be noted on the data sheet.

The station count method (Gould and Forsell 1989) will be used to survey the area around the boat. The survey area will consist of two concentric circles with the observer as the center of the circle. The radius of the first circle (A) will range from 0 to 300 m; the radius of the second circle (B) will range from 301 to 600 m.

Within the survey area (two concentric circles), all birds will be identified and counted during a 5-minute circular sweep. After the station count is completed, the observer will record dive altitudes and submersion times of foraging birds (gannets, pelicans, terns) for a period of 5 minutes. If time is available, data will be collected for diving ducks and gulls. This survey sequence will be repeated until the boat leaves for another fishing spot.

An attempt will be made to schedule one to two trips per month during the winter season and one trip per week during the spring/summer season.

Northern Gannet Roosting Locations

The goal of this survey is attempt to identify the night roosting location of Northern gannet. Boats will attempt to be used to follow the gannet evening flight to the roost site(s).

Methods

Data from previous surveys will be reviewed to identify concentration locations of Northern gannets in the study area. When weather permits (Beaufort 1-3), a boat (capable of speeds of up to 20 knots) will attempt to follow the gannets from one concentration area as they leave for the night roosting location. If the boat is successful in locating the roost, the location coordinates of the site will be recorded. Other gannet concentration locations in the Study Area will be visited in an attempt to find additional roosting locations.

EXHIBIT 1

DATA SHEETS

New Jersey Department of Environmental Protection
Ocean/Wind Power Environmental Baseline Studies

Supplemental Avian Survey
Shoals

Date:_______________ **Shoal Number:**__________ **Page:**___________

Observer:______________________________________

Location Coordinates:____

Start Time:_____________ **End Time:**____________

Species Code	Number	Zone	Comments (age, behaviors)

New Jersey Department of Environmental Protection
Ocean/Wind Power Environmental Baseline Studies

Supplemental Avian Survey
Foraging Behavior

Date:______________ **Survey Type: Shoal Fishing Boat** **Page:__________**

Observer:___________________________________

Location Coordinates:____

Start Time:____________ **End Time:___________**

Species Code	Number	Dive Altitude (Feet)	Submersion Time	Comments (age, behaviors)

New Jersey Department of Environmental Protection
Ocean/Wind Power Environmental Baseline Studies

Supplemental Avian Survey
Incidental Observations

Date:_______________ **Page:___________**

Observer:_____________________________________

Time	Location Coordinates	Species Code	Number	Direction From Boat	Range