

**WORK PLAN FOR ESTIMATING OILING RATES AMONG PELAGIC BIRDS USING
SHIP BASED SURVEYS IN THE VICINITY OF THE DEEPWATER HORIZON (MSC
252) OIL SPILL (BIRD STUDY #6)**

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INTRODUCTION

The Deepwater Horizon (MSC 252) oil spill began April 22, 2010. Oil spill-related injury to wildlife is of major concern to the natural resource trustees and BP. Most of the oil that continues to flow from the ruptured pipe from the drilling rig has not yet come ashore, but large amounts of oil on and under the water in the vicinity of the accident pose a threat to seabirds such as gannets and boobies, storm-petrels, shearwaters, gulls, and terns.

While the distribution and density of birds at sea are being estimated by aerial surveys (Bird Study #2), it is not possible to evaluate bird oiling from the air and it may not be possible to identify bird carcasses. To evaluate the proportion of live oiled birds in the pelagic zone, this plan proposes to put bird observers on ships involved in sampling water quality, fish populations, marine mammals, or other natural resources in deep water in the vicinity of the spill and at locations where currents are likely to concentrate oil.

In addition, the Trustees have proposed collecting data on bird carcasses encountered at sea using the criteria developed for beached bird surveys. They have also proposed, given the expanding geographic extent of the spill zone, that the at-sea observers also collect data to estimate bird densities which are intended to complement the aerial survey data.

BACKGROUND

As of June 15, 2010, surface oil slicks and sheens have affected much of the northern Gulf of Mexico off the coasts of Louisiana, Alabama, Mississippi, and panhandle Florida. The most commonly observed pelagic species using these waters during the summer include Band-rumped Storm-Petrel (*Oceanodroma castro*) and Bridled Tern (*Sterna anaethetus*). Audubon's Shearwater (*Puffinus lherminieri*) and Band-rumped Storm-Petrel are the highest priority species for conservation attention in the Southeast US Waterbird Conservation plan. These two species make relatively heavy use of Gulf waters; a high proportion of the total breeding populations of these two species use the Gulf of Mexico. Also of concern are facultative pelagic species such as Common Tern (*Sterna hirundo*) and Royal Tern (*Sterna maxima*).

Other species that have been recorded in the affected area late spring through summer include:

Yellow-nosed Albatross (*Thalassarche chlororhynchos*)
Manx Shearwater (*Puffinus puffinus*)
Cory's Shearwater (*Calonectris diomedea*)
Leach's Storm-Petrel (*Oceanodroma leucorhoa*)
Red-billed Tropicbird (*Phaethon aethereus*)
Northern Gannet (*Morus bassanus*)
Masked Booby (*Sula dactylatra*)
Red-footed Booby (*Sula sula*)
Magnificent Frigatebird (*Fregata magnificens*)
Red-necked Phalarope (*Phalaropus lobatus*)
Sabine's Gull (*Xema sabini*)
Brown Noddy (*Anous stolidus*)
Sooty Tern (*Onychoprion fuscatus*)

Black Tern (*Chlidonias niger*)
Pomarine Jaeger (*Stercorarius pomarinus*)
Parasitic Jaeger (*Stercorarius parasiticus*)
Long-tailed Jaeger (*Stercorarius longicaudus*)

Several other species will arrive in the affected area in the fall.

STUDY OBJECTIVES

1. Collect data describing the proportion of pelagic seabirds encountered along the ships path that are not visibly oiled, or that fall into pre-defined oiling categories.
2. Collect data to support an estimate of the density of seabirds along the ships path.
3. Document the location and state of bird carcasses encountered along the ships path.

STUDY AREA

At-sea surveys will be carried out in the area potentially affected by oil released by the Deepwater Horizon (MSC 252) oil spill. The original study area was defined as the region between the Texas/Louisiana border and Gulf County, Florida. As the spill has increased in size and the area of potential impact has widened, the study area has been expanded to include the gulf shore of Florida as far south as the Dry Tortugas, and the shoreline of Texas from Louisiana to the Mexican border. Offshore, the study area includes the Gulf of Mexico north of an imaginary line drawn between the Texas-Mexico border and the Dry Tortugas of Florida.

SAMPLING DESIGN

Ships conducting sampling at set stations provide the opportunity to observe birds on strip transects between stations, or in the case of marine mammal surveys, on the same transects as are being navigated for the mammals surveys. Observers will collect transect data while the ship is in transit. However, if using research vessels with float plans that focus on stopping at sampling stations, bird observers could perform point surveys. When practical, observers will also collect point count data while the ship is on station

Strip transects

Sample Units.—The sample unit is a strip of water within 300 m abeam of the ship in which all birds will be recorded along a length of transect.

Data Collection.— Surveys will be conducted from a viewing platform that is (1) elevated and (2) provides an unobstructed view of the water. Observations will be made when the ship is following a straight course for a set distance at a constant speed. Only seabirds within a 90° arc (between the bow and abeam) within 300 m of one side of the ship are considered “inside the transect” and relevant to this study for calculating a standardized density estimate. Density estimates will be collected and binned within temporal windows of no more than 10 minutes

duration, some or all of which may be consecutive and continuous. Birds detected within 100 m of the ship will be observed with greatest priority for determining oil exposure. In addition, birds observed within the transect width, but more than 100 m ahead of the ship that dive or take flight from the transect, should be recorded for density estimates if it appears that the behavior occurred in response to the research vessel. Care will be taken to avoid double-counting flying birds.

Observers will use image-stabilizing binoculars with at least 10X magnification to locate live and dead birds, identify them to species (or nearest taxon), and to determine the bird's oiling status using criteria developed for the beached bird surveys. "Big eye" optics will also be used to periodically evaluate the accuracy of 10X binoculars in determining the oiling status of birds within the transect width. To do this, a bird's oiling status is determined with 10X binoculars first, then immediately evaluated with the "big eye."

Observers will use the range finder provided to them to determine the distance between each bird and the observer. When two observers are present, one should focus on simple population counts within the strip-transect while the other focuses on confirmed observations of oiling status. However, priority should be given to oiling status observations if and when only a single observer is available.

Observer fatigue will be addressed by using two observers wherever possible, with each observer counting continuously for one hour before being replaced by the alternate. During periods of high seabird density, or whenever sufficiently rested, both observers may work jointly. However, in these circumstances only one observer may detect and record the observations used for seabird density; the second observer's role would be observing oiling status of birds. For research cruises in which space limits placement of only a single observer, this observer will detect and record for no longer than two continuous hours, with a 30 minute rest between additional observations. All observers will seek to use the ship's scheduled on-station research periods, meal times, and other opportunities to maximize coverage of the transit time devoted to recording seabird observations.

Data collected during the surveys will be recorded on the attached data sheets (Appendix A). For each bird, critical information includes: species (or closest taxon), whether the bird was confidently assessed for oiling, and whether the bird was oiled or not. For birds for which oiling status could not be confidently assessed, these observations will be noted for purposes of estimating population sizes, but they will not contribute to the determination of oiling rate. An oiling status is "confidently assessed" when the observer has undoubtedly observed oil on the bird or has undoubtedly observed the bird to be free of oil. In addition, to assess oiling detection probability, the distance to all confidently assessed birds will be measured using a range finder. Any birds for which oiling status could not be confidently determined due to issues with distance from observer, sea state, or weather limiting visibility should be noted as "undetermined" and the distance measured with the range finder.

Before each survey, surveyors should calibrate their visual, un-aided ability to estimate distance using a range finder on objects (e.g. buoys) at a variety of distances.

Trackline/location should be tracked using a GPS recording position every 30 seconds (or greater if GPS memory will not be filled during a given survey). Ideally, all sightings will be entered into an onboard laptop computer running a tracking program such as dLog. If this is not possible, sightings can be recorded on tape or digital recorders (or potentially on paper) along with the exact time (calibrated to the GPS), and sightings can be meshed to GPS location post-hoc. GPS waypoints for the position of the ship should also be taken for each sighting of an oiled animal.

Transect surveys will be run only when the ship is underway on a straight course at a constant speed. If the ship changes course more than a few degrees, a new transect will be started. However, a standardized method for counting seabirds at a single location will also be designed and used when the ship is stopped (e.g., at a sampling location for reef fish). All the same data will be collected for these on-station methods as for the strip transect surveys, excluding the trackline of the ship.

Point Counts

Sample Units.—The sample unit is the area within a 90- to 360-degree arc with a radius of 300 m from the observer in which all birds will be recorded.

Data Collection.— Surveys will be conducted from an appropriate vantage point when the ship is stopped at a stationary location at sea for at least 30 minutes. The observer will identify birds within an angle arc appropriate for the vantage point (e.g., 90-degree arc if looking out one side of the vessel, 270-degree arc off the bowsprit, or 360-degrees from a crow's nest). The observational arc reaches 300 m away from the observer for purposes of density estimates and 100 m for observing degree of oiling. All birds within 300 m will be counted and identified to species; all birds within 100 m will be observed for oiling. Behavior will be recorded for each bird. Care will be taken to avoid double-counting flying birds.

Observers should ideally use image-stabilizing binoculars with at least 10X magnification to identify live and dead birds, identify them to species (or nearest taxon), and to determine the bird's oiling status. If the ship is equipped with "big eye" optics, observers should try to use these higher magnification optics to determine with confidence presence or absence of oil on a bird. "Big eye" optics can also be used to periodically evaluate the accuracy of 10X binoculars in determining the oiling status of birds within the transect width. To do this, a bird's oiling status is determined with 10X binoculars first, then immediately evaluated with the "big eye." For all dead birds and for live birds with a confirmed oiling status, observers will use a range finder (either incorporated in the binoculars or stand-alone hand-held range finders) to determine the distance between the bird and the observer. When two observers are present, during periods of high bird density, one should focus on simple population counts while the other focuses on confirmed observations of oiling status. However, priority should be given to oiling status observations if and when only a single observer is available.

Observer fatigue will be addressed by using two observers wherever possible, with each observer counting continuously for one hour before being replaced by the alternate. During periods of high seabird density, or whenever sufficiently rested, both observers may work jointly.

However, in these circumstances only one observer may detect and record the observations used for seabird density; the second observer's role would be observing oiling status of birds. For research cruises in which space limits placement of only a single observer, this observer will detect and record for no longer than two continuous hours, with a 30 minute rest between additional observations. All observers will seek to use the ship's scheduled on-station research periods, meal times, and other opportunities to maximize coverage of the transit time devoted to recording seabird observations.

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The position of the point survey will be recorded using GPS. Ideally, all sightings will be entered into an onboard laptop computer running a tracking program such as dLog. If this is not possible, sightings can be recorded on tape or digital recorders (or potentially on paper) along with the exact time (calibrated to the GPS), and sightings can be meshed to GPS location post-hoc. GPS waypoints for the position of the ship should also be taken for each sighting of an oiled animal.

Dead Birds

If a dead bird is encountered at sea, it will likely not be feasible to attempt to collect it, especially if encountered during strip transect studies. Therefore, any dead birds should be noted on the Dead Pelagic Bird data sheet. Degree of oiling and other information will be evaluated visually using binoculars. If close enough, dead birds should be photographed.

Appendix A. BIRD OBSERVATIONS – DEGREE OF OILING

VESSEL NAME: _____ TRANSECT NUMBER: _____

DATE: _____ OBSERVER: _____

OPTICS: _____ TRANSECT WIDTH (m): _____

[illegible]

*0= not visibly oiled, 1=oil observed (describe in comments), 2=not able to confirm

BIRD OBSERVATIONS – SPECIES ABUNDANCE

VESSEL NAME: _____ TRANSECT NUMBER: _____

DATE: _____ OBSERVER: _____

OPTICS: _____ TRANSECT WIDTH (m): _____

[illegible]

BIRD OBSERVATIONS
HEADER DATA SHEET

VESSEL NAME: _____ TRANSECT NUMBER: _____

DATE: _____ OBSERVER: _____

Environmental variables (use codes):

Sea State: _____

Weather: _____

Clouds: _____

Swell Height: _____

Visibility: _____

Wind Direction: _____

Barometric Pressure: _____

Wind Speed: _____

Transect Information:

Start Position

Latitude _____ N/S?

Enter degree, minutes

Longitude _____ E/W?

Enter degree, minutes

TIME START _____

Enter in time using the 24 hour clock. ie. 16:45

Course (CMG) _____ **Speed (SMG)** _____
(0-359) (in knots)

Water Depth _____

If depth is available, enter it in meters.

Height of Platform Above Water _____

COMMENT:

END of TRANSECT DATA SHEET

VESSEL NAME: _____ **TRANSECT NUMBER:** _____

DATE: _____ **OBSERVER:** _____

Environmental variables (use codes):

Sea State: _____

Weather: _____

Clouds: _____

Swell Height: _____

Visibility: _____

Wind Direction: _____

Barometric Pressure: _____

Wind Speed: _____

Transect Information:

Start Position

Latitude _____ **N/S?**
Enter degree, minutes

Longitude _____ **E/W?**
Enter degree, minutes

TIME END _____

Enter in time using the 24 hour clock. ie. 16:45

Water Depth _____

If depth is available, enter it in meters.

COMMENT:

BEHAVIOR -(BEH) enter the birds behavior:

- 1--flying
- 2--sitting on the water
- 3--feeding
- 4-- carrying a fish
- 5 - ship (attracted to the ship)
- 6 - attracted to ship and following

State

- 0--calm, glassy
- 1--calm to rippled
- 2--smooth to wavelet
- 3--slight (1.25' to 4' waves)
- 4--moderate (4' to 8' waves)
- 5--rough (8' to 13' waves)
- 6--very rough (13' to 20' waves)

Weather

- 00--clear to partly cloudy, <50%
- 03--cloudy to overcast, >50%
- 04--Fog, Patchy
- 05- Fog, Solid
- 06--rain, light
- 07--rain, heavy

Clouds

- 0--no clouds
- 1--1/10 or less cloud cover
- 2-- 2/10 to 3/10 cloud cover
- 3--4/10 cloud cover
- 4--5/10 cloud cover
- 5--6/10 cloud cover
- 6--7/10 to 8/10 cloud cover
- 7--9/10 or more
- 8--completely overcast
- 9--sky obscured

Swell Height

Enter Swell Height in meters

Barometric Pressure (if available)

Visibility (how far one can clearly see, not how far away a bird can be evaluated for oil)

- 0 < 50m
- 1 50 to 200m

- 2 200 to 500m
- 3 500 to 1000m
- 4 1 to 2 km
- 5 2 to 4 km
- 6 4 to 10 km
- 7 10 to 20 km
- 8 20 to 50 km
- 9 >50 km

Wind Direction

- 1--SW
- 2--W
- 3--NW
- 4--N
- 5--NE
- 6--E
- 7--SE
- 8--S

Wind Speed

enter speed, 2 knots=1 m / s

Budget: Pelagic Bird Study Plan (Study #6)

Budget reflects estimated costs for opportunistic use of vessels with up to 2 expert observers per vessel to conduct surveys through December 2010, on 3 week cruises on average. A total of 6 cruises is anticipated; upon completion of 6 cruises, we will reevaluate conditions and assess the need for additional surveys.

Category	Item	Unit (wks)	Cost/Unit	Total Item Cost
Personnel	Principle investigator	8	2,508/wk	\$20,071
	Observers (12)	3	3,500/wk	\$126,000
	Personnel Total			\$146,071
Category	Item	Units	Cost/Unit	Total Cost
Travel	Airline tickets	13	\$ 900	\$11,700
Housing	Hotel - field biologists (12 people x 4 days)		\$ 125	\$6,000
	Hotel - principal investigator (1 x 4 days)			\$500
Per diem	Per diem (13 staff, 25 days)		\$ 50	\$16,250
Equipment	Laptop Computer (1 per boat)	6	\$1,000	\$6,000
	Binoculars - Image Stabilized (1 per observer)	12	\$600	\$7,200
	Big Eye or Spotting Scope (1 per boat)	6	\$2,000	\$12,000
	Weatherized Computer Storage Box	6	\$200	\$1,200
	Portable GPS Units and DataLog Software (1 per boat)	6	\$2,500	\$15,000
	Compass Rose(1 per boat)	6	\$100	\$600
	Rangefinder (1 per boat)	6	\$300	\$1,800
	Travel, Housing, Per diem, Equip Total			\$78,250
Subtotal				\$224,321
Administ.	Administrative overhead on subcontracts		20%	\$44,864
Subtotal				\$269,185
Contingency	Misc. equip, supplies, other unknown expenses		20%	\$53,837
Grand Total				\$323,022


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252) OIL SPILL (BIRD STUDY #6)

Approval of this work plan is for the purposes of obtaining data for the Natural Resource Damage Assessment. Parties each reserve its right to produce its own independent interpretation and analysis of any data collected pursuant to this work plan

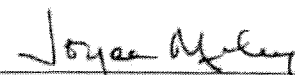
APPROVAL


Molly B Spurduto (USFWS)
Trustee NRDA Bird Group Lead

6/24/10
Date


FOL KOLAND GUDLEY
State of Louisiana Trustee Representative

7/16/10
Date


~~Ralph Martin (ENRPEC)~~
~~Responsible Party Representative~~

June 26, 2010
Date

BP NRDA Coordinator
Joyce Miley