

**USING RADIO TELEMETRY TO DETERMINE THE FATES OF BIRD
CARCASSES DRIFTING IN THE NORTHERN GULF OF MEXICO**

(Bird Study #1D)

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In coordination with:

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1.0 INTRODUCTION

The Beached Bird Model (BBM) provides a methodology for estimating the rate at which carcasses are deposited on beaches based on the number of beached birds that are recovered by collection teams, but does not provide insight as to the fate of carcasses prior to beaching. Carcasses drifting at sea may become waterlogged and sink or be consumed by scavengers before they come to rest on the shoreline. This study is designed to estimate the likelihood that birds dying at sea would be beached and thus be accounted for by beached bird surveys and the BBM.

The study will use radio telemetered bird carcasses to determine the movement patterns and persistence of floating carcasses before they are beached. Carcasses will be tracked until they are beached or until their radio signals terminate, indicating that the carcass has either sunk, been eaten, or that the transmitter has failed. To evaluate and account for transmitter failure rates, the study involves also tracking 'dummy' carcasses which are designed to float similarly to birds, but are not subject to sinking or scavenging.

2.0 OBJECTIVES

The purpose of this study is to investigate the fate of bird carcasses that begin to drift within the northern Gulf of Mexico. Specifically, the study will quantify the length of time carcasses float prior to sinking as well as the proportion of the study carcasses that do not sink and eventually become beached within the area that was searched for carcasses during the Deepwater Horizon (MC 252) oil spill. The information will be used to reduce uncertainty regarding avian mortality resulting from the Deepwater Horizon/MC 252 oil spill.

3.0 CARCASS DRIFT STUDIES- GENERAL BACKGROUND

The number of bird carcasses that are lost before beaching has been addressed in damage assessments for the *Apex Houston*, *Puerto Rican*, *Nestucca*, *Exxon Valdez*, *Citrus*, and the *S.S. Jacob Luckenbach* incidents. Estimates of the rate of carcasses lost at sea have been made by Ford et al. (1996) and Wiese (2003). For the *Nestucca* and *Exxon Valdez* incidents, VHF transmitters attached to ballasted floats were attached to both bird carcasses and to "dummy carcasses" released at sea. Carcasses and dummies were tracked until their signal was lost or until they beached. Signals from dummies were rarely lost at sea, indicating that carcass signal cessation was associated with carcasses being eaten or becoming waterlogged and sinking.

4.0 STUDY AREA AND TIMING

4.1 Study Area

The study area will include the coastal and offshore region extending from about Terrebonne Bay (91° 00' W), Louisiana, to Gulf Shores (87° 00' W), Alabama. This area accounted for the majority of the recoveries of birds with known locations.

4.2 Timing

The field study will be conducted over an approximately 6-week period in July and August, 2011.

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These months account for about 65% of the total carcasses recovered. The study will consist of three to five trials (or “releases”), each consisting of 40 to 75 carcasses and 10 to 25 dummies (for a five-trial and three-trial study, respectively). The number of releases (3-5) will depend on logistics, but to the extent possible, the releases will be spread out over a period of four weeks. The final two weeks of the study period will consist of tracking carcasses and dummies only. A total of about 248 carcasses and 66 dummies will be set out during the course of the project, under a five-release scenario. Releases will be made at three- to five-day intervals if five releases are conducted or 10-15 day intervals if three releases are conducted, depending on the time required for previously released carcasses to sink or to come to rest on shore. The purpose of multiple releases is to address temporal variations in environmental parameters that may influence how carcasses drift and sink at sea, as well as to create a logistically and administratively more manageable work schedule for field crews. Radiotracking is intended to continue for up to two weeks after the last release event but may be adaptively managed based on interim study results.

5.0 METHODS

5.1 Carcasses

To the extent practical, the study will use freshly salvaged bird carcasses collected from pre-existing sources such as airport animal control programs; no wild birds will be killed specifically for this study. Carcasses will not have been collected using lead shot or poisons that might be transferable to scavengers during the implementation of the drift study. Carcasses will be refrigerated soon after they are collected, but not frozen, if avoidable. The euthanization, handling, transport, and storage histories of the study carcasses will be documented (See Appendix B “Standard Operating Procedures for Avian Capture, Storage, and Transportation”). To the extent practical, the study prioritizes the use of wild birds that were euthanized by means other than shooting (e.g., carbon monoxide gas). If a sufficient number of wild carcasses that meet these criteria are not present at the outset of a deployment, the sample will be supplemented with farm raised mallards that meet these criteria (total number of mallards not to exceed 25, or half the total number of carcasses to be deployed, whichever is lesser, on any single deployment). To ensure that a sufficient number of farm raised birds are present, if needed, BP will have a vender ship 25 mallard carcasses directly to the USFWS Fairhope NRDA Office with delivery the morning prior to each deployment. The vender will follow the documentation guidelines established in the “Standard Operating Procedure for Avian Capture, Storage, and Transportation.” If fewer than half of the total number of carcasses scheduled for a particular release consists of fresh, non-shot wild birds, the deficit may be made up with, in order of preference, (a) wild birds euthanized by gunshot to the head with the smallest gauge shot that is feasible (no bullets), (b) wild birds shot in the body with the smallest gauge shot possible (no bullets), and (c) frozen carcasses as a last resort. For shot birds, no birds with large wounds will be used. The carcass condition will be documented prior to deployment. Wiese (2003) and Ford et al. (1991) found that freezing carcasses reduced their flotation time by about half compared to never-frozen carcasses. If sample size considerations make it necessary to utilize frozen carcasses or carcasses with unknown euthanization histories, those carcasses will be released specifically in areas where they are likely to beach relatively soon after release.

Gulls comprised about half of the birds recovered during the spill response. Gull carcasses are also generally more available from pre-existing sources than other species. Therefore, gull species will be the primary species used in this study. However, if opportunities arise to obtain appropriate carcasses of other spill-relevant species (e.g., northern gannets, common loons, pelicans, terns, etc.), these carcasses may be used as well. The ultimate species composition for this study will be greatly

determined by the species available through pre-existing sources and avian farms. Ford et al. (1996) used a mix of species of widely varying size, including Crested Auklets, Common Murres, White Winged Scoters, Surf Scoters, Harlequin Ducks, Pelagic Cormorants, and Double-crested Cormorants, and found no indication that sinking rate varied with species.

5.2 Dummies

Dummies will be constructed so that they float in a manner similar to the range of carcasses deployed in terms of their response to wind and current conditions. The individual dummies, transmitters, and transmitter float materials will be prepared off-site by the Trustee contractors and shipped to Fairhope. Final assembly of transmitted dummies and carcasses will occur in Fairhope just prior to each release (see Section 5.3). BP and other Trustee representatives may assist in the Fairhope assemblies.

Dummies will be constructed from plastic water bottles encased in neoprene, with the amount of water inside the bottles adjusted so that the dummies simulate the floating behavior of real carcasses. Before the first release of carcasses occurs, float field trials will be conducted using approximately three representative carcasses (e.g., one per species, size class, or carcass type [wild or farm-raised]) paired with a dummy to ensure that their drift characteristics are similar. Carcasses and dummies will be released in a marine or estuarine environment and followed by boat for at least six hours. These dummies will be used as models for assembling the dummies for each release batch. During the study, the actual trajectories of dummies and carcasses will be evaluated, and if needed, the water content of the dummies will be adaptively managed during the dummy assemblies for subsequent carcass and dummy release events so that the dummies float more like carcasses. A carcass used in the float testing may be subsequently deployed as a study carcass as long as the carcass shows no obvious signs of degradation as a result of the field testing and associated handling. Any float test carcass deployed as a study carcass will be identified on the relevant datasheets as one that was previously used in float testing.

5.3 Transmitter Assemblies

To the extent practicable, integrated teams of Trustee and BP representatives will perform the final assembly prior to each release event, fitting carcasses and dummies with VHF transmitter barges. The VHF transmitters will have ranges of approximately 20-40 km and battery lives of about eight weeks. Transmitters will be epoxied into small high density spherical foam 'barges' and attached using stainless steel wire to the upper legs and base of wings of carcasses or to reinforced eyelet holes on the dummies.

Transmitter barges will be constructed so that they are nearly neutrally buoyant so that the radio signal attenuates if the carcass becomes submerged. As has been done in other studies, barges will be weighted and shaped so that they remain upright with the transmitter antenna pointing skyward even if the carcass flips while at sea or is beached (Figure 1).

A total of 314 radiotransmitted items will be deployed during the course of this study. However, only 300 transmitters were obtained. Thus, 14 transmitters that were used earlier in the study will be recovered after the fates of those transmitted items has been determined and reused later in the study. Only transmitters and dummies will be reused, not carcasses.

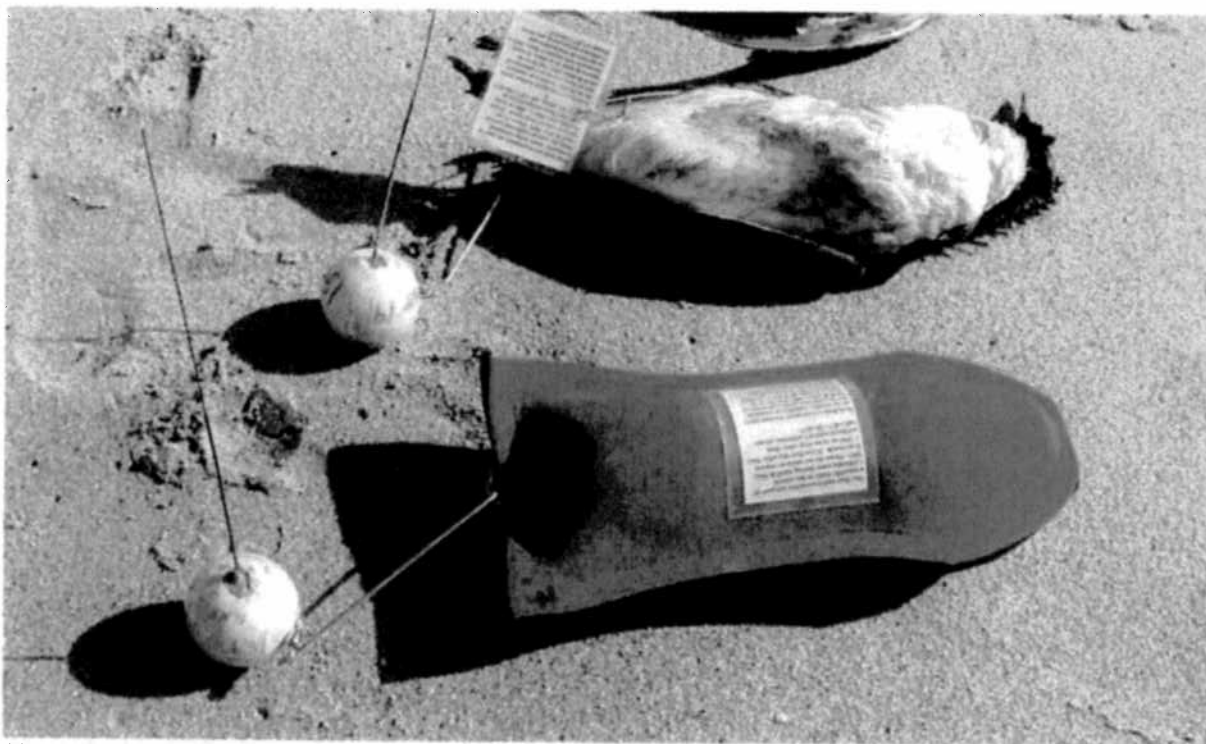


Figure 1: Example transmitter set-up. Bird species, dummy design, transmitter barge, and barge attachment design for the subject carcass drift study will not be exactly the same as shown here.

5.4 Public Outreach and Involvement

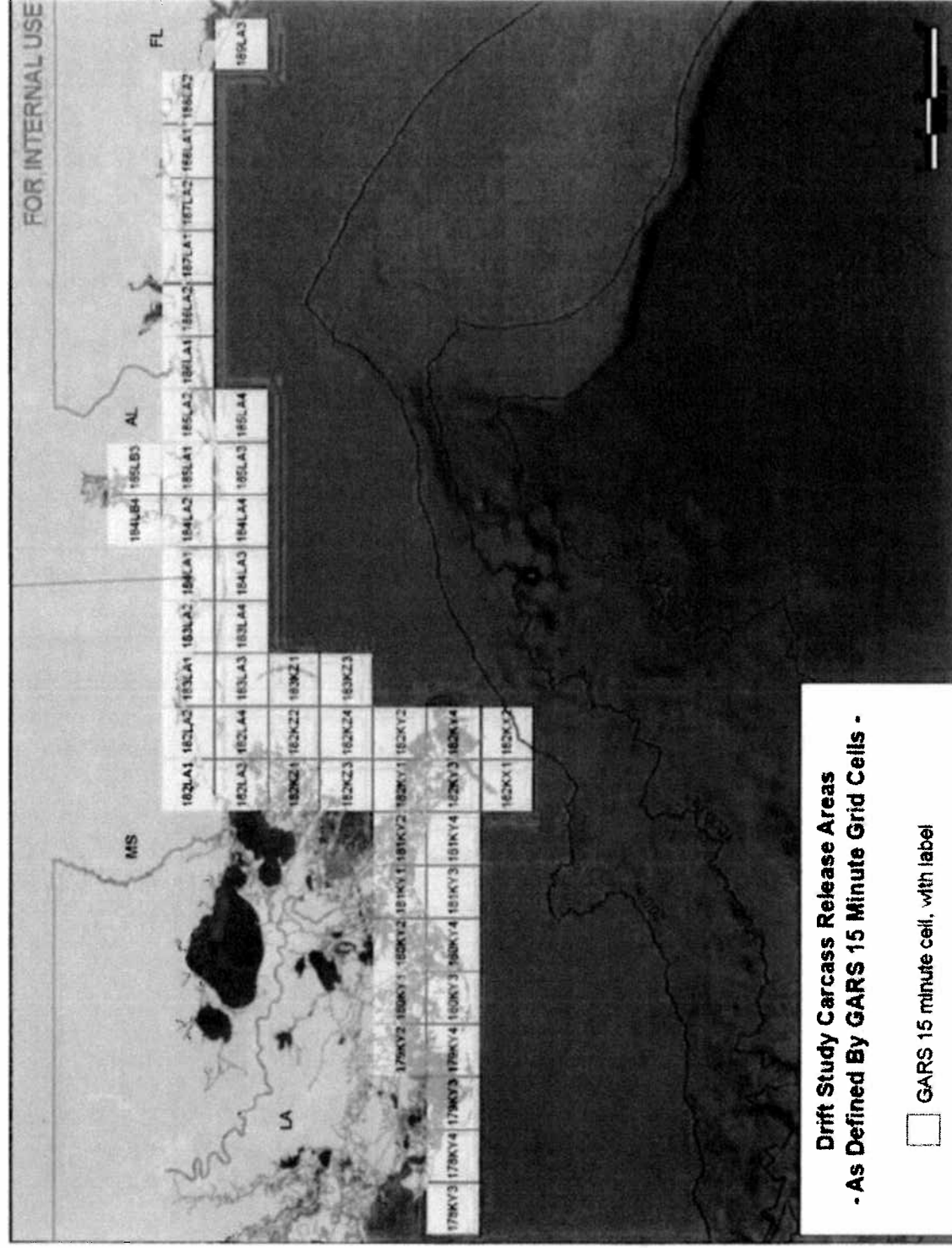
Individuals not affiliated with the implementation of this study may encounter transmitted carcasses or dummies in the field. To help prevent third parties from accidentally interfering with the study, it may be beneficial to provide some degree of public outreach regarding the implementation of the drift study. The Trustees and BP will cooperatively determine the extent of advanced notice or other mid-study public outreach that should be provided within the study area. At a minimum, the transmitter barges will be marked with a phone number (e.g., FWS Fairhope NRDAR Office) that can be called to report found carcasses or dummies. Additional information may be attached to the barges, carcasses, or dummies if it does not affect the buoyancy or drift characteristics of the study carcasses and dummies.

5.5 Release of Carcasses and Dummies

The primary intent is to release carcasses at sea in areas that contained the highest densities of birds within the study area during 2010, assuming that these were the areas where birds were most likely to have died during the spill if they died while in open water. Within the study area, the GARS 15' grid system will be used as a basis for carcass and dummy release points (Figure 2). The 2010 bird density data will be evaluated using this grid system (i.e., density estimates will be derived for each cell). The cells inside the study area that have the highest overall bird densities will be used for releases of carcasses/dummies in this study. Within each of these cells, a random waypoint (subject to the constraint that it is over water) within each cell will designate the location at which an individual carcass or dummy will be set adrift. Locations will be identified by randomly selecting a latitude value from within the range applicable to the subject cell and doing the same for a longitude value;

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Figure 2: 15' GARS Gird Cells



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if the location identified by this technique is over land, a new random location will be generated.

Carcasses and dummies will be deployed on a ratio of 4:1 in the nearshore areas and 3:1 in the offshore areas. One dummy will be released within each 15' x 15' cell in which a carcass is released over the course of the study.

Carcasses and dummies will be individually placed on the water from a hovering helicopter at the designated release points.

However, during the second and third release events, several carcasses will be released within a 15' grid cell located between 30 and 40 miles offshore, such as near the source of the Deepwater Horizon oil spill. During each release event, half of the offshore releases will be conducted by boat while the other half will be conducted by helicopter. Dummies will also be released offshore, one for every three carcasses. The helicopter and boat release locations will be randomly intermixed within the offshore study zone.

If the overall carcass drift study will use a combination of wild-caught and farm-raised bird carcasses, then the carcasses released nearshore and offshore will consist of a balanced mix of wild-caught and farm-raised bird carcasses.

The tentative schedule¹ for carcass/dummy releases are as follows:

Release #	Proposed dates	
1	July 15, 16, 17	40 carcasses and 10 dummies from helicopter nearshore
2	July 20,21	40 carcasses and 10 dummies from helicopter nearshore 12 carcasses and 4 dummies from helicopter between 30 and 40 miles from shore 12 carcasses and 4 dummies from a boat between 30 and 40 miles from shore.
3	July 25, 26	40 carcasses and 10 dummies from helicopter nearshore 12 carcasses and 4 dummies from helicopter between 30 and 40 miles from shore 12 carcasses and 4 dummies from a boat between 30 and 40 miles from shore.
4	July 29,30	40 carcasses and 10 dummies from helicopter nearshore
5	August 3,4	40 carcasses and 10 dummies from helicopter nearshore

5.6 Radio Telemetry Tracking

Tracking will be carried out from fixed-wing aircraft, boats, and on foot as appropriate. Two dedicated aircraft and three boat/ground-based tracking crews will be deployed. Tracking of the nearshore releases will be done by a Partenavia and a Cessna. Aircraft will fly the shoreline of the study area on a daily basis in order to determine which carcasses and dummies have beached and which are still at sea. Transmitters on the beach or nearshore will be located as precisely as possible via aerial tracking,

¹ This is the planned deployment schedule as of July 8, 2011. The study had originally planned to conduct the first deployment on July 8, with carcass preparations occurring on July 7. However, administrative difficulties required that the first deployment date was postponed—a decision made on July 7.

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probably within 10m or less. This position information will be relayed to the ground/boat teams. Carcasses still at sea will be located by the aerial teams by determining the position along the shoreline where the signal is strongest and using the combination of position and signal strength to approximate the current position of the transmitter offshore. Tracking of the offshore releases will be done by an Aspen Partenavia. The offshore releases will be tracked less closely-- probably within a couple hundred meters rather than 10 or 20m.

Data on transmitter position and carcass condition will be relayed by the aerial and boat/ground crews to RG Ford Consulting (RGFC)² on a daily basis or as frequently as possible given field crews' daily work load and the availability of necessary technology. In order to maximize the efficiency of search teams, RGFC will then utilize the predictive capabilities of the NOAA HAZMAT GNOME trajectory model to forecast the position of all transmitter units one and two days in the future. Note that, under this cooperative study effort, the GNOME model is being used solely for its extensive forecasting capabilities and is not being used to hindcast the DWH spill. The goal is to narrow the search area of the aerial radio trackers. Daily forecasts will be transmitted to search and tracking teams. (See Section 6.0 for additional details on data sharing among all Trustee parties and BP).

Aerial trackers will obtain data to make daily determinations regarding which transmitters are beached and can potentially be located by boat/ground crews. Each day, air and boat/ground teams will relay the position of carcasses/dummies that they have located that day to RGFC. There will be no attempt at this point to determine the actual or implied fate of any carcass; data collection will focus on the location and status of each carcass. Whenever possible, boat/ground crews will attempt to make visual contact with the carcass or dummy in order to verify and record its disposition and condition on a daily basis. However, priority will be given each day to checking on newly stranded carcasses. The field schedule and area of operations for the boat/ground crews will be adaptively managed to obtain the most data in the most cost-effective manner. Beached carcasses and dummies will be photographed to document the disposition and condition.

Stranded carcasses will be left on beaches to determine the likelihood of rewash. To distinguish rewash from removal by scavengers, a small wooden block will be placed under the carcass following the procedures presented in the Carcass Persistence Study – Bird Study #1C. If boat/ground crews are able to check on stranded carcasses with sufficient frequency, stranded carcasses subsequently relocated on the water will be scored as “floating after being rewashed,” and tracking will continue until the carcass disappears or the tracking for that cohort is ended. Stranded carcasses that disappear but leave a locatable block behind in the previous check day's position will be scored “removed by scavengers.”

At the end of the study (approximately two weeks after the final release event), any retrievable transmitters and their associated barges will be collected from the field. At the end of the study, all serviceable transmitters paid for by BP will be returned to BP or their representative. After field studies are completed, all remaining carcasses will be recovered by the Trustee representative on the field team, pursuant to the Avian Carcass Collection Protocol (Appendix C), and retained as official evidence unless and until written approval is given for their disposal in accordance with the retention requirements of Pretrial Orders #1, #30, #35, and any other applicable Court Orders governing tangle

² The daily data transfers among the field teams and RGFC can be shared with BP and other Trustee Representatives, if requested. At a minimum, the daily assignments for boat/ground teams will be provided to BP as soon as such plans are established so that BP can meet its logistic responsibilities with boats and personnel.

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items that are or may be issued in MDL No. 2179 IN RE: Oil Spill by the Oil Rig “DEEPWATER HORIZON” (E.D. LA 2010).

5.7 Wildlife Handling and Land Access Permits

All necessary permits or permissions for handling carcasses (e.g., Scientific Collecting Permit) and accessing public or private lands will be obtained from the appropriate federal, state, or other entities. Field staff will carry these permits with them at all times during the study. All aerial operations will abide by airspace policies and regulations applicable to the sites being overflown.

5.8 General Trustee-BP Logistical Coordination of Field Work

Scheduling Field Efforts – A good faith effort will be made to conduct all study elements and field effort that fall within the BP safety policy³ using cooperative, integrated teams of state and federal Trustee representatives and BP representatives. When field activities fall outside of BP’s safety policy, field teams will be integrated to the extent possible without interfering with the ability to complete the field work. State and federal Trustee and BP representatives will meet at least once per week to discuss the general field plan for the following week. The representatives will discuss the general plan and logistics (e.g., number of active field teams, their location, equipment needs, etc.), providing all representatives at least three days advance notice of notable changes in field team resources or resource needs. If a party’s representative is not present for such a discussion, that party will be notified by quickest and most effective means available as soon as such scheduling decisions are established. These meetings are in addition to the daily coordination that Trustee and BP representatives will conduct at the end of each field day to discuss the exact logistical details of the field work to be implemented the following day (e.g., which transects/grids are targeted for the day, morning meeting location, etc.) Each Field Crew Leader is responsible for establishing a daily and weekly schedule for his/her team based on the objectives and directions provided to them daily via RGFC. If a party’s representative is not present for the daily coordination discussion, that party will be notified by quickest and most effective means available as soon as such scheduling decisions are established.

Boat Capacity – BP will be responsible for procuring all boats. A good faith effort will be made to obtain boats for each outing large enough to accommodate all members of a field crew (both Trustee and BP), unless a larger boat would prevent effective implementation of the survey due to difficulties approaching the shoreline in shallow water or other reasons. Under circumstances where larger boats cannot be utilized, additional shallow draft boats may be obtained; however, every effort will be made to accommodate integrated teams (of Trustee and BP representative observers) in the same boat.

Safety – Field teams will comply with existing training and safety protocols as applicable to operations. Prior to commencement of field activities, BP and the Trustees will agree upon a person or persons to whom study participants may report any safety concerns. Such person(s) will take prompt action to address and resolve reported concerns.

Carcass Management - Carcasses encountered during field efforts that are not study carcasses will be processed according to the current oil spill carcass collection protocol as it may be amended (e.g., Avian Carcass Collection Protocol, Standard Operating Procedures for NRDA Bird Plan Study Field Crews, January 13, 2011).

³ Low level aerial surveys and all types of night operations in the field generally fall outside the BP safety policy.

6.0 DATA RECORDING AND HANDLING

Field Data Recording – Blank data sheets and directions for completing them are provided in Appendix A. These data sheets will be completed daily by each field team, and all field team members will sign the data sheet at the end of the day to certify the accuracy of the data recorded. Should discrepancies arise in the field, they should be noted and initialed by each observer prior to signature.

When photos of beached carcasses/dummies are taken, a white board (or equivalent) with the unique identification number of the carcass/dummy and the current date written on it will also be pictured in the photo.

GPS track logs will be generated and saved for all aerial surveys and any boat/ground crew efforts in which searches for carcass and dummy transmitters are conducted. Teams need not keep track logs if they are going to check carcasses/dummies that are at a specific, known location.

The Trustee representative on each field team will retain custody of all completed data sheets until they are transferred to the U.S. Fish and Wildlife Service's NRDA Office in Fairhope, Alabama, at the end of the study for archiving (and data entry into the ERDC database). The field team's camera memory card will remain in the custody of the Trustee representative on each field team until the completion of the study and will be archived at the NRDA Office in Fairhope.

Field Data Transfer - Prior to concluding each field day, integrated teams will share all data sheets, track logs, and official photographs with each other. BP/CardnoENTRIX representatives, and Louisiana representatives if present, may photograph or scan data sheets on a daily basis if desired. Field team members may also share electronic copies of all photographs taken on a daily basis, if desired and practical. On field efforts where LA or BP representatives are present, those field representatives will be responsible for transmitting the day's data to their appropriate headquarters.

In the event that the data is collected without a BP representative present, those data (data sheets, track logs, photos, any and all data collected as part of the field effort) will be e-mailed to a designated BP representative within 3 days of its being collected. In the event that transfer of such data is delayed due to equipment malfunction or other reasons, it will be emailed to a designated BP representative as soon as practicable.

In the event that the data is collected in Louisiana without a Louisiana representative present, those data (data sheets, track logs, photos, any and all data collected as part of the field effort) will be e-mailed, within 3 days of its being collected, to the Louisiana Oil Spill Coordinator's Office on behalf of Louisiana. In the event that transfer of such data is delayed due to equipment malfunction or other reasons, it will be emailed to the Louisiana Oil Spill Coordinator's Office as soon as practicable.

Final Disposition of Original Data and Datasheets - All data (including electronically archived data), and original data sheets or electronic files, must be transferred to the U.S. Fish and Wildlife Service's Fairhope, Alabama, NRDA Office following Chain-of-Custody procedures, with copies to the Louisiana Oil Spill Coordinator's Office on behalf of Louisiana for data collected in that state, and to BP (or CardnoENTRIX on behalf of BP) on a weekly basis. Camera memory cards will be submitted to the U.S. Fish and Wildlife Service's Fairhope, Alabama, NRDA Office under Chain-of-Custody after a card is full or after the study is completed pursuant to a protocol for transferring and uploading digital

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photos. Prior to transfer, BP or its representative will receive copies of all camera memory cards, unless it is more practical for the FWS Fairhope Office to generate the copy.

Laboratory Results - No collection of biological or other environmental samples, nor chemical analysis of any samples, is currently included in this Study Plan. In the event that samples are collected during the implementation of this study, and the Trustees and BP agree that such samples should be cooperatively submitted to a laboratory for analysis, each laboratory shall simultaneously deliver raw data, including all necessary metadata, generated as part of this work plan as a Laboratory Analytical Data Package (LADP) to the trustee Data Management Team (DMT), the Louisiana Oil Spill Coordinator's Office (LOSCO) on behalf of the State of Louisiana and to BP (or CardnoENTRIX on behalf of BP). The electronic data deliverable (EDD) spreadsheet with pre-validated analytical results, which is a component of the complete LADP, will also be delivered to the secure FTP drop box maintained by the Trustees' Data Management Team (DMT). Any preliminary data distributed to the DMT shall also be distributed to LOSCO and to BP (or CardnoENTRIX on behalf of BP). Thereafter, the DMT will validate and perform quality assurance/quality control (QA/QC) procedures on the LADP consistent with the authorized Analytical Quality Assurance Plan, after which time the validated/QA/QC'd data shall be made available simultaneously to all trustees and BP (or CardnoENTRIX on behalf of BP). Any questions raised on the validated/QA/QC results shall be handled per the procedures in the Analytical Quality Assurance Plan and the issue and results shall be distributed to all parties. In the interest of maintaining one consistent data set for use by all parties, only the validated/QA/QC'd data set released by the DMT shall be considered the consensus data set. In order to assure reliability of the consensus data and full review by the parties, no party shall publish consensus data until 7 days after such data has been made available to the parties. Also, the LADP shall not be released by the DMT, LOSCO, BP or CardnoENTRIX prior to validation/QA/QC absent a showing of critical operational need. Should any party show a critical operational need for data prior to validation/QA/QC, any released data will be clearly marked "preliminary/unvalidated" and will be made available equally to all Trustees and to BP (or CardnoENTRIX on behalf of BP).

7.0 BUDGET

The Parties acknowledge that this budget is an estimate, and that actual costs may be higher. BP's commitment to fund the costs of this study includes any additional reasonable costs within the scope of this approved study that may arise. The Trustees will make a good faith effort to notify BP in advance of any such increased costs. BP will directly procure all boat rentals, and therefore, boat-related costs are not included in the budget below.

The study proposes to deploy a total of 314 radiotransmitted items. However, only 300 transmitters were purchased. Thus, 14 transmitters used earlier in the study will be reused in the later part of the study. Only transmitters will be reused, not carcasses.

Durable Equipment - All durable equipment (such as cameras, GPS, etc.) purchased by BP for this study will be returned to BP or their designated representatives at the conclusion of their use for this study, unless otherwise agreed.

Some equipment needed for this study may be in BP's existing inventory. BP-owned equipment will be used if available and when appropriate to the needs of the proposed work.

	Unit Cost	Units	Unit Used:	Cost
R.G. Ford Consulting				
Manufacturing and Deployment				
<i>Direct Personnel:</i>				
Prep and Drop Crew: PI/Sr. Scientist	\$ 1,200.00	30	Day	\$ 36,000.00
Prep and Drop Crew: Biologist	\$ 875.00	30	Day	\$ 26,250.00
<i>Other Direct Costs:</i>				
Floats	\$ 204.00	300	Each	\$ 61,200.00
Dummies	\$ 90.00	75	Each	\$ 6,750.00
Carcasses	\$ 15.00	225	Each	\$ 3,375.00
Misc Supplies	\$ 1,000.00		Total	\$ 1,000.00
Rent on Processing Space	\$ 1,000.00	2	Month	\$ 2,000.00
Helicopter and Pilot	\$ 40,320.00	5	Release	\$ 201,600.00
Travel Cost	\$ 2,500.00	10	Trip	\$ 25,000.00
Tracking and Observation				
<i>Direct Personnel:</i>				
Field Staff (2)	\$ 508.80	90	Day	\$ 45,792.00
<i>Other Direct Costs:</i>				
Aircraft and Pilot (Partenavia)			Total	\$ 117,875.00
Travel Cost, Field Staff	\$ 1,400.00	2	Trip	\$ 2,800.00
Lodging and Per Diem, Field Staff	\$ 200.00	90	Day	\$ 18,000.00
Subcontract: BRI (see detail below)			Total	\$ 396,010.00
<i>Overhead on Direct Costs</i>				\$ 82,725.39
Coordination and Archiving				
<i>Direct Personnel:</i>				
Direction and Coordination:PI	\$ 1,200.00	10	Day	\$ 12,000.00
Coordination and Archiving: Staff	\$ 600.00	36	Day	\$ 21,600.00
TOTAL STUDY				\$ 1,059,977.39

Subcontract: BRI					
Time					
Project supervisor (hours)	\$ 105.00	100	Hour	\$	10,500.00
Field supervisor (hours)	\$ 75.00	440	Hour	\$	33,000.00
Field Assistant (hours)	\$ 60.00	360	Hour	\$	21,600.00
Field Assistant (hours)	\$ 60.00	360	Hour	\$	21,600.00
Field Assistant (hours)	\$ 60.00	360	Hour	\$	21,600.00
Field Assistant (hours)	\$ 60.00	360	Hour	\$	21,600.00
Field Assistant (hours)	\$ 60.00	360	Hour	\$	21,600.00
Travel					
Airline tickets	\$ 1,200.00	12	Each	\$	14,400.00
Car rental (4 trucks)	\$ 1,000.00	24	Each	\$	24,000.00
Gas (estimated 24,000 miles @ \$0.25)	\$ 0.25	24,000	Miles	\$	6,000.00
Aerial surveys (hour)	\$ 500.00	210	Hour	\$	105,000.00
Aviation gas (14 gallons/hr)	\$ 6.50	2940	Gallon	\$	19,110.00
Housing and per diem					
Hotel Director (nights)	\$ 150.00	2	Day	\$	300.00
Hotel project supervisor (nights)	\$ 150.00	20	Day	\$	3,000.00
Hotel Pilot (nights)	\$ 150.00	45	Day	\$	6,750.00
Hotel 6 field assistants (nights)	\$ 150.00	252	Day	\$	37,800.00
Per diem (all staff, days)	\$ 50.00	319	Day	\$	15,950.00
Equipment Rental					
Receivers	\$ 1,000.00	4	Each	\$	4,000.00
Antenna	\$ 200.00	4	Each	\$	800.00
Plane mount antenna	\$ 1,000.00	2	Each	\$	2,000.00
Headset	\$ 200.00	2	Total	\$	400.00
Misc				\$	5,000.00
SUBTOTAL BRI:				\$	396,010.00

8.0 REFERENCES

- Ford, R.G., M.L. Bonnell, D.H. Varoujean, G.W. Page, H.R. Carter, B.E. Sharp, D. Heinemann, and J.L. Casey. 1996. Total direct mortality of seabirds from the Exxon Valdez oil spill. Proceedings of the Exxon Valdez Oil Spill Symposium. pp. 684-711. American Fisheries Society Symposium. Vol. 18.
- Ford, R.G., D.H. Varoujean, D.R. Warrick, W.A. Williams, D.B. Lewis, C.L. Hewitt, and J.L. Casey. Seabird Mortality Resulting from The Nestucca Oil Spill Incident Winter 1988-89. Prepared for Washington Department of Wildlife. June 1991.
- Wiese, F.K. 2003. Sinking rates of dead birds: improving estimates of seabird mortality due to oiling. *Mar. Ornith.* 31: 65-70.

Final – 12 July 2011*

**WORK PLAN: USING RADIO TELEMETRY TO DETERMINE THE FATES OF BIRD
CARCASSES DRIFTING IN THE NORTHERN GULF OF MEXICO**

(Bird Study #1D)

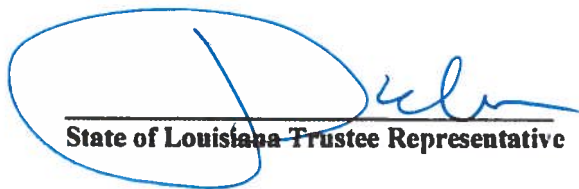
***** Approval of this work plan is for the purpose of obtaining data for the Natural Resources Damage Assessment. Each Party signing below hereby reserves its right to produce its own independent interpretation and analysis of any data collected pursuant to this work plan. *****


This plan will be implemented consistent with existing trustee regulations and policies. All applicable state and federal permits must be obtained prior to conducting work.

APPROVAL


Department of Interior Trustee Representative


Date


State of Louisiana Trustee Representative


Date


BP Representative


Date

* *New signature page is only to correct title on old signature page (pg. 15).
No changes made to plan.*

Final – 12 July, 2011

APPENDIX A: DATASHEETS

¹ Position of carcass/dummy on beach. PICK ONE: "LOW" (for the wash zone, below wrack line), "WRACK" (for at the most recent wrack or high tide line), "GRASS" (for items that penetrated marsh vegetation).

² PICK ONE: "SB" (sandy beach), "EM" (emergent marsh), "MSF" (mud/sand flat), "SSM" (scrub/shrub/mangrove), "RR" (rip-rap), or "OW" (open water).

³ PICK ONE: "Int." (intact, equivalent to No scavenging), "Dist." (disturbed, skin broken, mostly intact), "PR" (Pectorals removed but organs present), "OR" (Organs removed but pectorals present), "SB" (Skin and bones only; pectorals and organs removed), "PG" (Fragmentary, pelvic girdle only remaining), "Wing" (Fragmentary; one or both wings only remaining), "Skin" (feathers attached to skin fragments remaining), "Miss." (missing, no part of carcass remains; equivalent to Removed).

⁴ PICK ONE: "PL" (New block placed that day), "Yes" (block present in previous location), "Moved" (present but not found in previous location), "No" (missing).

Database Form ID: _____ Date Entered: _____

Database entry by (print and sign): _____

Directions for Filling Out “Drifter Sightings Datasheet”

General Instructions:

- Fill out the data form with ink, not pencil.
- To correct any mistakes written on the datasheet, draw a single line through the error and have one Trustee and one BP member of the field team initial it. The correct information can be written adjacent to the struck-out error.
- Fill out all cells in each row used. If a data field does not apply, enter “N/A” or draw a large “X” across the cell.
- Number the datasheets if more than one is used per field team per day. Restart the numbering on each field day or as necessary. For example, if Field Team #3 fills out 2 datasheets on Monday and 3 datasheets on Tuesday, the datasheets from Monday would be numbered “1 of 2” and “2 of 2,” while the Tuesday datasheets would be numbered “1 of 3,” “2 of 3,” and “3 of 3.”
- All observers will sign the datasheet at the end of the field day, indicating agreement in the content of the data. If more than one datasheet is used per field event, each page of the datasheet must be signed.
- Once a datasheet has been signed DO NOT add, delete, or alter any data on the datasheet. However, if such changes are unavoidable, the Trustee and BP members of the field team must discuss and agree to the changes before such changes are made. Changes must be initialed by at least one Trustee and BP field team member.
- Leave blank the “Database form ID” information in the footer of the datasheet.

Specific Instructions for Data Fields:

Observer Names / Org – Print the names of all members of the field team, both Trustee and BP personnel, that have a roll in collecting data. Print the name of the agency/organization for which the team member works.

Observer Signatures – Signatures of all team members.

Team ID – Enter the team name that the FWS NRDA Fairhope Office or Carcass Drift Study Leader provides. This is not the field team number that the NOAA Safety Operations center assigns you.

Camera # - Enter the number off the property tag that is on the camera.

Camera memory card # - Enter the number that is written on the memory card.

GPS unit # - Enter the number off the property tag that is on the GPS.

Operating by – Circle the mode of transportation used during the transmitter tracking or carcass/dummy checks. If a ground/boat team uses both a car and a boat to conduct carcass/dummy checks, circle both types of vehicles. Do not circle “car” if the field team only used the car to as transportation to/from the boat or aircraft.

Frequency – Enter the radio frequency of the transmitter assigned to the carcass / dummy.

Carcass/Dummy ID # - Enter the ID # assigned to the carcass/dummy.

Time – Use 24-hr military format. Enter time carcass/dummy was located by the field team.

Latitude / Longitude – Enter the GPS location of the carcass/dummy as it was located by the field team.

Beach position –

This data field is not applicable to transmitter tracking performed from aircraft.

For ground/boat teams - Position of carcass/dummy on beach. ENTER ONE of the following:

- "LOW" (for the wash zone, below wrack line),
- "WRACK" (for at the most recent wrack or high tide line),
- "UPPER" (for above the most recent wrack or high tide line),
- "GRASS" (for items that penetrated emergent marsh vegetation).

Habitat type – Enter the best descriptor for the habitat type in which the carcass/dummy was located by the field team. Choose from:

- "SB" (sandy beach),
- "EM" (emergent marsh),
- "MSF" (mud/sand flat),
- "SSM" (scrub/shrub/mangrove),
- "RR" (rip-rap), or
- "OW" (open water).

Condition code –

This data field is not applicable to transmitter tracking performed from aircraft.

For ground/boat teams – Condition of carcass. ENTER ONE of the following:

- "Int." (intact, equivalent to No scavenging),
- "Dist." (disturbed, skin broken, mostly intact),
- "PR" (Pectorals removed but organs present),
- "OR" (Organs removed but pectorals present),
- "SB" (Skin and bones only; pectorals and organs removed),
- "PG" (Fragmentary; pelvic girdle only remaining),
- "Wing" (Fragmentary; one or both wings only remaining),
- "Skin" (feathers attached to skin fragments remaining),
- "Miss." (missing, no part of carcass remains; equivalent to Removed).

Photo #s – Enter the photo number assigned by the camera.

Block status –

This data field is not applicable to transmitter tracking performed from aircraft.

For ground/boat teams – Only relevant for carcasses that have stranded. Information regarding the wooden block placed with the carcass. ENTER ONE of the following:

- "PL" (New block placed that day.),
- "Yes" (block present in previous location),
- "Moved" (present but not found in previous location),
- "No" (missing).

Comments – Enter any additional relevant or notable information about the carcass, dummy, transmitter barge, the transmitter itself, and environmental conditions.

APPENDIX B

Standard Operating Procedures for Avian Capture, Storage, and Transportation

MISSISSIPPI CANYON 252 OIL SPILL USING RADIO TELEMETRY TO DETERMINE THE FATES OF BIRD CARCASSES DRIFTING IN THE NORTHERN GULF OF MEXICO (BIRD STUDY #1D) STANDARD OPERATING PROCEDURES FOR AVIAN CAPTURE, STORAGE, AND TRANSPORTATION

Study Objectives

The purpose of this study is to investigate the fate of bird carcasses that begin to drift within the northern Gulf of Mexico. Specifically, the study will quantify the length of time carcasses float prior to sinking as well as the proportion of the study carcasses that eventually become beached within the spill zone. The information will be used to reduce uncertainty regarding avian mortality resulting from the Deepwater Horizon/MC 252 oil spill.

The following guidelines were developed for the U. S. Department of Agriculture, Animal and Plant Health Inspection Services, Wildlife Services to provide study specimen to the U.S. Fish and Wildlife Service for the Deepwater Horizon/MC 252 oil spill's Natural Resource Damage Assessment and Restoration Program.

Study Needs

The field study will use a total of 250 bird carcasses. This study requires freshly salvaged bird carcasses collected from pre-existing animal control programs; no wild birds will be killed specifically for this study. Gulls comprised about half of the birds recovered during the spill response and will therefore be the primary species used in this study. Conversely, if opportunities arise to obtain appropriate carcasses of other spill-relevant species (i.e. northern gannets, common loons, pelicans, terns, etc.) they may be used as well. The following table lists species groups that are acceptable for use in this study:

Gulls	Terns
Pelicans	Cormorants
Loons	Gannets
Skimmers	Skuas
Waterfowl	Alcids
Shearwaters	Albatrosses
Grebes	Petrels
Boobies	Jaegers

Carcass Condition

The preferred carcass type and condition for this study are wild-caught, fresh (not frozen) carcasses that were euthanized in a manner that did not compromise the integrity of the body cavity (e.g., not shot). The physical condition of carcasses called for in this study will require organization and timeliness of carcass deliveries to ensure their freshness. This study will not use carcasses that are:

- are diseased
- have been frozen
- have been shot

- have been poisoned
- have a compromised body cavity

Dates and Timing

This field study will use a total of 248 bird carcasses attached with radio transmitters and released in the study area, under a five-deployment scenario. Releases are scheduled to take place on selected dates over approximately 5 weeks (Table 1). Each release week and its associated carcass deployment dates, total amount of fresh bird carcasses needed each week, and the date they must arrive at the US Fish and Wildlife Service's NRDA office in Fairhope, Alabama, are outlined in Table 2. Carcasses may only be used when euthanasia occurred no greater than 5 days prior to deployment.

Table 2. Carcass deployment schedule⁸

Release #	Deployment Dates	Total Carcasses Needed Per Release Week	Arrival Date in Fairhope
1	July 15, 16, 17	40	July 13
2	July 20,21	64	July 19
3	July 25, 26	64	July 23
4	July 29,30	40	July 28
5	August 3,4	40	August 2

Capture methods

No wild birds will be killed specifically for this study. Only birds collected from pre-existing animal control programs will be used. Birds will be captured live using various types of trapping techniques such as manually or mechanically propelled nets or baited live traps.

Euthanasia

Birds will be euthanized following methods set forth by the American Veterinary Medical Association's (AVMA) "Guidelines on Euthanasia" June 2007. The most common method used will be immersion in a CO₂ chamber, although cervical dislocation may also occasionally be performed. In no case will the euthanasia method compromise the body cavity of the bird. Carcasses should be cooled but not frozen within 12 hours of sacrifice.

Collector: Carcass Documentation, Storage, and Shipping

Individuals collecting, euthanizing and storing carcasses will document conditions for each carcass/batch of carcasses. The collector will identify method of sacrifice, time of sacrifice, method of cooling, time cooling was initiated, time of shipping, and carcass condition at time of shipping on the Study Carcass Collection Form (Attachment 1).

- a) Assign each carcass an identification number. Use the 2 letter state abbreviation that each bird is collected in, accompanied by a sequential three-digit numbering for each bird carcass (e.g. PA001, PA002). Numbering of each carcass should continue where the previous collection day's numbering ended. Be sure to maintain a copy of all Study Carcass Collection Forms from each collection day to be sure identification numbers are not duplicated.

⁸ This is the planned deployment schedule as of July 8, 2011. The study had originally planned to conduct the first deployment on July 8, with carcass preparations occurring on July 7. However, administrative difficulties required that the first deployment date was postponed—a decision made on July 7, after study carcasses had been collected and shipped to the Fairhope NRDA Office.

- b) Place each carcass in a clear or white plastic bag (large sealable “Ziploc” type bag may work best).
- c) Record the carcass’ identification number and the species Alpha code on a piece of paper, written in pencil, and place this in the bag with the carcass. Additionally, write this same information on the outside of the plastic bag using a permanent marker (i.e. Sharpie). A list of the USGS species Alpha codes can be found at <http://www.pwrc.usgs.gov/bbl/manual/sname.htm>
- d) Complete the Study Carcass Collection Form (Attachment 1).
- e) Place each bird carcass in a cooler with frozen gel ice-packs following at least a one-to-one weight ratio (ice:carcasses). If there is room in the cooler, additional ice-packs can be placed on top of the cooler contents
 - a) If birds are dispatched in the field where they are captured, they must immediately be placed in coolers along with frozen gel ice-packs (remember to freeze gel ice-packs before conducting field collections).
- f) Carcasses must remain as cool as possible without freezing. When practicable, remove carcasses from coolers and place them in a refrigerator until they are shipped.
- g) When preparing carcasses to be shipped, be sure gel ice-packs are frozen, pack coolers following at least a one-to-one weight ratio, include a thermometer in the cooler, and seal coolers with duck tape. Complete the “Shipping Portion” of the Study Carcass Storage and Shipping Form (Attachment 2).
- h) Ship coolers and their associated data sheets using the fastest shipping service possible to:

US FWS NRDA Office
24190 US HWY 98, Suite E
Fairhope, AL 36532

- i) Immediately after the coolers have been sent, provide the Fairhope USFWS NRDA office with a copy of the shipping receipt and a tracking number by either:
 - a) Fax: 251-929-3440
 - b) Email: FW4NRDABeachBirds@fws.gov

Receiver: Carcass Documentation and Storage

Upon receipt of carcass shipments in Fairhope, complete the “Receiving Portion” of the Study Carcass Storage and Shipping Form (Attachment 2).

Data Sharing

Completed original datasheets should be archived at the FWS Fairhope NRDA Office. Copies will be provided to BP and other Trustee agencies pursuant to the provisions in the Carcass Drift Study Plan.

Attachment 1

Carcass Drift Study - Study Carcass Collection Form

Collection Location (decimal degrees, WGS84):

Latitude

Longitude

[illegible]

[illegible]

APPENDIX C: AVIAN CARCASS COLLECTION PROTOCOL

NOTE: The procedures described herein are designed to use the dead birds encountered during the course of any NRDA study. However, all study carcasses remaining at the end of the Carcass Drift study, regardless of the condition of the carcass, will be collected following the procedures of this Standard Operating Procedure.

Final – 12 July, 2011

AVIAN CARCASS COLLECTION PROTOCOL
Standard Operating Procedures for NRDA Bird Plan Study Field Crews
January 13, 2011

The purpose of this protocol is to describe when and how to collect bird carcasses, as part of US Fish and Wildlife Service NRDA field studies being conducted to assess potential injury to birds during the MS Canyon 252 Deepwater Horizon Oil Spill. This protocol is periodically updated, according to current NRDA needs and injury conditions.

BEACHED BIRD SEARCH TEAMS (or members of NRDA Bird Study Surveys assigned this task):

- Teams will consist of at least two members. At least one member of the team should have previous carcass search and collection experience or have completed standardized training based on this protocol.
- Each collection team will be issued a carcass collection kit. Each kit should contain a carcass collection form.
- Begin each collection by filling out the top portion of the form for each location; carcass specific information is entered in the lower portion under the "DEAD BIRDS COLLECTED" heading.

WHEN TO COLLECT CARCASSES

The attached "Carcass Collection at a Glance" table illustrates final disposition of the carcass, based on characteristics of the carcass. The table also defines when a carcass should be collected or left in place.

If the carcass is banded, tagged or transmitterd it could be a NRDA study bird. These carcasses will be collected regardless of their status. Record how bird is marked (band, tag or transmitter) and all associated numbers on its unique blue Evidence Identification Tag (see below).

If the carcass is of a species listed on the federal Endangered Species List, treat the carcass as if it were banded, tagged, or transmitterd.

Carcass Collection Protocol

- Wear nitrile gloves when handling bird carcasses. A new pair of gloves should be donned prior to handling each bird.
- If one or more bird carcasses are found and collected at any one location, assign a **white Evidence Seizure Tag** (Form 3-487) for that location. Each Seizure Tag is imprinted with a unique number. Fill out the entire datasheet **except for the INV number block** (the Evidence Custodian will fill this in at the Intake Center). Do not leave anything blank other than the INV.
- Complete a **blue Evidence Identification Tag** (Form 3-2052) for each carcass that is collected. One blue Identification Tag is used to identify each individual carcass and should be filled in to include: the white Seizure Tag Number – collection number; date; and initials of the collector. Collectors

should **not fill in the file no.** on the Identification tag (the Evidence Custodian will fill this at Intake Center).

NOTE: If more than one carcass is collected from a single location, then multiple blue Identification Tags will be recorded on the single white Seizure Tag assigned to that location. However, do not exceed 10 carcasses per seizure tag; use additional tags if necessary. If only a single carcass is collected, its blue Evidence Tag will be the only one recorded on the white Seizure Tag for that location.

- Photograph the carcass with the completed blue Identification Tag visible next to the carcass.
- Fill in the carcass information on the carcass collection form including: species identification (if known), lat/long of carcass collection location (decimal degrees, WGS 84), ID# (blue Evidence Identification Tag item number (assigned sequential number, i.e., 001, 002...010); field photograph number; and amount/description of oiling. Determinations on carcass condition, scavenging, and emaciation should be made by experienced personnel as time allows.
- Carcass handling procedure -**It is important that oiled carcasses do not touch plastic bags.** For simplicity, follow this same handling process with fresh, Not Visibly Oiled (NVO) carcasses, as well:
 1. First place the carcass in a paper bag, then place the paper-bagged-carcass in a plastic bag.
 2. Do NOT place used gloves in the bag with the carcass.
 3. Securely attach the completed blue Evidence Identification Tag to the outside of the plastic bag.
- Record the GPS location for each carcass on the "Bird Search Effort and Birds Collected Form."
- Complete the white Seizure Tag with information from all of the blue Identification Tags associated with this location. One member of the collection team should become responsible for this and their name should appear on the Seizure Tag.
- After the carcass(es) has been appropriately bagged and tagged, the accompanying white Seizure Tag should be filled in to include: the date and time; number of carcasses collected; all blue Identification Tag numbers associated this same location; and the name of the person collecting the carcasses.

ADDITIONAL NOTES:

- If you collect multiple carcasses from one location which have different dispositions (some to LE and some to NRDA), fill out a separate datasheet and white Seizure Tag to represent all carcasses for each different disposition. In other words, all oiled carcasses should be recorded on one data sheet and Seizure tag which goes to LE, and all NVO on another data sheet and Seizure tag which goes to Fairhope NRDA. Remember not to exceed 10 carcasses per Seizure Tag.
- For all oiled carcasses collected, make a copy of the completed datasheets. Leave the ORIGINAL with the carcass at the Intake Center. Provide the copy to the Fairhope NRDA field office.



**MS Canyon 252 Deepwater Horizon Oil Spill
USFWS OFFICE OF LAW ENFORCEMENT
Designated OILED CARCASS Intake Centers**

Fresh (intestines intact) oiled carcasses only
are to be sent to Law Enforcement at the locations below
(Wildlife rehab center contact info is listed for your information).

FWS LE Liaison Wildlife Rehab Center Coordinators	Officer Wesley Verrill Jr. Resee Collins Carmen Simonton	(573) 999-1694 (404) 314-6526 (404) 576-3874	wesley_verrill@fws.gov resee_collins@fws.gov carmen_simonton@fws.gov v
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ALABAMA

Environmental Studies Center 6101 Girby Road Mobile, Alabama	Susan Clemens	(251) 221-5000	LIVE OILED BIRDS ONLY No Carcasses
Alabama Office of Law Enforcement	Special Agent Donnie Grace	(251) 202-1556	donnie_grace@fws.gov

FLORIDA

Wildlife Sanctuary of NW Florida 105 North "S" Street Pensacola, Florida	Dorothy Kaufmann	(850) 433- 9453	LIVE OILED BIRDS ONLY No Carcasses
Florida Office of Law Enforcement	Special Agent Downie Wolfe	(904) 545- 2612	downie_wolfe@fws.gov

LOUISIANA

Wildlife Rehab Center 200 Lear Drive Hammond, Louisiana	Erica Miller Heather Neville	(985) 345- 8261	LIVE OILED BIRDS ONLY No Carcasses
Louisiana Office of Law Enforcement	Special Agent Phillip Siragusa	(337) 288- 2810	phillip_siragusa@fws.gov

MISSISSIPPI

Humane Society of South MS 2615 25 th Avenue Gulfport, Mississippi	Casey Sartin	18-5133	LIVE OILED BIRDS ONLY No Carcasses
Mississippi Office of Law Enforcement	Special Agent Ben Bryant	14-7115	ryant@fws.gov

NOT VISIBLY OILED Carcasses

FWS NRDA Field Office Contact Bird Planner or Bird Lead to arrange for disposition in New Orleans	Bird Lead	(251) 442- 7416	<u>FW4 NRDA Bird@fws.gov</u> And/or Bird Planner email
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NRDA Carcass Collection AT A GLANCE

The Condition ¹ of the Carcass is:	And Oiling ² Status is:	And the bird is "Marked" or Listed? ³	Should you Collect?	Disposition and/or Action Guideline
Fresh (Intestines Intact)	Oiled	Yes	Yes	Disposition per LE Designated Intake Centers; make a copy of data sheet (original stays w/bird, copy to NRDA Bird Lead); notify NRDA Bird Lead in Fairhope.
		No	Yes	
	Not Visibly Oiled	Either Yes or No	Yes	Cold storage for retention by NRDA, <u>contact NRDA Bird Lead to arrange</u> for cold storage at 3401 Alvar St., New Orleans, 70126 (504-895-4826).
Recent	Oiled or Not Visibly Oiled	Either Yes or No	Yes	
Old	Oiled or Not Visibly Oiled	Yes	Yes	
		No	No	Leave in place. Mark with zip-tie to indicate carcass has been observed.

¹ A "Fresh" bird has intestines intact. "Recent" is defined as any largely-intact bird with feathers, including flat, dry carcasses (e.g., one wing attached to body, carcass without head, etc). "Old" is defined as a carcass consisting only of bones and/or isolated portions of a bird (e.g., head only, etc).

² "Oiling" means oil is present and visible to the naked eye, including light or trace oil.

³ "Marked" is defined as having a bird band, tag or telemetry equipment associated with the remains. Record bird band, tag, and/or satellite transmitter information. Bands and tags stay on bird; transmitters go to NRDA Bird Lead. "Listed" means it is a species that is protected as Threatened or Endangered under the ESA.

Table updated: January 13, 2011

The following informational figures and lists are reproduced here from the original Carcass Collection Protocol (NRDA Bird Study #1) (Nov 14, 2010):

Evidence Seizure Tag:

EVIDENCE SEIZURE TAG

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

DATE/TIME OF SEIZURE: 5/29/2010 1300
FILE NO: 899766

☐ TAKEN FROM: ☐ RECEIVED FROM: PERSON AND/OR LOCATION: Gulfport, MS

30.235343
86.432243
WGS 84

DESCRIPTION OF EVIDENCE:
001) Northern Gannet - Oiled
002) Unknown bird
003) Laughing gull

SPECIAL AGENT INSPECTOR: Collector's name
BADGE NO:

FOR SEIZURE BY: GULFPORT, MS

SEIZED PROPERTY RECEIPT

DATE/TIME OF SEIZURE: 5/29/2010 1300
SEIZURE TAG NO: 899766

DESCRIPTION: Leave blank and attached

SPECIAL AGENT INSPECTOR: Collector's name
BADGE NO:

Second person in the chain of custody or Evidence Custodian

Leave the INV block blank; Evidence Custodians will fill in the INV number

No more than 10 Evidence Identification Tags on 1 Evidence Seizure Tag

Leave blank unless LE

COUNTY OR OUTPOST: United States transferred from custody of officer based on reverse side of this tag for:

DATE	COUNTY OR OUTPOST	INITIALS
5/29/10	Second person	SP
5/31/10	Third person	TP

RECEIVED BY: SPECIAL AGENT INSPECTOR: (Name) (Signature)
I hereby acknowledge that the evidence listed on the reverse side of this tag has been received by me for use in a wildlife law enforcement case under review by the indicated officer.

RECEIVED BY SIGNATURE: DATE:

FORWARDED BY: (Name) (Signature)
I hereby acknowledge that the evidence listed on the reverse side of this tag has been received by me for use in a wildlife law enforcement case under review by the indicated officer.

FORWARDED BY SIGNATURE: DATE:

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

BLUE EVIDENCE TAG:

Seizure Tag No. This number can be reused for multiple Evidence Identification Tags collected at the same site.

ID# of individual bird from the Bird Search Effort and Birds Collected Data Form

EVIDENCE IDENTIFICATION TAG

SEIZURE TAG NO.	ITEM NO.	DATE
902641-001		5/29/2010
REA NO.	DIVIDED BY (INITIALS)	
	MKH	

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDERNESS SERVICE
JUNE 23 04/02/10-802 (41)

FORM 3-3652

Date collected

Leave blank

Collector's initials

Carcass collection kit (USFWS):

Incident-specific maps or shoreline segment maps, if available
Evidence Seizure Tags, Form 3-487 (white)
Evidence Identification Tags, Form 3-2052 (blue)
BIRD SEARCH EFFORT and BIRDS COLLECTED DATA FORMs
Chain-of-Custody Forms
Carcass collection protocol
Large paper bags (for otter carcasses)
Paper bags
Small plastic bags
Large plastic bags
Rubber bands or twist ties
Pencil and / or permanent pen (sharpie)
Evidence tape
Nitrile gloves
Flagging (for marking large marine mammal carcasses)

Carcass collection kit (non-USFWS):

Incident-specific carcass collection instructions
Paper bags
Small plastic bags
Large plastic bags
Rubber bands or twist ties
Pencil and / or permanent pen (sharpie)
BIRD SEARCH EFFORT and BIRDS COLLECTED DATA FORMs
Chain-of-Custody Forms
Tape
Nitrile gloves
Flagging (for marking marine mammal carcass locations)

Please: Only one beach/marsh/mangrove segment per form. Complete form even if no birds are collected.

INV:

EVIDENCE SEIZURE TAG NUMBER:

Circle one: NRDA Wildlife Ops Evidence Custodian

Date: _____

Contact Info:

Segment Name (or State):

Segment Begin¹: Lat:
(or geographic landmark)

GPS WP#

Length of surveyed segment (km)

% of segment surveyed (approximate)

Segment End: Lat:
(or geographic landmark)

GPS WP#

Survey Mode²

Survey: 1 pass or roundtrip (circle one) Wind Speed (mph): Direction:

Start Time (24-hour clock):

End Time:

Disposition³:

DEAD BIRDS COLLECTED (one bird per line, use additional sheets if necessary)

[illegible]

¹ All Lat/Long: Decimal degrees, WGS 84

² Survey Mode: F = Foot, A = Airboat, B = Boat, V = Vehicle, O = Other (specify)

^bDisposition = Intake center where bird was transferred; Buras, LA; Gulfport, MS; Theodore, AL; Pensacola, FL; or Other (please specify)

*Species: Common name, "UNK" for unknown, "NONE" if no birds found

ID#: Consecutive numbers on the data sheet that are transferred to blue evidence tag attached to each bird.

^a Position relative to high tide line: U = Upper (above wrack line) W = Wrack, L = Low (wash zone)

Oiling: NONE = not visibly oiled, Trace = $\leq 5\%$ of body, Light = 6-20% of body, Moderate = 21-40% of body, Heavy = $>40\%$ of body

Scavenging: F = freshly dead whole carcass with little or no scavenging, L = lightly scavenged, H = heavily scavenged, M = mummified or skeletal, X = not evaluated

Age: HY = Hatch Year, JUV = Juvenile, AD = Adult, "UNK" for unknown

Database Form ID:

Database entry by (print and sign):

Date Entered:

Revised 14Jul10