



Detection Probability (Searcher Efficiency) Study

Bird Study #1B

End-of-Study Report

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1.0 INTRODUCTION

This report provides the data obtained from implementation of the Detection Probability (Searcher Efficiency) (Bird Study #1B) Work Plan (Appendix D). The Work Plan was developed and implemented cooperatively with personnel from BP and Cardno ENTRIX as part of the natural resource damage assessment (NRDA).

The purpose of this study was to collect data on carcass detection rates in spill-affected areas that have been systematically and repeatedly searched as part of the Beached Bird Survey (BBS) Study¹ (NRDA Bird Study #1/1A). The BBS Study was designed to collect information to facilitate estimation of the rate of spill-related carcass deposition in surveyed areas, which were primarily walkable sandy beaches. Information on carcass deposition onto marsh edges were collected through other efforts (e.g., activities of the response Wildlife Operations teams).

One of the major factors impacting the number of carcasses documented on a given BBS search is carcass detection rate (also referred to as searcher efficiency), defined as the probability that a searcher will detect a carcass truly on a beach during a standardized search ‘event’ (Byrd and Reynolds 2006a, Byrd et al. 2009). Because carcass detection rates are variable, dependent upon a range of local factors such as the degree of debris on the beach or the texture of the beach substrate (Van Pelt and Piatt 1995, Fowler and Flint 1997, Ford 2006, Byrd et al. 2009), this Searcher Efficiency Study was undertaken to document detection rates on a site-specific basis (i.e., within the spill-affected area) rather than apply search efficiency values from other geographic areas available in the scientific literature.

2.0 STUDY TIMING

The Searcher Efficiency Study (SES) was implemented in late September 2010, prior to cessation of BBS search efforts on or about September 30, 2010. Conducting the SES while BBS efforts were ongoing allowed collection of data using the actual teams conducting BBS surveys, while they were conducting them, thereby maximizing the utility and relevance of study results. Further, this approach provided substantial cost savings - because the search teams were already in place, the only incremental costs for the study were those associated with placement and retrieval of SES carcasses and related reporting.

The SES personnel began to arrive on site in the Daphne, AL area September 19, 2010, and conducted various mobilization tasks through September 22, 2010. The entire SES field crew conducted one study transect all together on September 21 (segment AL-26-02) as training and to test the protocols. Full study implementation and data collection took place from September 23 to September 28, 2010. Study personnel departed the study area at various times, as their assignments and demobilization activities were completed.

3.0 METHODS

Study methods are described in detail in the Work Plan. In summary, unholed carcasses obtained from government agencies, research organizations, and/or other sources were subtly marked and placed in transects to be searched by BBS teams. Carcass species, size, condition, density, and pattern of

¹ Full names of the Beached Bird Survey study work plans are “Work Plan for Estimating Mortality of Birds Using Beached Bird Surveys in the Gulf of Mexico Near the Mississippi Canyon 252 Oil Spill (Bird Study #1) and Work Plan for Estimating Mortality of Birds Using Beached Bird Surveys in Louisiana for the Mississippi Canyon 252 Oil Spill (Bird Study #1A-LA).

placement were designed to generally reflect BBS data from previous months.² Protocols were put in place for BBS teams to place birds on BBS transects and document which of these birds were ‘found’ by BBS teams (and to keep SES birds out of the beached bird evidence stream). ‘Seeded’ transects were searched by BBS teams using standard BBS methods and effort. Although the BBS teams generally knew the Searcher Efficiency Study was being implemented, the SES personnel strived to conduct the study keeping the BBS teams unaware of their efforts for a specific transect on any specific day. The following sections describe changes to the original study design or additional design details not included in the Work Plan that Study personnel discovered were necessary as the study was being implemented.

3.1 TRANSECTS

Carcasses were placed on 40 transects (Table 1). However, SES data were not generated at one transect (AL-23-04) -- due to a miscommunication with respect to BBS team schedules, the carcasses were retrieved by the SES field team before the BBS team had performed their search of the transect. Excluding this one transect mistake, SES data were collected from 39 Beached Bird Survey transects, located in Louisiana (n=18), Mississippi (n=6), Alabama (n=10), and western Florida (n=5). Maps showing the approximate locations of these transects are provided in the Work Plan.

Seven additional transects were identified in the Work Plan for potential inclusion in the study but were not included when it came time for implementation due to accessibility issues and/or incompatibilities in timing the SES with BBS field work. These transects are: AL-03-01; AL-25-04; LA-75-06; LA-82-05; LA-83-02; MS-20-06; and MS-23-01. The decision to exclude these transects came after carcasses had already been prepared for these transects.

² BBS data does not provide information on the number of beached birds left undetected by BBS teams. However, the SES was designed so that bird sizes, color, placement densities and other characteristics were not clearly different than conditions experienced by BBS teams.

TABLE 1: TRANSECTS USED FOR THE CARCASS DETECTION PROBABILITY STUDY

Date of SES data collection	BBS Transect ID	State	Carcass Detection Probability Study Field Personnel*	BBS team name
9/28/2010	AL-06-03	AL	PB	Dauphin Island
9/28/2010	AL-06-05	AL	PB	Dauphin Island
9/28/2010	AL-07-02	AL	PB	Dauphin Island
9/22/2010	AL-08-02	AL	NM, AR	Dauphin Island
9/22/2010	AL-08-04	AL	RB, JC, WS	Foley
9/22/2010	AL-18-01	AL	GF, TH	Dauphin Island
9/22/2010	AL-23-04	AL	RB, JC, WS	Foley
9/23/2010	AL-24-02	AL	RB, JC, WS	Foley
9/23/2010	AL-24-06	AL	RB, JC, WS	Foley
9/21/2010	AL-26-02	AL	RB, JC, WS, NM, AR, TH, JC, GF, VV	Foley
9/26/2010	AL-26-07	AL	PB, WS	Pensacola
9/24/2010	WFL-22-03	FL	GF, TH	Santa Rosa
9/24/2010	WFL-25-01	FL	GF, TH	Santa Rosa
9/23/2010	WFL-26-02	FL	GF, TH	Santa Rosa
9/23/2010	WFL-27-02	FL	GF, TH	Santa Rosa
9/23/2010	WFL-28-02	FL	GF, TH	Santa Rosa
9/27/2010	LA-562-01	LA	NM, AR	Rockefeller
9/27/2010	LA-562-02	LA	NM, AR	Rockefeller
9/27/2010	LA-562-03	LA	NM, AR	Rockefeller
9/26/2010	LA-563-01	LA	NM, AR	Rockefeller
9/25/2010	LA-640-06	LA	VV	Grand Isle
9/25/2010	LA-641-04	LA	VV	Grand Isle
9/24/2010	LA-642-01	LA	VV	Grand Isle
9/24/2010	LA-643-01	LA	VV	Grand Isle
9/26/2010	LA-644-01	LA	VV	Grand Isle
9/26/2010	LA-645-01	LA	VV	Grand Isle
9/25/2010	LA-75-02	LA	GF, TH, TD	Sabine
9/25/2010	LA-75-04	LA	GF, TH, TD	Sabine
9/26/2010	LA-76-02	LA	GF, TH, TD	Sabine
9/26/2010	LA-76-04	LA	GF, TH, TD	Sabine
9/26/2010	LA-76-06	LA	GF, TH, TD	Sabine
9/25/2010	LA-77-03	LA	NM, AR	Rockefeller
9/27/2010	LA-81-01	LA	GF, TH, TD	Sabine
9/27/2010	LA-83-04	LA	GF, TH, TD	Sabine
9/23/2010	MS-08-01	MS	NM, AR	Gulfport
9/23/2010	MS-08-06	MS	NM, AR	Gulfport
9/25/2010	MS-15-01	MS	ML, WS	Gulfport
9/25/2010	MS-17-02	MS	ML, WS	Gulfport
9/24/2010	MS-20-04	MS	JW, WS	Gulfport
9/24/2010	MS-23-09	MS	JW, WS	Gulfport

*SES team member affiliations: Trustees: Veronica Varela (VV), USFWS, and James Weigand (JW), BLM. Trustee Contractors: Rebecka Brasso (RB), Nadia Martin (NM), Julie Campbell (JC), Travis Darden (TD), Glenn Ford (GF) and Philip Bartley (PB). BP/ENTRIX: Aaron Richards (AR), Tray Hart (TH), Wendy Swindell (WS), and Marilee Lovit (ML).

3.2 CARCASS PREPARATION

A total of 153 carcasses were prepared for field use. Details on the bird preparation protocol can be found in the Work Plan. Bird carcasses used for the study were stored in a freezer at the FWS Ecological Services Field Office in Daphne, AL prior to study implementation. Consistent with the Work Plan, birds were sorted into four size classes: small (less than 200g), medium (200g-500g), large (500g-1,000g) and extra large (>1,000g). Study birds were assigned to one of two ‘condition’ categories (‘no/lightly scavenged’ or ‘heavily scavenged’). Birds assigned to the ‘heavily scavenged’ category were prepared to resemble scavenged birds prior to use in this study.³ Generally, the body cavity was opened and the internal organs were removed.

Due to limitations in the carcasses available for study implementation, modest adjustments to the distribution of carcass sizes were necessary (Table 2).

TABLE 2: MODIFICATIONS TO CARCASS SIZE CLASS DISTRIBUTIONS

Carcass size	Intended in Work Plan	Implemented
Small	23 (14.6%)	10 (7.6%)
Small/Medium	1 (0.6%)	0
Medium	96 (60.8%)	91 (69.5%)
Large	3 (1.9%)	0
Extra-large	35 (22.2%)	30 (22.9%)

Each carcass was labeled with a unique identification number using two small tags attached in locations unlikely to affect visibility of the carcasses to BBS teams. One tag was attached to the patagium and one tag was attached to the upper leg. The tags were made of semi-translucent plastic rings obtained from a hardware store, and the bird ID number was written on the rings using permanent black marker. Bird species, condition, intended position relative to surf, and identification number were recorded in a database (see Appendix A for summary information about each bird used in the study). Additionally, a small, laminated card was attached to each carcass identifying it as part of the “Tagged Carcass Study.” The card was designed primarily to inform the BBS teams in order to avoid confusion of SES carcasses with carcasses collected for NRDA evidence. The card read:

TAGGED CARCASS STUDY, DO NOT remove bird, **DO NOT** photograph bird, **DO NOT** create GPS waypoint. Record the following at the bottom of your data sheet (**DO NOT** list this bird in the data table): 1) Bird species, 2) GPS lat/long, 3) Carcass number (tag on wing and leg), 4) Beach position. If questions, please **CALL** [phone number⁴].

Birds to be deployed on a given transect were individually bagged, with the transect number and carcass/placement details (i.e., size category, condition, distance from start of transect and position

³ Bird weights were determined prior to preparation. The only exception was for bird #134 (used on transect LA-76-02), which was incidentally weighed only after it had been prepared to mimic ‘scavenged’ condition.

⁴ The phone number of the Trustee project coordinator was provided on the card but redacted in this report for purposes of personal privacy.

relative to surf) indicated on the bag. All birds to be deployed at a single transect were grouped and placed together in a larger bag with the transect number and number of birds included indicated on the bag.

3.3 CARCASSES USED IN STUDY IMPLEMENTATION

Details on the intended combinations of scavenging state, beach position, and number of carcasses per transect are found in the Work Plan. However, some modifications to these details were made during study implementation. Tables 3 and 4 show these modifications. For instance, a misplacement of bagged carcasses during transit to the study sites resulted in a few changes in the combination of carcass size, beach position, and /or scavenging state, as the field team used carcasses they had available to them, some of which were carcasses previously used on other transects. Some carcasses were swapped between transects AL-06-03, AL-06-05, AL-07-02, AL-24-02, and AL-26-07 due to bag misplacement. In addition, beach raking occurred on some transects, removing the wrack. Therefore, carcasses intended for placement in the wrack line were instead placed at the high tide line, where the wrack had been, on beaches that had been raked clean.

Appendix A contains a listing of the final study implementation data.

TABLE 3: MODIFICATIONS TO SCAVENGING CONDITION AND BEACH POSITION DISTRIBUTIONS

	Intended in Work Plan	Implemented
Scavenging		
None	108 (67.9%)	88 (67.2%)
Heavy	51 (32.1%)	43 (32.8%)
Position		
Upper	83 (52.5%)	72 (55.4%)
Wrack	42 (26.6%)	35 (26.9%)
Lower	33 (20.9%)	23 (17.7%)

TABLE 4: MODIFICATIONS IN NUMBER OF CARCASSES PER TRANSECT

	Intended # Carcasses	# Carcasses Placed
AL-06-03	3	2
AL-06-05	5	3
AL-07-02	3	5
AL-08-04	5	3
AL-18-01	5	2
AL-24-02	5	4
WFL-27-02	5	4
Net change from total # intended		-8

In some cases, “distance from the transect start” was changed in the field because: 1) some transects were shorter than the expected two kilometers; 2) beach conditions required a slight change in bird placement; or, 3) for some of the Grand Isle transects, carcass placement needed revising to avoid placing carcasses while in the view of the BBS team (see Section 3.4 for further explanation). Specifically, the distance from transect start was changed for carcass numbers 11, 12, 29, 31, 32, 33, 43, 48, 49, 113, 114, and 115. Distances used in field implementation are shown in Appendix A.

3.4 CARCASS DEPLOYMENT AND RETRIEVAL

Details on carcass deployment and retrieval can be found in the Work Plan. In general, teams of at least two people (at least one Trustee representative and one BP/ENTRIX representative) handled carcass deployment and retrieval activities at each transect. One person teams were utilized when agreed upon by Trustee and BP/ENTRIX representatives and by the individual who would be working alone. For Grand Isle transects, boat space limitations allowed for only one team member, a Trustee representative. For three Dauphin Island transects, no BP/ENTRIX representatives were available and therefore these transects were completed by one Trustee representative. One team of two BP/ENTRIX representatives was also employed due to a lack of Trustee representatives available at that particular location and time. Exhibit 1 shows which Study personnel worked each transect.

In general, BBS teams were made aware that the Searcher Efficiency Study was taking place, but were not told if/when specific transects would be seeded with carcasses for SES purposes. In some cases, despite best efforts, the timing of placement and recovery teams overlapped with the presence of BBS teams. Therefore, some BBS teams were aware when, but not where, carcasses had been placed on a transect. Regardless, BBS teams were instructed to follow standard BBS search protocols.

Field teams typically deployed carcasses a few hours before the BBS teams were scheduled to search a given transect, which generally meant that carcass deployments occurred at sunrise or soon after. The evening before field teams deployed to their next transects, they obtained a cooler of dry ice and bags of bird carcasses prepared for use on those transects.

For Grand Isle transects, access issues required SES field personnel to share boat space with BBS teams. This precluded placing carcasses on beaches prior to the arrival of the BBS teams to the sites. BBS teams and SES teams arrived at the beach together, and the BBS team waited out of sight while the SES team seeded the transect. On one transect, the boat deposited the SES team at one end of the transect, and the SES team seeded the transect from “end to start” while the BBS team was transported to the other end of the transect and started the BBS search from there. Eventually, the SES and BBS teams met in mid-transect, but all carcasses were deployed before the teams came within sight of each other.

As described in the Work Plan, field teams placed carcasses at ‘wrack’, ‘upper’ and ‘lower’ positions on the beach. The overall intent was to place birds in a natural, realistic manner. No deployed carcasses were completely buried by sand or wrack, although some debris or sand was deliberately deposited on some carcasses. Three photographs were taken of each bird placement.

3.5 DATA COLLECTION AND MANAGEMENT

Details on data collection and management procedures can be found in the Work Plan. Study data sheets were developed to document carcass placement and retrieval and note the corresponding BBS survey team results, which indicated whether placed carcasses were ‘found’ by BBS teams. Procedures also were developed to collect and manage photographs taken of bird placements.

A set of three photos were taken of each carcass deployed; however, there were the following exceptions:

- No photos were taken at transect LA-563-01 (carcasses # 113, 114, and 115) in order to protect the digital camera from rain.
- Photos for transect MS-08-01 (carcass #92) were taken; however, the images do not depict the carcass, because the carcass was placed above the high tide line (i.e., in reeds) and the sun had not come up yet.
- Photos were taken of carcass # 154 at transect LA-83-04; however, the images, particularly those taken from 10 and 25 m away, are very dark and not discernable because the sun had not risen yet and the camera flash was not sufficient.
- No photos were taken at transect LA-76-06 (carcasses # 139, 140, and 141) due to camera malfunction.

The SES field teams coordinated efforts closely with BBS team supervisors. BBS team personnel were asked to record the location of ‘tagged carcass study’ carcasses (clearly denoted by a tag with identification number and the presence of a laminated card beneath the carcass noting it is a part of the ‘tagged carcass study’), if they found any such carcasses during their regularly scheduled BBS searches. Substantial efforts were made to avoid potential contamination of the BBS digital and carcass evidence streams. BBS teams were briefed by the FWS Beached Bird Survey leader prior to the start of the Searcher Efficiency Study to make them aware that the study was taking place. BBS teams were instructed NOT to photograph ‘tagged carcass study’ carcasses and to leave carcasses where they were found for later retrieval by the Carcass Detection Probability Study teams.

After completion of the study, a Trustee representative performed a review of the datasheets to confirm that all critical data fields had been filled out, particularly whether the SES carcass had been ‘found.’ In some instances, whether a carcass was found was not entered on the SES datasheet by the transect SES study team before the datasheet was signed. The corresponding BBS datasheet was obtained from the FWS Data Manager in the Fairhope, Alabama office. The BBS datasheets were consulted, and the proper data was entered on the SES datasheet. Such occurrences were clearly noted on the SES datasheet with a blue-ink star drawn at the top of the data column titled “Carcass detected by BBS team?” and the date the addition was made clearly indicated at the top of the datasheet in blue ink. Copies of revised datasheets were provided to the Trustees and BP/CardnoENTRIX.

3.6 DATA SHARING

Details on data sharing procedures can be found in the Work Plan. Data sheets were signed by field teams at the end of each day. Original data sheets remained in the possession of the Trustee counterpart of each team until they completed their assigned transects and returned to the Fairhope, AL field office. The BP/CardnoENTRIX representative on each team was provided the opportunity to photograph each data sheet at the end of the day. At the end of the study, the original data sheets were provided to a designated Trustee representative. The Trustee representative scanned all data sheets onto CDs; one set of CDs was mailed to a designated BP/CardnoENTRIX representative and one set to Trustee contractor Industrial Economics, Inc. (IEc) following Chain of Custody procedures. Datasheets that were revised, identified as such with a blue hand-drawn star added to the upper part of the datasheet, were also compiled and distributed among the parties under Chain of Custody procedures.

Photographs of carcass placements were downloaded to a computer and given a name following conventions specified in the Work Plan. At the end of the study, electronic copies were made and a full

set of photos were provided to a designated Trustee and a designated BP/CardnoENTRIX representative following Chain of Custody procedures.

Copies of the associated BBS datasheets were also compiled and provided to a designated Trustee and a designated BP/CardnoENTRIX representative following Chain of Custody procedures.

4.0 RESULTS

A table of raw results documenting each bird utilized in the study is provided in Appendix A. These data have been reviewed, verified, and validated through a cooperative process among the Trustees and BP/CardnoENTRIX. Appendix B contains documentation on the results of the cooperative data validation process. The data presented herein are excerpted from the “consensus dataset” agreed upon by all parties. This section of the report provides summaries of the data from several perspectives. This section does not offer discussion on results or interpretive conclusions.

Overall, 128 carcasses were placed on transects in the study area (excluding the three carcasses that were retrieved before BBS teams surveyed the transect), and 114 were detected (89.1%).

TABLE 5: CARCASS DETECTION RESULTS BY STATE

State	# Transects	# Carcasses Placed	# Detected	% Detected
Louisiana	18	66	56	84.8%
Mississippi	6	18	14	77.8%
Alabama	10	28	28	100.0%
Florida	5	16	16	100.0%

TABLE 6: CARCASS DETECTION BY BIRD SPECIES

Species	# Carcasses Placed	# Detected	% Detected
American oystercatcher	1	0	0%
Duck, unidentified species	1	1	100.0%
Gull chick	1	1	100.0%
Gull, unspecified species	46	40	87.0%
Green-winged teal	3	3	100.0%
Least tern	1	1	100.0%
Laughing gull	50	45	90.0%
Black skimmer	1	1	100.0%
Tern sp.	2	1	50.0%
Herring gull	18	17	94.4%
Mew gull	2	2	100.0%
Storm petrel	2	2	100.0%

TABLE 7: CARCASS DETECTION BY CARCASS CONDITION

Scavenging Condition	# Carcasses Placed	# Detected	% Detected
Heavily scavenged	37	29	78.4%
No/lightly scavenged	91	85	93.4%

TABLE 8: CARCASS DETECTION BY SIZE CLASS

Carcass Size Class	# Carcasses Placed	# Detected	% Detected
Small	10	7	70.0%
Medium	88	78	86.6%
Extra Large	30	29	96.7%

TABLE 9: CARCASS DETECTION RATES BY CARCASS POSITION ON BEACH

Carcass Position	# Carcasses Placed	# Detected	% Detected
Low (wash zone)	23	21	91.3%
Wrack	35	32	91.4%
Upper (high tide)	70	61	87.1%

5.0 OTHER OBSERVATIONS

Based on our experience during study implementation we provide the following additional observations:

- 1) A variety of factors not specifically measured in this study, including (but not necessarily limited to) beach substrate type and color, beach width, presence of wrack, raking activity, variation in tidal heights, timing of carcass placements and BBS searches relative to tidal cycle, and prevalence of footprints or other similar non-natural disturbances to the sand substrate potentially can affect searcher efficiency results.
- 2) Despite the best efforts of SES field teams to disguise evidence of their presence (e.g., by walking outside of BBS search areas as much as possible), some BBS teams anecdotally reported being tipped off by the presence of unusual footprints or ATV tracks, particularly in remote areas where footprints and ATV tracks were otherwise rare. While quantification of the potential effects of this issue on carcass detection rates is not possible, this factor suggests that carcass detection rates determined for this study are conservative (i.e., more likely to overstate than understate actual carcass detection rates by BBS teams).

6.0 REFERENCES

- Byrd, G.V. and J.H. Reynolds. 2006a. Detection probabilities for bird carcasses on beaches of Unalaska Island, Alaska, following the wreck of the *M/V Selendang Ayu*. U.S. Fish and Wildlife Service, Alaska Maritime National Wildlife Refuge, Homer, AK.
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- Van Pelt, T.I. and J.F. Piatt. 1995. Deposition and persistence of beachcast seabird carcasses. *Marine Pollution Bulletin*, 30: 794-802.

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LIST OF APPENDICES

- A Summary of Searcher Efficiency Study Results by Carcass
- B Cooperative Data Verification and Validation Process for the Searcher Efficiency Study
- C Carcass Preparation Datasheet
- D Carcass Detection Probability Study Work Plan

APPENDIX A

SUMMARY OF SEARCHER EFFICIENCY STUDY RESULTS BY CARCASS

Except for column "Dist. From Transect Start," these data have been reviewed, verified, and validated through a cooperative process among the Trustees and BP/CardnoENTRIX. The data presented here, except for the column "Dist. From Transect Start," are excerpted from the "consensus dataset" agreed upon by all parties. Transect AL-23-04 excluded.

Date	Transect ID	State	BBS Team	Carcass ID	Size	Carcass State	Species	Position	Dist. from Transect Start (m)*	Detected by BBS team?
9/28/2010	AL-06-03	AL	Dauphin Is.	43	XL	H	Herring Gull	upper	N/D	Y
9/28/2010	AL-06-03	AL	Dauphin Is.	103	M	N	Laughing Gull	wrack	1343	Y
9/28/2010	AL-06-05	AL	Dauphin Is.	59	M	N	Laughing Gull	upper	313	Y
9/28/2010	AL-06-05	AL	Dauphin Is.	93	XL	N	Herring Gull	upper	495	Y
9/28/2010	AL-06-05	AL	Dauphin Island	98	XL	H	Herring Gull	upper	344	Y
9/28/2010	AL-07-02	AL	Dauphin Is.	52	M	N	Green-winged Teal	low	1368	Y
9/28/2010	AL-07-02	AL	Dauphin Is.	56	XL	H	Herring Gull	upper	1574	Y
9/28/2010	AL-07-02	AL	Dauphin Is.	60	M	N	Laughing Gull	wrack	1272	Y
9/28/2010	AL-07-02	AL	Dauphin Is.	97	M	N	Gull	wrack	1802	Y
9/28/2010	AL-07-02	AL	Dauphin Is.	102	M	N	Laughing Gull	wrack	511	Y
9/22/2010	AL-08-02	AL	Dauphin Is.	48	XL	N	Herring Gull	upper	1100	Y
9/22/2010	AL-08-02	AL	Dauphin Is.	49	XL	N	Herring Gull	upper	1500	Y
9/22/2010	AL-08-02	AL	Dauphin Is.	50	M	N	Laughing Gull	upper	282	Y
9/22/2010	AL-08-04	AL	Foley	63	M	H	Laughing Gull	low	402	Y
9/22/2010	AL-08-04	AL	Foley	64	XL	N	Herring Gull	wrack	539	Y
9/22/2010	AL-08-04	AL	Foley	65	M	N	Laughing Gull	upper	694	Y
9/22/2010	AL-18-01	AL	Dauphin Is.	53	M	N	Laughing Gull	wrack	596	Y
9/22/2010	AL-18-01	AL	Dauphin Is.	54	M	N	Laughing Gull	upper	733	Y
9/23/2010	AL-24-02	AL	Foley	29	XL	N	Herring Gull	low	N/D	Y
9/23/2010	AL-24-02	AL	Foley	31	M	N	Laughing Gull	upper	N/D	Y
9/23/2010	AL-24-02	AL	Foley	32	XL	N	Herring Gull	upper	N/D	Y
9/23/2010	AL-24-02	AL	Foley	33	M	N	Laughing Gull	upper	N/D	Y
9/23/2010	AL-24-06	AL	Foley	83	M	N	Laughing Gull	wrack	1330	Y
9/23/2010	AL-24-06	AL	Foley	84	S	N	Laughing Gull	wrack	442	Y
9/21/2010	AL-26-02	AL	Foley	24	M	N	Laughing Gull	wrack	1389	Y

* N/D indicates that the distance was changed during field implementation but no revised distance was written on the datasheet.

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Date	Transect ID	State	BBS Team	Carcass ID	Size	Carcass State	Species	Position	Dist. from Transect Start (m)	Detected by BBS team?
9/21/2010	AL-26-02	AL	Foley	25	S	N	Storm Petrel	upper	750	Y
9/26/2010	AL-26-07	AL	Pensacola	81	M	N	Laughing Gull	upper	704	Y
9/26/2010	AL-26-07	AL	Pensacola	82	M	N	Laughing Gull	wrack	527	Y
9/27/2010	LA-562-01	LA	Rockefeller	108	M	H	Laughing Gull	low	240	Y
9/27/2010	LA-562-01	LA	Rockefeller	109	M	H	Laughing Gull	wrack	515	Y
9/27/2010	LA-562-01	LA	Rockefeller	110	S	N	American Oystercatcher	upper	944	N
9/27/2010	LA-562-01	LA	Rockefeller	111	M	N	Laughing Gull	upper	1451	Y
9/27/2010	LA-562-01	LA	Rockefeller	112	M	N	Green-winged Teal	wrack	388	Y
9/27/2010	LA-562-02	LA	Rockefeller	170	M	H	Laughing Gull	upper	560	Y
9/27/2010	LA-562-02	LA	Rockefeller	171	M	H	Laughing Gull	upper	664	Y
9/27/2010	LA-562-02	LA	Rockefeller	172	M	N	Laughing Gull	wrack	586	Y
9/27/2010	LA-562-03	LA	Rockefeller	166	XL	N	Herring Gull	wrack	225	Y
9/27/2010	LA-562-03	LA	Rockefeller	167	XL	N	Herring Gull	upper	838	Y
9/27/2010	LA-562-03	LA	Rockefeller	168	M	N	Laughing Gull	upper	1559	Y
9/27/2010	LA-562-03	LA	Rockefeller	169	XL	H	Herring Gull	upper	220	Y
9/26/2010	LA-563-01	LA	Rockefeller	113	XL	H	Herring Gull	upper	782	N
9/26/2010	LA-563-01	LA	Rockefeller	114	M	H	Laughing Gull	wrack	536	Y
9/26/2010	LA-563-01	LA	Rockefeller	115	M	N	Laughing Gull	low	128	Y
9/25/2010	LA-640-06	LA	Grand Isle	1	M	N	Laughing Gull	upper	1709	Y
9/25/2010	LA-640-06	LA	Grand Isle	2	M	N	Laughing Gull	wrack	622	Y
9/25/2010	LA-640-06	LA	Grand Isle	3	M	N	Laughing Gull	wrack	1238	Y
9/25/2010	LA-641-04	LA	Grand Isle	7	M	N	Laughing Gull	upper	1014	Y
9/25/2010	LA-641-04	LA	Grand Isle	8	M	H	Laughing Gull	low	971	Y
9/25/2010	LA-641-04	LA	Grand Isle	9	XL	H	Herring Gull	wrack	1808	Y
9/25/2010	LA-641-04	LA	Grand Isle	10	S	N	gull chick	upper	985	Y
9/24/2010	LA-642-01	LA	Grand Isle	11	XL	N	Herring Gull	low	N/D	Y
9/24/2010	LA-642-01	LA	Grand Isle	12	M	N	Laughing Gull	upper	N/D	Y
9/24/2010	LA-643-01	LA	Grand Isle	13	M	N	Laughing Gull	low	608	Y
9/24/2010	LA-643-01	LA	Grand Isle	14	XL	N	Herring Gull	wrack	850	Y
9/26/2010	LA-644-01	LA	Grand Isle	4	M	N	Laughing Gull	upper	1261	N
9/26/2010	LA-644-01	LA	Grand Isle	5	M	H	Laughing Gull	wrack	269	N
9/26/2010	LA-644-01	LA	Grand Isle	6	M	H	Laughing Gull	wrack	1856	Y
9/26/2010	LA-645-01	LA	Grand Isle	15	M	H	Laughing Gull	upper	615	Y
9/26/2010	LA-645-01	LA	Grand Isle	16	M	N	Laughing Gull	upper	737	Y
9/25/2010	LA-75-02	LA	Cameron	122	M	N	Gull; Unidentified	low	226	Y

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Date	Transect ID	State	BBS Team	Carcass ID	Size	Carcass State	Species	Position	Dist. from Transect Start (m)	Detected by BBS team?
9/25/2010	LA-75-02	LA	Cameron	123	M	H	Gull; Unidentified	upper	1520	Y
9/25/2010	LA-75-02	LA	Cameron	124	M	N	Gull; Unidentified	low	952	Y
9/25/2010	LA-75-02	LA	Cameron	125	M	H	Gull; Unidentified	low	1649	Y
9/25/2010	LA-75-02	LA	Cameron	126	M	N	Gull; Unidentified	wrack	1869	Y
9/25/2010	LA-75-04	LA	Cameron	127	M	N	Gull; Unidentified	upper	900	Y
9/25/2010	LA-75-04	LA	Cameron	128	M	N	Gull; Unidentified	upper	164	Y
9/25/2010	LA-75-04	LA	Cameron	129	XL	N	Gull; Unidentified	wrack	903	Y
9/25/2010	LA-75-04	LA	Cameron	130	XL	N	Gull; Unidentified	upper	1581	Y
9/26/2010	LA-76-02	LA	Sabine Pass	131	M	N	Gull; Unidentified	upper	1691	N
9/26/2010	LA-76-02	LA	Sabine Pass	132	M	N	Gull; Unidentified	upper	1150	Y
9/26/2010	LA-76-02	LA	Sabine Pass	133	M	N	Gull; Unidentified	upper	1851	N
9/26/2010	LA-76-02	LA	Sabine Pass	134	XL	H	Gull; Unidentified	upper	874	Y
9/26/2010	LA-76-02	LA	Sabine Pass	135	M	N	Gull; Unidentified	wrack	836	Y
9/26/2010	LA-76-04	LA	Sabine Pass	136	M	N	Gull; Unidentified	wrack	535	Y
9/26/2010	LA-76-04	LA	Sabine Pass	137	M	H	Gull; Unidentified	low	947	Y
9/26/2010	LA-76-04	LA	Sabine Pass	138	M	N	Gull; Unidentified	upper	1899	Y
9/26/2010	LA-76-06	LA	Sabine Pass	139	M	N	Duck; Unidentified	upper	242	Y
9/26/2010	LA-76-06	LA	Sabine Pass	140	M	N	Gull; Unidentified	low	830	Y
9/26/2010	LA-76-06	LA	Sabine Pass	141	M	N	Gull; Unidentified	wrack	1074	Y
9/26/2010	LA-76-06	LA	Sabine Pass	142	M	N	Gull; Unidentified	upper	1651	Y
9/26/2010	LA-76-06	LA	Sabine Pass	143	XL	N	Gull; Unidentified	wrack	1882	Y

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Date	Transect ID	State	BBS Team	Carcass ID	Size	Carcass State	Species	Position	Dist. from Transect Start (m)	Detected by BBS team?
9/25/2010	LA-77-03	LA	Rockefeller	163	M	N	Laughing Gull	upper	1105	Y
9/25/2010	LA-77-03	LA	Rockefeller	164	M	H	Laughing Gull	upper	289	Y
9/25/2010	LA-77-03	LA	Rockefeller	165	M	H	MEGU	low	1062	Y
9/27/2010	LA-81-01	LA	Sabine Pass	155	M	H	Gull; Unidentified	low	1657	N
9/27/2010	LA-81-01	LA	Sabine Pass	156	S	H	Tern; Unidentified	wrack	836	N
9/27/2010	LA-81-01	LA	Sabine Pass	157	M	H	Gull; Unidentified	upper	1585	N
9/27/2010	LA-81-01	LA	Sabine Pass	158	XL	N	Gull; Unidentified	low	1865	Y
9/27/2010	LA-81-01	LA	Sabine Pass	159	M	H	Gull; Unidentified	low	399	Y
9/27/2010	LA-83-04	LA	Sabine Pass	150	M	N	Gull; Unidentified	upper	1178	Y
9/27/2010	LA-83-04	LA	Sabine Pass	151	M	N	Gull; Unidentified	upper	928	Y
9/27/2010	LA-83-04	LA	Sabine Pass	152	XL	N	Gull; Unidentified	upper	1597	Y
9/27/2010	LA-83-04	LA	Sabine Pass	153	M	H	Gull; Unidentified	upper	511	N
9/27/2010	LA-83-04	LA	Sabine Pass	154	M	N	Gull; Unidentified	wrack	1662	Y
9/23/2010	MS-08-01	MS	Gulfport	90	XL	N	Gull	upper	1696	Y
9/23/2010	MS-08-01	MS	Gulfport	91	M	N	Gull	low	989	Y
9/23/2010	MS-08-01	MS	Gulfport	92	M	H	Gull	upper	660	Y
9/23/2010	MS-08-06	MS	Gulfport	85	M	N	Gull	wrack	1429	Y
9/23/2010	MS-08-06	MS	Gulfport	86	M	H	Gull	low	1130	N
9/23/2010	MS-08-06	MS	Gulfport	87	XL	N	Gull	upper	244	Y
9/25/2010	MS-15-01	MS	Gulfport	93	XL	N	Herring Gull	upper	495	Y
9/25/2010	MS-15-01	MS	Gulfport	94	M	N	Green-winged Teal	wrack	255	Y
9/25/2010	MS-15-01	MS	Gulfport	95	M	H	Laughing Gull	upper	465	Y
9/25/2010	MS-17-02	MS	Gulfport	96	M	N	Laughing Gull	upper	1412	N
9/25/2010	MS-17-02	MS	Gulfport	97	M	N	Mew Gull	low	1802	Y
9/25/2010	MS-17-02	MS	Gulfport	98	XL	H	Herring Gull	low	344	Y
9/24/2010	MS-20-04	MS	Gulfport	99	S	N	Laughing Gull	upper	1674	N
9/24/2010	MS-20-04	MS	Gulfport	100	M	H	Laughing Gull	wrack	1445	Y
9/24/2010	MS-20-04	MS	Gulfport	101	M	H	Laughing Gull	wrack	659	N
9/24/2010	MS-23-09	MS	Gulfport	105	M	N	Laughing Gull	upper	353	Y

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Date	Transect ID	State	BBS Team	Carcass ID	Size	Carcass State	Species	Position	Dist. from Transect Start (m)	Detected by BBS team?
9/24/2010	MS-23-09	MS	Gulfport	106	M	H	Laughing Gull	upper	1648	Y
9/24/2010	MS-23-09	MS	Gulfport	107	M	N	Laughing Gull	upper	1444	Y
9/24/2010	WFL-22-03	FL	Santa Rosa	20	M	H	Gull; Unidentified	upper	1413	Y
9/24/2010	WFL-22-03	FL	Santa Rosa	21	XL	N	Gull	upper	1231	Y
9/24/2010	WFL-22-03	FL	Santa Rosa	22	M	N	Gull; Unidentified	upper	1276	Y
9/24/2010	WFL-25-01	FL	Santa Rosa	23	M	N	Gull; Unidentified	upper	1458	Y
9/24/2010	WFL-25-01	FL	Santa Rosa	26	M	N	Gull; Unidentified	low	832	Y
9/24/2010	WFL-25-01	FL	Santa Rosa	27	M	N	Gull; Unidentified	wrack	1246	Y
9/23/2010	WFL-26-02	FL	Santa Rosa	28	S	N	Least Tern	upper	1403	Y
9/23/2010	WFL-26-02	FL	Santa Rosa	36	XL	N	Gull	wrack	1217	Y
9/23/2010	WFL-26-02	FL	Santa Rosa	37	XL	N	Gull	upper	982	Y
9/23/2010	WFL-27-02	FL	Santa Rosa	38	M	N	Laughing Gull	upper	1167	Y
9/23/2010	WFL-27-02	FL	Santa Rosa	39	S	N	Tern; Unidentified	upper	966	Y
9/23/2010	WFL-27-02	FL	Santa Rosa	40	S	N	Skimmer	upper	1427	Y
9/23/2010	WFL-27-02	FL	Santa Rosa	41	S	N	Petrel; Unidentified	low	405	Y
9/23/2010	WFL-28-02	FL	Santa Rosa	17	XL	N	Gull	upper	333	Y
9/23/2010	WFL-28-02	FL	Santa Rosa	18	M	H	Laughing Gull	upper	721	Y
9/23/2010	WFL-28-02	FL	Santa Rosa	19	M	H	Laughing Gull	upper	353	Y

that will be made to the applicable records in the Department's MC252 NRDA Database based on those conversations. With the exception of records where the specific name was changed to the more generic "gull", any inconsistencies between the CPD and the datasheet that could not be resolved based on carcass weight or photographic evidence defer to the field datasheet for the official cooperative dataset input.

Official title of document:

COOPERATIVE REVISIONS TO DATA GENERATED BY THE "ESTIMATING MORTALITY OF BIRDS USING BEACHED BIRD SURVEYS IN THE GULF OF MEXICO NEAR THE MC252 OIL SPILL STUDY" - (SEARCHER EFFICIENCY STUDY (BIRD STUDY #1B))

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APPENDIX C
CARCASS PREPARATION DATASHEET

1810 *

Carcass ID	Transect ID	Size	Species	Weight (g)	Condition
1	LA-640-06	Medium	Laughing Gull	303	No/light
2	LA-640-06	Medium	Laughing Gull	316	No/light
3	LA-640-06	Medium	Laughing Gull	319	No/light
4	LA-644-01	Medium	Laughing Gull	292	No/light
5	LA-644-01	Medium	Laughing Gull	200	heavy
6	LA-644-01	Medium	Laughing Gull	296	heavy
7	LA-641-01	Medium	Laughing Gull	368	no/light
8	LA-641-04	Medium	Laughing Gull	322	heavy
9	LA-641-04	X-L	Herring Gull	1014	heavy
10	LA-641-04	Small	Gull chick	118	no/light
11	LA-642-01	X-L	Herring Gull	1016	no/light
12	LA-642-01	Medium	Laughing Gull	331	no/light
13	LA-643-01	Medium	Laughing Gull	322	no/light
14	LA-643-01	X-L	Herring Gull	1094	no/light
15	LA-645-01	Medium	Laughing Gull	348	heavy
16	LA-645-01	Medium	Laughing Gull	253	no/light
17	WFL-28-02	X-L	Herring Gull	1076	no/light
18	WFL-28-02	Medium	Laughing Gull	311	heavy
19	WFL-28-02	Medium	Laughing Gull	318	heavy
20	WFL-22-03	Medium	Laughing Gull	276	heavy
21	WFL-22-03	X-L	Herring Gull	1166	heavy
22	WFL-22-03	Medium	Laughing Gull	335	no/light
23	WFL-25-01	Medium	Laughing Gull	302	no/light
24	AL-26-02				
25	AL-26-02				
26	WFL-25-01	Medium	LG	306	no/light
27	WFL-25-01	Medium	LG	317	no/light
28	WFL-26-02	Small		41	heavy
29	AL-24-02				
30					
31					
32					
33					
34	AL-25-04				
35					
36	WFL-26-02	X-L	HG	1040	no/light
37	WFL-26-02	X-L	HG	1057	no/light
38	WFL-27-02	Medium	Laughing Gull	358	no/light
39	WFL-27-02	Small		198	no/light
40	WFL-27-02	Small		87	no/light
41	WFL-27-02	Small		32	no/light
42	WFL-27-02	Medium	Laughing Gull	259	no/light
43					
44		Medium	LG	262	heavy
45	AL-03-01	X-L	Herring Gull	1010	no/light
46		X-L	HG	1040	heavy
47		Medium	LG	322	heavy
48	AL-09-02	X-L	HG	1223	no/light
49	AL-09-02	X-L	HG	1138	no/light
50	AL-09-02	Medium	Laughing Gull	409	no/light
51	AL-14-01	X-L	HG	1064	no/light

done
done
done

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Carcass ID	Transect ID	Size	Species	Weight (g)	Condition
52	AL-19-01	sm. medium	LG	309	
AL-09-0253		medium	laughing Gull	326	no/light
54		medium	LG	387	no/light
55		medium	LG	309	no/light
56	AL-06-05	XL	herring Gull	1186	heavy
57	AL-06-05	medium	LG	254	no/light
58	AL-06-05	medium	LG	288	no/light
59	AL-06-05	medium	laughing Gull	320	heavy
60	AL-06-05	medium	LG	317	no/light
61					
62					
63	AL-09-04	medium	laughing Gull	299	heavy
64	AL-09-04	XL	herring Gull	1099	no/light
65	AL-09-04	medium	LG	326	no/light
66					
67					
68					
69	AL-23-04	medium	LG	330	no/light
70	AL-23-04	medium	laughing Gull	276	heavy
71	AL-23-04	medium	LG	286	no/light
72					
73					
74					
75					
76					
77	22	XL	Herring Gull	1050	heavy
78					
79	AL-26-01	XL	HEGU	1014	no/light
80	AL-26-01	XL	Herring Gull	1206	heavy
81	AL-06-02	medium	LAGU	319	no/light
82	AL-06-02	medium	LAGU	307	no/light
83	AL-24-06	medium	LAGU	311	no/light
84	AL-24-06	small	AMOT Hawk	176	no/light
85	MS-08-06	M	LAGU	292	no/light
86	MS-08-06	medium	laughing Gull	238	heavy
87	MS-08-06	XL	HEGU	1090	no/light
88	MS-20-06	medium	laughing Gull	316	heavy
89	MS-20-06	M	LAGU	321	no/light
90	MS-08-01	XL	HEGU	1164	no/light
91	MS-08-01	medium	LAGU	221	no/light
92	MS-08-01	medium	laughing Gull	262	heavy
93	MS-15-01	XL	HEGU	1025	no/light
94	MS-15-01	small	SWTE	292	no/light
95	MS-15-01	medium	laughing Gull	280	heavy
96	MS-17-02	medium	LAGU	299	no/light
97	MS-17-02	medium	HEGU	425	no/light
98	MS-17-02	XL	HEGU	1135	heavy
99	MS-20-04	small		110	no/light
100	MS-20-04	no/small	LAGU	224	heavy
101	MS-20-04	medium	LAGU	317	no/light
102	MS-20-04	medium	LAGU	290	no/light

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Carcass ID	Transect ID	Size	Species	Weight (g)	Condition
103	MS-23-01	medium	LAGU	333	heavy
104	MS-23-01	medium	LAGU	323	no/light
105	MS-23-02	medium	LAGU	258	heavy
106	MS-23-02	medium	LAGU	306	heavy
107	MS-23-02	medium	LAGU	345	no/light
108	LA-562-01	medium	LAGU	292	heavy
109	LA-562-01	medium	LAGU	331	heavy
110	LA-562-02	small	MEGU	199	no/light
111	LA-562-02	medium	LAGU	310	no/light
112	LA-562-02	medium	GWTE	272	no/light
113	LA-562-01	XL	MEGU	1123	heavy
114	LA-562-01	medium	LAGU	284	heavy
115	LA-562-01	medium	LAGU	314	no/light
116					
117					
118					
119					
120					
121					
122	LA-75-02	medium	LAGU	290	no/light
123	LA-75-02	medium	LAGU	333	heavy
124	LA-75-02	medium	LAGU	390	no/light
125	LA-75-02	medium	LAGU	337	heavy
126	LA-75-02	medium	LAGU	254	no/light
127	LA-75-04	medium	LAGU	430	no/light
128	LA-75-04	medium	LAGU	410	no/light
129	LA-75-04	XL	MEGU	1176	no/light
130	LA-75-04	XL	MEGU	1010	no/light
131	LA-76-02	medium	LAGU	361	no/light
132	LA-76-02	medium	MEGU	416	no/light
133	LA-76-02	medium	LAGU	294	no/light
134	LA-76-02	XL	MEGU	1777	heavy
135	LA-76-02	medium	MEGU	307	no/light
136	LA-76-04	medium	LAGU	302	no/light
137	LA-76-04	medium	LAGU	239	heavy
138	LA-76-04	medium	MEGU	391	no/light
139	LA-76-06	small/med	GWTE	352	no/light
140	LA-76-06	small/med	LAGU	292	no/light
141	LA-76-06	medium	LAGU	287	no/light
142	LA-76-06	medium	LAGU	293	no/light
143	LA-76-06	XL	MEGU	1226	no/light
144	LA-93-05	medium	LAGU	264	no/light
145	LA-93-05	medium	MEGU	393	no/light
146	LA-93-02	medium	LAGU	257	heavy
147	LA-93-02	small	LAGU	151	heavy
148	LA-93-02	XL	MEGU	1120	no/light
149	LA-93-02	M	LAGU	321	heavy
150	LA-93-04	small	LAGU	282	no/light
151	LA-93-04	small	LAGU	290	no/light
152	LA-93-04	XL	MEGU	1018	no/light
153	LA-93-04	M	LAGU	296	heavy

→ after scavenging

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Carcass ID	Transect ID	Size	Species	Weight (g)	Condition
154	LA-93-04	M	LAGU	323	no/light
155	LA-94-01	M	LAGU	276	heavy
156	LA-94-01	S	LAGU	151	heavy
157	LA-94-01	M	LAGU	294	heavy
158	LA-94-01	XL	HEGU	1011	no/light
159	LA-94-01	S/med	LAGU	275	heavy
160	LA-75-06	XL	HEGU	1146	no/light
161	LA-75-06	L	HEGU	943	no/light
162	LA-75-06	M	LAGU	277	no/light
163	LA-75-06	M	LAGU	318	no/light
164	LA-75-02	M	LAGU	302	heavy

172 LA-562-02 medium LAGU 296 no/light

165 LA-77-03 L HEGU 498 heavy

166 LA-562-03 XL HEGU 1001 no/light

167 LA-562-03 XL HEGU 1045 no/light

168 LA-562-03 M LAGU 329 no/light

169 LA-562-03 XL HEGU 1112 heavy

170 LA-562-02 M LAGU 330 heavy

171 LA-562-02 M LAGU 238 heavy

APPENDIX D

CARCASS DETECTION PROBABILITY STUDY WORK PLAN

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