WORK PLAN FOR ESTIMATING SECRETIVE MARSH BIRD MORTALITY
DEEPWATER HORIZON (MC 252) OIL SPILL
NRDA BIRD STUDY #3

MODIFICATION #1: MARSH BIRD HELICOPTER SURVEY METHODOLOGY

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INTRODUCTION

The Deepwater Horizon (MC 252) oil spill began April 22, 2010. Oil spill related injury to wildlife is of major concern to the natural resource trustees, BP and the American public. Seabirds, colonial waterbirds, coastal marsh birds, and shorebirds are particularly susceptible to impacts from the oil. Several work plans have been developed to concurrently evaluate oil spill related injuries to these different avian guilds. The Secretive Marsh Bird work plan addresses injury to secretive marsh birds (species that live in dense marsh vegetation and are difficult to see) by: (1) quantifying abundances and densities of secretive marsh bird species in un-oiled representative habitats; (2) quantifying the proportion of live oiled and live un-oiled birds in representative habitats through active observation or capture of live individual birds; (3) estimating representative marsh bird mortality rates using radio telemetry; and (4) quantifying fiddler crab burrow densities to supplement our understanding of marsh-specific rail densities. This modification to the Secretive Marsh Bird work plan uses helicopter surveys to determine densities of oiled and unoiled birds in Louisiana marshes.

The primary species of interest are clapper rails (*Rallus longirostris*) and seaside sparrows (*Ammodramus maritimus*). Other marsh bird species that may be commonly found in fresh and/or brackish water, such as king rails (*R. elegans*), least bitterns (*Ixobrychus exilis*), mottled ducks (*Anas fulvigula*), purple gallinules (*Porphyrio martinica*), moorhens (*Gallinula chloropus*), and marsh wren (*Cistothorus palustris*) are also of interest.

Objective:

(1) Provide oiled and un-oiled marsh wildlife densities (in particular clapper rail oiling status and densities)

METHODS

Marsh bird distribution and density will be estimated using line transect sampling from a helicopter flying at low levels in a stratified random sampling design. Typically, the stratified random sampling approach will use a random number generation table to randomly select the first transect starting point and then all transects flown will be on a grid expanded out systematically from that initial point. This often improves the representative quality of the sample by reducing sampling error. It can produce a weighted mean that has less variability than the arithmetic mean of a simple random sample of the population

This helicopter technique has been optimized for the detection of oiled and un-oiled rails at a low-level altitudes (e.g., less than 500') at ground speeds averaging 5 to 15 miles per hour (e.g., just past a hover speed in most cases) during resources at risk surveys for spill responses since 2004 (Goatcher, pers. comm.). Survey altitudes will be one meter

average over the tops of vegetation encountered (e.g. 2-10 meters). Observers will primarily focus on rails, but will attempt to identify all bird species and their oiling status. Observations of all oiled and un-oiled birds, mammals, alligators and other species within the flight transect will also be recorded.

The helicopter surveys will be conducted in southern Louisiana marshes (Fig. 1) between August 1 and September 30, 2010. These low-level flights will adhere to safety standards for low-level Special Use Mission flights under the authority of the Department of the Interior's National Business Center, Aviation Management Directorate (DOI AMD OPERATIONAL PROCEDURES (OPM) MEMORANDUM NO. 06-29; http://amd.nbc.gov/library/opm/06-29.pdf) (Included in the Appendix).

Two types of transects will be flown: Interior Marsh Transects (IMT) and Shoreline Transects (ST). Interior Marsh Transects will be 5-km long flown by a helicopter at low-level. This study design requires twenty, 5-km IMT transects in each of two marsh habitat types, *Phragmitis* and *Spartina/Juncus*, for a total of 40 IMT transects. The primary purpose of the IMT flights will be to obtain data to support secretive marsh bird density estimates and to determine the proportion of secretive marsh birds that may be oiled.

Shoreline Transects along waterlines will be flown at the low-level over moderately and heavily oiled sites. Flights will not be made over refuges and wildlife management areas without authorization. No flights will come within 500 meters of colonies of nesting birds. The ST flights will also be implemented in oiled and un-oiled areas parallel to the interface of the marsh with the Gulf and associated bays/lakes and waterways (bayous, creeks, channels, canals) and will be 10 km in length. Some of these ST flights will be converted to IMT strip transect flights if large expanses of oiled marsh are encountered that may not be covered with ST flights. There will be at least 40 STs flown, or more, depending on remaining allocated flight days. Transit time to sites from airports and calibration of instruments will require several flight days. It is expected that weather will impact about 25% of flights, requiring adjustments to be made in schedules.

Twenty-four helicopter days total are required for IMT and ST transect flights, transit flights, downtime for weather/maintenance, stand-by time, calibration/training flights and other contingencies. Weather and scheduling entrance into the controlled air space of the IC Air Ops Group (e.g., NRDA flights are low on their priorities list) will be the most challenging scheduling issues.

An Automated Route Reconnaissance Kit (ARRK)
( ) will be used to keep the helicopter on transect and this will be connected for time and location stamps to voice recordings from and to high resolution video camera(s) mounted on the helicopter. The ARRK system is developed for and currently in use in Afghanistan and Iraq by the military for vehicle and helicopter recon patrols. An on-board U.S. Army Corps of Engineers (USACE) Engineer Research and Development Center (ERDC) technician will operate the software and data capture systems for subsequent processing and analysis. A

qualified wildlife biologist (LDWF, USFWS or USGS) observer will record through voice narration via the helicopter helmet intercom network into the ARRK all birds and their observed oiling status flushed by the helicopter or observed on the ground within the boundaries of a transect. Distance in meters will be estimated or measured with a laser range finder from the center line (helicopter) to each bird when first observed as needed to determine if they are within the transect. A fixed width transect will be flown calibrated to the field of view of the ARRK video camera. This transect width is expected to be approximately 10 to 20 meters, depending on the altitude and attitude of helicopter and width of wide-angle lenses used.

Post-flight track plot, point, video and voice recorded data will be analyzed by the project interagency technical analysis team the same or next day, within 24 hours of each flight. The raw data and any subsequent data processing will be uploaded to the DOI-ERDC NRDA Database and the appropriate folder on the NRDAR Birds FTP site (or other appropriate NRDA data repository) daily, unless weather or other circumstances prevent transmissions. If technical problems prevent the distribution of data packages for more than 3 concurrent days, field activities could be paused until problems are resolved.

The ARRK system allows email files (KML format) of the track-line, points, video and voice data to be sent to reviewers via email for analyses on Google Earth. Because voice, video and incident marks are indicated by nodes observed along the track-line (flight lines) post-flight reviewers can go directly to the data and not have to view flight video segments where no birds or other wildlife were observed. This data sharing feature of ARRK will allow authorized trustee contractor scientists and trustee representatives (and BP/ENTRIX representatives, if this study plan is implemented as a cooperative NRDA study) to be material participants in the determination of degree of oiling and absence of oiling of wildlife without having to fly at low-levels themselves. Reviewers can be at multiple sites or in the same conference room while reviewing the flight data.

Data may be used to estimate density using the freely available program DISTANCE, which is specifically designed for analysis of line-transect data. Secretive marsh bird oiling rates, secretive marsh bird population density estimates, and corresponding confidence intervals may be developed for all habitat types encountered. Within two weeks of the last flight our team will have processed the data through QA/QC and validated it in a Preliminary Data Report to the Trustees. Before November 30, 2010, we will deliver a Final Project Report to the Trustees.

Estimated Costs to Implement Marsh Bird Helicopter Surveys

If implemented as an independent assessment study of the Trustees, the funding for these surveys will be provided by DOI to the USACE/ERDC and the U.S. DOI Fish and Wildlife Service. The Fish and Wildlife Service will contract via interagency agreements with the U.S. Geological Survey (15% funds transfer rate) and the Louisiana Department of Wildlife and Fisheries (0% funds transfer rate) for expert ornithological and operational technical assistance to implement the surveys and analyze the data. All general supplies and equipment, including the ARRK video camera system and technicians will be provided by USACE/ERDC through existing in-kind assets or through their procurement process.

Helicopter required:
One AMD certified Bell Jet Long Ranger IV or equivalent horsepower helicopter, fixed floats (preferred) or pop-out floats, life raft, distress radio beacon (ELT or EPIRB), gyroscopic nose camera mount (1), doorway camera mounts (2) and removable doors.

Helicopter days needed: 24 days
20 days for surveys (6 hours/day for survey + 2 hours/daily transit to survey sites)
4 days for round trip transit to and from home base

Staff required:
One AMD helicopter pilot with low-level and extended overwater (platform to platform) certification. The pilot must have no less than 200 hours at low-level marsh and seabird wildlife captures and surveys and be highly proficient in low-level clapper rail rotor wash surveys. Three rotary wing AMD certified observer biologists with marsh bird wildlife expertise (must also possess B3 certifications in A101, A105, A106, A108, A113, and water ditching (recommended)). The observer biologists must be recognized ornithological experts and will come from the Louisiana Department of Wildlife and Fisheries, and the U.S. Department of the Interior's Fish and Wildlife Service and Geological Survey. Three ARRK system and camera operators/data processors/technicians with AMD B3 certifications will be provided by the USACE ERDC, Vicksburg, MS for data collection, post survey analyses and report/publication writing.

Personnel, equipment, and supplies:

<u>USACE/ERDC will:</u>

1. Provide expert technical assistance on low-level helicopter wildlife surveys
2. Provide report and journal publications preparation and co-authorship
3. Provide data and ARRK statistical analyses of flight data; uploads daily to NRDA FTP
4. Provide ARRK hardware, software, cameras and trained ARRK technicians

5. Procure and rent equipment, facilities and supplies for post flight data processing at multiple locations.
6. Procure or rent safety equipment and supplies.

Item	Unit	Cost/Unit	Total Cost
Technicians USACE (3) (6 mon.)			$108,000
Car rental or GOV reimbursement			$ 5,000
Fuel for rental or GOV vehicles (2)			
*Lodging for Technicians (3)			$ 42,300
*Per diem for Technicians (3)			$ 12,780
Misc. Equipment (rental/purchase tables/chairs, work room rent, tools)			$ 10,000
Misc. Supplies (printer paper/ink, DVDs, data storage devices, etc.)			$ 10,000
Safety Equipment (flight helmets, nomex coveralls, flight PFDs, PPE)			$ 5,000
Sub-total			$194,955
USACE-ERDC overhead (50.2%)			$ 97,867
USACE-ERDC total			$292,822

DOI/FWS will:

1. Provide expert direction and training on low-level helicopter wildlife surveys as Principle Investigator
2. Provide report and journal publications preparation and co-authorship
3. Provide data and ARRK statistical analyses of flight data; uploads daily to NRDA FTP
4. Project safety officer and aircraft manager; procure aviation services through approved AMD vendors and schedule flights

Item	Unit	Cost/Unit	Total Cost
Ecologist, Project Leader			$28,500
Hazard premium pay			$2,700
Car rental or GOV reimburse			$3,400
Fuel for automobile			$8,251
Lodging and per diem ($235/$71)			
Helicopter Rental AMD OCWN			$307,200
Sub-total			$360,455
Overhead (64.34%)			$231,917
TOTAL			$592,372

LDWF will: (Budget Breakout - Technical Assistance to Secretive Marsh Bird Surveys by Helicopter Project)

1. Provide expert technical assistance on low-level helicopter wildlife surveys
2. Assist with report and journal publications preparation and co-authorship
3. Provide scientists (avian or ornithological marsh bird experts) to fly low-level surveys
4. Serve as project liaison to LDWF managed lands and secure over flight access as needed, subject to need and individual land unit manager approvals.

Item	Unit	Total Cost
Biologists LDWF	hrs or days	$5,400
Car rental or LDWF GOV reimbursement	days	$600
Fuel for rental or LDWF GOV vehicles	days	$225
Lodging and per diem ($ lodging/$ per diem)	days	$2,448
TOTAL		$8,673

DOI/USGS will:

1. Provide expert technical assistance on low-level helicopter wildlife surveys
2. Provide report and journal publications preparation and co-authorship
3. Provide preliminary daily data and statistical analyses of flight data
4. Provide scientists (avian or ornithological experts) and biometricians
5. Develop and lead random points selections in survey area and plot flight transect grids
6. Provide final line transect statistical analyses and wildlife density estimates from transect data

Item	Unit	Total Cost
Scientist, avian expert	hrs $ /hr days (hr days)	$19,575
Hazard premium pay	(low-level helicopter)	$4,950
Statistician	hrs	$6,375
Car rental or GOV reimburse.	days	$2,200
Fuel for automobile	days	$8,251
Lodging and per diem ($235/$71)	days	$26,316
Sub-total		$64,967
Overhead (15%)		$9,745
TOTAL		$74,721
TOTAL FOR PERSONNEL & EQUIPMENT:		**$968,588**

*Lodging/per diem based on worst case New Orleans rates for FWS Lake Front Apt. Helibase, where operations may be co-located.

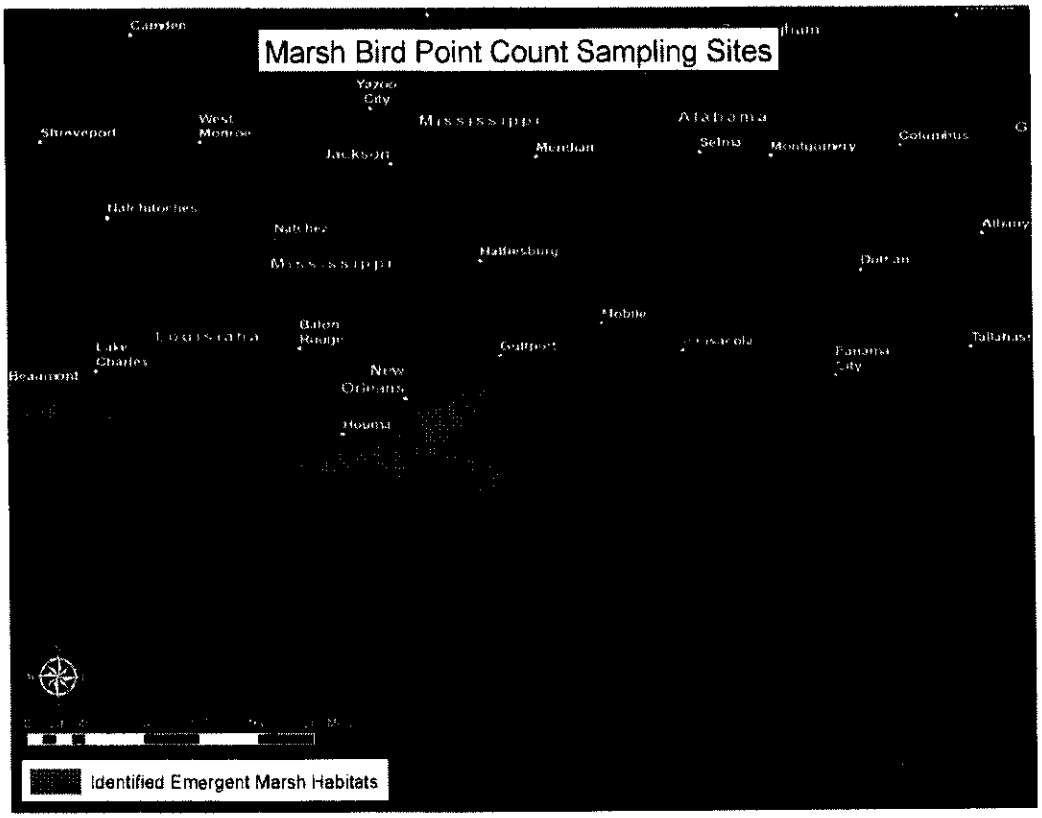

Figure 1. Map of area covered by marsh bird surveys. Red indicates distribution of marshes. All work will be conducted in Louisiana.

APPROVAL PAGE
FOR MODIFICATION #1 TO SECRETIVE MARSH BIRD WORK PLAN:
MARSH BIRD HELICOPTER SURVEY

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

Veronica W. Varela — 8/11/2010

Trustee NRDA Bird Group Lead — Date

Veronica W. Varela

FOR ROLAND GUIDRY — 8/24/10

State of Louisiana Trustee Representative — Date

Date

APPENDIX

United States Department of the Interior

National Business Center
Aviation Management
300 E. Mallard Dr., Ste 200
Boise, Idaho 83706-3991

DOI AM OPERATIONAL PROCEDURES (OPM) MEMORANDUM NO. 06-29
Subject: Special Use Activities and Revised Standards for Technical Oversight
Effective Date: January 1, 2006
Supersedes: OPM 05-29 dated February 3, 2005
Distribution: A, B, & C
Expiration: December 31, 2006

.1 Purpose. This OPM establishes policies and procedures regarding: (a) special use activities, and (b) inspection and technical oversight of vendor pilots and aircraft flying for the Department of the Interior (DOI). It was written to preclude duplication of effort between DOI and the Federal Aviation Administration (FAA) while recognizing that DOI has Departmental oversight responsibilities that must be performed.

.2 Authority. This policy is established by the Associate Director, Department of the Interior, Aviation Management (DOI AM), in accordance with the provisions of Departmental Manual 350 DM 1 and Secretarial Order 3250 dated September 30, 2003.

.3 Definitions.
A. Point-to-Point Transportation. Flights between airports (excluding operations defined in paragraph .3C below and in 351 DM 1.7 as "special use") where the route of flight is determined by the pilots, based upon navigational requirements.

B. High Reconnaissance. A route of flight which includes reconnaissance and is conducted above 500' above ground level (AGL). This reconnaissance does not include any aircraft maneuvers which are in excess of commercial pilot skills, maneuvering below 1.4 VSO (airplane landing configuration stall speed), or climbs/turns/descents greater than the standard rate. This does not include any type of precise maneuvering or specialized equipment.

C. Special Use Activities. Operations involving the utilization of airplanes and helicopters in support of DOI programs which are not point-to-point flight activities and which require special control measures due to their inherently higher risk. This may require deviation from normal operating practices where authorized by DOI AM. Special pilot qualifications and techniques, special aircraft equipment, and personal protective equipment are required to minimize risk to personnel and property. These activities include:

Low level flight (within 500' of the surface)

Mountain flying (helicopter)
Resource reconnaissance
Fire reconnaissance
Air tactical group supervision
Toe-in, single-skid, and step-out landing (helicopter)
Cargo letdown
External load - short line ≤50' (helicopter)
External load - longline >50' (helicopter)
Rappel
Short-haul
Offshore platform landings (helicopter)
Vessel landings
Water landings - floats or hull (helicopter)
Wheel operations on unprepared landing areas (airplane)
Animal darting, paint ball
Animal eradication
Animal gathering and capture
Airframe mounted net gun (helicopter)
Handheld net gun
Aerial ignition
Night vision goggles
Smoke jumping/paracargo
Water/retardant application
Note: Future flight activities may be developed which should also be identified as special use.
If a question exists, the applicable DOI AM regional/area office should be consulted.

D. Precision Reconnaissance. This type of reconnaissance is conducted above 500' AGL. Transect-type operations, utilization of specialized equipment, or missions not normally conducted in the commercial sector are examples of specific tasks that require special consideration. Precision reconnaissance is divided into three subcategories: resource reconnaissance, fire reconnaissance, and air tactical group supervision. These special use activities do not require the use of PPE, survival kits, or first aid kits because they are conducted exclusively above 500' AGL and are considered low risk.
E. Administrative Approval Document. A written notice, issued by DOI AM and carried aboard the aircraft, from which the user can verify that the vendor has a current and approved aircraft rental agreement for that specific aircraft. **Note: This document DOES NOT denote a DOI technical inspection or approval.**

.4 Policy. All vendor pilots flying for DOI shall conform to the standards contained in 351 DM 3 and all vendor aircraft flying for DOI shall conform to the standards contained in 351 DM 2. Vendor pilots and aircraft flying only point-to-point transportation and high reconnaissance shall comply with 14 CFR 135 and applicable state regulations for operations, maintenance, and equipment. Personal protective equipment (PPE) requirements will be as specified in the *ALSE Handbook* as amended by this OPM.

.5 Procedures.
A. Vendor Pilots.
1) Pilots shall document their experience on the OAS-64, Interagency Pilot Qualifications and Approval Record, and submit this form to DOI AM.
2) DOI AM will complete an administrative pilot review of flight experience,

medical currency, 14 CFR 135 checkride currency, accident/violation history, and DOI Aviation Mishap Information System (AMIS) history and as documented on the OAS-64.
3) After it has been determined that a pilot meets the experience requirements and a satisfactory administrative review has been completed, point-to-point transportation and high reconnaissance pilot qualifications may be issued for a two-year cycle period (not to exceed 26 months).
4) Pilot approval for special use activities will be in accordance with 351 DM 3 and the following flight evaluation intervals:
a) An initial flight evaluation will be conducted for each special use activity to be flown regardless of whether or not periodic evaluations are required.
b) The following special use activities require only an initial evaluation:
Aerial ignition
Airframe mounted net gun (helicopter)
External load - short line ≤50'(helicopter)
Low-level flight (helicopter)
Mountain flying (helicopter)
Offshore platform landings (helicopter)
Resource reconnaissance
Fire reconnaissance
Air tactical group supervision
Water landings/floats or hull (helicopter)
Single engine airplane water/retardant application
c) The following special use activities require periodic flight evaluations.
A pilot must have completed a satisfactory flight evaluation within the preceding three-year cycle period (not to exceed 38 months) before performing the following activities:
Animal darting, paint ball
Animal eradication
Animal gathering and capture
Cargo letdown
External load - longline >50' (helicopter)
Handheld net gun
Low-level flight (airplane)
Toe-in, single-skid, and step-out landing (helicopter)
Vessel landings
Water/retardant application (except single-engine airplanes)
Wheel operations on unprepared landing areas (airplane)
d) The following special use activities require annual flight evaluations.
A pilot must have completed a satisfactory flight evaluation within the preceding 14 months before performing the following activities:
Night vision goggles
Rappel
Short haul
Smoke jumping/paracargo
e) Confirmation of 14 CFR compliance may be accomplished via a quality assurance program of random sampling of the OAS-23, Aircraft Use Report, and verification of periodic flight evaluations and medical certifications.
f) Pilot qualification removal/suspension will be in accordance with current revocation procedures found in 351 DM 3, appendix 1.

B. Vendor Aircraft.

1) The bureau shall submit an OAS-20, Request for Rental Services, through its national aviation manager to the DOI AM Flight Coordination Center identifying the bureau's point-to-point aircraft requirements.
2) For new vendors, a business meeting shall be scheduled to discuss administrative procedures, safety expectations, and problem resolution processes with suggested attendance by the requesting bureau(s), interagency partners, vendor senior management, and the servicing DOI AM field office representative. This meeting is administrative in nature and is not for technical inspection purposes.
3) Aircraft meeting all administrative requirements will be issued an administrative approval document for a two-year period (not to exceed 26 months) which shall
be carried in the aircraft and made available for review upon request.

C. Aviation Life Support Equipment.
1) The *Aviation Life Support Equipment (ALSE) Handbook* does not apply to vendor aircraft procured under an aircraft rental agreement (ARA) when conducting point-to-point (non-special use) activities and low risk special use activities, which are resourcereconnaissance, fire reconnaissance, and air tactical group supervision.
2) For all other special use activities, the PPE requirements of the *ALSE Handbook* apply.
3) Aircraft used in offshore missions, such as Minerals Management Service aircraft, are not required to comply with the survival kit requirements of appendix 1 to the *ALSE Handbook.* These aircraft are required to meet the survival kit requirements of 14 CFR 135.167.

D. Quality Control.
1) Technical oversight and inspection is the responsibility of the FAA and is supported by quality control input from DOI users.
a) Incidents, hazards, and maintenance deficiencies shall be reported via the SAFECOM Incident Reporting System (www.safecom.gov) or telephonically to the servicing DOI AM field office for matters of urgency.
b) DOI AM will consolidate the information and, as appropriate, communicate it to the FAA office having responsibility for the vendor.
c) DOI AM may visit point-to-point vendors occasionally for quality control purposes.
2) Removal of vendors will be in accordance with current revocation procedures found in 351 DM 3, appendix 1.