

**Assessing Potential Sublethal and Chronic Health Impacts from the
Mississippi Canyon 252 Oil Spill on Coastal and Estuarine Bottlenose
Dolphins: Addendum**

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

The trustees have developed a preliminary conceptual model of the DWH release, potential pathways and routes of exposure, and potential receptors. This preliminary model has informed the trustees' decision to pursue the studies outlined in the work plan. By signing this work plan and agreeing to fund the work outlined, BP is not endorsing the model articulated in the 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.

Jessica White for Lisa Di Pinto

Department of Commerce Trustee Representative

3/09/2012

Date

[Signature]
FOR
KOLA MD
GUYARD

Louisiana Trustee Representative

3/21/2012

Date

[Signature]

BP Representative

3-19-2012

Date

Assessing Potential Sublethal and Chronic Health Impacts from the Mississippi Canyon 252 Oil Spill on Coastal and Estuarine Bottlenose Dolphins: Addendum

Original Plan Signed by NOAA, Louisiana, BP: April 12, 2011

Summary of original plan: Under the original plan, capture-release health assessments of bottlenose dolphins were conducted in Barataria Bay, Louisiana and Sarasota Bay, Florida to address potential sublethal, chronic and indirect health impacts of the Deepwater Horizon (DWH) oil spill. Satellite-linked and VHF radio tags were attached to dolphins in Barataria Bay to better understand their movements, range and preferred habitats.

Proposed addendum: 1) Continue tracking satellite-linked tags and conduct photographic monitoring of dolphins in Barataria Bay, 2) conduct focused boat-based surveys to monitor reproductive outcomes of pregnant dolphins identified during the August 2011 capture-release in Barataria Bay, as well as dolphins that have been sampled via remote biopsy in Barataria Bay and Mississippi Sound during 2011; all dolphins encountered will be photographed. Surveys to address the first objective will be conducted monthly February-May, 2012 or until tags are no longer transmitting, whichever comes later. Surveys to address the second objective will be conducted monthly June-August 2012, with the latter surveys providing supplemental opportunistic information for Objective 1.

Rationale and survey plan:

Objective 1: Continue tracking satellite-linked tags and photographic monitoring of Barataria Bay dolphins

During the August 2011 dolphin health assessment in Barataria Bay, 25 dolphins were fitted with a satellite-linked tag to gain information on their movements and range, as well as to aid in relocating each individual for periodic follow-up to assess overall visual appearance. Boat-based surveys were conducted by the Louisiana Department of Wildlife and Fisheries (LDWF) through October 2011 to collect photographs to document the visual appearance of tagged dolphins and to document tag loss to confirm that a tag which ceased to transmit was due to tag/battery failure rather than mortality of the dolphin. Because a majority of the tags were still transmitting, additional surveys were conducted in November 2011 by a NOAA/CZS crew. These surveys were conducted in coordination with the scheduled Barataria Bay Photo-ID work.

The performance of the satellite-linked tags has exceeded expected transmission and attachment life, and as of January 20, 2012, over half (13/25) of the tags were still transmitting. The surveys proposed here will continue the boat-based surveys to obtain photographic images, document the visual appearance of tagged dolphins, and monitor for any indication of health issues (e.g. emaciation, respiratory distress, skin lesions). Six of the 13 dolphins with transmitting tags were pregnant at the time of capture, so it is particularly important to obtain visual observations of

those animals to monitor their status. An increase in neonatal/fetus strandings in the northern Gulf of Mexico has already been noted in January 2012, making the need to begin the monitoring surveys time critical.

Survey Strategy for Objective 1: Surveys will be conducted by LDWF monthly (5 days per month) from February 2012 – May 2012 or until tags are no longer transmitting, whichever comes later. Specific survey dates will be determined based on favorable weather conditions and availability of LDWF staff. Chicago Zoological Society (CZS) staff will sort and examine images, and provide a summary of individuals sighted and observations of their appearance. CZS will also examine photos for tag condition and dorsal fin changes at the site of tag attachment and provide a final summary of fin changes.

Objective 2: Conduct focused boat-based surveys to monitor reproductive success

Ten females sampled during the capture-release study were determined to be pregnant and all of these pregnancies were determined via ultrasound to either be 1st or 2nd trimester. Bottlenose dolphins have a 12 month gestation period and give birth to a single calf. Previous work in Sarasota Bay, Florida, has demonstrated that bottlenose dolphin calves remain in close proximity to their mothers for their first 3-6 years (Wells et al. 1987; Wells 2003). However, it is crucial to observe the females as close to the estimated time of parturition as possible to be able to document births of calves that may not survive for long after birth. Observations of some mother/calf pairs may be documented in Spring 2012 by the ongoing photo-identification (photo-ID) surveys (3rd addendum to “Proposed Data Collection Plan to Assess Injury to Louisiana and Mississippi Estuarine Dolphin Stocks”). However, parturition will likely occur in May or later for dolphins documented to be in the 1st trimester as of August 2011, and observations will be needed several weeks to months after birth to document whether the calves survive. Therefore, the additional surveys proposed here will be conducted monthly (5 days per month) from June 2012 – August 2012 to provide additional information on reproductive outcomes of females documented to be pregnant during the August 2011 capture-release study.

In addition to the pregnancies documented from the capture-release study, other possible pregnancies will be determined via analysis of progesterone concentration in blubber collected from remote biopsy samples. Therefore, the surveys will also aim to photograph dolphins which were previously biopsied in Barataria Bay and in Mississippi Sound during 2011 under the NRDA dolphin photo-ID/biopsy workplan “Proposed Data Collection Plan to Assess Injury to Louisiana and Mississippi Estuarine Dolphin Stocks”.

Survey Strategy for Objective 2:

Prior sighting locations and satellite-linked tag location data will be used to identify areas for concentration of survey effort to maximize probability of acquiring target individuals. Daily location data from satellite-linked tags are already available through an existing contract with the CZS. Captured dolphins were also freeze-branded with a unique alphanumeric and this will

facilitate identifying them. Once located, dolphins will be photographed using established photo-ID methods, and the presence of a neonate or calf will be recorded. For dolphins that were not freeze-branded, photo-ID images will be compared to catalogued images of previously biopsied dolphins that were determined to be pregnant. Each monthly photo-ID survey will be conducted by a single boat staffed by 3 or more researchers.

Roles and responsibilities:

LDWF: LDWF researchers will provide a vessel and staff for monthly Objective 1 surveys to monitor dolphins captured and tagged as part of the health assessment program in Barataria Bay. A NOAA researcher (Eric Zolman) will lead the February surveys, but all following surveys will be led and staffed by LDWF personnel. Following the data intake, images collected in the field will be transferred to the CZS in Sarasota, Florida, for processing and analysis to evaluate tag and dorsal fin conditions. LDWF will also provide a vessel and crew member for the Barataria Bay photo-ID surveys in June-August 2012. LDWF will provide a crew member for the Mississippi Sound photo-ID surveys in June-August 2012.

CZS: CZS researchers will sort, process and analyze LDWF collected images of tagged dolphins to evaluate tag and fin status, and provide a summary of individuals sighted and observations of their appearance. CZS will also continue to provide location data from satellite-linked dolphins to optimize the field team's survey effort. Copies of all images will be provided to BP or its designee as per the data sharing agreement.

NOAA: A NOAA researcher (Eric Zolman) will lead the February 2012 surveys for tagged dolphins. NOAA researchers will lead the photo-ID field surveys June-August 2012 in Barataria Bay and Mississippi Sound, and will be responsible for photo-analysis of collected images and integration into the Finbase database.

BP: The trustees will notify BP or its designated representative in advance of all field activities and provide an opportunity for BP or its representative to participate in all sampling events.

Data Handling and Sharing:

A. Data Handling

MC 252 NRDA chain-of-custody procedures will be observed for all NRDA samples. All samples will be transferred with appropriate chain-of-custody forms. Camera memory cards (and accompanying GPS track data files) will be handled under Chain-of-Custody after a card is full or after the study is completed pursuant to the **NRDA Field Sampler Data Management Protocol**, 10-22-2010, which includes the protocol for transferring and uploading digital photos.

All field and laboratory data will be collected, managed and stored in accordance with any written SOPs developed for this project.

All materials associated with the collection or analysis of samples under these protocols or pursuant to any approved work plan, including any remains of samples and, including remains of extracts created during or remaining after analytical testing, must be preserved and disposed of in accordance with the preservation and disposal requirements set forth in Pretrial Orders ("PTOs") # 1, # 30, #35, # 37, #39 and #43 and any other applicable Court Orders governing tangible 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). Destructive analytical testing of oil, dispersant or sediment samples may only be conducted in accordance with PTO # 37, paragraph 11, and PTO # 39, paragraph 11. Circumstances and procedures governing preservation and disposal of sample materials by the trustees must be set forth in a written protocol that is approved by the state or federal agency whose employees or contractors are in possession or control of such materials and must comply with the provisions of PTOs # 1, # 30, # 35, 37, #39 and #43.

B. *Data Sharing*

Copies of all non-analytical data collected in accordance with this plan, (including raw data, field sheets, and field notes, photos, photo logger forms and GPS files), will be transferred to the NOAA NRDA Sample Intake Team following NRDA data management protocols. An identical copy of all documentation will be provided *as requested* to BP/Cardno-ENTRIX and the Louisiana Oil Spill Coordinator's Office (LOSCO) within a reasonable timeframe once data intake, QA analyses and data entry procedures are complete, but no later than 45 days after the data are collected. In the event that this Addendum is not signed by BP when field data are collected, non-analytical data shall be shared with BP not later than 45 days after the Addendum is signed.

Field teams will complete data sheets each day. Each team member will sign the data sheet indicating agreement on the content of the data sheet. The Trustee representative will retain custody of all completed data sheets until they are transferred to the data intake team, which will meet the field crew at either the NOAA lab in Pascagoula, Mississippi or the LDWF Lab in Grand Isle, Louisiana after the completion of each survey window. BP/CardnoENTRIX representatives, if present, may obtain a copy of all data sheets and photographs once data intake has been completed. In addition, the data will also be added to NOAANRDA.org within 72 hours of completion of data intake. Photo-matching will be performed using the Finbase database. The Finbase database (with the photo catalog used for the analysis), including matches, will be provided simultaneously to the trustees and BP under the following schedule:

- NRDA Data collected from July 2011 through May 2012 (under Third Addendum to photo-identification and biopsy plan): November 15, 2012
- NRDA Data collected through August 2012 under this addendum: November 15, 2012

Estimated Costs: The Addendum budget covers the costs of managing the project, processing data (e.g., photos) and analyzing photo-ID data (e.g., managing and matching).

The Parties acknowledge that this budget is an estimate, and that actual costs may prove to be higher. BP's commitment to fund the costs of this work includes any additional reasonable costs within the scope of this approved work plan that may arise. The trustees will make a good faith effort to notify BP in advance of any such increased costs.

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

Literature Cited

- Balmer, B. C., R. S. Wells, L. H. Schwacke, T. K. Rowles, C. Hunter, E. S. Zolman, F. I. Townsend, B. Danielson, A. J. Westgate, W. A. McLellan and D. A. Pabst. 2011. Evaluation of a single-pin, satellite-linked transmitter deployed on bottlenose dolphins (*Tursiops truncatus*) along the coast of Georgia, U.S.A. *Aquatic Mammals*. 37:187-192.
- Wells, R.S. 2003. Dolphin social complexity: Lessons from long-term study and life history. Pp. 32-56 *In*: F.B.M. de Waal and P.L. Tyack, eds., *Animal Social Complexity: Intelligence, Culture, and Individualized Societies*. Harvard University Press, Cambridge, MA.
- Wells, R.S., M.D. Scott and A.B. Irvine. 1987. The social structure of free-ranging bottlenose dolphins. Pp. 247-305 *In*: Genoways, H. (ed.), *Current Mammalogy*, Vol. 1. New York: Plenum Press.

ESTIMATED BUDGET		
OBJECT CLASS	Specifics on Budget Estimate	Amount
Data Analysis labor (NOAA)	1 full-time contractor 2 months)	\$14,000
Photo-analysis labor & fieldwork overtime (NOAA)	1 full-time contractors 4 months (\$56K), \$12.5K overtime (OT) (30 field days for 2 contractors)	\$68,500
Fieldwork Labor (LDWF)	3 staff for 20 days (5d/month for 4 months), 1 staff for 48 days (16d/month for 3 months) (fieldwork, OT, logistics and planning)	\$47,500
Photo-analysis & location data for satellite tagged dolphins (CZS)	Staff time (█ month) & oversight (█/month) (\$2025/month for 8 months)	\$16,200
Argos/CLS America cost (CZS)	Tracking data for satellite-linked tags (8 months)	\$21,000
Lodging & Meals (LDWF & NOAA)	NOAA contractors (2@█/day for █ days,) & LDWF (1@█ day for █ days)	\$43,200
Travel (NOAA)	Airfare, car rental, government vehicle use	\$10,000
Vessel use (LDWF & NOAA)	1 vessel, 50 days @\$500/day (fuel, boat & trailer maintenance, engine replacement fee, misc.)	\$25,000
Supplies (LDWF & NOAA)	Batteries, SD cards	\$1,500
Equipment (NOAA)	Data backup	\$2,000
Accelerated photo-analysis	2 contractors for █ months @\$60K	\$120,000
Project Total		\$368,900

Table 1. NRDA 2012 Bottlenose Dolphin Tag Monitoring and Reproductive Outcomes Sampling Schedule. Survey days in February - May will be conducted at any time during the month, depending on optimal weather conditions and availability of LDWF staff. Survey days in June-August will be conducted during optimal weather conditions with an 8-day survey window.

Season/Site	February	March	April	May	June	July	August
Barataria Bay (days)	5 days	5 days	5 days	5 days	5 days within 8- day window	5 days within 8- day window	5 days within 8- day window
Mississippi Sound (days)					5 days within 8- day window	5 days within 8- day window	5 days within 8- day window