

# **Preassessment of Injury to Ospreys from the Deepwater Horizon (MC 252) Oil Spill**

**Final Report  
USFWS Contract # F11PC00050, Study # 9  
Contract Title: William and Mary Osprey Study  
October 2011**

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## **INTRODUCTION**

The study was performed under a contract with the U.S. Fish and Wildlife Service on behalf of the Natural Resource Trustees for the Deepwater Horizon natural resource damage assessment and restoration case. This End-of-Study Draft Summary Report is submitted in fulfillment of the reporting requirements in Contract # F11PC00050, Study # 9 and Title: William and Mary Osprey Study.

## **Objectives**

This study collected data for estimation of re-occupancy rates for osprey nests within the Area of Potential Impact (API) and Reference (REF) study areas along the Gulf Coast. These measures may inform estimates of any potential spill-related changes in the number of active breeding territories. In addition, a highly concentrated population of osprey nests in the API was monitored during the 2011 breeding season to determine post-spill changes in productivity.

Specific objectives include:

1. Survey 30% of the study area to map osprey nests occupied during the 2010 breeding season.
2. Collect nesting material from a subset of nests mapped in objective one for the assessment of oiling.
3. Resurvey nests mapped in objective one during the early phase of the 2011 breeding season to assess re-occupation rates.
4. To document 2011 nest activity and chick production at selected on Horn Island and East Ship Island, MS.

## **Geographic Scope**

The geographic scope of the study included the nearshore areas of the Area of Potential Impact (API) from Atchafalaya Bay, LA to Apalachicola Bay, FL and the Reference area (REF) from Apalachicola Bay, FL to Charlotte Harbor, FL (Figure 1). Nearshore included all land and water from the barrier islands to 1 km inland on the mainland of the Gulf of Mexico.

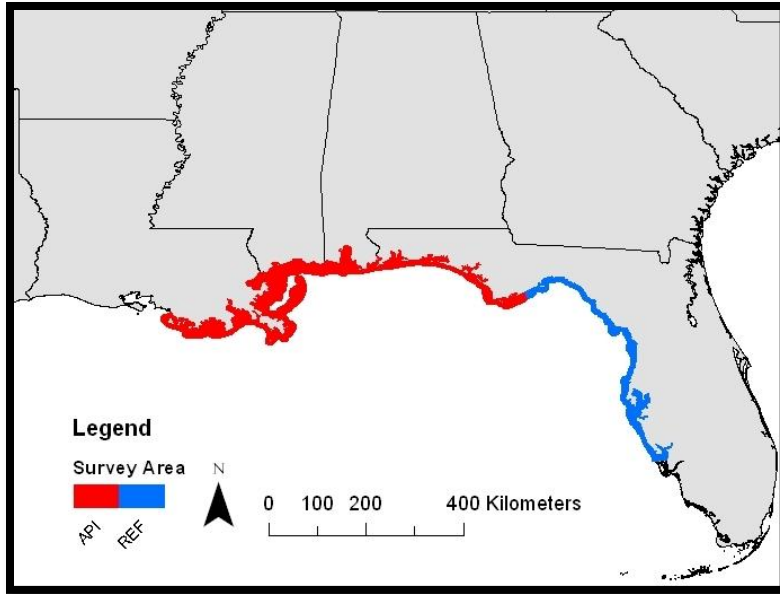


Figure 1. Geographic scope of the Area of Potential Impact (API) and Reference (REF) for the Osprey study.

## METHODS

### Rapid Assessment Aerial Survey

We conducted aerial surveys during December 4-6, 2010 in 30% of the API and REF study areas to document existing nest structures that were believed to be active during the 2010 breeding season (Figure 2). Surveys were conducted by two observers from a fixed-wing aircraft and nests were mapped and coded according standard operating protocols for the study (Appendix A). In January 2011, three nests were reported by Louisiana Wildlife Management Area staff on or near Pass a Loutre WMA. These areas were surveyed by plane on January 26<sup>th</sup> but not found by observers. The nests were later located in February on the ground with assistance from Pass a Loutre WMA staff.

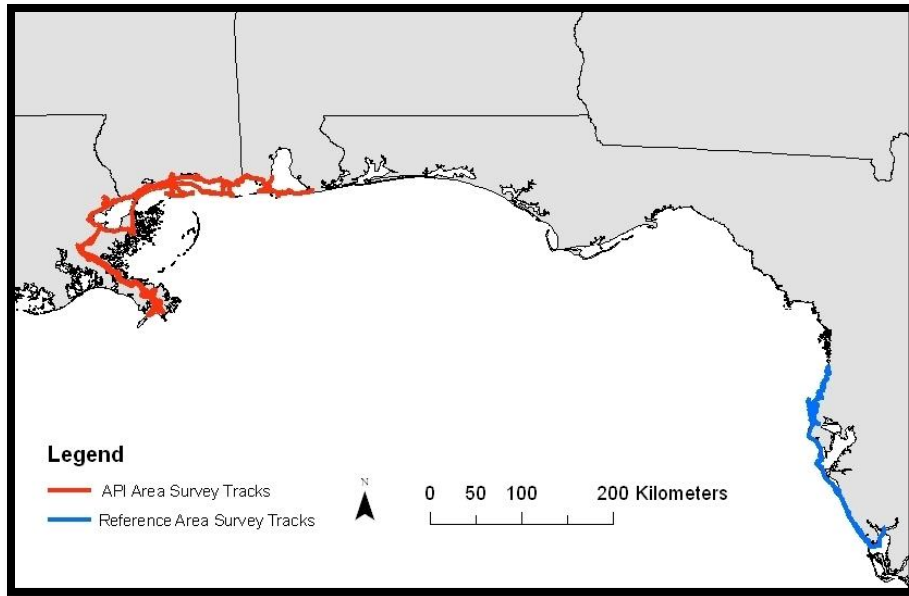


Figure 2. Aerial Survey routes for Osprey Rapid Assessment flights in December 2010 and January 2011. Routes covered approximately 30% of each study area.

### Rapid Assessment Ground Sampling

Nests in Florida, Mississippi, and Louisiana were accessed by ground crews in January and February 2011 to examine contents and collect samples of nest lining for evidence of oiling. Sampling only occurred if nests could be safely accessed. This eliminated a majority of nests in the API because of the instability of dead trees used as nest substrates. Nests were accessed by extension ladders, bucket trucks, or climbing channel markers (Figure 3). Nest lining samples were collected and stored in accordance with standard operating procedures for this task (Appendix B).



Figure 3. Libby Mojica and Fletcher Smith sampled Osprey nests on Horn Island, MS (left), Singing River Island, MS (middle), and Pass a Loutre, LA (right).

### Reoccupation Surveys

Two aerial surveys were conducted to document reoccupation of 2010 nests during the 2011 breeding season. The REF study area was surveyed on March 11 and the API on March 31.

Flight restrictions over Gulf Islands National Seashore required observations of 46 nests in the API to be conducted on foot. These nests were surveyed on April 28-29th. One osprey nest (API-003) was not resurveyed on the March 31<sup>st</sup> flight or by foot.

### **Productivity Surveys**

Horn and East Ship Islands were surveyed by foot on April 28-29, May 24-25, June 22-23, and July 9<sup>th</sup>. Data collection teams included staff from the College of William and Mary, Entrix, National Park Service, and US Fish and Wildlife Service (Figure 4).



Figure 4. Aaron Richards (Entrix) and Libby Mojica (William and Mary) surveying Osprey nests on Horn Island, MS (Left). A nest on Horn Island occupied by two adult Osprey (API-097 (Right)).

## **RESULTS**

### **Rapid Assessment Aerial Survey**

During aerial surveys in December 2010, a total of 79 Osprey nests were mapped in the API and 80 nests in the REF. A majority of the nests documented in the API were in dead trees and clustered on the barrier islands of Mississippi (Figure 4).

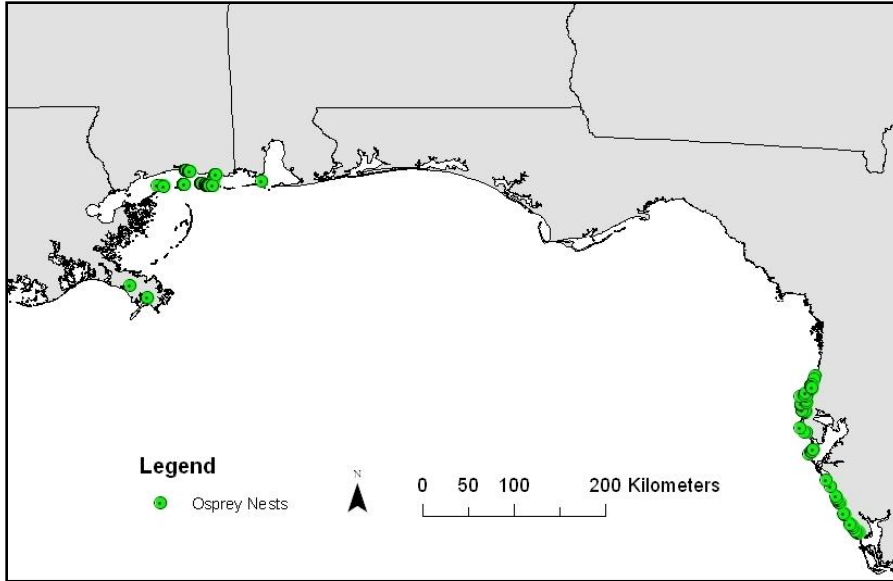


Figure 5. Osprey nests detected from aerial and ground surveys.

### Rapid Assessment Ground Sampling

Orange phosphorescing substances were documented in nesting material on Horn and Singing River Islands in Mississippi (Figure 5, Table 1). Nest lining material in two nests, API-008 Singing River Island and API-083 Pass a Loutre WMA, were inconclusive when examined under UV light and require further examination by a laboratory. Feathers were collected from Osprey nests where available and none had visible orange phosphorescence under UV light (API-006, API-044, REF-008, REF-009, REF-027, REF-0028).

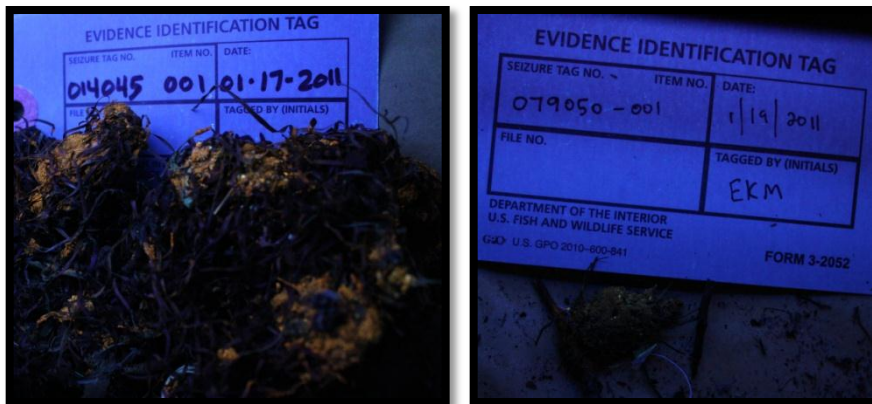


Figure 6. Nest material reflecting orange under UV light from nests on Horn Island (left) and Singing River Island (right).

Table 1. Osprey nests visited on the ground in January-February 2011. Nest lining was collected from all accessible nests and evaluated for possible oil exposure (orange phosphorescence) with a UV light. Coordinates were recorded at the base of each nest structure in WGS 1984.

Nest	Nest Lining collected?	Orange phosphorescent		Latitude	Longitude	Location
		Nest Lining?				
API-006	Yes	Yes		30.33796	-88.57007	Singing River, MS
API-008	Yes	Possible*		30.33823	-88.57895	Singing River, MS
API-044	Yes	Yes		30.24709	-88.72060	Horn Island, MS
API-075	Yes	Yes		30.22632	-88.60276	Horn Island, MS
API-079	Yes	Yes		30.22632	-88.60601	Horn Island, MS
API-080	Yes	No		30.33300	-88.56935	Singing River, MS
API-082	Yes	No		29.12288	-89.24337	Pass a Loutre, LA
API-083	Yes	Possible*		29.13349	-89.24099	Pass a Loutre, LA
API-084	No	Not Evaluated		29.24976	-89.41048	Venice, LA
REF-001	Yes	No		26.82536	-82.26456	Placida Harbor, FL
REF-006	Yes	No		26.82803	-82.27155	Placida Harbor, FL
REF-008	Yes	No		26.83934	-82.27973	Placida Harbor, FL
REF-009	Yes	No		26.83228	-82.27186	Placida Harbor, FL
REF-026	Yes	No		27.11320	-82.46271	Venice, FL
REF-027	Yes	No		27.10946	-82.44996	Venice, FL
REF-028	Yes	No		27.11018	-82.45562	Venice, FL
REF-030	Yes	No		27.13160	-82.47021	Laurel, FL
REF-031	No	Not Evaluated		27.15112	-82.47848	Laurel, FL
REF-032	Yes	No		27.16136	-82.48450	Laurel, FL
REF-033	Yes	No		27.17862	-82.49381	Osprey, FL
REF-050	No	Not Evaluated		27.91748	-82.62600	Dunedin, FL
REF-069	Yes	No		28.16059	-82.77416	Tarpon Springs, FL

\*Items in the nest phosphoresced yellow or orange but a definitive decision was not made during collection whether nest lining was contaminated with oil.

## Reoccupation Surveys

A total of 159 nests monitored for reoccupation in 2011. Occupation by Ospreys was documented at 116 of the 159 nests (Table 2).

Table 2. Occupation of osprey nests in the 2011 breeding season.

	Unoccupied	Occupied	Total
API	22	56	78
REF	20	60	80
Total	42	116	159

## Productivity Surveys

A total 94 nests were monitored on Horn and East Ship Islands. Of these, 64 were documented as occupied and 47 were active. A total of 30 chicks were determined to have fledged from 16 nests.

## **ACKNOWLEDGMENTS**

We thank the following people for their assistance in the field Megan Boldenow (USFWS), Brenda Zaun (USFWS), Tammy Johnson (USFWS), Wendy Brewer (NPS), Todd Baker (LWLF), Jerry Galloway (LWLF), Carly Galrden (Entrix), Aaron Richard (Entrix), Taj Schottland (Entrix), Winston Rutherford (Entrix), Wendy Swindell (Entrix), and Craig Kling (Entrix). Gary Hopkins and Jolene Williams at Gulf Islands National Seashore provided logistical and permitting support. These US Fish and Wildlife Service staff assisted with contracting and implementation of the osprey plan: Anne Secord, Alfredo Begazo, Pete Tuttle, Sue Cameron, Cindy Kane, Robyn Cobb, Resee Collins, Anne Condon, Amy Defreese, Cindy Fury, Anne Hecht, Chuck Hunter, Mark Koneff, Craig Koppie, Karen Marlowe, Carolyn Marn, Candace Martino, Brian Millsap, Mark Otto, John Schmerfeld, Brenda Smith, Mark Snyder, Brian Spears, Veronica Varela, Carol Aron, Mike Pixely, Tim Breen, Angela Matz, Cara Collins, Vincent Chua, Dan Reinkensmeyer, Dave Mosby, Dan Sparks, Jean Calhoun, Tammy Johnson, Tina Moran, Karen Nelson, Megan Boldenow , Peggy Guyton, Denise Klimas, and Brenda Zaun. Our highly skilled pilots were Erik Himmel and Charlie Hammond of Hammond Air Service, Ron Towater of Ocala Aviation, and Brokaw Van Anda of Van Anda Aviation. Boat captains included Horn Island Charters/Due South Charters (Biloxi, MS), I'm Alone Charters Inc (Pascagoula, MS), Skinny Water Charters (Tampa, FL), and Capt. Geoffrey Page (Venice, FL). Access to nests on Singing River Island was provided by Noblitt Electric Inc and the Port of Pascagoula.

## **APPENDIX A. Standard Operating Procedures for Osprey Rapid Assessment Aerial Surveys**

### **Study Objectives**

To locate, map and characterize a subsample of osprey nests occupied during the 2010 breeding season. Mapped nests will be checked from the ground to collect nest lining material, addled eggs, and dead chicks. Nests will be revisited in the spring of 2011 to document reoccupation by breeding adults.

### **Study Areas**

Aerial mapping will be conducted within at least 30% of both the area of potential impact (API) and reference study areas (REF) (figure 1.)

1. The API includes near shore waters from Atchafalaya Bay, LA to Apalachicola Bay, FL.
2. The REF includes near shore waters east of Apalachicola Bay, FL to Charlotte Harbor, FL.

### **Materials**

PPE equipment  
Marine radio and cell phone communications  
GPS (handheld and GPS enabled notebook computer)  
Camera  
Data form

### **Flight Protocols**

#### **1. Pre-flight Protocols**

All activities will conform to "Safety requirements and check in protocols for NRDA field team tracking in Houma Sector for MS Canyon 252" dated 4 September 2010. All flights will follow National Park Service (NPS) and National Wildlife Refuge (NWR) protocols when crossing over their lands.

- Review of equipment checklist to ensure all equipment is present, working properly and replacement batteries are available and charged
- Pre-flight briefing with observers and pilot to review flight plan and protocols.

#### **2. Flight Protocols**

##### **a. Mapping Flight**

Flights will be conducted by a pilot and 2 observers along the primary Gulf shoreline in areas with adjacent uplands. Area of coverage will include a band approximately 1 km wide but will also include barrier islands. In areas with adjacent marsh habitat, a series of transects will be flown at altitudes and spacing to maximize nest detection probability.

All mapping flights will occur at altitudes of approximately 100m when flying over open water, unpopulated shoreline, and marsh. In accordance with The Federal Aviation Regulation, Sec. 91.119, minimum altitude will increase to 500 feet over sparsely populated areas and 1000 feet

over any congested area of a city, town, or settlement, or over any open air assembly of persons

Observations will be conducted by two biologists. Upon locating a nest, the pilot will circle the nest allowing one biologist to map the nest on a GPS-enabled notebook computer, while the other biologist characterizes the nest.

#### **b. Nest Characterization**

All data will be recorded on the Osprey Rapid Assessment Aerial Survey Form (appendix 1)

- Each nest or nest remnant detected will be given a unique, alpha-numeric code.
- Nests will be mapped using a GPS-enabled notebook.
- Nest substrate, nest condition, nest lining and osprey activity will be recorded using criteria listed on the Osprey Rapid Assessment Aerial Survey Form

### **3. Post-flight Protocols**

- Nest waypoints and GPS track will be downloaded from GPS unit and uploaded onto the NRDA information infrastructure.
- Nest coordinates (WGS 84 DD.ddddd) from the waypoints will be recorded on Osprey Rapid Assessment Aerial Survey Form.
- Osprey Rapid Assessment Aerial Survey Form will be reviewed by both observers, signed and dated, scanned, and original data sheets mailed to NRDA.
- Data from completed Osprey Rapid Assessment Aerial Survey Form will be entered into NRDA information infrastructure.



# **APPENDIX B. Standard Operating Procedures for Osprey Ground Nest Check**

**ORIGINAL 1/14/2011, REVISED 6/20/2011**

## **Study Objectives**

1. To access osprey nests occupied during the 2010 breeding season, examine nest contents for oil, collect nest lining samples, and collect addled eggs and dead chicks.
2. To revisit the osprey nests in spring 2011 to document rate of reoccupation by breeding adults.
3. To document 2011 nest activity and chick production at selected nests.

## **Study Areas**

An aerial survey will be used to locate and map nests within the 30% of study areas.

1. Surveys in the Area of Potential Impact include nearshore waters from Atchafalaya Bay, LA to Pensacola FL.
2. Surveys in the reference area include nearshore waters east of Apalachicola Bay, FL to Charlotte Harbor, FL. Standard Operating

## **Materials**

- PPE equipment
- Boat
- Marine radio and cell phone communications
- Field notebook
- GPS (handheld and marine)
- Camera
- Data forms
- Sample collection supplies
- Black lights
- Copies of state and federal permits to work with Osprey nests
- Mirror pole
- First aid kit
- Tree climbing equipment: Self-closing snaps (locking), tensile strength 5,000 lbs; Carabineers (positive-locking), tensile strength 5,000 lbs; Climbing lines (synthetic, >1/2" diameter, tensile strength 5,400 lbs; Work-positioning lanyards; Prusik loops and split-tails; Climbing Saddle with chest harness; throw line and shot pouch; Telescopic pole; helmet; safety glasses; sturdy shoes; gloves

## **Pre-Fieldwork Protocols**

All activities will conform to "*Safety requirements and check in protocols for NRDA field team tracking in Houma Sector for MS Canyon 252*" dated 29 January 2011.

## **Field Work Protocols**

### *Nest Approach*

Depending on location and nest substrate, access to nests may be by vehicle, boat, or on foot. Canoes, kayaks, or an outboard motorboat may be used to navigate to the nest. During the breeding season (March –July), nests on National Park Service land will be viewed from the nearest shoreline beach to avoid disturbance to the adults or chicks.

### *Nest Observations*

For selected nests predominantly at Gulf Islands National Seashore, nests will be visited once a month through July 15<sup>th</sup> 2011 to document activity and chick production, in accordance with the April 2011 Osprey Plan Addendum. Data collected during each nest visit will be recorded on an *Osprey Rapid Assessment Nest Check Form*. Observers will view nests for up to 15 minutes with binoculars or spotting scope to assess breeding behavior (nest building, incubating, brooding, feeding chicks, etc.). Select nests in accessible trees may be viewed with a mirror pole to count eggs or chicks. Chicks will be counted when they are old enough that heads can be counted over the rim of the nest. A nest will be considered successful if at least one chick reaches 7 weeks of age. If a nest appears to be inactive after being previously observed as active (eggs or chicks in nest), observers will approach the base of the tree to look for evidence of predators (raccoon tracks, scat, or claw marks). Any sign of predation will be photographed. Because of NPS permit restrictions, nest tree coordinates recorded on the ground will be calculated from the shoreline using a digital range finder and compass bearing and later calculated by a script in ArcGIS.

### *Entering the Nest*

Selected nests may be accessed in accordance with the November 2010 Osprey Study Plan. Nest access will vary by substrate. All nests will be visually evaluated for safety before attempting to access the nest. Only nests determined to be safe will be accessed. Standard arborist equipment will be used to climb nests in trees using a fixed rope ascent or climbing spurs per International Society of Arborist guidelines. Nests on manmade structures will be accessed by ladder or roof access. Nests on channel markers will be accessed by climbing the structure's ladder. A mirror mounted on a telescopic pole will be used to view the inside of the nests that are easily accessible or if access into the nest is unsafe.

### *Site inspection*

Each nest will be evaluated for safety concerns before work can begin. Safety of the field crew is the number one priority. Field crews will wear PPE and have clear lines of communications while assessing the work site. Potential safety hazards such as electrical lines, sharp metal, rotting boards, strong winds or inclement weather will be identified. Trees will be evaluated for signs of rot, dead limbs, biting insects, poisonous plants, and other potential unsafe conditions.

### *Gear inspection*

Climbing gear will be inspected before each climb including climbing saddles, helmets, ropes, and mechanical devices. Any gear showing fraying or damage will be replaced before the climb.

### *Pre-climb inspection*

Field crews will inspect the tree and plan the climbing route while still on the ground. Safe tie-in points will be identified to provide access into the nest.

### *Nest evaluation*

1. Data collected at each nest will be recorded on an *Osprey Rapid Assessment Nest Check Form*
2. Each nest will be evaluated for condition of nest, nest lining, and bird behavior.
  - a. Nest Condition
    - i. Intact: nest is not damaged and has a fully formed nest cup
    - ii. Damaged: nest is leaning in tree or falling apart, otherwise nest is intact
    - iii. <1/3 remaining: a small remnant of the original nest remains in the tree
    - iv. Absent: nothing of the nest remains in the tree
  - b. Nest lining
    - i. Good: nest lining from the previous breeding season is present and intact in nest cup. Nest lining may include seaweed, grass, pine straw and other materials.
    - ii. Poor: minimal nest lining remains in nest. Sticks at center of nest visible without nest lining to cover them.
    - iii. Absent: No nest lining observed in nest.
    - iv. Not-evaluated (N/E): this option should be used when nests are observed from the ground and the nest lining contents cannot be directly observed.
  - c. Bird data
    - i. Number of adults: record the number of adult Osprey within the breeding territory. If no adults are observed within 10 minutes, zero adults are recorded in this data field.
    - ii. Number of juveniles: record the number of fledged juvenile Osprey.
    - iii. Number of eggs: assumed to be at least 1 egg if an adult is observed in incubating position on the nest.
    - iv. Number of chicks: assumed to be at least 1 chick if adult is observed in brooding position or feeding behavior on the nest. If adults are present at the nest or within the territory but are not incubating, brooding, or feeding young during the observation period the nest was assumed to be empty of chicks and/or eggs.
    - v. Chick Age (weeks):
      1. Not assessed (N/A) or not evaluated (N/E) should be used when the "Number of Chicks" data field is zero.
      2.  $\leq 2$  weeks: chicks are tightly brooded in the nest by adults. Chick heads cannot be seen over the rim of the nest.

3. 2-4 weeks old: small chick heads can be seen over the rim of the nest, primarily during feeding. Chicks may be intermittently brooded depending on weather conditions, often just shaded by the adult's body.
  4. 5-6 weeks old: chicks will begin to feed themselves when food is delivered to the nest by adults.
  5. 7-8 weeks old: chicks begin fledging the nest. If chicks are in the nest, often standing in nest or flapping wings.
3. Photographs of each nest and its contents will be taken to document condition. Photographs will be cataloged and stored per "*Guidance for transferring digital photographs from wildlife operations and NRDA field teams to the USFWS data management group.*"

### **Sample Collection**

1. Nest lining materials will be collected from each accessible nest during the non-breeding season. Samples will be stored in bags, sealed, and labeled per NRDA Chain-of-Custody procedures.
2. Samples will be evaluated for oil exposure using ultraviolet light per the USFWS document "*Procedure for Photography of Oil on Avian Plumage Using an Ultraviolet Light Source*" dated 11 Sept 2010. Photos of samples under UV and non-UV light will be taken for evidence and stored on SD cards.
3. Samples will be stored at the CCB office and shipped together at the end of the field work to USFWS or transferred immediately to USFWS personnel at the Fairhope, Alabama Field Office.
4. Addled eggs or carcasses found in the nest during occupancy surveys will be handled and processed in the following manner:

Nitrile gloves will be used when handling bird carcasses. A new pair of gloves will be donned prior to handling each bird. A blue evidence identification tag (Form 3-2052) will be filled out for each individual egg or carcass. The carcass or egg will be photographed with the completed blue identification tag visible next to the carcass. Information will be recorded on species, lat/long of carcass collection location (decimal degrees, WGS 84), field photograph number; and amount/description of oiling. Determinations on carcass condition, scavenging, and emaciation should be made by experienced personnel as time allows.

It is important that oiled or unoiled carcasses or eggs do not touch plastic bags. Place the carcass or egg in a paper bag, then place the paper-bagged-carcass/egg in a plastic bag. Do not place used gloves in the bag with the carcass. Securely attach the completed blue Evidence Identification Tag to the outside of the plastic bag. Transfer the bagged carcass and accompanying chain of custody report to the Fairhope, AL Office of USFWS.

### **Non-Osprey Wildlife**

For marine mammals and turtles (found dead or injured) contact the Institute for Marine Mammal Studies (IMMS) 1-888-767-3657. If other injured, oiled or unoiled, birds or other wildlife are found, contact Gary Hopkins, Lead Biologist for Gulf Islands National Seashore at 228-230-4104.

Date: \_\_\_/\_\_\_/\_\_\_

Study Area (circle): API or Reference

Observers: \_\_\_\_\_ Entrix Observer: \_\_\_\_\_

Nest Code: \_\_\_\_\_ Coordinates WGS 84 DD.ddddd: \_\_\_\_\_ N \_\_\_\_\_ W \_\_\_\_\_

Nest Data			Bird Data					
Nest Substrate	Nest Condition	Nest Lining	If Oil Present Y/N	Number of Adults	Number of Juveniles	Number of Eggs	Number of Chicks	Chick Age (weeks) Y/N
Photo Card and Photo Numbers			Photo Card and Photo Numbers		Adult 1 Behavior	Adult 2 Behavior	Oiling Y/N	

Collection Data Y/N				Banding Data Y/N	
Blood	Feathers	Eggs	Chicks	Nest Lining	Measurements
Photo Card and Photo Numbers					
Adults Banded				Chicks Banded	
Photo Card and Photo Numbers					

Observer 1 Signature: \_\_\_\_\_ Date: \_\_\_\_\_ Observer 2 Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Data entered (date): \_\_\_/\_\_\_/\_\_\_ Database Form ID: \_\_\_\_\_ Entrix Observer Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Database entry person (name): \_\_\_\_\_ Database entry person (signature): \_\_\_\_\_

<b>Nest Substrate</b> 1 Day Marker 2 Light Marker 3 Live Tree 4 Dead Tree 5 Duck Blind 6 Platform 7 Other Man Made (specify in notes)	<b>Nest Condition</b> 1 Intact 2 Damaged 3 <1/3 remnant 4 Absent	<b>Nest Lining</b> 1 Good 2 Poor 3 Absent	<b>Adult Behavior</b> 1 None 2 Osprey on Nest 3 Osprey within 200 m 4 Incubating Position 5 Brooding Position 6 Feeding Young
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Evidence Tag	SD card	Photo Number	Comments

Notes:

