SUPPLEMENTAL BIOLOGICAL ASSESSMENTS

Louisiana Island Restoration:
Caillou Lake Headlands (Whiskey Island), Chenier-Ronquille, and Shell Island

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Contents

Introduction

For an explanation of the origin of this project and certain defined terms, such as "Oil Spill" or "Trustees", please see the cover letter accompanying this Supplemental BA, which is by this reference incorporated herein.

This supplemental Biological Assessment (BA) provides additional information pursuant to the ESA, to ensure the proposed projects are not likely to jeopardize the continued existence of the proposed[1] rufa red knot[2] (*Calidris canutus rufa*) at three barrier island locations in Louisiana: Caillou Lake Headlands (Whiskey Island), Chenier Ronquille, and Shell Island (West Lobe and Portions of East Lobe) (Figure 1). Each of the proposed barrier island restoration project locations is separate from the other. These projects have been previously reviewed through separate section 7 consultations with the U.S. Fish and Wildlife Service (See Tables 1 and 2 for details of prior consultations) for effects to listed species and designated critical habitats and the findings resulting from the reviews are still valid (Table 1, Table 2). Therefore, the information within this Supplemental BA is presented to facilitate a conference for the proposed red knot for each project location. In addition, we have reviewed the Chenier Ronquille and Shell Island project with respect to West Indian manatee as manatee was not previously considered (Table 1). We have also reviewed the Shell Island project with respect to piping plover (in addition to red knot) because the environmental baseline of Shell Island has changed since the original consultation.

While North Breton Island is part of the overall proposed Louisiana Outer Coast Restoration Project developed by the Trustees (see cover letter), it is not addressed in this supplemental BA, because a separate consultation is already in progress. The three barrier island projects are presented here together to facilitate review and reduce redundancy of repetitive information.

The outline of this Supplemental BA is non-traditional in that we will first present information that is common to all projects (e.g., status of the species, life history). Then project specific chapters will present the action area, environmental baseline, a brief summary of the proposed project, potential effects from the project on the species, a conclusion and effect determination, and references cited.

[1] Section 7(a)(4) of the Endangered Species Act (ESA) of 1973, as amended, provides a mechanism for identifying and resolving potential conflicts between a proposed action and proposed species or proposed critical habitat at an early planning stage. While consultations are required when the proposed action may affect listed species, a conference is required only when the proposed action is likely to jeopardize the continued existence of a proposed species or destroy or adversely modify proposed critical habitat. However, Federal action agencies may request a conference on any proposed action that may affect a proposed species or proposed critical habitat.

[2] All of the information in this document is in reference to the rufa red knot, unless otherwise stated.

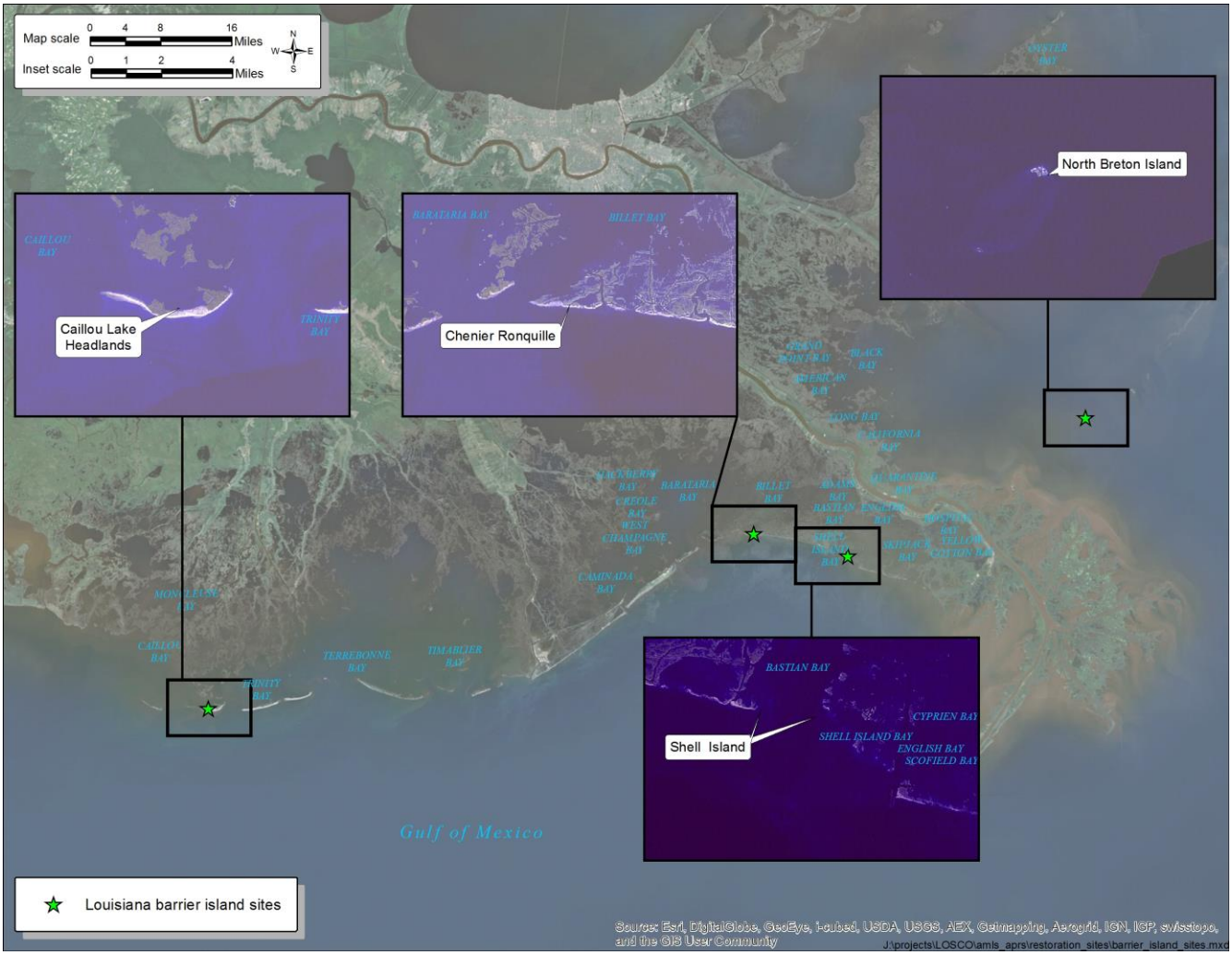

Figure 1. Louisiana Outer Coast Restoration locations. From west to east: Caillou Lake Headlands (also known as Whiskey Island), Chenier Ronquille, the West Lobe and portions of the East Lobe of Shell Island, and North Breton Island.

Table 1. Species and critical habitat evaluated in previous consultations for the proposed project locations included in this Supplemental BA.

LOCATION	CONSULTATION DATE	SPECIES DETERMINATION						CRITICAL HABITAT DETERMINATION
		Gulf sturgeon	**Pallid sturgeon**	**West Indian manatee**	**Sea turtles[3]**	**Piping plover**	**Red knot**	**Piping plover**
Caillou Lake Headlands (Whiskey Island)	September 23, 2010 and August 12, 2013	N/A[4]	N/A	NLAA[5]	NE[6]	NJ[7]	Not considered [8]	NAM[9]
Chenier Ronquille[10]	June 7, 2012	N/A	N/A	N/A	N/A	NLAA	Not considered	N/A
Shell Island[11]	May 22, 2012	N/A	NLAA	NLAA	N/A	NLAA	Not considered	N/A

[3] Kemp's ridley, Hawksbill, loggerhead, leatherback, and green sea turtles.
[4] N/A = species and/or critical habitat were not addressed in the consultation indicating a "no effect" determination by the project sponsor due to a lack pf presence in or near the action area.
[5] NLAA = not likely to adversely affect.
[6] NE = no effect.
[7] NJ = may affect and is likely to adversely affect; however the action will not jeopardize the survival and recovery of the species.
[8] The red knot was proposed for listing on September 30, 2013. Therefore, the proposed red knot was not considered in these consultations.
[9] NAM = no adverse modification or destruction of critical habitat.
[10] Migratory birds were considered in this consultation and best management practices were included to avoid take.
[11] Migratory birds were considered in this consultation and a Migratory bird abatement plan is necessary to avoid take.

Table 2. Recent relevant consultation documents for each barrier island, including biological assessments and biological opinions.

LOCATION	DOCUMENTS
Caillou Lake Headlands (Whiskey Island)	USFWS. 2010. Final Biological Opinion Louisiana Coastal Area Terrebonne Basin Barrier Shoreline Restoration Project, Terrebonne Parish, Louisiana (43440-2010-F-2767). Prepared by U.S. Fish and Wildlife Service, Lafayette, Louisiana. 99pp. CECI. 2013. Caillou Lake Headlands Restoration Project (TE-100_ Biological Assessment LDNR No. 2503-12-22 Terrebonne Parish, Louisiana. On behalf of the Coastal Protection and Restoration Authority of Louisiana. Prepared and submitted by Coastal Engineering Consultants, Inc. (CECI). July 12. USFWS. 2013. Letter to Colonel Richard L. Hansen, U.S. Army Corps of Engineers. August 12. Amended consultation for the biological assessment from the Louisiana Coastal Protection and Restoration Authority's (CPRA) consultant, Coastal Engineering Consultants, Inc. (CECI), regarding CPRA's permit application (MVN-2013-0266-WOO) for their proposed Caillou Lake Headland Restoration (i.e., Whiskey Island, CPRA Project TE-l 00) project in Terrebonne Parish, Louisiana.
Chenier Ronquille	NOAA. 2013. Chenier Ronquille Barrier Island Restoration Project Environmental Assessment, Fed No. BA-76, Plaquemines Parish, Louisiana. USFWS. 2012. Letter to Dr. John D. Foret, National Marine Fisheries Service. June 7. Response to request for concurrence that the proposed project is not likely to adversely affect piping plover.
Shell Island	USFWS. 2012. Letter to Colonel Edward R. Fleming, U.S. Army Corps of Engineers. May 22, 2012. Informal consultation for the Shell Island East Restoration Berm Enhancement Project and the Shell Island West Natural Resource Damage Assessment Restoration Project. 3pp.

Chapter 1 – Status of the Red knot

There are six subspecies of red knot (*Calidris canutus*); however, only one subspecies, the rufa red knot (*C. c. rufa*), is currently proposed for listing (as of September 30, 2013) and may be affected by the proposed projects. All of the following information regarding red knot is summarized from the Species Assessment and Listing Priority Assignment Form (USFWS 2011) and proposed listing rule (78 FR 60024) and is in reference to the rufa red knot, unless otherwise stated.

Description of the Species

The red knot is a medium-sized shorebird about 9 to 11 inches (in) (23 to 28 centimeters) in length with a proportionately small head, small eyes, short neck, and short legs. It has a black bill which is not much longer than head length. Legs are typically dark gray to black, but sometimes greenish in juveniles or older birds in non-breeding plumage (feathers). Because the proposed project areas (herein sometimes collectively referred to as the "action area") are not breeding areas, the red knot would primarily be exhibiting non-breeding plumage[12] which is dusky gray above and whitish below. Many individuals, however, would acquire breeding plumage in the action area, prior to and during spring migration (March-May), and may retain breeding plumage during early portions of fall migration (July-September) (Baker et al. 2013). Juveniles resemble non-breeding adults, but the feathers of the scapulars (shoulders) and wing coverts (small feathers covering base of larger feathers) are edged with white and have narrow, dark subterminal bands, giving the feather a scalloped appearance. Adult body mass varies seasonally, with lowest mean mass during early winter (125 grams (g)) and highest mean values during spring (205 g) and fall (172 g) migration.

General Range

The range of the red knot during migration extends along the Atlantic and Gulf of Mexico coasts of North, Central, and South America, from the Canadian arctic to the southernmost extent of South America.

Breeding

Breeding occurs within the central Canadian high arctic. Red knots generally nest in dry, slightly elevated tundra locations. Red knots are estimated to begin breeding at two years of age and may survive to seven years. Breeding success of High Arctic shorebirds, like red knot, varies dramatically among years in a somewhat cyclical manner. Breeding seems to be affected by two main factors: weather that affects nesting conditions and food availability, and the abundance of arctic lemmings[13] which affects predation rates.

Migration

Southward migration from arctic breeding areas begins in mid-July, stopping at various locations along the Atlantic slope to feed and rest. Red knots would generally be expected to "stopover" within the action area from late July through October, then continue their fall migration to their primary wintering grounds, or remain on the Gulf coast for the winter.

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[12] For information regarding breeding plumage descriptions, see the Species Assessment and Listing Priority Assignment Form (USFWS 2011b) or Baker et al. (2013).

[13] Artic lemmings are a rodent that serves as a prey source for many predators. When lemmings are abundant predators concentrate on the lemmings, and shorebirds breed successfully. When lemming populations are limited, predators switch to shorebird eggs and chicks 78 FR 60024.

For red knots wintering in South America, the birds are present in the South America wintering areas from November through February. Range and distribution during the fall and spring migration and winter in Mexico and Central America are not well known. It is also unknown if segregation of juvenile and adult red knots occurs on the wintering grounds, if juveniles may winter separately from adults, or occur in habitats not used by adults (78 FR 60024).

During the spring migration, red knots begin moving northward along the Atlantic coast of South America in late February or March. The northward migration is very rapid. Red knots complete their pass along the Atlantic coast of the United States from the middle to the end of May. Known spring stopover areas are along coastal Virginia and Delaware Bay in Delaware and New Jersey, where the birds are present in mid-to late May in high abundance (i.e., approximately 90 percent of the entire population may be present in the Delaware Bay in a single day). After a few weeks during the spring stopover on the mid-Atlantic Coast, the red knot may make additional stops in southern Canada and then return to their breeding grounds in the Canadian Artic.

Wintering and Foraging Habitat

Wintering areas for the red knot include the Atlantic coasts of Argentina and Chile (particularly the island of Tierra del Fuego that spans both countries), the north coast of Brazil (particularly in the State of Maranhao), the Northwest Gulf of Mexico from the Mexican State of Tamaulipas through Texas (particularly at Laguna Madre) to Louisiana, and the Southeast United States from Florida (particularly the central Gulf coast) to North Carolina (78 FR 60024 and references within). Smaller numbers of red knot winter in the Caribbean, and along the central Gulf coast (Alabama, Mississippi), the mid-Atlantic, and the Northeast United States. In the United States, the red knot is found principally in intertidal marine habitats, especially near coastal inlets, estuaries, and bays, or along restinga formations[14].

Within the United States, red knot migratory and wintering habitats are principally utilized for resting and foraging activities. In the Southeastern United States, red knots commonly forage on bivalves, gastropods, and crustaceans along sandy beaches, tidal mudflats, salt marshes, and peat banks. In Florida, the birds also use mangrove and brackish lagoons. Along the Texas coast, red knots forage on beaches, oyster reefs, and exposed bay bottoms and roost on high sand flats, reefs, and other sites protected from high tides. Coquina clams are a frequent and often important food resource for red knots, and are common along Gulf beaches and in some places occur abundantly.

Demographics

Assessing the population size of a wide-ranging migratory species such as the red knot is difficult as counts within their expansive Arctic breeding areas are not feasible. More recently, analysis of multi-year data generated within two key red knot localities (Tierra del Fuego, wintering area and Delaware Bay, migration stopover area) demonstrated roughly a 75 percent decline in species' population estimates since the 1980s (78 FR 60024 and references within).

A large portion of individual red knot accounts occurring within the fall or spring stopover and / or wintering areas along the Gulf coast has been documented within a centralized database (AKN 2013). The southeastern wintering population (Florida, Georgia, South Carolina, North Carolina, and Virginia) was reported at approximately 7,500 individuals and 4,500 individuals in 2005 and 2006, respectively. Five surveys along the west coast of Florida between 2005 and 2010 indicated an approximate average of

[14] A restinga formation is an intertidal shelf typically formed of densely-packed dirt blown by strong, offshore winds.

1,432 individuals. Records compiled prior to 1999 indicated the Louisiana coastline supported approximately 2,500 red knots. Red knots have been observed along other Gulf coast States at various locations, though generally in lower numbers (Alabama = 70, Mississippi = 35) across nearly all months of the year (AKN 2013). Red knots in southwest and northwest Florida have been observed utilizing more than one site within a region or sub-region. In the northwest birds during spring and winter moved among the sites at distances of 5 km, 23 km, and 27 km (Smith 2010) and birds in the in southwest during the winter moved among sites varying between 1 km and 20 kilometers (Schwarzer 2011).

Louisiana Range and Migration Pattern

These data were summarized by Russell (2014) unless otherwise stated. Purrington (2012) notes the species as an uncommon[15] to common migrant on Gulf beaches and uncommon to scarce winter visitor. The birds seem to disappear in the coldest winters, perhaps moving down the Texas coast or even farther south. Most wintering birds have been documented within the Grand Terre/Grand Isle region west to Raccoon Island, Terrebonne Parish (35 on 6 February 2011), but presumably some may winter offshore on the seldom-visited Chandeleur Island chain. A high count of 70 individuals was documented on 6 February 2011, on Timbalier Island. More "normal" winter counts range from 1 to 10 birds. Wintering birds appear to be largely absent from the southwestern Louisiana beaches where they are regular during spring and fall migration, even occurring occasionally in rice fields and coastal marshes as far inland as the Intracoastal Waterway and Calcasieu Lake.

Red knot numbers increase in April and early May with a peak count documented in southeast Louisiana of 530 individuals on Grand Isle on 1 May 2004. More recently, the Barataria-Terrebonne National Estuary Program (BTNEP) has been recording presence of red knots on 13 miles of shoreline at Caminada Headland during bi-monthly wintering shorebird compliance surveys for piping plover (BTNEP, unpublished data). These surveys recorded an average of 11.7 red knots per survey from highly variable sightings; ranging from 0 individuals on numerous occasions to a high of 64 individuals during a single survey in September of 2013. The source of these birds may be the Texas population of red knots, but perhaps they are also augmented by birds that spend the winter along the Yucatan and Tamaulipas to Tabasco coastline in northeastern and eastern Mexico. Currently, eBird[16]® numbers from Mexico do not support this hypothesis, but there is a paucity of coastal shorebird reports from this region. See the project specific chapters for red knot use of the project areas.

Reason for Proposed Listing and Threats

The red knot was proposed as a threatened species on September 30, 2013, due to loss of both breeding and nonbreeding habitat; potential for disruption of natural predator cycles on the breeding grounds; reduced prey availability throughout the nonbreeding range; and increasing frequency and severity of asynchronies ("mismatches") in the timing of the birds' annual migratory cycle relative to favorable food and weather conditions.

Main threats to the red knot in the United States include: reduced forage base at the Delaware Bay migration stopover area; decreased habitat availability from beach erosion, sea level rise, and shoreline stabilization in Delaware Bay; reduction in or elimination of forage due to shoreline stabilization, hardening, dredging, beach replenishment, and beach nourishment in Massachusetts, North Carolina, and Florida; and beach raking which diminishes red knot habitat suitability. These and other threats in

[15] "Uncommon" usually implies annual occurrence, but not always to be encountered daily and from 1-10 birds, seldom more.

[16] www.ebird.org

Canada and South America are detailed in the Species Assessment and Listing Priority Assignment Form (USFWS 2011) and the proposed listing rule (78 FR 60024). Unknown threats may occur on the breeding grounds.

General Effects to the Species from Barrier Island Restoration Projects

Human disturbance including vehicle or equipment use (based on off road vehicle (ORV) use) can have an adverse effect on foraging and roosting shorebirds. The severity of the impact depends on the degree of disturbance and the availability of other suitable feeding and resting areas. An ORV driving along a beach without stopping may have a relatively insignificant effect. However, when they are used with great frequency or for long periods (such as when ORVs are used for recreation as opposed to transportation), they probably cause shorebirds to leave and not return (Niles et al. 2007).

Disturbance compels birds to pay an energetic cost of flying to a new area; it may reduce the amount of time that the birds are able to feed, and can prevent them from feeding in the most preferred sites. Disturbance, however, may have little impact on birds if suitable alternate foraging areas are nearby in which the birds can feed (Niles et al. 2007). One measure of sensitivity to disturbance is whether the birds return to an area after being disrupted. Burger et al. (2004) found that shorebirds flew away and did not return to forage in response to 58 percent or more human disruptions. Human disturbance causes disruption of resting and foraging birds and shifting of use from optimal foraging sites to less suitable sites; this could negatively impact the ability of the red knots, if affected, to attain the weight gain needed for migration to the Arctic and successful breeding there. Human disturbance could cause a substantial disruption to foraging and resting red knots and when coupled with diminished prey resources and reduced habitat availability, such human disturbance may displace red knots from optimal foraging sites to areas that may be less suitable.

Additional impacts from restoration activities can occur in the form of reduced prey and foraging opportunities resulting from the placement of sediments onto existing beach, tidal areas and mud flat habitats during construction of the proposed restoration measures. However, prey species smothered by dune and beach nourishment activities are expected to recolonize the project area within 6 months to 2 years once construction activities cease (Rakocinski et al. 1996, Schlacher et al. 2012), especially given the use of appropriate sandy materials for renourishment.

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Chapter 2 – Status of the Piping Plover

On January 10, 1986, the piping plover (*Charadrius melodus*) was listed as endangered in the Great Lakes watershed and threatened elsewhere within its range, including migratory routes outside of the Great Lakes watershed and wintering grounds (50 FR 50726). A discussion of piping plover is included in this supplemental BA because the environmental baseline of Shell Island has changed since the original consultation.

Description of the Species

The piping plover is a small, sand-colored, robin-sized shorebird. Three separate breeding populations have been identified, each with its own recovery criteria: the northern Great Plains (threatened), the Great Lakes (endangered), and the Atlantic Coast (threatened) (USFWS 1988, 1996, 2003).

General Range

The piping plover ranges from prairie Canada and the Great Plains, along the Great Lakes, and the Atlantic coast and migrates to the southeastern U.S. along the Gulf and Atlantic coasts.

Breeding

Breeding activity begins in mid-March when birds begin returning from the southern Atlantic and Gulf coasts to their nesting areas (Coutu et al. 1990; Cross 1990; Goldin et al. 1990; MacIvor 1990; Hake 1993). Plovers are known to begin breeding in their first adult year (MacIvor 1990; Haig 1992); however, the percentage of birds that breed in their first adult year is unknown. Piping plovers generally fledge only a single brood per season, but may re-nest several times if previous nests are lost.

Migration

Piping plovers migrate to the Gulf of Mexico from each of the three breeding populations to winter (i.e., forage, loaf, other non-breeding activities), spending up to 10 months of their life cycle on their migration and winter grounds, generally July 15 through as late as May 15. Some individuals may remain in the Gulf during one or more summer seasons[17] (i.e., versus returning to breeding areas). The source breeding population of a given wintering individual cannot be determined in the field unless it has been banded or otherwise marked. However, research has demonstrated that the winter ranges of the breeding populations overlap, with the majority of individuals wintering in the project area originating from the northern Great Plains and prairie Canada breeding population (Gratto-Trevor et al. 2012).

Wintering and Foraging Habitat

Wintering is a particularly critical time in the species' life cycle due to the energetics involved with migration and preparing for the next breeding season. Behavioral observations of piping plovers on the wintering (non-breeding) grounds suggest that they spend the majority of their time foraging (Nicholls and Baldassarre 1990, Drake 1999a, 1999b). Feeding activities may occur during all hours of the day and night (Staine and Burger 1994, Zonick 1997) and at all stages in the tidal cycle (Goldin 1993, Hoopes 1993). Wintering plovers primarily feed on invertebrates such as polychaete marine worms, various crustaceans, fly larvae, beetles, and occasionally bivalve mollusks (Bent 1929, Nicholls 1989, Zonick and Ryan 1996). They peck these invertebrates on top of the soil or just beneath the surface.

Wintering plovers are dependent on a mosaic of habitat patches and commonly make local movements (i.e., cross-inlet movements) as well as occasional movements of up to 18 km (11 miles) (Maddock et al.

[17] These individuals are assumed to be juveniles; no nesting occurs along the Gulf Coast.

2009) among these patches depending on local weather and tidal conditions for foraging. However, the average distance traveled has been estimated to be only 3.3 km (2.1 miles) (Drake 1999b; Drake et al. 2001). These habitat mosaics used for foraging include moist substrate features such as intertidal portions of ocean beaches, washover areas, mudflats, sand flats, algal flats, shoals, wrack lines, sparse vegetation, shorelines of coastal ponds, lagoons, ephemeral pools, and areas adjacent to salt marshes (USFWS 2001). Studies from the coastal breeding range have shown that the relative importance of various feeding habitat types may vary by site. Prey items and biomass are more abundant and available to plovers on sound islands and sound beaches than the ocean beach. Intertidal mudflats and/or shallow subtidal grass flats appear to have greater value as foraging habitat than the unvegetated intertidal areas of a flood shoal (Gibbs 1986, Coutu et al. 1990, McConnaughey et al. 1990, Loegering 1992, Goldin 1993, Hoopes 1993, Cohen et al. 2006). Therefore, habitats on the sound sides of inlets and islands, mudflats, and shallow subtidal grass flats are typically considered optimal habitats for plovers, though individuals may use all habitat types.

Wrack is the primary component of roosting habitat for nonbreeding piping plovers. Both old and fresh wrack are used by piping plovers as roosting habitat. Other habitats valuable for roosting include intertidal habitats, backshore (defined as zone of dry sand, shell, cobble, and beach debris from mean high water line up to the toe of the dune), washover areas and ephemeral pools (Lott et al. 2009, Maddock et al. 2009, Smith 2007, Drake 1999b).

Demographics

The 2006 Piping Plover Breeding Census, the last comprehensive survey throughout the breeding grounds, documented 3,497 breeding pairs with a total of 8,065 birds throughout Canada and U.S (Elliott-Smith et al. 2009).

Louisiana Range and Migration Pattern

Whereas, approximately 30 percent of the piping plover population winters in coastal habitats from Louisiana through the Gulf Coast of Florida, this portion of the population is spread over several hundred miles. Piping plovers generally arrive in Louisiana as early as mid-July and remain through the winter and mid-spring. Some individuals have been documented to remain all year along the Louisiana coast. These individuals are hypothesized to be juvenile birds that are not ready to breed.

Reason for Proposed Listing and Threats

Piping plovers were listed principally because of habitat destruction and degradation, predation, and human disturbance. Threats to piping plovers and their habitats used during winter and migration include habitat loss and fragmentation, motorized vehicle use, pedestrian recreational use, pollution, and in certain circumstances, inlet and shoreline stabilization projects, inlet dredging, artificial structures such as jetties and groins, and beach maintenance and nourishment, although the latter can also eventually benefit piping plovers by restoring their habitat.

General Effects to the Species from Barrier Island Restoration Projects

See the discussion for red knot above, as general effects to piping plover from barrier island restoration would be the same.

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Chapter 3 – Status of the West Indian Manatee

A discussion of the West Indian manatee is included in this supplemental BA because it was not included in the original consultation for Chenier Ronquille or Shell Island.

Description of the Species

The West Indian manatee, *Trichechus manatus*, was first listed as endangered in 1967 (32 FR 4061) under the Endangered Species Preservation Act of 1966. This listing was expanded in 1970 to include other names and the species' range in the Caribbean and northern South America (35 FR 18319). The West Indian manatee includes two subspecies: the Antillean manatee (*Trichechus manatus manatus*) and the Florida manatee (*Trichechus manatus latirostris*). The Antillean manatee does not occur within the Chenier Ronquille project area and is not considered within this consultation. The Florida manatee primarily occurs in two geographically distinct areas, one on the Atlantic coast and the other in the Gulf of Mexico, primarily along peninsular Florida. Manatees within these areas are further sub-divided into four management units: Northwest, Southwest, Atlantic, and Upper St. Johns River (USFWS 2001a; USFWS 2007). The USFWS has sole responsibility for entering into section 7 consultation for this species[18] with other Federal agencies. In addition to the ESA, manatees are afforded protection under the Marine Mammal Protection Act (MMPA) of 1972, as amended (16 U.S.C. 1461 *et seq*.). The MMPA establishes, as national policy, maintenance of the health and stability of marine ecosystems, and whenever consistent with this primary objective, obtaining and maintaining optimum sustainable populations of marine mammals. It also establishes a moratorium on the taking of marine mammals, which includes harassing, hunting, capturing, killing, or attempting to harass, hunt, capture, or kill any marine mammal.

The following information regarding manatees is summarized from the Florida manatee Recovery Plan (USFWS 2001a and references within) unless otherwise stated. Florida manatees are massive (adults average about 10 feet in length and 2,200 pounds in weight), fusiform-shaped mammals with skin that is uniformly dark grey, wrinkled, sparsely haired, and rubber-like. Manatees possess paddle-like forelimbs, no hind limbs, and a spatulate, horizontally flattened tail. In the United States, manatees occur primarily in Florida during the winter. Manatees may range as far west as Texas on the Gulf Coast and on the Atlantic coast from Florida as far north as Massachusetts when water temperatures are warmer (USFWS 2007 and references within). On the Gulf Coast, manatees congregate mainly in central and south peninsular Florida; however, observations of manatees west of the Suwannee River during winter months have been increasing over the last decade (Manatee Database, unpublished data).

General Range and Migration Pattern

In general, each spring as water temperatures increase, manatees disperse outside of their home ranges to waters along the Florida Panhandle, Alabama, Mississippi, and Louisiana (USFWS 2001a, Pabody et al. 2009, Fertl et al. 2005). In Alabama, a number of manatees (one to fifteen individuals) are routinely seen in the calm, shallow waters of rivers and sub-embayments of Mobile Bay and the Mobile-Tensaw Delta. However, manatees have been observed in the coastal areas, off barrier islands, and up to 145 kilometers offshore (Pabody et al. 2009, Fertl et al. 2005). Manatees are often sighted in Alabama between mid-April through mid-October, though sightings of manatees have been reported in all months (Pabody et al. 2009). Manatees have been sighted in Mississippi and Louisiana typically in estuarine

[18] National Marine Fisheries Service has consultation responsibilities for all other marine mammals within the Gulf of Mexico.

and river mouth habitats, though there have been sightings near barrier islands and offshore as well (Fertl et al. 2005).

Louisiana Range and Migration Pattern

In Louisiana, manatees frequently enter Lakes Pontchartrain and Maurepas, and associated coastal waters and streams during the summer months. They have also been reported in the Amite, Blind, Tchefuncte, and Tickfaw rivers, and in canals within the adjacent coastal marshes of Louisiana. Occasionally, manatees are also seen farther west along the Louisiana Gulf coast.

Habitat and Foraging

Manatees are found in freshwater, brackish, estuarine, and marine environments in water of sufficient depth (generally 5 feet to less than 20 feet) throughout their range. Typical inland and coastal habitats include: freshwater springs, rivers, creeks, and man-made canals, natural and artificial brackish and estuarine waterways within various temperate and sub-tropical coastal ecosystems (e.g., salt marshes and mangrove swamps). Manatees also have been observed within nearshore marine environments and, on occasion, offshore. During the cooler months when ambient water temperatures drop below 68°F, manatees are confined to the coastal waters of the southern half of peninsular Florida, as well as springs, industrial warm water outfalls, and passive warm water refuges in other locations. During the spring and summer months, they may migrate throughout their range and appear to choose areas based on adequate food supply, water depth, and possibly proximity to freshwater.

As herbivores, manatees feed on a wide range of aquatic vegetation within these habitats. Shallow seagrass and eelgrass beds, with ready access to deep channels, are generally preferred feeding areas in coastal and riverine habitats (Smith 1993), respectively. In coastal northeastern Florida, manatees feed in salt marshes on smooth cordgrass (*Spartina alterniflora*) by timing feeding periods with high tide (Baugh et al. 1989, Zoodsma 1991). They also forage on algae attached to artificial surfaces such as docks, pilings, bulkheads, rock walls, and jetties. Manatees use springs and freshwater runoff sites for drinking water. Secluded canals, creeks, embayments, and lagoons are used for resting, cavorting, mating, calving and nurturing their young; while open waterways and channels are used as travel corridors (Gannon et al. 2007, Marine Mammal Commission 1986, 1988). Manatees occupy different habitats during various times of the year, with a focus on warm water sites during winter.

Demographics

Population size is difficult to estimate for many reasons including confounding factors with survey techniques and environmental conditions. The West Indian manatee 5-year Status Review summarized the total Florida manatee population based on 2001 data and estimated population size at approximately 3,300 individuals (USFWS 2007 and references within). The most recent synoptic survey of the Florida manatee population, conducted in January 2011, recorded over 4,800 manatees (Florida Fish and Wildlife Conservation Commission Florida Wildlife Research Institute (FWC FWRI) 2013). In general, the manatee population is considered to be stable or increasing throughout its range, except the Southwest management unit (USFWS 2007).

Breeding

Breeding has been reported in all seasons, though most adult males do not appear to have evidence of sperm production between December and February. Breeding takes place when one or more males are attracted to an estrous female which forms a mating herd. Mating herds can last up to four weeks. The length of the gestation is estimated between 11 and 14 months; with normal litter size of one manatee.

Reason for Listing and Threats

The greatest man-made threats to Florida manatees include loss of warm water habitat and collisions with watercraft (the hulls and/or propellers of boats and ships) (USFWS 2007). Warm water habitats can be adversely affected by human disturbance, development, and groundwater withdrawals, while economics and alternative energy sources can potentially reduce or eliminate warm water discharges from industrial sites (USFWS 2007). Watercraft speed is a factor in many collisions between watercraft and manatees. Other human induced mortality events include: entrapment in water control structures, entanglement in fishing gear (crab traps, monofilament line, etc.), entrapment in culverts and pipes, and ingestion of debris (USFWS 2001a and references within, USFWS 2007 and references within). Natural mortality factors include: perinatal mortality, cold stress, red tides and brevetoxin exposure, strandings and displacements due to hurricanes and winter storm events, and other undetermined causes (USFWS 2007 and references within).

Non-lethal threats include harm or injury to manatees from propellers, harassment of manatees by boats and swimmers, and foraging habitat loss or degradation from propeller scarring and changes in water quality. Vegetation loss and harassment may result in manatees moving away from preferred sites. The loss of vegetation in certain areas (e.g., as seen in winter foraging areas) requires manatees to travel greater distances to feed. Adequate feeding habitat associated with warm-water refuge sites is important to the overall recovery of the Florida manatee. Warm season foraging habitat does not currently appear to be limiting.

General Effects to the Species from Barrier Island Restoration Projects

If present, vessel and dredge operation and placement of materials in water could startle or strike a manatee. Strikes generally result in injury or mortality.

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Chapter 4 – Caillou Lake Headlands (Whiskey Island)[19]

Action Area and Environmental Baseline

Restoration of beach, dune, and back-barrier marsh habitats at the Caillou Lake Headlands location is proposed on Whiskey Island, a barrier island situated within the Louisiana Department of Wildlife and Fisheries (LDWF) Isle Dernieres State Wildlife Refuge and Terrebonne Basin barrier shoreline system (Figure 1). Louisiana would be the lead Trustee for the design and construction of this project, working cooperatively with the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Department of the Interior (DOI). The project was federally authorized under the Water Resources Development Act of 2007 and selected as a preferred alternative in the Terrebonne Basin Barrier Shoreline Restoration (TBBSR) *Integrated Feasibility Study and Final Environmental Impact Statement* (USACE, 2010), and included in the state's Master Plan (CPRA 2012).

The Isle Dernieres chain of barrier islands has undergone significant fragmentation and reduction in size because of natural processes and human activities. Based on data from historical maps, satellite imagery, and aerial photography, long-term shoreline retreat rates at Whiskey Island have been estimated to be approximately 57 feet/year (Martinez et al., 2009). To slow these loss rates, portions of Whiskey Island have been restored over the past 15 years using funds received through the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) (LCWCRTF 2002, 2010). During 2010-2012, Whiskey Island was documented to support about 120 hectares of flat[20] and about 25 hectares of surrounding bayside intertidal habitat (Curtiss 2013). During this time period, available waterbird habitat decreased. Curtiss (2013) indicated the restored marsh habitat on the bayside was prone to more flooding and proposed this effect may be due to settling and compaction of restored sediments.

Few data regarding the use of Caillou Lake Headlands by red knots are available. However, recent observations from eBird[21]® documented 30 individuals in 2008; 12 individuals in 2010; and 2 to 5 individuals present in the project area in 2011. Since August 2012, twenty-three field surveys have been conducted on Whiskey Island and additional portions of the Isle Dernieres. These surveys average sightings of 3.5 red knots per survey with the numbers of individuals present on a given day being highly variable (ranging from 0 to 25) (unpublished field survey data, D. Lee, CPRA, personal communication).These observations should not be interpreted as population counts and no indication of observation effort or methods is available. Based on these data, which are the best available, we estimate that up to 30 individuals may be using the project area at any one time during implementation of the proposed project.

Description of the Action

Restoration at the Caillou Lake Headlands location is proposed on Whiskey Island, a barrier island within the LDWF Isle Dernieres State Wildlife Refuge and Terrebonne Basin barrier shoreline system (Figure 2). Plans and proposals to restore Whiskey Island have been developed over time in multiple

[19] All information from this chapter is summarized from the previous biological assessment (CEC 2013) or the Draft programmatic and Phase III Early Restoration Plan and Draft Early Restoration Programmatic Environmental Impact Statement (DOI 2013) unless otherwise stated.

[20] Low elevation beach habitat with minimal topographic profiles rarely impacted by wave energy, inundated during higher than average tides, storm overwash events, or heavy rainfall. Flats often hold water in the form of shallow pools or saturated substrate which can support growth of algae.

[21] www.ebird.org

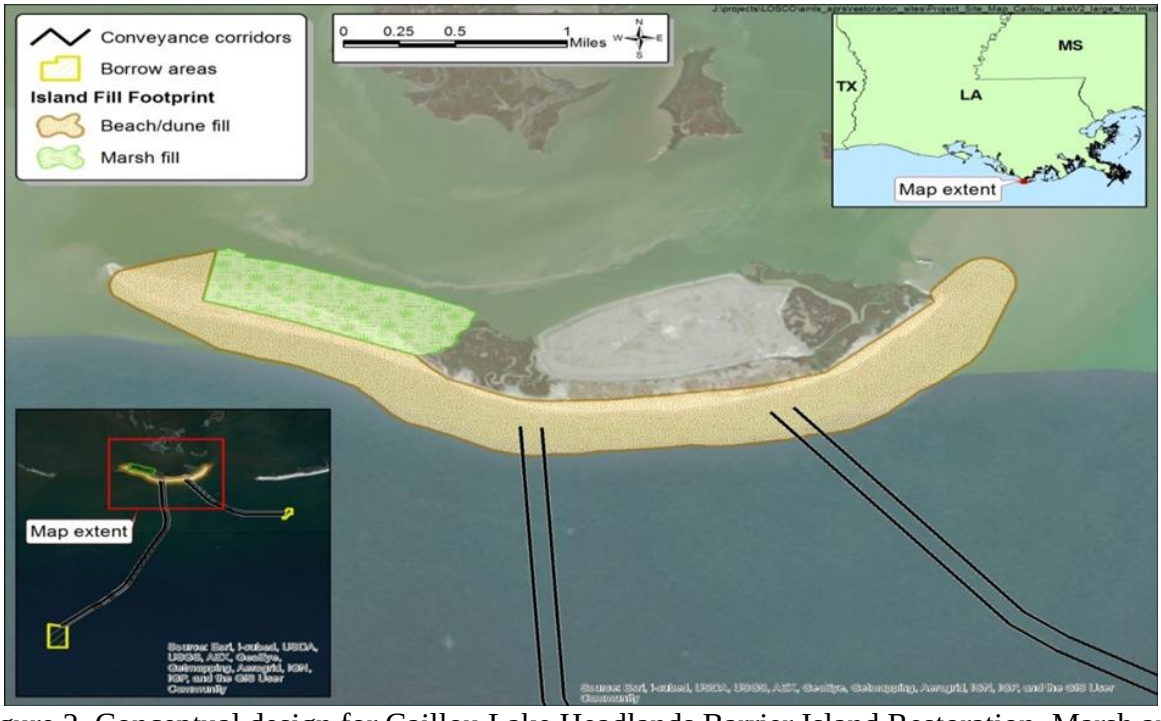

Figure 2. Conceptual design for Caillou Lake Headlands Barrier Island Restoration. Marsh and beach/dune fill areas are approximate. Imagery of Whiskey Island is from 2010.

documents, including *Coast 2050: Toward a Sustainable Coastal Louisiana* (LCWCRTF and WCRA, 1998), the LCA Ecosystem Restoration Study (USACE, 2004), and the LCA *Integrated Feasibility Study and Final Environmental Impact Statement for the Terrebonne Basin Barrier Shoreline Restoration* (USACE, 2010).

The proposed project would continue restoration work on Whiskey Island and include the reestablishment of a beach and dune platform along the length of the shoreline and the construction of a marsh platform along the western end of the island on the landward side of the dune. Approximately 1,000 acres of barrier island habitat, including beaches, dunes, and back-barrier marsh would be constructed.

Restoration at this location would require approximately 8.9 million cubic yards (CY) of beach/dune fill (i.e., sand-sized sediments) that would be pumped through temporary pipeline corridors to the project site from an offshore borrow area at Ship Shoal (Figure 2). Restoration at this location would also require approximately 1 million CY of marsh fill (i.e., mixed sand-, silt-, and clay-sized sediments) that would be pumped through temporary pipeline corridors from a nearshore borrow area adjacent to the project site (Figure 2).

Construction of Whiskey Island would utilize hydraulically dredged sediments to create beach, dune, and back-barrier marsh habitats. The back-barrier marsh platform would be constructed to an elevation of +2.4 ft. NAVD88. Construction of containment dikes using in-situ material would be required for the back-barrier marsh platform to retain hydraulically dredged sediments while the platform undergoes compaction and dewatering. Containment dikes are expected to degrade naturally over time. If necessary, dikes would be gapped after a period of time to allow hydrologic connection to the bay and to prevent ponding of water within the containment area. The dune platform would be constructed to an elevation of approximately +6.4 ft. NAVD88, and sand fencing would be erected to capture windblown sand and foster dune development. The dune platform and other supratidal areas would be planted with

native vegetation shortly after construction. The back-barrier marsh platform would be planted after a period of compaction and dewatering has occurred and the platform is stable enough for planting activities. The project was designed to avoid disturbing approximately 286 acres of existing mangroves on the island to minimize the ecological impact during construction.

Conservation Measures, Terms and Conditions

DOI intends to adopt the LCA *Integrated Feasibility Study and Final Environmental Impact Statement for the Terrebonne Basin Barrier Shoreline Restoration* (USACE, 2010) to fulfill DOI's National Environmental Policy Act (NEPA) requirements for analysis of the Whiskey Island location of the Terrebonne Basin Barrier Shoreline Restoration project. The State of Louisiana, through CPRA (defined below) will uphold all non-discretionary reasonable and prudent measures (RPMs) and terms and conditions as set forth in the August 12, 2013 letter from the USFWS to the Army Corps of Engineers (USFWS, 2013) for both piping plover and red knot. The USFWS also provided conservation recommendations in this letter. The August 12, 2013 letter represents an amendment to the 2010 Biological Opinion (USFWS, 2010) and incorporates the 2010 Biological Opinion as an attachment to the letter.

The reasonable and prudent measures and associated implementing terms and conditions as well as the conservation recommendations from the 2010 Biological Opinion and 2013 amendment are listed below. Because the red knot was not proposed for listing when the previous consultations were completed, the species was not considered and the conditions were specific to piping plover. Below, the language for the measures has been revised to: be inclusive of red knots so as to minimize potential take of red knot and acknowledge that Louisiana's Coastal Protection and Restoration Authority (CPRA) will be the implementing agency.

1. **A baseline piping plover and red knot distribution survey shall be conducted within the migrating and wintering season immediately prior to initial construction within the action area. As part of that survey, the project footprint should be delineated using a global position system (GPS) unit and appropriately marked/flagged for future survey reference and data collection.**
    a. A survey schedule (with dates) for piping plovers and red knots is listed in Appendix B (incorporated by reference See USFWS 2013) and the recommendation is for at least 3 survey dates per month; this schedule should be followed as closely as possible. If conditions require a deviation from the recommended survey schedule, such information should be carefully documented, including an explanation why any deviation from the recommended schedule was deemed necessary. The Service recognizes that given the remoteness of the project area and the potential for inclement weather conditions during the plover wintering season, three survey dates per month may be difficult to achieve in Louisiana. Therefore, the Service will require a minimum of two survey dates per month.
    b. Piping plover and red knot identification, especially when in non-breeding plumage, can be difficult. Qualified professionals with shorebird/habitat survey experience must conduct the required survey work. Piping plover/red knot monitors must be capable of detecting and recording locations of roosting and foraging plovers and knots, and documenting observations in legible, complete field notes. Aptitude for monitoring includes keen powers of observation, familiarity with avian biology and behavior, experience observing birds or other wildlife for sustained periods, tolerance for adverse weather, experience in data collection and management, and patience.
    c. Binoculars, a GPS unit, a 10-60x spotting scope with a tripod, and the Service datasheet must be used to conduct the surveys.

d. Negative (i.e., no plovers or knots seen) and positive survey data shall be recorded and reported.
e. Piping plover and red knot locations shall be recorded with a GPS unit set to record in decimal degrees in universal transverse mercator (UTM) North American Datum 1983 (NAD83).
f. Habitat, landscape, and substrate features used by piping plovers and red knots when seen shall be recorded. Such features are outlined on the Service data sheet in Appendix B (not attached).
g. Behavior of piping plovers and red knots (e.g., foraging, roosting, preening, bathing, flying, aggression, walking) shall be documented on the Service data sheet in Appendix B (not attached).
h. Color-bands, flags, and alphanumeric markers seen on piping plovers and red knot shall also be carefully documented, and should also be reported according to the information found at the following websites. Information regarding color-band observations can be found at:
http://www.fishwild.vt.edu/piping_plover/Protocols_final_draft.pdf,
http://www.waterbirds.umn.edu/Piping_Plovers/piping2.htm, and
http://www.fws.gov/northeast/pipingplover/pdf/BahamasBandReporting2010.pdf.

2. A survey of the intertidal benthic prey species community shall be conducted within the migrating and wintering season immediately prior to initial construction, at the same time as the piping plover and red knot distribution surveys, in order to establish a baseline of benthic prey species diversity and abundance.
a. A qualified professional with sediment/macroinvertebrate sampling experience must conduct the required benthic prey species surveys.
b. A baseline macroinvertebrate survey will be conducted at the same time of the initial piping plover/red knot survey during the migrating/wintering season immediately prior to construction. Additional surveys will be conducted during the migrating/wintering season each year post-construction for three consecutive years to determine benthic prey species recovery. Such surveys shall be conducted at the same time as the plover/knot surveys.
c. Sampling will be conducted using a basic before and after control and impact design method. Sampling will be coordinated with piping plover and red knot foraging observations based on low tide surveys.
d. In addition to recording benthic species abundance and diversity, a qualitative measure of sediment characteristics (sand, shell, mud) will also be recorded.
e. A detailed sampling methodology shall be developed in coordination with the Service and Louisiana Department of Wildlife and Fisheries (LDWF) prior to initiating surveys.

3. Piping plover and red knot monitoring surveys shall be conducted during the migrating and wintering seasons throughout initial project construction and three consecutive years following completion of initial construction (following the methods in bullet 1 above).

4. To confirm re-establishment of suitable foraging habitat for migrating and wintering piping plovers and knots, monitoring surveys of the intertidal benthic prey species community shall be conducted each year following completion of initial construction for three consecutive years, preferably at the same time as the bird surveys (following the methods in bullet 2 above).

5. The Service shall be notified in writing at least 6 months prior to a renourishment event. If renourishment events are conducted during the migrating and wintering season, piping plover

and red knot monitoring surveys shall be conducted for the duration of such construction activities following the survey schedule outlined in Appendix B (not attached).

6. A comprehensive report describing the actions taken to implement the RPMs and terms and conditions associated with this incidental take statement (including data sheets from surveys conducted) shall be submitted to the Service by June 1 of the year following completion of all required surveys.
    a. Incorporate all data collected into an appropriate database, preferably one for piping plovers/red knots and one for benthic prey species.
    b. Annual update reports shall be provided to the Service and LDWF by June 30 of each calendar year once construction begins. Annual update reports should include data sheets, maps, a copy of the database, and the progress and initial findings of piping plover/red knot and benthic community surveys, as well as any problematic issues that may hinder future survey efforts.
    c. If CPRA foresees any problematic issues that would require a change in the recommended survey schedule due to work conditions or project delays, CPRA should immediately notify the Service so that we can resolve/correct any such issues.
    d. A final comprehensive report should be provided to the Service and LDWF by June 30 following the third year of surveys. That final report should include an analysis of all data results from the piping plover and benthic community surveys.
    e. At least six months prior to mobilization, CPRA should notify the Service in writing prior to each proposed renourishment event. That notification should include whether there are any changes in the proposed amount of renourishment.

7. Upon locating a dead or injured piping plover or red knot that may have been harmed or destroyed as a direct or indirect result of the proposed project, CPRA and/or contractor shall be responsible for notifying the Service's Lafayette, Louisiana, Field Office (337/291-3100) and the LDWF's Natural Heritage Program (225/765-2821). Care shall be taken in handling an injured piping plover or red knot to ensure effective treatment or disposition and in handling dead specimens to preserve biological materials in the best possible state for later analysis.

Below are the Conservation Recommendations (i.e., discretionary measures) from the previous consultation:

1. CPRA should consider retro-fitting all sand fencing poles with pointy tops or caps to reduce avian predation.

2. As an alternative to installing sand fencing for the proposed project and other projects, CPRA should evaluate the feasibility of promoting natural dune growth with planting native dune grasses.

3. We encourage Trustees to take a proactive approach via application of their Section 7(a)(1) responsibilities, which would further minimize the issues surrounding the cumulative impacts to listed and at-risk species resulting from implementation of coastal restoration projects in Louisiana.

4. We encourage CPRA to continue to coordinate with the Service and LDWF during the preplanning phases of future restoration projects (including any sand placement projects) within piping plover designated critical habitat or habitats used by red knot.

Effects of the Action

Red knots have been observed using terrestrial habitats in the general area of the proposed project (see data above). Project implementation timeframes will likely coincide with red knot migrating and wintering seasons on Whiskey Island; therefore, it is possible that individuals may be present during project construction.

The proposed project could result in short-term increases in noise and human presence that may harass red knot while foraging or roosting throughout the entire island. These actions may cause temporary displacement of birds to other nearby habitats through more than one wintering and migration season. Collectively, these disturbances could potentially lead to increased energy expenditures that might not otherwise occur in the absence of the project.

Though red knots migrate great distances during the fall and spring between their wintering and breeding grounds, we do not believe individuals would fly from the islands in response to the human disturbance and machinery. The short-term increases in noise and human presence could startle individuals, though we would expect normal activity to resume quickly in the general vicinity. Repeated startling events could potentially result in reduced bird foraging and resting efficiencies, thereby lowering overall fitness. Therefore, we consider the individual birds remaining in the area subject to harassment via dredge and material placement, noise or other human/equipment disturbance.

Additional, unavoidable short-term adverse impacts to red knot remaining on the island during construction of the proposed restoration measures would occur in the form of reduced prey and foraging opportunities resulting from the placement of sediments onto existing beach, tidal areas and mud flat habitats. However, prey species smothered by dune and beach nourishment activities are expected to recolonize the project area within 6 months to 2 years once construction activities cease (Rakocinski et al. 1996, Schlacher et al. 2012). Therefore, impacts to existing habitat are projected to be temporary through or up to two years.

Red knot could be temporarily displaced to other islands or the mainland (approximately 5 to 10 miles away) for feeding and loafing, especially if disturbance becomes too great or foraging on Whiskey Island becomes limiting during or after construction. We expect that habitat and prey abundance on the other islands and mainland to be sufficient to support displaced birds. Temporary displacement over two seasons may result in lowered fitness due to energy expended searching for a new location with adequate habitat and food resources, or displacement to a lower quality habitat or intra-species competition. Therefore, we consider temporary displacement over more than one season harassment.

Other additive effects from implementing the proposed project to red knot include increasing foraging and resting habitats on the island. We expect the restored island will bolster feeding and loafing habitats for red knot within 6 months to two years.

Conclusion and Determination

We anticipate that the proposed project may affect, and is likely to adversely affect, the red knot, if the species is listed prior to or during project implementation. Therefore, we request to initiate a formal conference to address potential impacts from the proposed Caillou Lake Headlands (Whiskey Island) Barrier Island restoration project to the red knot. Available information suggests that 30 individuals could be present in the area at any one time during the migration and winter time periods. We believe any red knots present may be harassed such that their normal feeding behaviors are modified and their condition possibly reduced. In the event red knot are listed, we request take of up to 30 red knots through harassment. We do not believe this level of anticipated take would result in jeopardy (i.e.,

appreciably reduce the likelihood of both the survival and recovery of the species in the wild by reducing the reproduction, numbers, or distribution) to the species because:

1. Records compiled prior to 1999 indicated the Louisiana coastline supported approximately 2,500 red knots.

2. Though reduced condition is possible, we believe it is unlikely because available foraging habitats exist nearby. If foraging habitat or food availability decline or become unsuitable during project implementation, we would expect red knot to move to nearby locations. Though these locations are a greater distance than typical foraging movements, they are within the distance documented for occasional movements.

3. After the completion of the proposed project an increase in habitats and foraging opportunities for red knot will be available within six months to two years.

The non-discretionary, reasonable and prudent measures and terms and conditions identified above for piping plover will be implemented for red knot as well. We expect these measures to minimize take of red knot, if listed prior to or during project implementation. We request your concurrence with our determination.

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Chapter 5 – Chenier Ronquille

Action Area and Environmental Baseline

Chenier Ronquille is located along the Plaquemines/Barataria Bay barrier shoreline, approximately eight miles east of Grand Isle (Figure 1). Chenier Ronquille serves as the western anchor of the Plaquemines/ Barataria shoreline and forms the eastern boundary of Quatre Bayou Pass. NOAA would be the lead Trustee for the design and construction of this project, working cooperatively with Louisiana and U.S. Department of the Interior (DOI). The Chenier Ronquille barrier island restoration was authorized in 2010 as a candidate project under CWPPRA. Although it received design phase funding, it did not receive construction funding under CWPPRA. Chenier Ronquille barrier island restoration is also included in the state's Master Plan (CPRA 2012).

Recent shoreline change measurements suggest an average shoreline retreat rate of approximately 44 feet/year, although retreat rates of 108 feet/year have been measured. The barrier island has been breached, which is increasing the shoreline retreat rate of the island (Thomson et al. 2011). This project aims to increase island longevity by restoring beach, dune, and back-barrier marsh habitats. The Chenier Ronquille restoration would tie into two recently constructed projects to the east and restore one of the remaining reaches of the Plaquemines/Barataria shoreline. The two surrounding projects, though recent in construction, are expected to provide suitable foraging and resting habitat for red knots.

In the vicinity of Chenier Ronquille, approximately 7 red knots were reported in 2010 (www.ebird.org). These observations should not be interpreted as population counts and no indication of observation effort or methods is available. Based on these data, which are the best available, we estimate that up to 7 individuals may be using the action area at any one time during implementation of the proposed project. Although we do not expect manatees will be found in the project area due to lack of water clarity and sea grasses or other forage, they could possibly be resting or migrating in the area.

Description of the Action

Restoration work would repair the breaches in the shoreline and provide additional sediment to be re-worked by natural processes over the 20-yr project life, which would reestablish and increase the island's longevity via dune and marsh creation. Additionally, the project would restore the shoreline, dune, and back-barrier marsh to increase island habitat utilized by essential fish and wildlife species both on the barrier headland and in quiescent bays. Approximately 500 acres of barrier island habitat, including beaches, dunes, and back-barrier marsh, would be constructed.

Construction would utilize dredged sediment to create a beach, dune and marsh platform. Marsh construction would be to +2.5 ft NAVD88, because soil settlement analysis indicated this would provide the optimum number of years above mean high water (accounting for settlement of fill material, subsidence, and eustatic sea level rise) and is similar to the marsh elevation used for similar successful projects. Containment dikes would be constructed to retain delivered dredged sediment until the platform has dewatered. Containment dikes are expected to degrade through natural erosion from waves. Dikes would be gapped after settlement of marsh fill materials, if necessary, to allow hydrologic connection should the expected erosion or settlement not occur.

The dune has a constructed elevation of +8 feet, NAVD and a width of 150 feet. Dune cross-sections are designed to maintain a minimum of +5 ft NAVD88 dune height after a 10-year storm event (Thompson et al. 2011). Sand fencing would be erected on the constructed dune to capture naturally windblown sand and passively build or maintain the dune feature.

Sediment for this project would be pumped through temporary pipeline corridors from the borrow areas to the restoration site (Figure 3). Restoration at this location would require the excavation of approximately 2.0 million CY of beach/dune fill. Restoration at this location would also require excavation of approximately 2.4 million CY of marsh fill for the back-barrier marsh (using a design elevation of +2.5 feet NAVD88 and 240,000 CY of fill for the primary dikes and access channels. The beach and marsh fill borrow areas are located approximately 1.7 to 2.8 miles southwest of the project area and were initially developed for the now-completed East Grand Terre Island and Chaland Headland Restoration Projects.

Conservation Measures, Terms and Conditions

DOI has independently evaluated the 2013 Environmental Assessment for the Chenier Ronquille Barrier Island Restoration Project (Chenier Ronquille EA), BA-76, prepared by NOAA (2013), and finds that it complies with Council on Environmental Quality (CEQ) and DOI requirements for adopting NEPA analyses prepared by other agencies. The Chenier Ronquille EA and Finding of No Significant Impact can be found in their entirety at (http://losco-dwh.com). Accordingly, DOI intends to adopt the Chenier Ronquille EA to fulfill DOI's NEPA requirements for analysis of the Chenier Ronquille restoration location of the Louisiana Outer Coast Restoration Project. NOAA will uphold all avoidance and minimization measures identified in the Chenier Ronquille EA and associated consultation (USFWS 2012). These conservation measures are listed below (bullets 1 and 2) and are updated to include red knot. An additional conservation measure will be implemented to avoid impacts to any manatees that could be resting or migrating through the area (bullet 3).

1. Education of the Federal and State teams [i.e., any individuals working on the project] and construction contractors on the species interactions to avoid would be part of the ongoing Federal [i.e., NOAA] oversight.

2. Nesting colonial waterbirds, piping plover, red knot, and manatee would be avoided given provisions provided by USFWS and NMFS Protected Resources.

3. The most recent version of the "Standard Conditions for In-Water Work in the Presence of Manatees" provided by USFWS will be implemented

Effects of the Action – Red Knot

Chenier Ronquille currently consists of eroding and fragmented shoreline, low elevation saline marsh, and sparse supratidal mangrove habitat. The proposed project area is highly susceptible to over-wash and conversion of land to open water. The project area provides some foraging habitat for red knots on remnant patches of intertidal beach, over-wash fans, or sand and mud flats exposed during seasonally low tides. Little to no roosting habitat (i.e., unvegetated or sparsely vegetated beach above high tide) exists within the project area due to the low elevations of the remaining sandy areas. Because of the lack of roosting habitat, we would expect any red knots foraging in the project area to fly daily to other islands for roosting as a normal behavior.

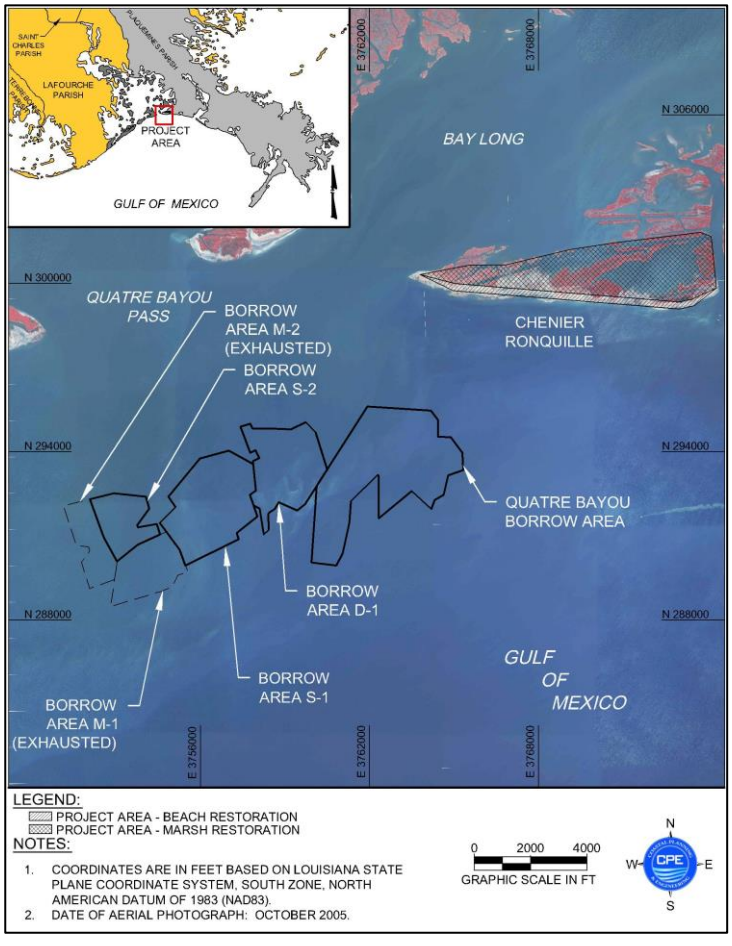

Figure 3. Location of Chenier Ronquille Barrier Island and proposed project and borrow areas.

Proposed activities would likely occur when red knots could be present in the project area. Loud noises and human presence may disturb any foraging birds. We would expect individuals to move to the nearby restored areas along the Plaquemines/Barataria shoreline, which likely would serve (due to proximity) as roosting habitats used by birds foraging at Chenier Ronquille. We do not consider this behavior to be displacement but rather within their normal daily movement patterns for foraging and roosting. The benthic prey species smothered by the additional sediment in the project area will naturally re-colonize within 6 months to 2 years post-construction and red knots would not be permanently excluded from the project area.

Effects of the Action – West Indian Manatee

Vessel and dredge operation, retention dike construction, and placement of materials in water could startle or strike a manatee, if present. Strikes generally result in injury or mortality. Noise from these activities could also startle or harm a manatee. The conservation measures will ensure that construction activities do not startle, harm, or harass a manatee and that no work is conducted if a manatee is present in the action area.

Conclusions and Determinations

Implementation of the proposed project would ultimately benefit the red knot by increasing, restoring, and prolonging the existence of suitable habitat. Because construction effects are temporary,

discountable, and insignificant in nature, we have determined that the proposed project is not likely to adversely affect the red knot, if listed.

Due to the implementation of a conservation measure and the low likelihood of manatee presence, we have determined the proposed project is not likely to adversely affect the West Indian manatee. As mentioned previously, manatees are afforded protection under the Marine Mammal Protection Act (MMPA) of 1972, as amended (16 U.S.C. 1461 *et seq*.). Because we have minimized effects to manatee to an insignificant and discountable level and no incidental take of manatees is anticipated under ESA, no take under the MMPA will occur. We request your concurrence with our determinations.

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Chapter 6 – Shell Island (West Lobe and Portions of East Lobe)

Action Area and Environmental Baseline

Shell Island (East and West Lobes) is located approximately 49 miles south-southeast of New Orleans, along the southern margin of the Barataria Basin in Plaquemines Parish (Figure 1) and comprises a portion of the Plaquemines barrier shoreline. Restoration at the Shell Island (East and West Lobes) location would occur on Shell Island West and the western portion of Shell Island East (Figure 4). The eastern portion of Shell Island East was completed in 2013. Approximately 680 acres of barrier island habitat, including beaches, dunes, and back-barrier marsh, would be constructed as a part of the proposed project. The borrow sources and conveyance pipelines for the project are shown in Figure 5.

Based on shoreline change analysis, the short-term shoreline retreat rates of Shell Island have been estimated at approximately 157 feet/year (Martinez et al., 2009). This project aims to increase island longevity by restoring beach, dune, and back-barrier marsh habitats on Shell Island West and the western portion of Shell Island East. Restoration work would repair breaches in the shoreline, reestablish a primary dune along the length of the shoreline, and construct a back-barrier marsh platform. The currently proposed project design has much of the material placement occurring in open water.

Prior to the 2013 restoration of the eastern portion of Shell Island East, the island consisted of little marsh habitat and was of little to no habitat for resting or foraging shorebirds. At that time, the Service did not have historical use records for either piping plover within the project area and few, if any, surveys had been conducted in the project area or vicinity due to its remote location and previous lack of suitable habitat. Based upon a lack of suitable habitat and the low likelihood of piping plover presence, on May 22, 2012, the Service concurred with a may affect, not likely to adversely affect determination for piping plover. Red knots were not considered in the prior consultation as they were not proposed for listing at the time.

The restoration of the eastern portion of Shell Island East, represents a change to the environmental baseline of the action area. Because of that restoration, we anticipate the eastern portion of Shell Island East to be now able to support foraging and resting shorebirds, including both piping plover and red knot, by the time the proposed project (i.e., East and West Lobes) is ready for implementation.

Little information is available regarding piping plover and red knot use of Shell Island. However, in response to the Deepwater Horizon oil spill, the State constructed an oil spill protection berm at Shell Island (see site labeled W-8 in Shaw Coastal, Inc. 2011). Bird monitoring was required for the construction of the oil spill protection berm (berm0. No piping plovers were observed during surveys for the berm construction; however, there was a one-time observation of more than 60 red knots present at the monitoring site. This observation should not be interpreted as population counts and no indication of observation effort or methods is available. Based on these data, which are the best available, we estimate that up to 60 individual red knots may be using the project action area at any one time during implementation of the proposed project. Piping plover are still not known to be present at the project site. The West Indian manatee is unlikely to be present at the project area for any length of time as the site does not contain suitable foraging habitat for the species.

Project Description

The proposed action described here is for the Shell Island West NRDA (East and West Lobes) Restoration Project BA-111, which includes construction of the West Lobe and a portion of the East

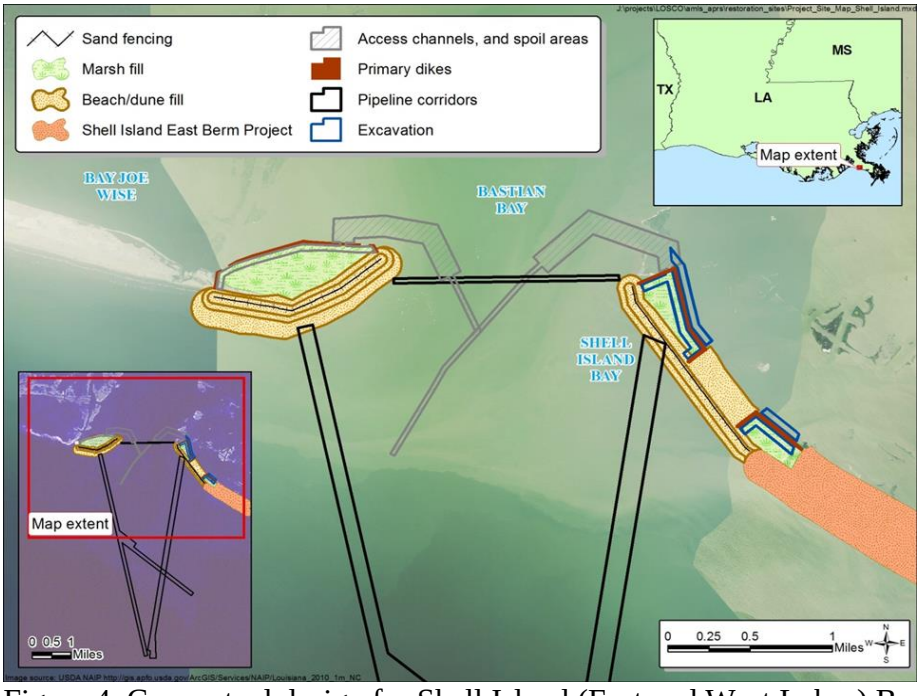

Figure 4. Conceptual design for Shell Island (East and West Lobes) Barrier Island Restoration. Access channel and spoil areas include excavation and disposal areas. The Shell Island East Berm Barrier Island Restoration Project is constructed.

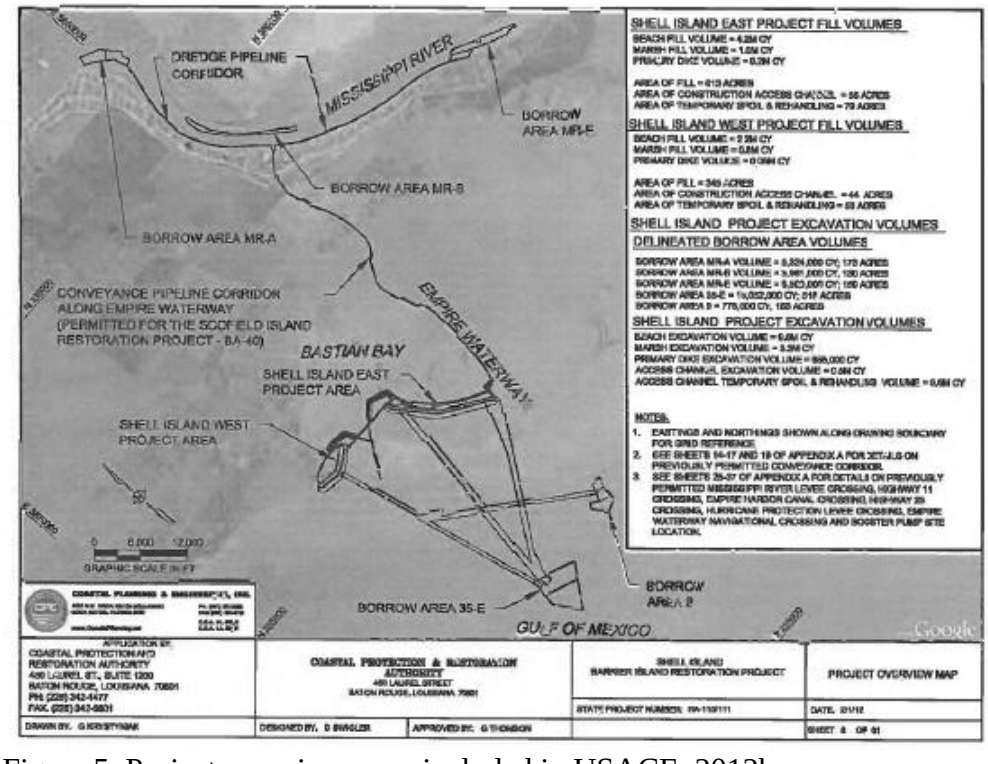

Figure 5. Project overview map, included in USACE, 2012b.

Lobe rather than one island. As discussed above, the eastern portion of Shell Island East was completed as project BA-110. Louisiana would be the lead Trustee for the design and construction of this project, working cooperatively with the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Department of the Interior (DOI).

Approximately 680 acres of barrier island habitat, including beaches, dunes, and back-barrier marsh, would be constructed. The proposed restoration at this location would require approximately 4.5 million cubic yards (CY) of beach/dune fill, including approximately 2.2 million CY for Shell Island East Lobe and approximately 2.3 million CY of beach/dune fill for Shell Island West Lobe. The beach/dune fill borrow site options in the Mississippi River have been identified and the sediment would be pumped through a pipeline along a conveyance corridor on the Empire waterway permitted for the Scofield Island Restoration Project (BA-40; LCWCRTF, 2012). The dune would be constructed to an elevation of approximately +8.0 feet NAVD 88. Sand fencing would be installed to trap and retain wind-blown sediments and help foster dune development. Restoration at this location would also require approximately 1.9 million CY of marsh fill, including approximately 1.1 million CY of marsh fill for Shell Island East and approximately 0.8 million CY of marsh fill for Shell Island West. The marsh fill borrow site has been identified south of the project site in Louisiana state waters of the Gulf of Mexico, and sediment would be pumped through the temporary conveyance pipeline within permitted corridors to the restoration site. The marsh would be located on the landward side of the dune and would be constructed to +2.5 feet NAVD 88. Beach/dune and back-barrier marsh areas would be planted with the appropriate native species by installing approved nursery stock. The containment dikes, which help retain hydraulically dredged sediments while the platform undergoes compaction and dewatering, would be breached and/or degraded within the first few years to allow for tidal exchange with the created marsh and to prevent ponding of water within the containment area. The conceptual design for Shell Island (East and West Lobes) Barrier Island Restoration is shown in Figure 4.

Conservation Measures, Terms and Conditions

A consultation for the East and West portions of Shell Island (BA-110/111) was completed by the Service on May 22, 2012 (USFWS 2012). In this analysis, the Service concurred that the proposed East and West Shell Island restorations are not likely to adversely affect the piping plover because the completed project would sustain any existing suitable plover habitat; the potential disturbance to foraging and/or roosting plovers would be temporary and discountable in nature; and there is an abundance of suitable habitat in nearby areas into which piping plovers can temporarily disperse. No conservation measures were required at that time. Manatees were not discussed in the May 22, 2012 consultation, presumably because they were addressed in a different but related consultation for Caminada Headlands (USACE 2011, 2012a, 2012b).

Because of the restoration of the eastern portion of Shell Island East, the habitat is now suitable for piping plover and red knot. Therefore, we propose to implement the following conservation measures on Shell Island to avoid and minimize impacts to any piping plover or red knots that may now be using the area (bullets 1 and 2). An additional conservation measure will be implemented to avoid impacts to any manatees that could be resting or migrating through the area (bullet 3).

1. Education of the Federal and State teams [i.e., any individuals working on the project] and construction contractors on the species interactions to avoid would be part of the ongoing Federal [i.e., NOAA] oversight.

2. Nesting colonial waterbirds, piping plover, red knot, and manatee would be avoided given provisions provided by USFWS and NMFS Protected Resources.

3. The most recent version of the "Standard Conditions for In-Water Work in the Presence of Manatees" provided by USFWS will be implemented

Effects of the Action – Red Knot and Piping Plover

We anticipate the newly constructed eastern portion of Shell Island East will be able to support some foraging and resting shorebirds by the time the proposed project (i.e., East and West Lobes) is ready for implementation. In addition, numerous other areas with ample shorebird habitat are within two miles of the proposed project including Chaland Headlands (restoration completed a minimum of six years ago) and Pelican and Scofield Islands (restoration completed in 2012).

Proposed activities would likely occur when red knots and piping plover could be present in the project area. Loud noises and human presence may disturb any foraging red knots and piping plovers. We would expect individuals to move to the nearby restored areas along Shell Island, Chaland Headlands, and Pelican Island. We expect these areas to likely serve (due to proximity) as regular foraging and roosting habitats used by birds in the proposed project area. We do not consider this behavior to be displacement but rather, these movements would be within their normal daily movement patterns for foraging and roosting. The benthic prey species smothered by the additional sediment in the project area will naturally re-colonize within 6 months to 2 years post-construction and red knots and piping plover would not be permanently excluded from the project area.

Effects of the Action – West Indian Manatee

Vessel and dredge operation, retention dike construction, and placement of materials in water could startle or strike a manatee, if present. Strikes generally result in injury or mortality. Noise from these activities could also startle or harm a manatee. The conservation measures will ensure that construction activities do not startle, harm, or harass a manatee and that no work is conducted if a manatee is present in the action area.

Conclusion and Determinations

Implementation of the proposed project would ultimately benefit the red knot and piping plover by increasing, restoring, and prolonging the existence of suitable habitat. Due to the implementation of proposed conservation measures (bullet 1 and 2) and because construction effects are temporary, discountable, and insignificant in nature, we have determined that the proposed project is not likely to adversely affect the piping plover or red knot, if listed.

Due to the implementation of a conservation measure (bullet 3) and the low likelihood of manatee presence, we have determined the proposed project is not likely to adversely affect the West Indian manatee. As mentioned previously, manatees are afforded protection under the Marine Mammal Protection Act (MMPA) of 1972, as amended (16 U.S.C. 1461 *et seq*.). Because we have minimized effects to manatee to an insignificant and discountable level and no incidental take of manatees is anticipated under ESA, no take under the MMPA will occur. We request your concurrence with our determinations.

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