CHAPTER 6: PROTECTED SPECIES IN PLAN AREA

Federally listed Animal Species Potentially Affected by Proposed Activities

Federally protected animal species that are likely to utilize the beach and coastal dune system at some point in their life history may potentially be affected by emergency shoreline protection and other activities covered under this Plan. Accordingly, take is being requested for the following species:

1. Choctawhatchee Beach Mouse (*Peromyscus polionotus allophrys*);
2. Piping Plover (*Charadrius melodus*);
3. Loggerhead Turtle (*Caretta caretta*);
4. Green Turtle (*Chelonia mydas*);
5. Leatherback Turtle (*Dermochelys coriacea*); and,
6. Kemp's Ridley Turtle (*Lepidochelys kempii*).

Choctawhatchee Beach Mouse (CBM)

Biological Information

The Choctawhatchee beach mouse (*Peromyscus polionotus allophrys*) is designated as "endangered" at both the State and Federal levels. This subspecies of oldfield mouse has a small body, haired tail, relatively large ears, and protuberant eyes. Adult mice have a head and body length between 2.7 to 3.5 inches (6.9 and 8.9 cm) and have tails approximately 1.7 to 2.5 inches (4.3 to 6.3 cm) in length. The upper parts are colored orange-brown to yellow-brown, the underparts are white, and the tail has a variable dorsal stripe.

CBM inhabit primary, secondary, and occasionally tertiary sand dunes with a moderate coverage of grasses and forbs (Hipes *et al*. 2000). Beach mice inhabit burrows during the daytime and forage for food throughout the dune system at night. A beach mouse home range may contain up to 20 burrows in different parts of its foraging area (USFWS 1987). Burrows are usually located on the well-drained sloping side of a dune and typically consist of: a) an entrance tunnel up to 3 ft (1 m) deep (mean depth of 1.7 ft; 53 cm); b) a nest chamber at a depth of 2 to 3 ft (0.6 to 0.9 m), and c) an escape tunnel. The escape tunnels generally rise from the nest chamber to just below the exterior of the dune, typically within 1 inch (2.5 cm) of the surface. These escape tunnels are extremely vulnerable to crushing via trampling by humans, horses, or other animals and provide reason to limit dune access in areas where CBM burrows are evident.

All *Peromyscus polionotus* are nocturnal rodents. Although the nocturnal habits of the CBM have not been studied specifically, they are expected to behave similarly to the Santa Rosa beach mouse. Santa Rosa beach mice were trapped more commonly on nights with half to new moons and cloudy skies, and they were observed to rarely leave

their burrows during full moons (Blair 1951). Tracking studies have indicated that peaks of activity occur shortly after dusk and again after midnight (Wooten 2001).

Beach mice feed primarily upon seeds, grass, and fruits, but have been shown to prey on insects in the spring and summer when seeds are scarce (Moyers 1996). Beach mice appear to forage on food items based on availability and have shown no preferences for particular seeds or fruits (Moyers 1996).

Beach mice along the Gulf Coasts of Florida and Alabama generally live about nine months (Swilling 2000). They are generally monogamous (Foltz 1981, Smith 1966). While a majority of individuals appear to pair for life, paired males may sire extra litters with unpaired females. Male beach mice are capable of breeding at an age of 25 days. Females are able to breed at 35 days of age. Gestation averages 24 days, and litter sizes average three to four with extremes of one and eight individuals. Peak breeding season for beach mice is autumn and winter, declining in spring, and falling to low levels in summer.

Beach mice populate some of the most geologically active barrier islands in Florida, including Perdido Key (Perdido Key beach mouse), Santa Rosa Island (Santa Rosa beach mouse), Shell Island (Choctawhatchee beach mouse), and Anastasia Island (AIBM). The constantly shifting shorelines of these islands have undergone remarkable geological changes over the last century (Johnson and Barbour 1990, Pilkey *et al.* 1984). Beach mice rely on these geological changes and periodic storms to overwash and/or erode the dune system, thereby pruning vegetation and maintaining their habitat in early succession. But, beach mice also rely on the availability of the backdune transitional zone, including coastal strand habitat, where they can temporarily retreat during storm events. These backdune areas are commonly altered or eliminated by beachfront development, thereby threatening the ability of beach mice populations to persist through sequences of intermittent storms.

The CBM was listed as an endangered species primarily because of the fragmentation, adverse alteration, and loss of habitat due to coastal development. Habitat loss and fragmentation associated with residential and commercial real estate development is considered the single most important factor contributing to the endangered status of beach mice (Holler 1992, Humphrey 1992, James 1992, Stout 1992). Additional contributing factors include: currently low population numbers; habitat loss from other causes (including hurricanes); predation by snakes, raccoons foxes, bobcats, armadillos, raptors, red-imported fire ants, and free roaming cats and dogs (Blair 1951, Bowen 1968, Holler 1992, Novak 1997, Moyers *et a*l. 1999, Van Zant and Wooten 2003); and competition by animals associated with human development (mice).

In the 1950's, the CBM was widespread and abundant along beaches from Okaloosa to Bay Counties (Bowen 1968). By 1979, only 40 percent of the original habitat remained undeveloped, it was scattered in non-contiguous patches, and the CBM had been extirpated from seven of its nine historical localities (Humphrey and Barbour 1981).

Approximately 2,500 acres (1,012 hectares) of viable Choctawhatchee beach mouse habitat currently exist throughout its range (USFWS 2007).

Site-Specific Information

The CBM became federally protected in 1985, at which time they were only known to occur at the Topsail Hill area in Walton County and Shell Island within Bay County. Altogether, its range included only about 10 mi (16.1 km) of coastline (50 FR 23872). In 1989, a cooperative interagency effort reintroduced CBM onto the central and west units of Grayton Beach State Park within Walton County, thereby increasing the amount of coastline inhabited by this species an additional 1.0 mi (1.6 km; Holler and Mason 1989). In 1999, with the closing of East Pass and Shell Island connecting to West Crooked Island, CBM increased their range by approximately 4.0 mi (6.4 km) ; Lynn 2000).

Currently, three disjunct populations of CBM are thought to exist within Walton County: Topsail Hill Preserve State Park (and adjacent eastern and western private lands), Grayton Beach State Park (and adjacent eastern private lands), and Deer Lake State Park (and adjacent eastern private lands; Figure 6). Approximately 96 percent of the lands known to be occupied by CBM are in public ownership. Translocations to establish a population of CBM on private lands at Camp Creek/WaterSound in Walton County began in March of 2003, and the population was supplemented in March 2005 with individuals from Topsail Hill Preserve State Park. This population now appears to be relatively stable (Moyers 2006).

Topsail Hill Preserve State Park consists of 1,648 acres (667 hectares), of which approximately 277 acres (92 hectares) consists of suitable CBM habitat. The Topsail population has been affected in recent years by hurricanes and flooding but otherwise has been relatively stable. The Grayton Beach sub-population consists of two units within Grayton Beach State Park. The Park is divided into a central and western unit that are connected by a narrow band of primary dunes. Total acreage of the Park is 2,195 acres (888 hectares) with 123 acres (50 hectares) providing suitable CBM habitat. Although the status of the CBM in this area is not well understood, recent accounts indicate a declining population (Moyers *et al*. 1999). Private lands adjacent to both Topsail Hill Preserve and Grayton Beach State Parks also provide suitable habitat and may be occupied by the CBM.

Deer Lake State Park contains roughly 49 acres (19.8 hectares) of suitable beach mouse habitat. The Deer Lake population was established via translocations from Topsail Hill Preserve State Park to the adjacent WaterSound property in 2003 and 2005 (USFWS 2003; USFWS 2005). However, trapping has not been conducted since, and thus the current status of this population is unknown.

The U.S. Fish and Wildlife Service has designated critical habitat for the CBM within the Plan Area. This designation collectively applies to 536 acres (217 hectares) of coastal dune habitat within Walton County, all of which is contained within Topsail Hill Preserve, Grayton Beach, and Deer Lake State Parks (Figure 6).

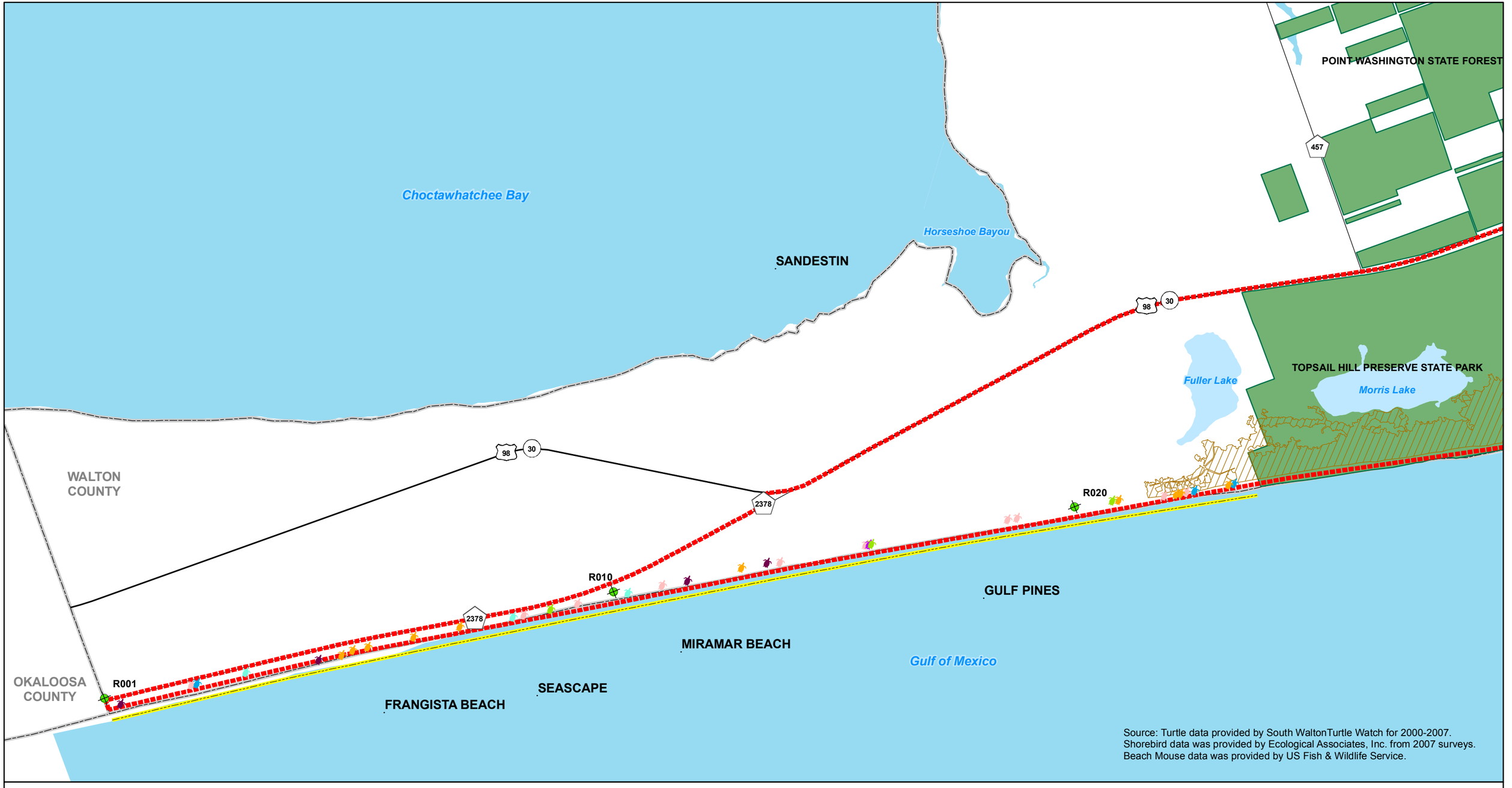

Figure 6A

Locations of federally listed species within the Plan Area - West Walton County

N

1 inch = 2,000 feet

2,000 1,000 0 2,000 Feet

Turtle Nests/Year

- 2000
- 2001
- 2002
- 2003
- 2004
- 2005
- 2006
- 2007

- Range Monuments (10th)
- Primary Shorebird Resting Areas
- Choctawhatchee Beach Mouse Habitat
- Planned Future Beach Restoration Projects
- Existing Beach Restoration Projects
- State Parks
- County Boundaries

Walton County Planning Division, twg, 9/8/2009
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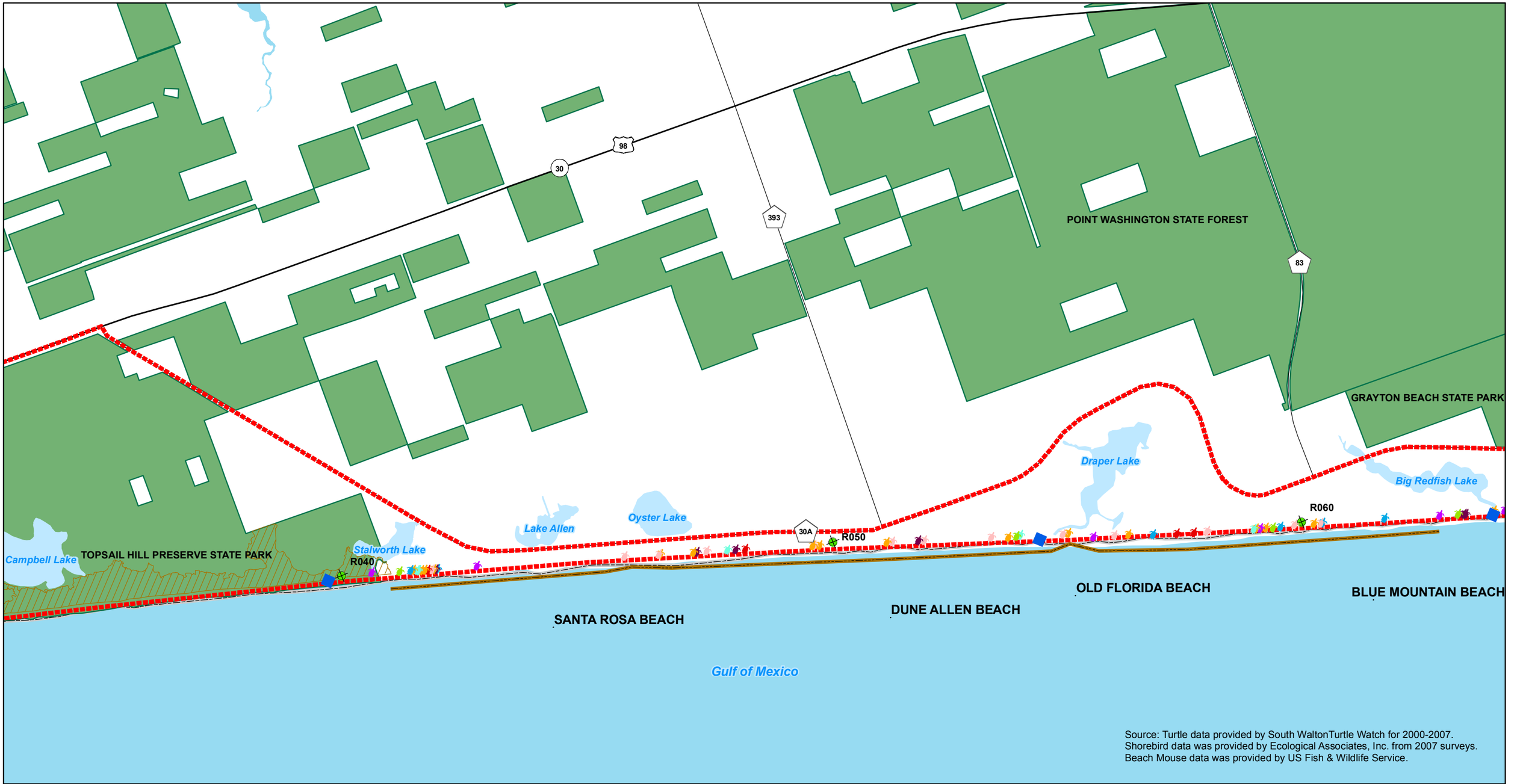

Figure 6B

Locations of federally listed species within the Plan Area - West Central Walton County

N

1 inch = 2,000 feet

2,000 1,000 0 2,000 Feet

Turtle Nests/Year

- 2000
- 2001
- 2002
- 2003
- 2004
- 2005
- 2006
- 2007

- Range Monuments (10th)
- Primary Shorebird Resting Areas
- Choctawhatchee Beach Mouse Habitat
- Planned Future Beach Restoration Projects
- Existing Beach Restoration Projects
- State Parks
- County Boundaries

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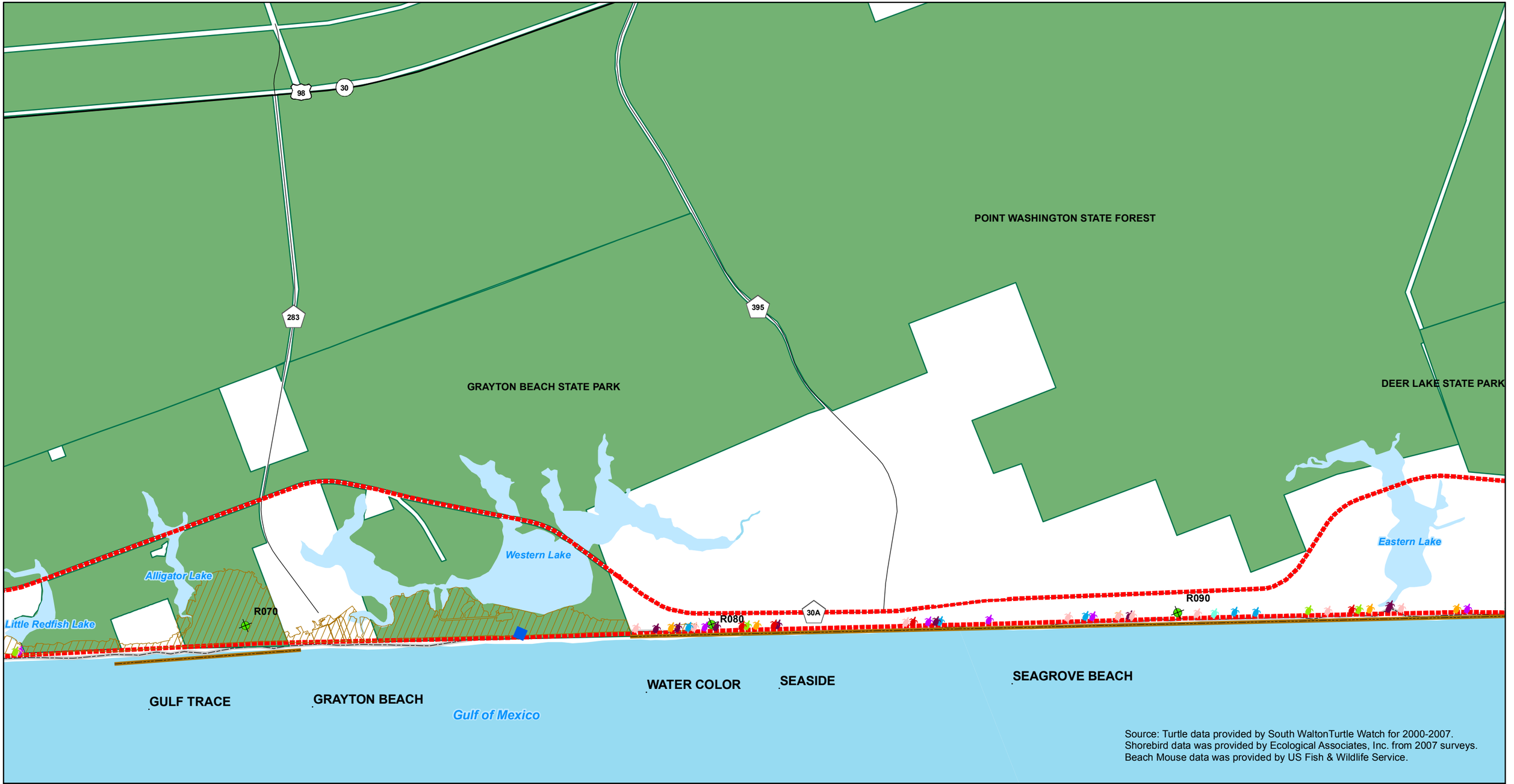

Figure 6C

Locations of federally listed species within the Plan Area - East Central Walton County

N

1 inch = 2,000 feet

2,000 1,000 0 2,000 Feet

Turtle Nests/Year

- 2000
- 2001
- 2002
- 2003
- 2004
- 2005
- 2006
- 2007

- Range Monuments (10th)
- Primary Shorebird Resting Areas
- Choctawhatchee Beach Mouse Habitat
- Planned Future Beach Restoration Projects
- Existing Beach Restoration Projects
- State Parks
- County Boundaries

Walton County Planning Division, twg, 8/19/2009
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This GIS data is not a legal representation of the features depicted; any assumption of the legal status of this data is hereby disclaimed.

POINT WASHINGTON STATE FOREST

DEER LAKE STATE PARK

WALTON COUNTY

BAY COUNTY

30

98

Powell Lake

Deer Lake

R100

Camp Creek Lake

30A

R110

R120

WATER SOUND

ALYS BEACH

SEACREST BEACH

ROSEMARY BEACH

INLET BEACH

Gulf of Mexico

Source: Turtle data provided by South WaltonTurtle Watch for 2000-2007.
Shorebird data was provided by Ecological Associates, Inc. from 2007 surveys.
Beach Mouse data was provided by US Fish & Wildlife Service.

Figure 6D

Locations of federally listed species within the Plan Area - East Walton County

N

1 inch = 2,000 feet

2,000 1,000 0 2,000 Feet

Turtle Nests/Year

- 2000
- 2001
- 2002
- 2003
- 2004
- 2005
- 2006
- 2007

- Range Monuments (10th)
- Primary Shorebird Resting Areas
- Choctawhatchee Beach Mouse Habitat
- Planned Future Beach Restoration Projects
- Existing Beach Restoration Projects
- State Parks
- County Boundaries

Walton County Planning Division, twg, 9/8/2009
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Piping Plover

Biological Information

The piping plover (*Charadrius melodus*) is a small North American shorebird, averaging about 7 inches (17 cm) long. Plumage and coloration vary somewhat by season. Breeding birds have a white belly, beige back and crown, a black upper tail with a white edge, a single black breastband, a black bar across the forehead, and orange legs and bill. In winter (non-breeding), the bill becomes mostly black, the legs fade to a pale yellow, and the black bands disappear (USFWS 1996).

Breeding begins in mid-March and continues into the summer. The USFWS recognizes three distinct piping plover population segments which breed, respectively, along the Atlantic coast, the Great Lakes, and within the Northern Great Plains from Nebraska northward to Canada. The Great Plains breeding population is the largest, while less than one percent of the population breeds in the Great Lakes region (Haig and Plissner 1993). During the fall, all breeding populations migrate southward to overwinter along the Atlantic and Gulf coasts from North Carolina to Mexico (USFWS 1996). During the 1991 International Census for piping plovers, the highest concentrations of over-wintering birds were found on the coasts of Texas. Although breeding populations are distinct, mingling of birds from the various breeding areas apparently occurs within winter habitat (Haig and Oring 1988, Haig and Plissner 1993).

Primary constituent elements of wintering piping plover habitat include sand and/or mud flats with no or sparse emergent vegetation. Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting piping plovers (USFWS 2001). Plovers feed on intertidal portions of sandy ocean beaches, mudflats, sand flats, and shorelines of coastal ponds or lagoons (Gibbs 1986, Coutu *et al*. 1990, Hoopes *et al*. 1992). Feeding activities of both adults and chicks can occur at all hours of the day and night (Burger 1994) and at all tidal stages (Goldin 1993). Plovers eat a variety of small invertebrates, such as worms, insects, insect larvae, crustaceans, and mollusks.

The piping plover was listed as endangered in the Great Lakes watershed and threatened elsewhere within its range under the provisions of the ESA in 1986. Plovers were hunted to near extinction until it was prohibited by the provisions of the U.S. Migratory Bird Treaty Act in 1918. Habitat loss and degradation, pollution, disturbance by humans and free roaming pets, and predation continue to jeopardize the species.

Site-Specific Information

The Florida panhandle is utilized as over-wintering habitat by piping plovers from all three breeding populations. Individual birds exhibit a high degree of wintering site fidelity (Nicholls and Baldassarre 1990; Stucker and Cuthbert 2006). Information on the

distribution of piping and snowy plovers is collected nationwide every five years by the U.S. Geological Survey. During the three winter surveys conducted from 1991 to 2001, an average of 103 piping plovers were observed on beaches in the panhandle region. Sites that appear particularly important to plovers include Shell Island in Bay County and Lanark Reef within Franklin County. No plovers were observed within Walton County during the 1996, 2001, or 2006 censuses. However, during the 1991 census, several plovers were observed in the vicinity of Grayton Beach State Park.

Loggerhead Sea Turtle

Biological Information

The loggerhead turtle (*Caretta caretta*) was federally listed on July 28, 1978 as a threatened species under the ESA (43 FR 32800). Internationally, it is considered "endangered" by the World Conservation Union (Hilton-Taylor 2000) and is listed in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Circumglobal in range, this species can be found in temperate, subtropical, and tropical waters of the Atlantic, Pacific, and Indian Oceans (Dodd 1988). With the exception of brief periods when adult females emerge on sandy beaches to nest, loggerheads spend their entire lives in marine and estuarine waters, as do other sea turtles.

The loggerhead sea turtle is characterized by a large head with blunt jaws, and adults have an average weight of about 200 lbs (75 kg). It feeds on mollusks, crustaceans, fish, and other marine animals.

Loggerheads inhabit the continental shelves and estuarine environments in the temperate and tropical regions of the Atlantic, Pacific, and Indian Oceans. Major nesting beaches are located in the Sultanate of Oman, southeastern U.S., and eastern Australia. The species is widely distributed within its range. It may be found hundreds of miles out to sea, as well as in inshore areas such as bays, lagoons, salt marshes, creeks, ship channels, and the mouths of large rivers. Coral reefs, rocky places, and shipwrecks are often used as feeding and resting areas.

Adult loggerheads are known to migrate long distances between foraging areas and nesting beaches. In Florida, female loggerhead turtles nest on average every 2.7 years (Dodd 1988). Remigration intervals (years between successive nesting events) are not fixed within individual turtles, and may vary from one nesting cycle to the next. During non-nesting years, adult females from U.S. beaches are distributed in waters off the eastern U.S. and throughout the Gulf of Mexico, Bahamas, Greater Antilles, and Yucatán.

Genetic evidence supports long-held beliefs that sea turtles exhibit a natal homing instinct; upon reaching reproductive age, they return to their natal beaches to nest (Meylan *et al*. 1990, Bowen *et al*. 1993, Allard *et al*. 1994). Mating season in Florida begins in March, prior to commencement of nesting. The loggerhead sea turtle nesting

and hatching season for the northwest Florida region officially extends from May 1 through October 31.

The general nesting process for all species of sea turtles is stereotypical, with subtle variations (Miller 1997). Nesting involves a series of sequential behaviors: ascending the beach, making the body pit, digging the egg chamber, laying eggs, filling the egg chamber, covering the body pit, and returning to the surf (Hailman and Elowson 1992).

Nesting occurs almost exclusively at night. Female sea turtles emerge from the surf zone and ascend the beach in search of an appropriate place to construct their nests. If a suitable nesting site cannot be found, the turtle will return to the ocean and will typically select another site either later that night or the next night (Miller *et al.* 2000). Nest placement can be influenced by physical and chemical parameters of the beach (Stoneburner and Richardson 1981, Wood and Bjorndal 2000) as well as by anthropogenic factors such as artificial lighting (Salmon *et al*. 1995) and beach armoring (Mosier 1998, Bouchard *et al.* 1998).

Female sea turtles typically lay several clutches of eggs during each season that they nest (Ehrhart 1982). The average number of nests laid per female typically ranges from 3.0 to 5.5 nests per season (Murphy and Hopkins 1984, Frazer and Richardson 1985, Hawkes *et al.* 2005, Scott 2006, Tony Tucker, Mote Marine Laboratory, *pers. comm.* as cited in NMFS and USFWS 2008). Renesting intervals are approximately two weeks (Hirth 1980, Ehrhart 1982), with individuals usually returning to the same general area to lay successive clutches (Carr 1967, Dodd 1988).

Sea turtle nests incubate for variable periods of time depending on prevailing sediment temperatures. The loggerhead turtle incubation period ranges from approximately 49 to 80 days for nests left *in situ* (in place; Dodd 1988).

Hatchlings emerge from their nests almost exclusively at night, presumably using decreasing sand temperature as a cue (Hendrickson 1958, Mrosovsky 1968, Witherington *et al.* 1990). Sea turtle hatchlings receive no parental care. Most loggerhead hatchlings originating from U.S. beaches are believed to spend their time in the open ocean of the North Atlantic gyre for an extended period of time, perhaps as long as 10 to 12 years, and are best known from the eastern Atlantic near the Azores and Madeira. Post-hatchlings have been found floating in association with *Sargassum* rafts. Once they become juveniles, they begin migrating to coastal areas in the Northwest Atlantic where they become bottom feeders in lagoons, estuaries, bays, river mouths, and shallow coastal waters. These juveniles occupy coastal feeding grounds for a decade or more before maturing and making their first reproductive migration, the females returning to their natal beach to nest.

The NMFS and USFWS (2008) summarized the geographic distribution of loggerhead turtle nesting. The most recent reviews show that only two loggerhead nesting aggregations have greater than 10,000 females nesting per year (Baldwin *et al*. 2003, Ehrhart *et al*. 2003, Kamezaki *et al*. 2003, Limpus and Limpus 2003, Margaritoulis *et al*.

2003): South Florida (U.S.) and Masirah (Oman). Nesting aggregations with 1,000 to 9,999 females nesting each year occur in Georgia through North Carolina (U.S.), Quintana Roo and Yucatán (Mexico), Brazil, Cape Verde Islands (Cape Verde, eastern Atlantic off Africa), and Western Australia (Australia). Smaller nesting aggregations with 100 to 999 nesting females annually occur in the Northern Gulf of Mexico (U.S.), Dry Tortugas (U.S.), Cay Sal Bank (The Bahamas), Tongaland (South Africa), Mozambique, Arabian Sea Coast (Oman), Halaniyat Islands (Oman), Cyprus, Peloponnesus (Greece), Island of Zakynthos (Greece), Turkey, Queensland (Australia), and Japan.

In the U.S., loggerheads nest from Texas to Virginia. Total estimated nesting in the U.S. has fluctuated between 47,000 and 90,000 nests per year over the last decade (FWC, unpublished data; Georgia Department of Natural Resources, unpublished data; South Carolina Department of Natural Resources, unpublished data; North Carolina Wildlife Resources Commission, unpublished data). The vast majority of nesting in the U.S. occurs in Florida. The beaches of east central and southeast Florida from Brevard to Broward Counties are especially prolific nesting areas, accounting for about 90 percent of the total nests deposited each year in Florida (Meylan *et al.* 1995).

Genetic research involving mitochondrial DNA (mtDNA) has identified five distinct loggerhead nesting sub-populations/nesting aggregations in the Northwest Atlantic (Bowen 1994 and 1995, Bowen *et al*. 1993, Encalada *et al*. 1998, Pearce 2001):

- Northern (North Carolina, South Carolina, Georgia, and northeast Florida);
- South Florida (from 29°N latitude on Florida's east coast to Sarasota on Florida's west coast);
- Dry Tortugas, Florida
- Northwest Florida (Eglin Air Force Base and the beaches near Panama City); and
- Yucatan (eastern Yucatan Peninsula).

Data indicate that gene flow between these five regions is very low. If nesting females are extirpated from one region, dispersal from adjacent sub-populations will not be sufficient to replenish the depleted stock (TEWG 1998 and 2000). Recent analysis of data collected as part of the State's Index Nesting Beach Survey (INBS) program has revealed a 41 percent decline in nest counts over the last 10 years.

Site-Specific Information

Walton County's 25.6 mi (41.2 km) of coastline supports less than one percent of the total loggerhead nesting in the State of Florida (Meylan *et al*. 1995). Within the Florida panhandle (Escambia, Santa Rosa, Franklin, Okaloosa, Walton, Bay, and Gulf Counties), Walton County accounted for 4.9% of all loggerhead nesting between 1996 and 2007 (FWC 2008). Since 1996, an average of 43.9 loggerhead nests per year have been documented (Table 2). After reaching a record high of 72 nests in 2000, nesting declined to a record low of 21 in 2007, a statistically significant decrease of 70 percent (F_{11}=14.616, r^2=0.59, $p<0.01$). However, loggerhead nesting has recovered somewhat in

the two most recent years (Figure 7). This local pattern mirrors a statewide trend. The Florida Fish and Wildlife Research Institute (FWRI), the research branch of the FWC, reports that loggerhead nesting in Florida declined 41 percent between 1998 and 2008, but has stabilized in recent years (http://research.myfwc.com).

Loggerhead nest densities along the entire County shoreline between 1996 and 2007 ranged from 0.7 (2007) to 2.4 nests per mile (1999 and 2000; 1.1 to 3.9 nests/km). The overall average during that period was 1.5 nests/mi (2.4 nests/km). Nest densities are typically highest in the State parks. For example, since 2000 there have been 30 loggerhead nests reported in Topsail Hill Preserve State Park, and 29 in Grayton Beach State Park. That equates to a total of 5.9 and 9.3 nests/mile (9.5 and 15.0 nests/km), respectively. Although nest densities are lower elsewhere in the County, the majority of nesting occurs outside of the State parks.

Between 2000 and 2007, a total of 229 nests and 130 loggerhead false crawls (non-nesting emergences) were documented on those County-managed beaches outside of the three State parks (Figure 6). That represents 79.2% of all nests in the County (289) during that period. Nesting success, the percentage of all crawls resulting in nests, was 63.8%.

Green Sea Turtle

Biological Information

In 1978, the breeding populations of the green turtle (*Chelonia mydas*) in Florida and on the Pacific Coast of Mexico were federally listed as endangered; all other populations were listed as threatened (43 FR 32800). Allard *et al*. (1994) concluded that the Florida nesting population of green turtles is genetically distinct, and Meylan *et al*. (1995) stated that the Florida green turtle nesting aggregation deserves recognition as a regionally significant colony.

The green turtle is a circumglobal species in tropical and subtropical waters. The major green turtle nesting colonies in the Atlantic Ocean occur on Ascension Island, Aves Island, Costa Rica, and Surinam (NMFS and USFWS 1991b). Nesting in the United States occurs in small numbers in the U.S. Virgin Islands and on Puerto Rico and in larger numbers along the east coast of Florida, particularly from Brevard County south to Broward County.

The green sea turtle grows to a maximum size (carapace length) of about four feet (1.2 m) and a weight of 440 lb (164 kg). It has a heart-shaped shell, small head, and single-clawed flippers. Hatchling green turtles eat a variety of plants and animals, but adults feed almost exclusively on seagrasses and marine algae. They are generally found in fairly shallow waters (except when migrating) inside reefs, bays, and inlets. Age at sexual maturity is believed to be between 20 and 50 years (Hirth 1997).

Table 2. Number of Documented Sea Turtle Nests by Species Within Walton County, 1996 to 2009.[1]				
Year	Number of Nests			
	Loggerhead	Green Turtle	Leatherback	Kemp's Ridley
1996	48	5	0	0
1997	67	0	0	0
1998	46	4	0	0
1999	72	0	0	0
2000	72	5	0	0
2001	36	0	0	0
2002	40	4	0	0
2003	44	4	0	0
2004	25	5	0	0
2005	27	0	0	0
2006	24	5	0	0
2007	21	1	1	1
2008	**48**	**7**	**1**	**2**
2009	**45**	**0**	**0**	**0**
Total	**615**	**40**	**2**	**3**
Average	**43.9**	**2.9**	**0.1**	**0.2**

[1] Source: FWC, 2010.

The nesting behavior and life history stages of green turtles are similar to those of loggerheads, although there are slight differences. For example, the eggs of green turtles tend to be larger and deposited deeper on the beach than those of loggerheads. Additionally, green turtles typically do not begin nesting in Florida until late May. Estimates of the number of green turtle nests deposited each year in Florida range from several hundred to over 9,600 (FWC 2006). Like the loggerhead, green turtles lay multiple clutches of eggs during the nesting season. The mean clutch size of green turtle nests is usually 110 to 115 eggs, but this mean varies among populations (NMFS and USFWS 1991b).

Total population estimates for the green turtle are unavailable. However, green turtle nesting in Florida has been significantly increasing since 1989 (Witherington *et al*. 1996, FWC 2009).

Site-Specific Information

Green turtles have been documented to consistently nest within Walton County, albeit in relatively low numbers. Walton County beaches support only 0.07% of the entire State's green turtle nests but accounted for 14.7% of the nests documented in the Florida panhandle between 1996 and 2007 (FWC 2008). Of the seven northwest Florida counties

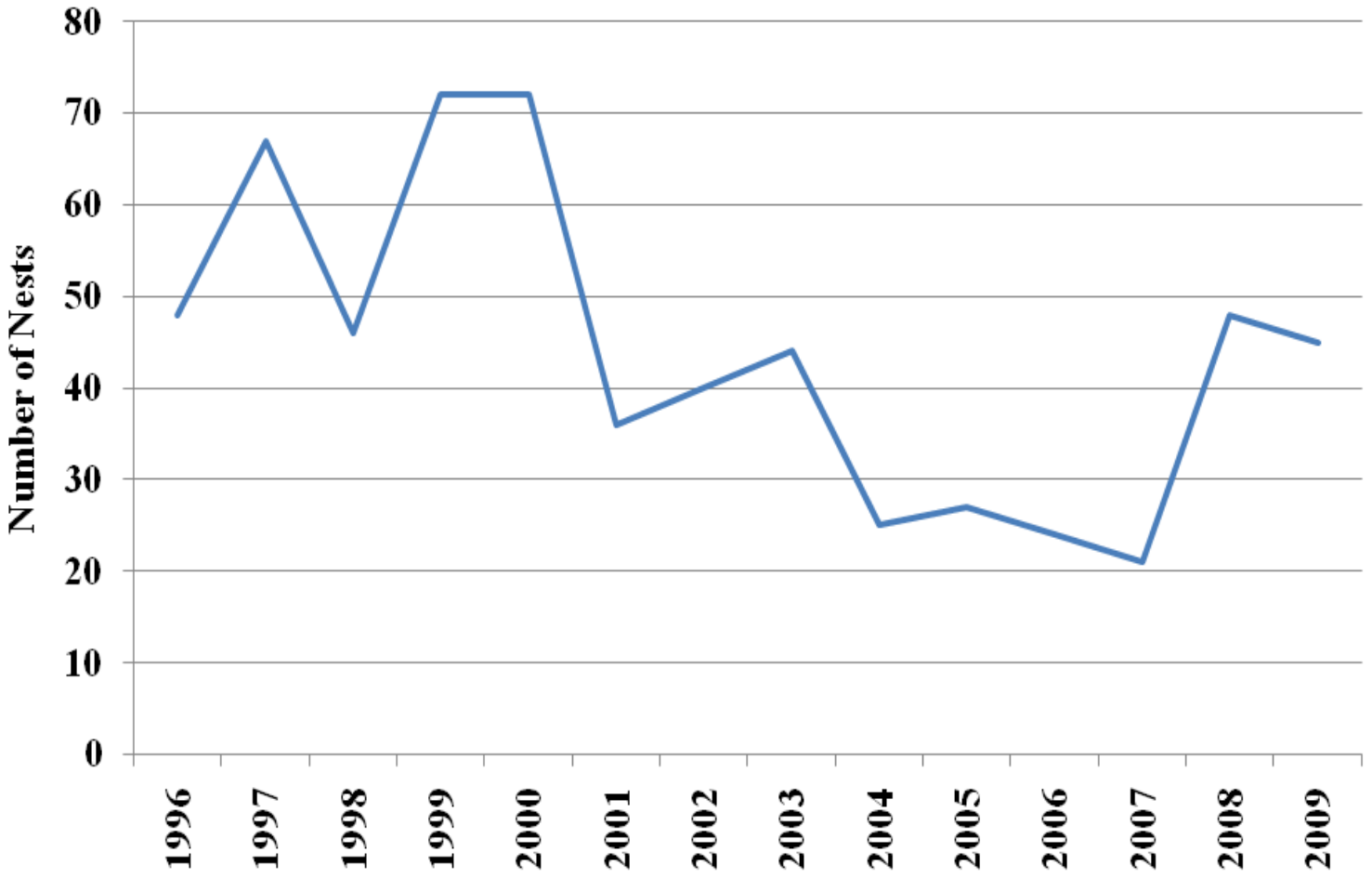

Figure 7. Number of loggerhead nests documented each year on the beaches of Walton County, Florida, 1996-2009. Source: FWC, 2010

that support green turtle nests, Walton ranks third behind Okaloosa (46.4%) and Gulf (17.0%) Counties in average number of nests per year.

Between 1996 and 2009, an average of 2.9 green turtle nests per year were documented in Walton County, with the largest number (7) occurring in 2008 (Table 2). However, green turtles have a distinctive biannual nesting pattern, with relatively low nest numbers one year followed by relatively high numbers the next. Over the 14-year period referenced above, an average of 5.0 green turtle nests were recorded during even numbered years compared with only 0.8 nests per year in odd numbered years. This equates to an average annual nest density of 0.20 nests per mile (0.12/km) during even numbered years and 0.03 nests per mile (0.02/km) during odd numbered years.

Within Walton County, green turtle nesting activity is highest within Topsail Hill Preserve State Park; between 2000 and 2007, 17 nests were reported in the park. Only 25 percent of green turtle nests during that period occurred outside of the three State parks (FWC 2008).

Leatherback Sea Turtle

Biological Information

The leatherback turtle (*Dermochelys coriacea*), the largest of the extant species of sea turtles, was federally listed as an endangered species in 1970 (35 FR 8491). Unlike other sea turtles, the carapace, or top shell, of the leatherback is not covered with bony plates. Rather, its carapace is composed of a black, oil-saturated, rubber-like tissue that is strengthened by a mosaic of thousands of small bones just below the outer skin of the carapace. The morphology of the leatherback is so distinct that it is placed in a separate family (Dermochelyidae) from other extant species of sea turtles (Cheloniidae; NMFS and USFWS 1992).

Whereas the other species of sea turtles tend to inhabit relatively shallow coastal waters where they feed on bottom dwelling plants and animals, leatherbacks tend to be pelagic (Pritchard and Trebbau 1984). They feed primarily on soft-bodied animals, such as jellyfish, that are abundant in the open ocean (Lazell 1980, Shoop and Kenney 1992).

Circumglobal in range, leatherback turtles travel great distances between their winter foraging and summer nesting grounds (Goff *et al*. 1994, Girondot and Fretey 1996). The leatherback turtle is found in the Atlantic, Pacific, and Indian Oceans and has been spotted as far north as the Barents Sea, Canadian Maritime Provinces and Alaska, and as far south as Chile, the Cape of Good Hope, and New Zealand (Pritchard and Trebbau, 1984). The leatherback can inhabit colder waters than other sea turtles, because it is apparently able to maintain an internal temperature that exceeds ambient water temperature; it may be active at temperatures reportedly as low as 32ºC (0ºC; Frair *et al*. 1972, Goff and Lien 1988).

Nesting grounds are distributed throughout the Atlantic, Pacific, and Indian Ocean basins between 30ºN and 20ºS latitude (Stewart and Johnson, 2006). The most important nesting beaches currently occur in the Western Pacific (on the beaches of Papua New Guinea, Papua, Indonesia, Soloman Islands, and Vanuatu), the Southern Caribbean (in Suriname, French Guiana, and Trinidad), and the Eastern Atlantic (in Gabon; NMFS and USFWS 2007). Nesting in the United States occurs primarily in Puerto Rico, the U.S. Virgin Islands, and southeastern Florida.

The total population of mature females worldwide was previously estimated to consist of only 34,500 (Spotila *et al*. 1996), with many populations, particularly those in the Pacific, are threatened with extinction in the foreseeable future (Stewart and Johnson 2006). Though the Pacific coasts of Costa Rica and Mexico formerly supported nesting aggregations of global significance, nesting on those beaches has declined precipitously (Spotila *et al*. 2000, Sarti Martinez *et al*. 2007). However, other populations, including appear to be increasing. For example, leatherback nesting in Florida has increased significantly since 1989 (FWC, unpublished data). The majority (75 percent) of the leatherback turtle nests recorded in Florida between 1990 and 2008 occurred in St. Lucie, Martin, and Palm Beach Counties.

Leatherbacks are thought to migrate to their nesting beach about every two to three years and nest about six times during the nesting season (NMFS and USFWS 1992, Miller 1997). The leatherback sea turtle nesting and hatching season in southeast Florida extends from late April through October 31. Tucker (1989) and Tucker and Frazer (1991) reported that leatherback turtles nested an average of five to seven times per year, with a mean internesting interval of about nine to ten days.

The mean annual clutch size of leatherback turtles varies from 65 to 80 yolked eggs (Tucker and Frazer 1991, NMFS and USFWS 1992), and incubation periods vary from 55 to 75 days (NMFS and USFWS 1992).

Site-Specific Information

Documented leatherback nests are rare in northwest Florida, with the first being recorded in 1974 on St. Vincent Island in Franklin County. From 1996 through 2007, a total of 36 nests were reported on panhandle beaches (FWC 2008). By far the largest percentage of those (63.9%) occurred in Franklin County. Walton County accounted for only one of those nests, and that nest was documented in 2007 (Table 2). One additional nest was documented in 2008. The majority of the nests within the region have had low natural hatching success.

Kemp's Ridley Sea Turtle

Biological Information

The Kemp's ridley sea turtle (*Lepidochelys kempii*) has received protection in Mexico since the 1960's and was listed as endangered under United States law in 1970 (35 CFR

18320). Together with the olive ridley, they are the smallest of the extant species of sea turtles. The range of the Kemp's ridley includes the Gulf coasts of Mexico and the U.S. and the Atlantic coast of North America as far north as Nova Scotia and Newfoundland. Adult turtles are thought to spend most of their time in the Gulf of Mexico, while juveniles and subadults also regularly occur along the eastern seaboard of the United States (USFWS and NMFS 1992). The Kemp's ridley is carnivorous, feeding on swimming crabs, mollusks, jellyfish, and fish, with blue crabs apparently a preferred food.

Kemp's ridleys nest singly or in large groupings called *arribadas*. Unlike the loggerhead, Kemp's ridley nesting occurs during the day. The majority of nesting takes place on western Gulf of Mexico beaches primarily in the Mexican states of Tamaulipas and Veracruz (USFWS and NMFS 1992; USFWS 2001). Nesting occurs from April into July. Kemp's ridleys are thought to nest every one or two years, depositing an average of 2.5 clutches per nesting season (TEWG 2000). The renesting interval is between 20 and 28 days, and the mean clutch size is about 110 eggs (Miller 1997). Some females breed annually and nest an average of 1 to 4 times in a season at intervals of 10 to 28 days. Age at sexual maturity is believed to be between 7 to 15 years (TEWG 1998).

After leaving the nesting beach, hatchlings are believed to become entrained in eddies within the Gulf of Mexico, where they are dispersed within the Gulf and Atlantic by oceanic surface currents until they reach about 7.9 inches (20 cm) in length, at which time they enter coastal shallow water habitats (Ogren 1989).

Site-Specific Information

Nesting of Kemp's Ridley sea turtles in Florida is rare and only three nests were documented in Walton County between 1996 and 2009 (Table 2). Within northwest Florida, a total of 25 nests were documented between 1996 and 2007, with the vast majority of those (80 percent) occurring in Escambia County (FWC 2008). Nests within the Florida panhandle are generally deposited from mid-May to mid-July.

State-listed Plant and Animal Species Potentially Affected by Proposed Activities

State listed plant and animal species that occur within the Plan Area and that may be affected by activities covered under this HCP are listed in Table 3. There are no known federally listed plant species that occur within Walton County in areas likely to be affected by the County-managed and/or regulated activities covered under this HCP.

A review of the State's Breeding Bird Atlas database (http://myfwc.com/bba/data/CountySpecies.asp) reveals that between 1986 and 1991, there were four confirmed nestings by snowy plovers and three confirmed nestings by least terns on the beaches of Walton County. Nesting by other state-listed bird species has not been documented within the Plan Area, although appropriate nesting habitat exists. The extent of recent bird nesting on the County's beaches is not known.

Of the state-listed bird species, only the least tern was observed during summer shorebird surveys conducted during 2007 (DeTect 2007). During bi-monthly surveys conducted between May and August, 163 least terns were observed on County beaches, although no nesting was documented. Snowy plovers are known to be occasional visitors to County beaches. A total of 23 snowy plovers were documented on County beaches during the 2001 International Piping and Snowy Plover Census in Florida (Ferland and Haig, 2002).

Table 3. State-listed Plant and Animal Species Within the Plan Area Potentially Affected by Proposed Activities.

Scientific Name	Common Name	State Status[1]	Habitat
FAUNA			
Birds			
Charadrius alexandrinus	Snowy plover	T	Beaches
Haematopus palliatus	American oystercatcher	SSC	Beaches, sandbars, mudflats
Rynchops niger	Black skimmer	SSC	Coastal waters, beaches
Sterna antillarum	Least tern	T	Coastal beaches and estuaries
FLORA			
Chrysopsis godfreyi	Godfrey's goldenaster	E	Back dunes, coastal scrub
Chrysopsis gossypina ssp. *cruiseana*	Cruise's goldenaster	E	Coastal dunes
Lupinus westianus	Gulfcoast lupine	T	Disturbed open sandy areas, dunes
Opuntia stricta	Prickly-pear cactus	T	Shell mounds, coastal areas

[1]E = Endangered; T = Threatened; SSC = Species of Special Concern.

Other Federal and State-listed Plant and Animal Species Potentially Occurring in Plan Area Unaffected by Proposed Activities

Table 4 provides a listing of State and federally protected species that may be present within or adjacent to the Plan Area but are not likely to be affected by covered activities based upon their known geographical distributions and/or habitat requirements.

Table 4. State and Federally Protected Species Potentially Occurring Within the Plan Area But Not Likely to be Affected by Covered Activities.[1]

Scientific Name	Common Name	Federal Status	State Status	Habitat
FAUNA				
Mammals				
Trichechus manatus	Manatee	E	E	Coastal waters

Table 4.
(Continued)

Scientific Name	Common Name	Federal Status	State Status	Habitat
Reptiles				
Alligator mississippiensis	American alligator	SAT	SSC	Swamps, lakes, rivers
Drymarchon couperi	Eastern indigo snake	T	T	Highly variable
Reptiles				
Gopherus polyphemus	Gopher tortoise		SSC	Dry uplands
Amphibians				
Ambystoma bishopi	Reticulated flatwoods salamander	T	SSC	Pine flatwoods with scattered wetlands
Rana capito	Gopher frog		SSC	Sandy uplands
Birds				
Egretta caerulea	Little blue heron		SSC	Fresh-, brackish, and saltwaters
Egretta thula	Snowy egret		SSC	Swamps, steams, lakes
Egretta tricolor	Tricolored heron		SSC	Wetlands, mangroves
Eudocimus albus	White ibis		SSC	Variable
Mycteria americana	Wood stork	E	E	Marshes, lagoons, tidal creeks
Pelecanus occidentalis	Brown pelican		SSC	Coastal waters
Picoides borealis	Red-cockaded woodpecker	E	T	Mature pine woodlands
Fish				
Acipenser oxyrinchus desotoi	Gulf sturgeon	T	T	Gulf of Mexico (adult); coastal rivers (spawning)
FLORA				
Agrimonia incisa	Incised groove-spur		E	Sandhills
Andropogon arctatus	Pine-woods bluestem		T	Flatwoods
Asclepius viridula	Southern milkweed		T	Wet flatwoods
Baptisia calyclosa var. villosa	Hairy wild indigo		T	Pine or oak woods; sandhills
Calamintha dentata	Toothed savory		T	Sandhills, dry bluffs

Table 4.
(Continued)

Scientific Name	Common Name	Federal Status	State Status	Habitat
Calamovilfa curtissii	Curtiss' sandgrass		T	Pinelands, wet prairie, marsh
Carex baltzellii	Baltzell's sedge		T	Hammocks, bluffs
Cladonia perforata	Reindeer lichen	E	E	Rosemary scrub
FLORA				
Drosera intermedia	Spoon-leaved sundew		T	Wet flatwoods, marshes
Euphorbia telephiodes	Telephus spurge	T	E	Wet flatwoods
Hymenocallis henryae	Panhandle spiderlily		E	Cypress depressions, wet flatwoods
Linum westii	West's flax		E	Cypress swamp
Litsea aestivalis	Pondspice		E	Bayheads, swamps
Macranthera flammea	Hummingbird flower		E	Seepage slopes, pond edges
Pinguicula primulifloria	Primrose-flowered butterwort		E	Shallow water, swamps
Platanthera integra	Yellow fringeless orchid		E	Swampy meadows, boggy depressions
Polygonella macrophylla	Large-leaved jointweed		T	Sand pine-oak scrub
Rhexia parviflora	Small-flowered meadowbeauty		E	Margins of open cypress swamps
Rhexia salicifolia	Panhandle meadowbeauty		T	Coastal swales
Rhododendron austrinum	Florida flame azalea		E	Forested bluffs, hammocks
Sacoila lanceolata	Leafless beaked orchid		T	Sandhills, roadsides
Sarracenia leucophylla	White-top pitcherplant		E	Bogs, creek swamps
Tephrosia mohrii	Pineland hoary pea		T	Sandhills
Thalictrum cooleyi	Cooley's meadowrue	E	E	Savannas, bogs
Verbesina chapmanii	Chapman's crownbeard		T	Wet flatwoods
Xyris scabrifolia	Harper's yellow-eyed grass		T	Seepage slope, wet prairie

[1] Source: Florida Natural Areas Inventory (FNAI) occurrence data based on habitat type.

Migratory Shorebirds

The beach environment within the Plan Area provides potential nesting, resting, and foraging habitat for various species of resident shorebirds, as well as resting and stopover points for migratory species. Some of these birds are listed by the State of Florida and/or the USFWS as either threatened or endangered species, including the piping plover, snowy plover, American oystercatcher, least tern, and black skimmer. However, the taking of birds, nests, and eggs of all migratory shorebirds is prohibited by the U.S. Migratory Bird Treaty Act as well as the State Wildlife Code. Insofar as these shorebirds are dependent in some capacity on the beach and dune environment for all or portions of their life cycle, they may be potentially affected by covered activities.

The following non-listed shorebirds may occur within the Plan Area, based upon known geographical distributions:

- Black-bellied plover (*Pluvialis squatrola*);
- Bonaparte's gull (*Larus philadelphia*);
- Caspian tern (*Sterna caspia*);
- Common tern (*Sterna hirundo*);
- Forster's tern (*Sterna forsteri*);
- Killdeer (*Charadrius vociferous*);
- Dunlin (*Calidrus alpina*);
- Gull-billed tern (*Sterna nilotica*);
- Herring gull (*Larus argentatus*);
- Laughing gull (*Larus atricilla*);
- Red knot (*Calidrus canatus*);
- Ring-billed gull (*Larus delawarensis*);
- Royal tern (*Sterna maxima*);
- Ruddy turnstone (*Arenaria interpres*);
- Sanderling (*Calidrus alba*);
- Sandwich tern (*Sterna sand:vicensis*);
- Semipalmated plover (*Charadrius semipalmatus*);
- Shortbilled dowitcher (*Limnodromus griseus*);
- Spotted sandpiper (*Actitus macularia*);
- Willet (*Catoptrophurus semipalmatus*);
- Wilson's plover (*Charadrius wilsonia*); and
- Western sandpiper (*Calidrus mauri*).

From May to August 2007, a comprehensive Countywide survey was conducted in an effort to characterize the local shorebird community and identify preferred habitat (DeTect 2007). Surveys were conducted twice each month with visual counts conducted every 0.2 mi (0.3 km), for a total of 124 survey locations. A total of 5,078 shorebird sightings were documented during the surveys. The majority (76 percent) of sightings occurred in August. Eight bird species were observed (in order of abundance): laughing gull, royal tern, sanderling, sandwich tern, least tern, willet, ruddy turnstone, and black-

bellied plover. It is important to note that some shorebird species, such as the piping plover, may not be present in Florida during the summer. Accordingly, surveys conducted during the summer do not document the full assemblage of birds occurring on County beaches. Nonetheless, distributional data for summer and year-round residents is useful in characterizing the quality of habitat for shorebirds in general, as wintering species (e.g., piping plovers) often associate with other shorebird species (Nicholls and Baldassarre 1990, Eubanks 1992).

Approximately 60 percent of all birds sighted were within the central portion of the County (R-48 to R-78) between unincorporated Santa Rosa Beach and Grayton Beach State Park. Relatively few birds were observed within the western portion of the County (Figure 6). No nesting was observed. Resting and feeding birds showed a clear preference for sections of beach surrounding dune lake outfalls, particularly those at Stallworth Lake, Draper Lake, Big Redfish Lake, Western Lake, and Camp Creek Lake. Nearly 10 percent of all birds sighted in the County were within the vicinity of the Stallworth Lake outlet. Thus, although shorebirds utilize the entire County coastline, the areas of beach near coastal dune lake outfalls appear to provide particularly important habitat.