

Wintering Piping Plover Surveys 2003
Galveston, TX to Carrabelle, FL
22 February – 3 March

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Summary

Rapid and widespread surveys were conducted for Piping Plovers (*Charadrius melodus*) in a ten day period from 22 February to 3 March 2003 on the Gulf of Mexico coast of the United States. The survey objective was to locate and identify color banded Piping Plovers. Twenty-four proposed or designated Critical Habitat Units for Piping Plover were visited between Galveston Island, TX and Carrabelle, FL. Surveys yielded 125-140 Piping Plovers; six were observed wearing color bands; color banded birds were identified from Canadian Prairies and Great Lakes populations. Although not exhaustive, rapid and widespread surveys are relatively inexpensive, provide useful information to managers and can be an efficient use of highly skilled observers.

Introduction

Piping Plovers are small, sand-coloured shorebird that breed and winter in the Northern Western hemisphere (Haig 1992). In the United States, Piping Plovers (PIPLs) are considered a Threatened Species on the Atlantic Coast (USFWS 1996) and in the Great Plains; the Great Lakes population is considered Endangered (USFWS 1988). In Canada, PIPLs are considered a Endangered (CWS). In the US winter range, PIPLs hold the status of Threatened (USFWS). In 2001, the US Fish and Wildlife Service (USFWS) designated winter critical habitat on the Atlantic and Gulf coasts (USFWS 2001).

Piping Plovers can be difficult to locate and identify in winter as they are cryptic, found interspersed with other wintering plovers and shorebirds, and are widely distributed at low densities. Despite comprehensive International Piping Plover Winter Censuses every five years, relatively few plovers banded on the breeding grounds have been resighted during winter; sightings have been opportunistic by particularly tenacious biologists and bird watchers. Sightings of individuals banded on breeding grounds are particularly useful for identifying wintering distribution, patterns among wintering populations and winter habitat use. Highly trained individuals can efficiently locate plovers and color banded individuals. A series of rapid surveys was initiated by the Canadian Wildlife Service in December 2002 on the south Texas coast and yielded numerous sightings of color banded Piping Plovers by Kathryn Mehl. This survey was a continuation of previous efforts, but concentrating on the Gulf Coast from Galveston Island, TX to Carrabelle, FL. Portions of this area are difficult to survey due to remoteness and offshore islands and have generated fewer reports than expected of color banded individuals over the last decade (per observation, J. Stucker).

Methods

Locations for surveys were chosen based on inclusion in the proposed or final Wintering Critical Habitat rule (Figure 1). Locations were surveyed on foot and by car, with access to two locations provided via airboat or small boat. One to three observers were used per location with observers moving across an area and scanning with binoculars and spotting scopes before continuing into areas with birds. When Piping Plovers were discovered they were evaluated for presence of leg bands; if bands were present observations were recorded in notebooks and confirmed by a second observer. Several counts were taken of flocks over a short period of time by up to three observers and a consensus count agreed upon. Care was taken not to double count individuals when moving through areas with multiple groups. Locations where Piping Plovers were observed were recorded from nearby using a GPS unit.

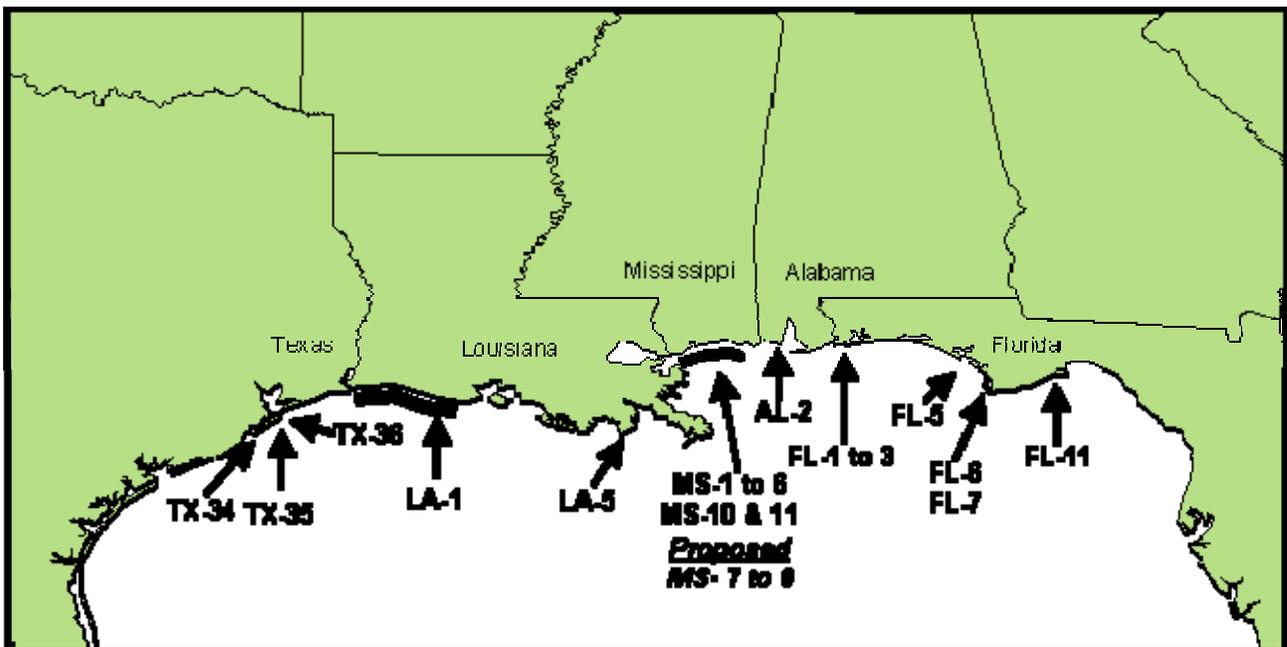


Figure 1. Piping Plover winter Critical Habitat Units surveyed 22 February to 3 March 2003.

Piping Plovers were found at five of 24 Critical Habitat Units: TX-36 (Bolivar Flats), LA-1 (in Rockefeller State Refuge), AL-2 (Pelican Island), FL-2 (Big Sabine Point) and FL-3 (Navarre State Park) (Table 1). The largest concentration was at Bolivar Flats, where 85-100 Piping Plovers were observed roosting in a mixed flock with Snowy (*Charadrius alexandrinus*, SNPL) and Wilson's plovers (*Charadrius wilsonia*, WIPL) and Sanderlings (*Calidris alba*). Seven individuals were found together in a 9.1 km stretch of barrier beach on Rockefeller Refuge. Twenty-seven Piping Plovers were observed in two groupings on Pelican Island. The smallest "flocks" were found in Florida; one group of two individuals and one of four was found on Santa Rosa Island.

Six banded Piping Plovers were observed (Table 2): two at Bolivar Flats and four at Pelican Island. One Bolivar Flats Piping Plover retained only a single incoloy band on its right tarsus; its origin is unknown. A second individual was banded [left tarsus pastel green over red – right leg tibia white flag over kelly green on tarsus]; its origin was Dryboro Lake, SK (personal communication Cheri Gratto-Trevor). Banded Piping Plovers observed at Pelican Island originated from several breeding locations. Two individuals, single red band right tarsus, and a single blue-orange-blue triple split band right tarsus were likely 2002 fledglings from Wilderness State Park, MI. A third individual was banded only on its right tarsus kelly green over metal (incoloy); its breeding location was unknown but likely either Great Lakes or Canadian Prairies. A fourth bird was banded left tibia – white band, right tibia red band and right tarsus metal band (incoloy); this individual was banded in Canadian Prairies.

Evaluation of individual sites follows in a standardized narrative by state and critical habitat unit.

Table 1. Locations and ownership of areas where Piping Plovers were observed 22 February – 3 March 2003.

Date	Location	# PIPL seen	# with bands	UTM coordinates			Substrate	Ownership Status
23-Feb-03	TX-36 Bolivar Flats	85-100	2	15R	0332141	3249990	Sand-mud flat, wrack nearby	State and private (Houston Audubon)
24-Feb-03	LA-1 Rockefeller State Wildlife Refuge	7	none	15R	0520324	3278963	Sand-mud flat, wrack nearby	State
27-Feb-03	AL-2 Pelican Island	27	4	16R	0394061	3343570	Sand-mud-algal flat	State or Federal
28-Feb-03	FL-2 Big Sabine Point	4	none	16R	0495711	3358025	Sand-mud flat	University of West Florida
28-Feb-03	FL-3 Navarre Beach	2	none	16R	0514252	3361324	Sand	State (State Park) & Federal (Eglin Airforce Base)

Table 2. Summary of banded Piping Plover observed 22 February – 3 March 2003.

Location	left leg	right leg	Origin
TX-36 Bolivar Flats	nothing	tarsus - incoloy	Unknown
TX-36 Bolivar Flats	tarsus - pastel green over red	tibia - white flag tarsus- kelly green	Dryboro Lake, SK
AL-2 Pelican Island		tarsus - red	Wilderness State Park, MI
AL-2 Pelican Island		tarsus - blue-orange-blue split	Wilderness State Park, MI
AL-2 Pelican Island		tarsus - kelly green over incoloy	Unknown (Great Lakes or Canadian Prairies)
AL-2 Pelican Island	tibia – white band	tibia - red band tarsus incoloy	SK

Texas

Access to north-eastern Critical Habitat Units in Texas is relatively easy. Much of what appeared to be the best habitat was not easily accessible. TX-37, Rollover Bay was not accessible.

TX-34 San Luis Pass, southern tip of Galveston Island

Piping Plovers seen: None

Banded Piping Plovers seen: None

Date: 22 February 2003

Description of surveyed area: All of TX-34, including east side of unit to northern boundary and westward to the wind-tidal flats; flats were not accessed for surveys

Survey type: vehicle and walking

Weather: sunny breezy, ~21° C (70° F)

Tide: low – mid/high and rising

Description of habitat: East side of unit is wide, gently sloping sand flat beach; western side is wind-tidal flats. The western area appears to hold the best habitat. Very little wrack or natural debris on beach.

Comments and observations: This area was very heavily used by people with vehicles (cars and trucks) for recreation. Additional hazards and disruptions for birds that we observed included kite flying, para-sails attached to go-carts, unleashed dogs, horse back riding and bridge maintenance.

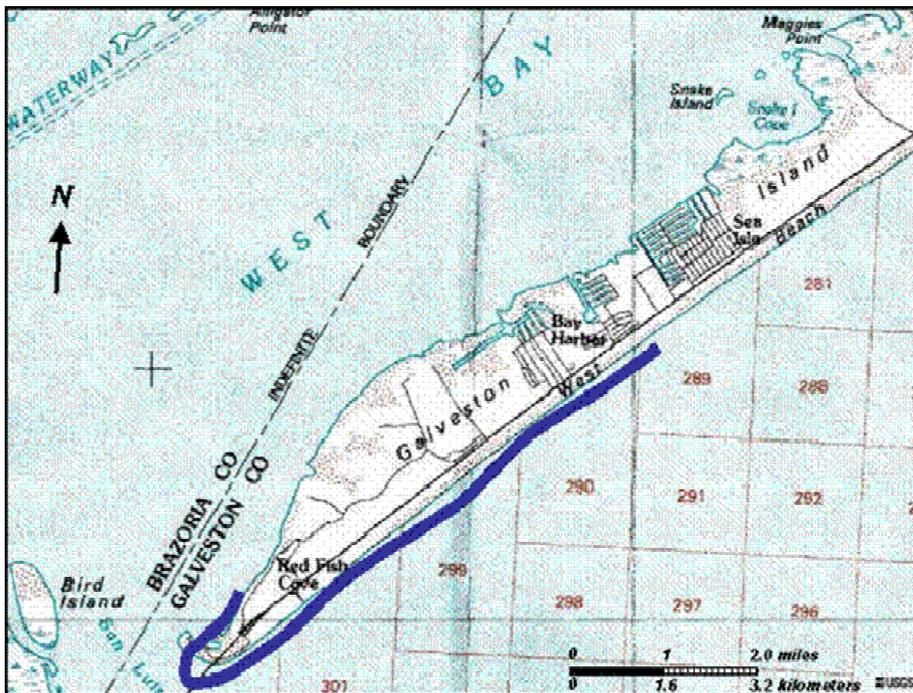


Figure 2. TX- 34 San Luis Pass, Texas. Surveyed area shown with blue line.

TX-35 Galveston East Beach

Piping Plovers seen: None

Banded Piping Plovers seen: None

Date: 22 - 23 February 2003

Description of surveyed area: Area at northern tip of peninsula south of jetty westward to nature area. Best area included in Big Reef nature preserve.

Survey type: vehicle and walking

Weather: 22 February – wind >40 km/hr (20 mph) and driving mist, 10°C (50°F) **Tide:** rising & high

23 February 2003 – wind 15 km/hr (10 mph), sun, 16°C (60°F) **Tide:** rising & high

Description of habitat: sand flats to east and barrier spit with back water marsh area toward north-west. With exception of Big Reef Nature Preserve, very little wrack or natural debris on beach. Galveston City property appears groomed.

Comments and observations: Major construction site - likely dredge spoil holding area with water releases (?) at night toward jetty area. [Construction area cordoned off with 8 ft (2.5 m) fence topped with barbed wire and large sand berms (3 m/10 ft); unable to see inside. Evidence of very large water release on 2/23 when there was no rain on 2/22.] Very few shore birds of any kind seen in area either day with exception of immediate vicinity of jetty. Western end of unit near nature area much more appropriate habitat with back water, oyster flats and marsh; a wide diversity of shorebirds and waterbirds noted. Heavy use of north end of beach from Galveston city property onto Big Reef Nature Preserve as a dog walking area; dogs were not leashed.

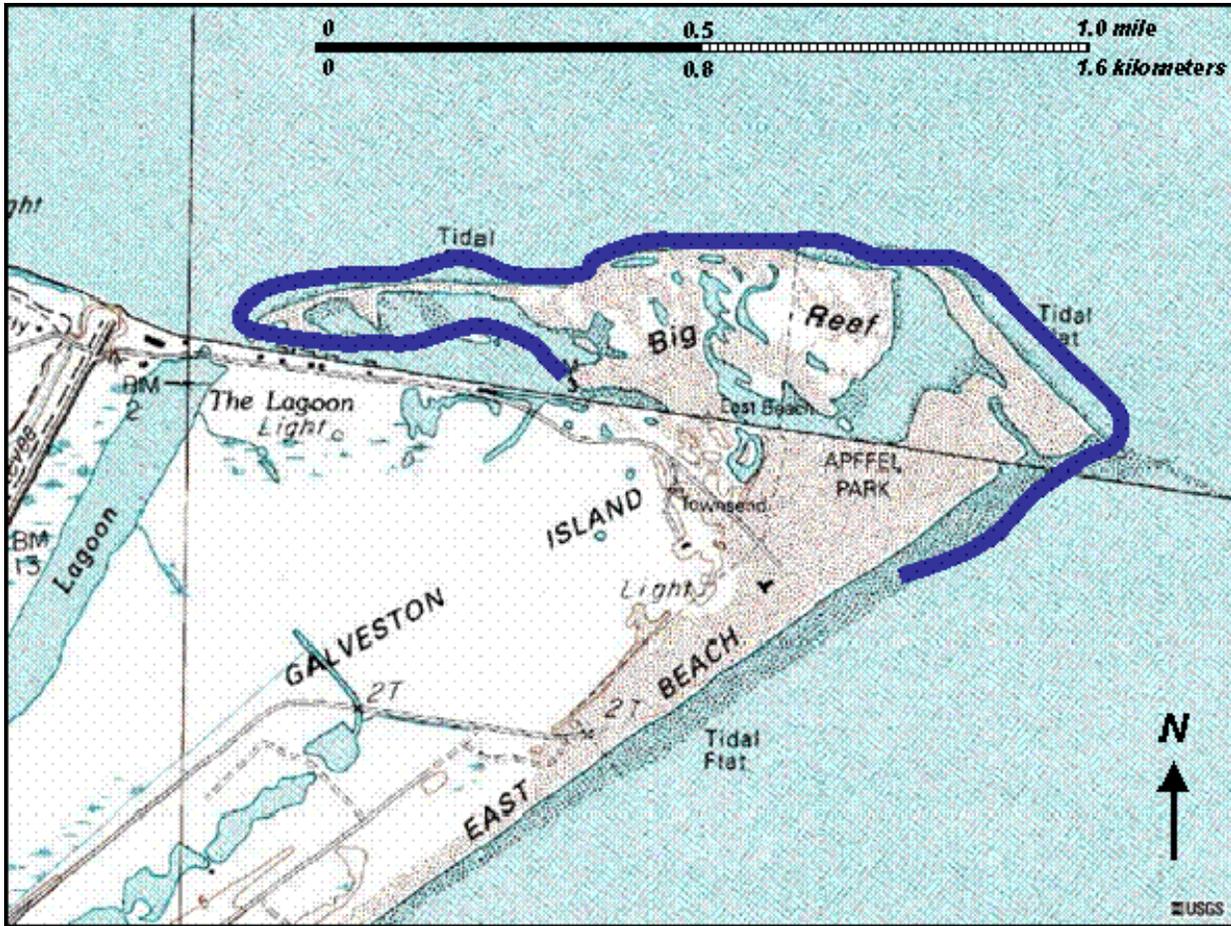


Figure 3. TX- 35 Galveston East Beach, Texas. Surveyed areas shown with blue line.

TX-36 Bolivar Flats

Piping Plovers seen: 85-100 Piping Plovers

Banded Piping Plovers seen: 2 banded (1 color banded)

- left tarsus pastel green over red – right leg tibia white flag, tarsus kelly green
- single metal (incoloy) band on right leg

Date: 23 February 2003

Description of surveyed area: entire critical habitat unit, from Audubon sanctuary to north/eastern edge of unit

Survey type: vehicle and walking

Weather: breezy, 18°C (65°F) and sunny **Tide:** high

Description of habitat: gently sloping, packed sand beach, graduating into a more mud based substrate in sanctuary. With exception of sanctuary, very little wrack or natural debris on beach. Piping Plovers found on sand-mud flat in vicinity of wrack.

Comments and observations: Outside of sanctuary area, much traffic by people with vehicles (cars and trucks). Inside sanctuary, unobservant birders disturbed roosting flock several times. Entire 85-100 PIPLs seen with SNPL and WIPL were in area 20 x100 m.

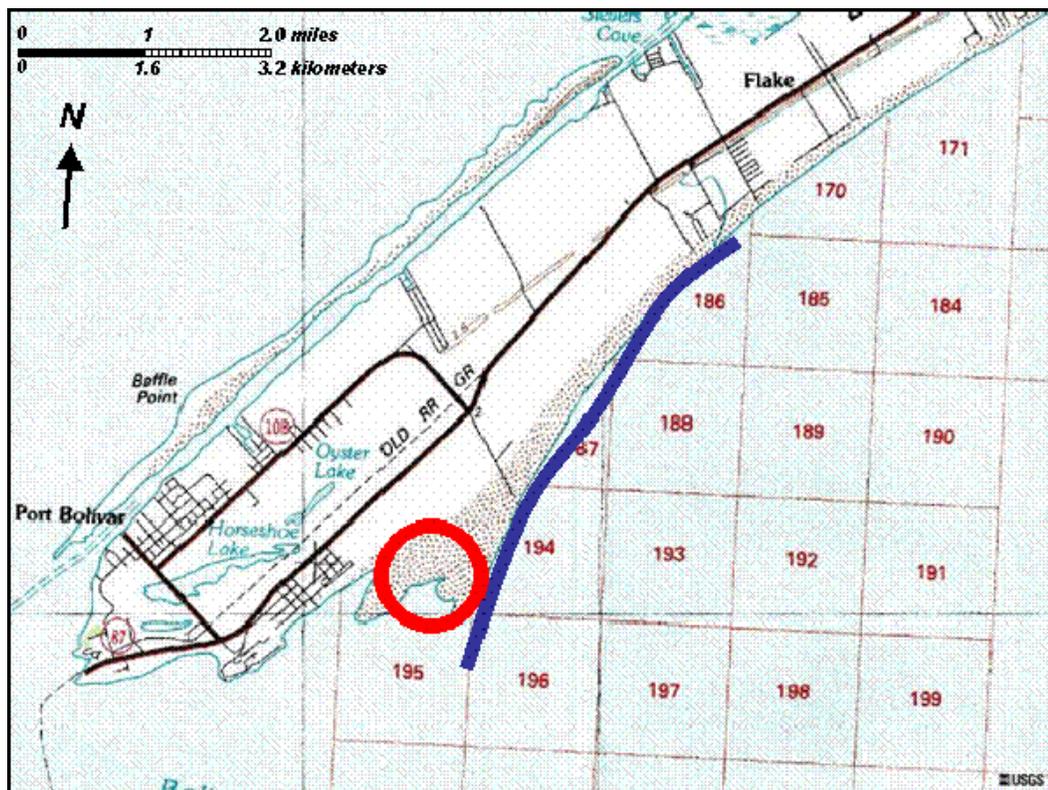


Figure 4. TX- 36 Bolivar Flats, Texas. Piping Plover locations highlighted red circle; surveyed areas shown with blue line.

Louisiana

The Louisiana coastline was for the most part undisturbed beaches, with the exception of Grand Isle. When compared to the Galveston area, the beaches, particularly portions of LA-1, are steeper with looser sand, although habitat varies dramatically within this unit. No attempt was made to access the islands that comprise the majority of Louisiana's critical habitat units. Louisiana State Natural Heritage personnel assisted with surveys in LA-1; Rockefeller Refuge personnel transported surveyors to and from the coastline in Rockefeller Refuge.

LA-1 Southeastern coast of Louisiana from Sabine Pass to Cheniere au Tigre

Piping Plovers seen: 7 PIPL in Rockefeller State Wildlife Refuge, western beach

Banded Piping Plovers seen: None

Date: 24 February 2003

Description of surveyed area: Portions of LA-1: Constance Beach westward ~ 8 km via several beach accesses, Cameron from east side of jetty ~1 km, 2 beach accesses between Cameron and Oak Grove, 9.1 km beach in Rockefeller State Refuge from ~5 km east of western boundary to St. Joseph Bayou

Survey type: foot

Weather: clear, sunny 18°C (65°F)

Tide: rising and falling

Description of habitat: Variable coastline, from very loose steep beach in west to cow pasture/mud flat near Cameron, to barrier beach in Rockefeller Refuge (~30-35 m wide and much wrack where Piping Plovers found.)

Comments and observations: This is an enormous CH unit. Much of it is inaccessible or difficult to access because of the coastal marshes. From discussion with LA Natural Heritage staff, areas within a few miles of Sabine Pass likely have the appropriate habitat but could require 15-20 km walking or an ATV to access. The area west of the west jetty in Cameron also sounded suitable from discussion. Some landowners include the marsh and beach areas as pasture, and private lands access is an issue. The Sabine Pass area eastward has numerous offshore oil drilling platforms. Constance Beach, eastward and westward at time of surveys were inaccessible because of large dredge spoil pipes (1 m diameter) running the length of beach.

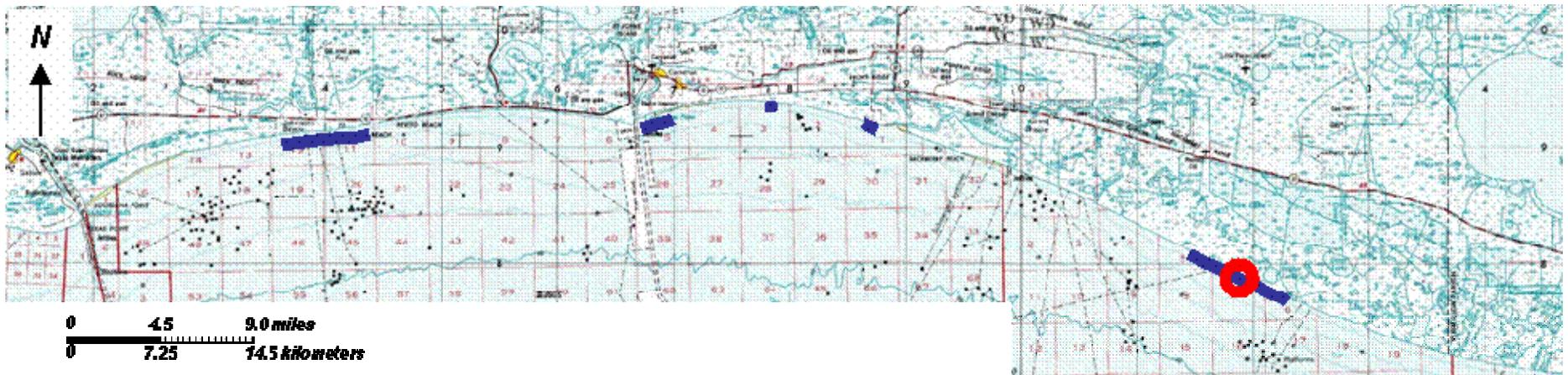


Figure 5. LA-1 Southeastern coast of Louisiana. Piping Plover locations highlighted by red circle; surveyed areas shown with blue line.

LA-5 Grand Isle

Piping Plovers seen: None

Banded Piping Plovers seen: None

Date: 25 February 2003

Description of surveyed area: Grand Isle beaches from jetty in south-west to State Park in north east; no access to Elmer's Island obtained so no surveys were conducted in this part of Critical Habitat Unit.

Survey type: foot

Weather: clear, 16°C (60°F) and sunny

Tide: rising to high

Description of habitat: Relatively narrow sand beach, gently sloping; often groomed

Comments and observations: Hurricanes and tropical storms have eroded what beach was originally available as habitat 20-30 years ago. From state park interpretive exhibits, aerial photographs show much of the island as wide beaches (60+ m) with little to no vegetation or dune succession. In state park, that habitat is all but gone with large areas of coastal shrub land coming within 10m of water. State park was creating a new campground with RV hook-ups behind primary dune.

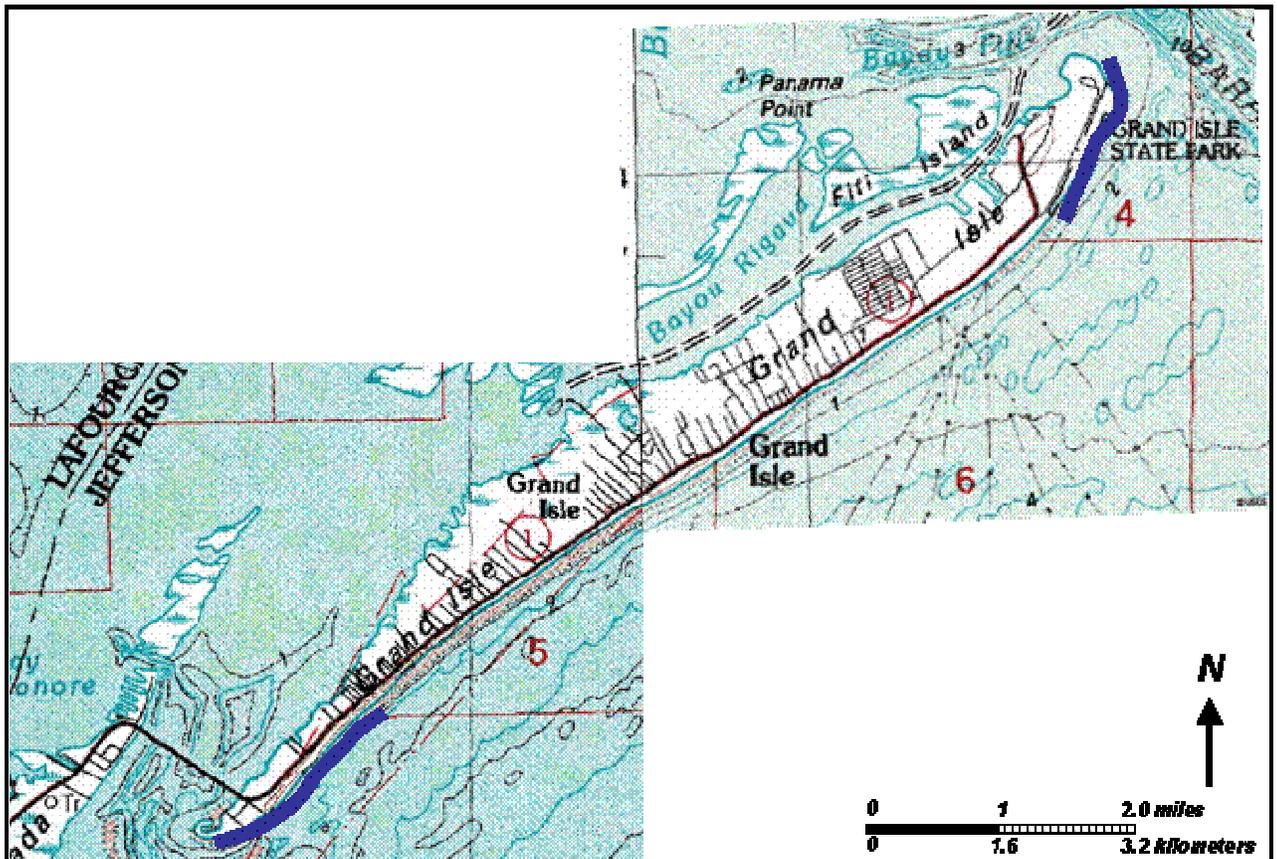


Figure 6. LA-5 Grand Isle, Louisiana. Surveyed areas shown with blue line.

Mississippi

The Mississippi shoreline is very developed with a series of hardened shoreline, structures, harbors and casinos. The interspersed beaches, often extensive (>5km), were mostly uniform, level and unlikely to hold much potential habitat for Piping Plovers when we observed them. During surveys very few areas had anything other than a few Sanderlings patrolling the shoreline. Paul Necaie of Bay St. Louis USFWS office accompanied us throughout Mississippi. From aerial photos, the better habitat in Mississippi appears to be on the offshore islands.



Figure 7. Western and Central Mississippi Coastline. Surveyed areas shown with blue line cover Critical Habitat Units MS-1 through MS-6, MS-10 & MS-11 and proposed units MS-7, MS-8 and MS-9.

MS-1 through 9 Lakeshore/Bay St. Louis to Biloxi

MS-1 Lakeshore to Bay St. Louis

MS-6 Mississippi City

MS-2 Henderson Point

MS-7 (proposed unit) Beauvoir

MS-3 Pass Christian

MS-8 (proposed unit) Biloxi West

MS-4 Long Beach

MS-9 (proposed unit) Biloxi East

MS-5 Gulfport

Piping Plovers seen: None

Banded Piping Plovers seen: None

Date: 26 February 2003

Description of surveyed area:

Survey type: vehicle – with periodic stops to dash 30 m to shore and scan. Frequent stops in the west (every 0.5-1 km) but as we drove eastward, stops less frequent (5 km) unless shorebirds observed.

Weather: 10-16°C (50-60°F), torrential downpours, thunderstorms **Tide:** rising

Description of habitat: Almost all beaches being prepared for summer and being repaired after late fall storms. Much enrichment and beach grooming taking place with very large graders. In areas not completed yet, muddy sand flats with some vegetation. Most beach areas 30-40 m wide, abutting highway. If area is not maintained as beach with renourishment it reverts to marsh.

Comments and observations: Weather was pretty bad, but we were able to detect Semipalmated (*Charadrius semipalmatus*) and Black-bellied plovers (*Pluvialis squatarola*) and Sanderlings. If you drive carefully, passengers can scan 90% of beach and shoreline.

MS-10 Ocean Springs West

MS-11 Ocean Springs East

Piping Plovers seen: None

Banded Piping Plovers seen: None

Date: 26 February 2003

Description of surveyed area: entire unit

Survey type: observed from vehicle

Weather: periodic rain showers

Tide: high

Description of habitat: Degraded beach (~10 m wide); requests pending with USFWS for renourishment. Road abuts beach and relatively large trees come fairly close to beach edge. Not typical Piping Plover habitat.

Comments and observations: Habitat in this area appears limited in quantity and quality.

Alabama

Alabama has some beautiful, albeit limited habitat for Piping Plovers. Pelican Island in particular is quite a spectacular barrier island. Because of its greater elevation and aspect, it is very likely that Little Dauphin Island (~6 km N of Pelican Island) is alternate habitat in inclement weather. Boat access and survey assistance on Little Dauphin and Pelican was provided by Darren La Blanc of Mobile USFWS office and Bon Secour National Wildlife Refuge.

AL-2 Dauphin Island, Little Dauphin Island and Pelican Island

Piping Plovers seen: 27 PIPLs on Pelican Island

Banded Piping Plovers seen: 4 color banded

- single red band right tarsus
- single blue-orange-blue triple split band right tarsus
- single kelly green over metal (incoloy) on right tarsus
- left tibia – white band, right tibia red band and right tarsus metal band (incoloy)

Date: 27 February 2003

Description of surveyed area: Pelican Island, Dauphin Island, Little Dauphin Island

Survey type: boat and walking

Weather: windy >24 km/hr (15 mph) but decreasing, cloudy to sunny 16°C (60°F)

Tide: low to rising

Description of habitat: *Little Dauphin Island* and areas near bridge are barrier spits with shrubs in higher areas and marsh on west side; beach side relatively steep with loose sand. Good mud-sand flat toward north end of Little Dauphin.

Dauphin Island is well developed and retains few areas with habitat appropriate for Piping Plovers. Walking surveys yielded very few plovers and no Piping Plovers.

Pelican Island is a barrier island to the south of Dauphin Island and likely attains a maximum elevation of ~0.5m above sea level; little or no herbaceous vegetation present. Shorebirds and waterbirds abundant in area; Piping Plovers found on algal – mud-sand flats in the central-southern portions of island.

Comments and observations: Several thousand cormorants observed at very south-eastern tip of Pelican Island. Thousands of shorebirds found in middle portions of Pelican Island. If banded Piping Plovers, particularly Great Lakes birds, are confirmed in winter 2003-04, conservation of this area will be vital. Offshore oil platforms almost too numerous to count.

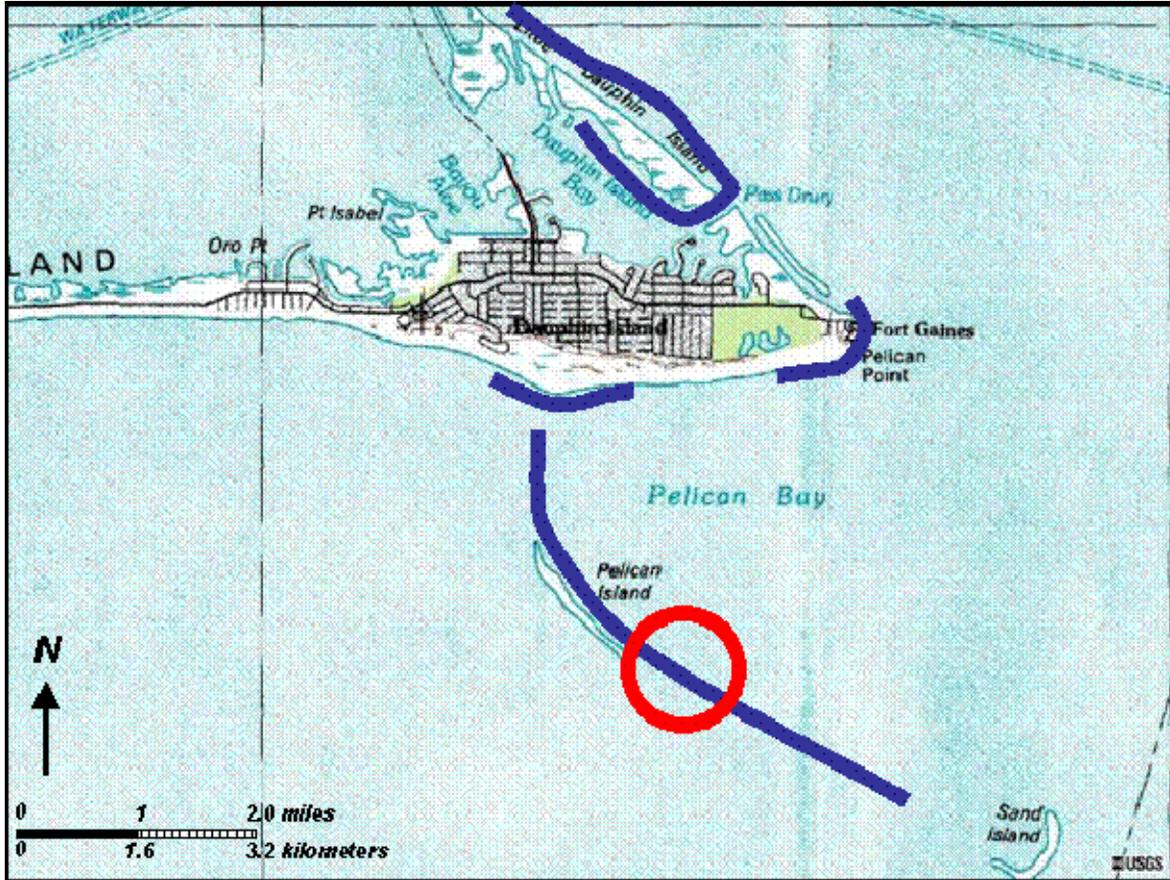


Figure 8. AL-2 Dauphin Island – Little Dauphin Island and Pelican Island. Piping Plover locations highlighted red circle; surveyed areas shown with blue line.

Florida

Beaches in Florida, particularly those with adjoining mudflats, potentially provide good habitat for Piping Plovers. Development pressures on the barrier beaches of Florida's panhandle appear quite severe, and extensive habitat is only found offshore or where the public has limited access (e.g. Tyndall AFB). Additional areas not formally surveyed showed great promise, including mudflat areas near Port St. Joe. Critical Habitat Units FL-9 and FL-10 were not visited due to thunderstorms but appeared to have habitat for Piping Plovers; FL-9 is under enormous development pressure. A more thorough survey of bayside of Santa Rosa Peninsula and Perdido Key would likely yield more wintering Piping Plovers. Discussions with Patty Kelly, USFWS, suggest that Florida's "bend" east of Carrabelle has more marsh and sand-mud flat habitat that may harbor more Piping Plover habitat; this area has not been surveyed for Piping Plovers and merits further investigation.



Figure 9. FL-1, FL-2, FL-3 near Pensacola, Florida. Piping Plover locations highlighted with red circles; additional surveyed areas shown with blue circle.

FL-1 Big Lagoon State Park

Piping Plovers seen: None

Banded Piping Plovers seen: None

Date: 28 February 2003

Description of surveyed area: Entire unit viewed from observation platform in Big Lagoon State Park

Survey type: foot

Weather: 16°C (60°F) and sunny

Tide: mid-low and falling

Description of habitat: very narrow sand/mud beach island/peninsula with trees and other woody vegetation.

Comments and observations: This unit could provide foraging habitat if considered as habitat complex with Perdido Key.

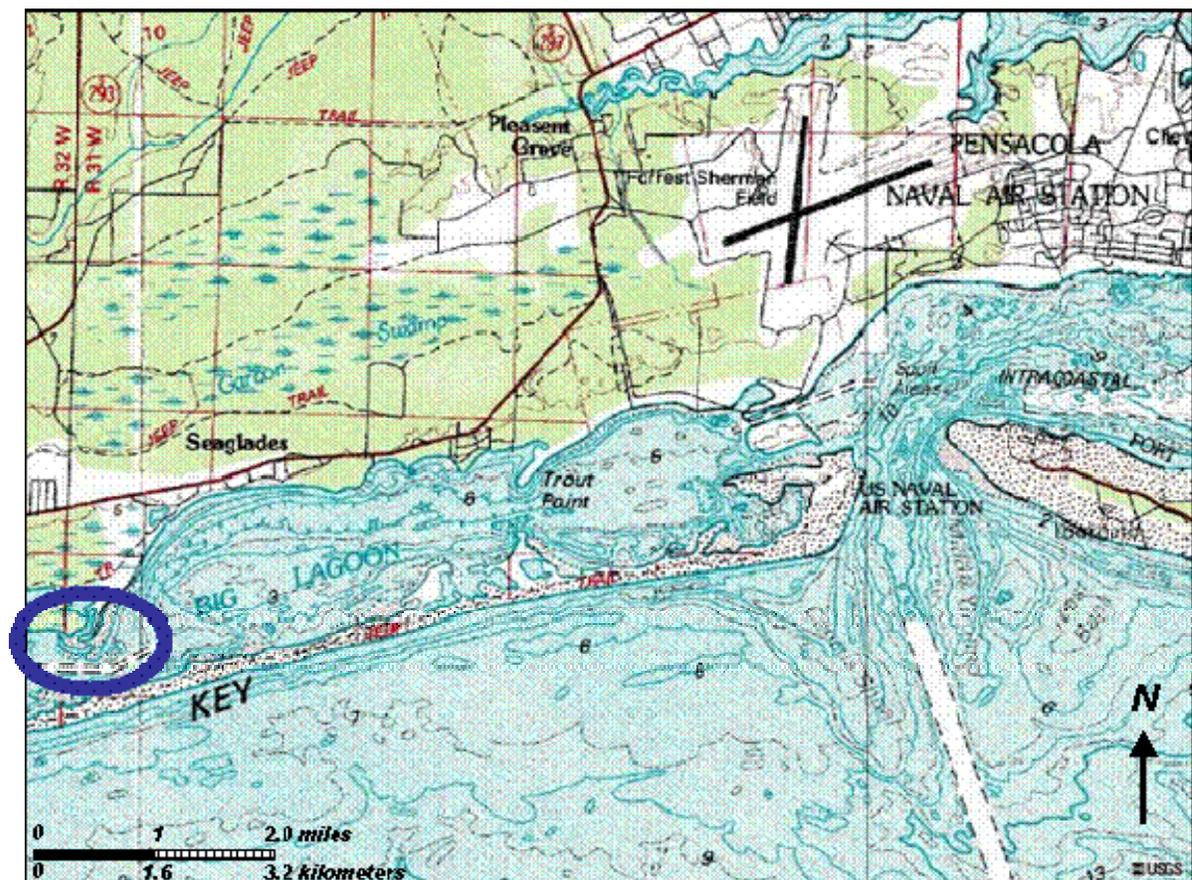


Figure 10. FL-1 Big Lagoon State Park, Florida. Surveyed areas shown with blue circle.

FL-2 Big Sabine Point

Piping Plovers seen: 4 PIPLs

Banded Piping Plovers seen: None

Date: 28 February 2003

Description of surveyed area: Small bays and points extending S-SE from Big Sabine Point; beach along Santa Rosa Sound, extending ~750 m eastward from points.

Survey type: foot

Weather: 18°C (65°F) and sunny

Tide: low to mid and rising

Description of habitat: small bays with very nice sand-mudflats; multiple points S-SE of Big Sabine Point (on Gulf Island National Seashore property). Relatively narrow (2-4 m) low gradient sand beach east of points.

Comments and observations: PIPLs observed in mudflat/bay area S-SE of Big Sabine Point. Many shorebirds in mudflat and sand spit portion of CH including Wilson's Plovers, Semipalmated Plovers, Killdeer (*Charadrius vociferous*), Sanderlings, Dunlin (*Calidris alpina*) and peeps (*Calidris sp.*). No PIPLs and few other shorebirds on narrow beach area east of points. Ocean side of this area had a roosting flock of 19 Snowy Plovers.

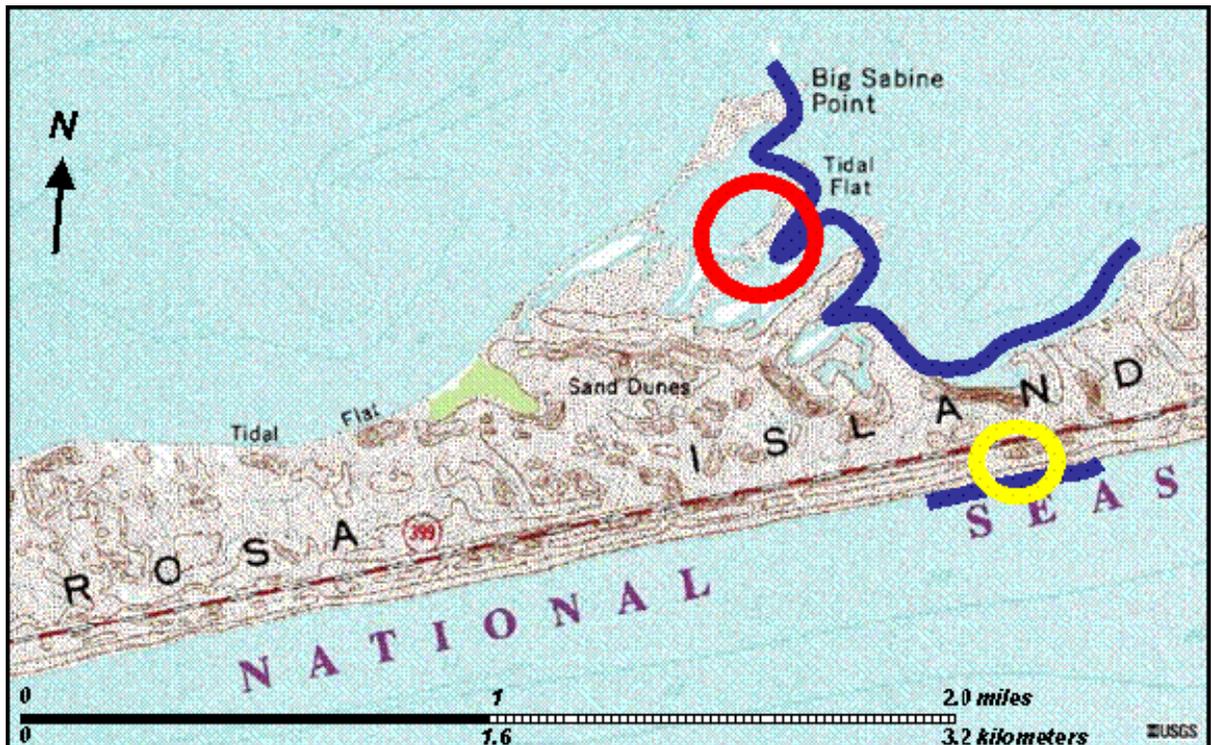


Figure 11. FL-2 Big Sabine Point, Santa Rosa Island, Florida. Piping Plover locations highlighted with red circle; surveyed areas shown with blue line. Snowy Plover flock indicated by yellow circle.

FL-3 Navarre Beach

Piping Plovers seen: 2 PIPLs

Banded Piping Plovers seen: None

Date: 28 February 2003

Description of surveyed area: Bay-side beach (State Park) from Hwy 399 bridge east to near Eglin AFB property.

Survey type: foot

Weather: 18°C (65°F) and sun/clouds

Tide: low to mid and rising

Description of habitat: low gradient beach and mudflats associated with small point. Best habitat before point owned by Eglin Air Force Base.

Comments and observations: extensive development activities associated with construction of multiple access boardwalks to bayside beach and other state park facilities which will provide ready access to bayside habitat for park goers. Monitoring of this area in upcoming years should be a high priority to determine continued use of area by wintering Piping Plovers.

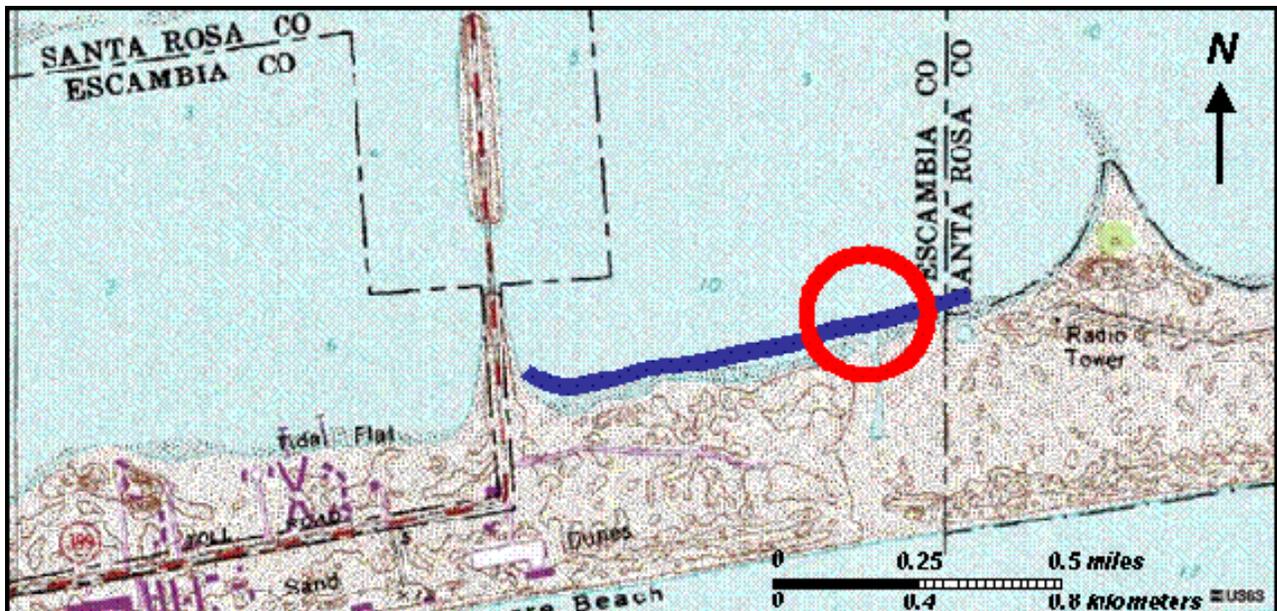


Figure 10. FL-3 Navarre Beach, Santa Rosa Island, Florida. Piping Plover locations highlighted with red circle; surveyed areas shown with blue line.

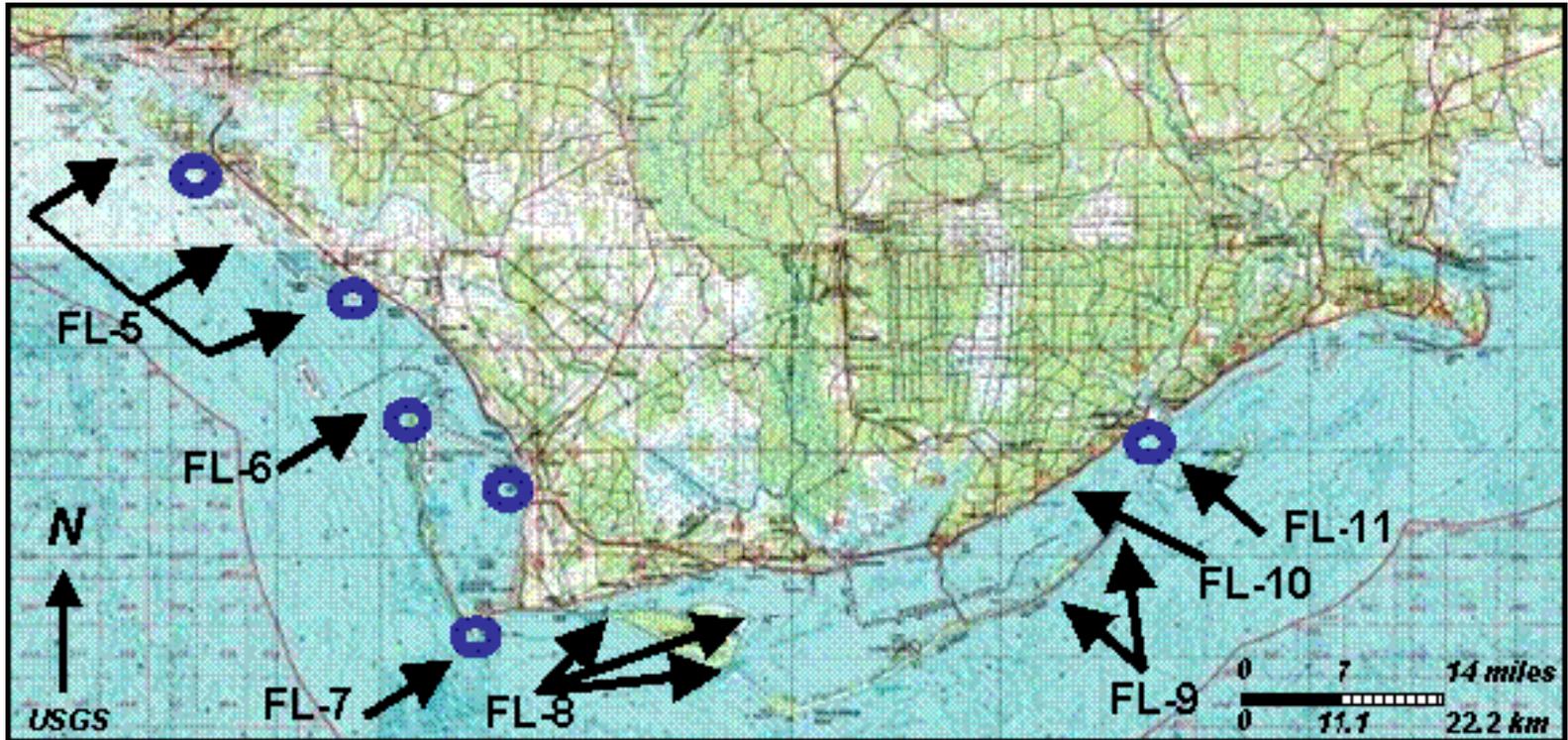


Figure 11. Overview of Florida from Panama City to Carrabelle with approximate locations of Piping Plover Critical Habitat Units. Surveyed areas shown with blue circles; Critical Habitat locations indicated by arrows.

FL-5 Crooked Island

Piping Plovers seen: None

Banded Piping Plovers seen: None

Date: 2 March 2003

Description of surveyed area: Tyndall Air Force Base, peninsula running northwest toward Shell Island, “Tyndall Beach”; visual scanning using binoculars and spotting scope of southern tip of Shell Island. Southern portion of Crooked Island East Beach via vehicle access. Base access arranged by Jack Mobley, Tyndall AFB Natural Resources Office.

Survey type: foot

Weather: sunny, 13-16°C (55-60°F)

Tide: rising

Description of habitat: Barrier sand peninsula; huge created dune from dredge operation. Bay side of Shell Island looks like it could hold potential mud flat habitat. Southern portion of Crooked Island East Beach; low gradient sand beach with occasional secondary water sources. Very few shorebirds at this location.

Comments and observations: Few Sanderlings seen on peninsula on Tyndall Beach; Wilson’s and Snowy Plovers seen on tip of peninsula and on southern tip of Shell Island. Ready access to other portions of Critical Habitat unit limited with no ATV or boat; bayside habitat looked promising for PIPLs. Limited public access to Tyndall Beach; extensive public use of Crooked Island East Beach. We did not cover enough of the habitat in this unit to assess its importance for Piping Plovers.

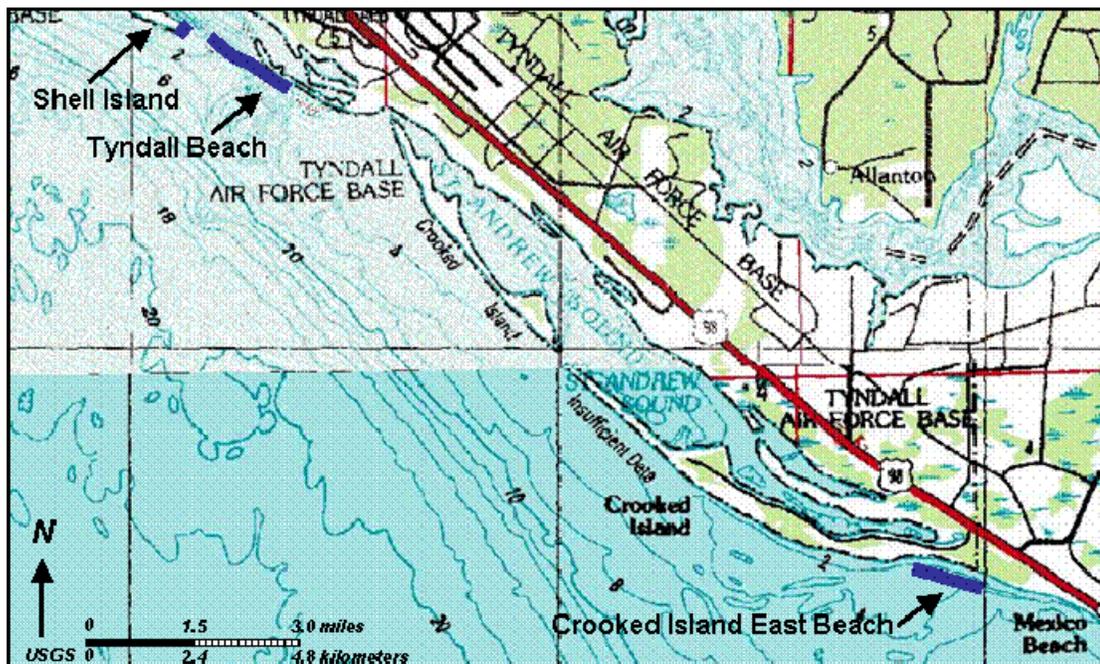


Figure 12. FL-5 Shell and Crooked Island, Florida. Surveyed areas shown with blue lines.

FL-6 St. Joseph State Park

Piping Plovers seen: None

Banded Piping Plovers seen: None

Date: 1 March 2003

Description of surveyed area: From end of road in park on western side of peninsula north ~4 km in wilderness area. Did not continue walking 5 km to tip of peninsula due to time and weather.

Survey type: foot

Weather: Rain showers and threatening thunderstorm cells, wind >20 km/hr (10-15 mph), 16°C (60°F)

Tide: low and rising

Description of habitat: Beautiful white sand beach, relatively steep with well developed large dune system on east.

Comments and observations: 8-10 SNPL seen along with Sanderlings. On map, tip of peninsula habitat may involve some mud flat/marsh areas; this could be more suitable and typical of PIPL habitat. In order to adequately cover area would need one or more days (walking) or a boat.

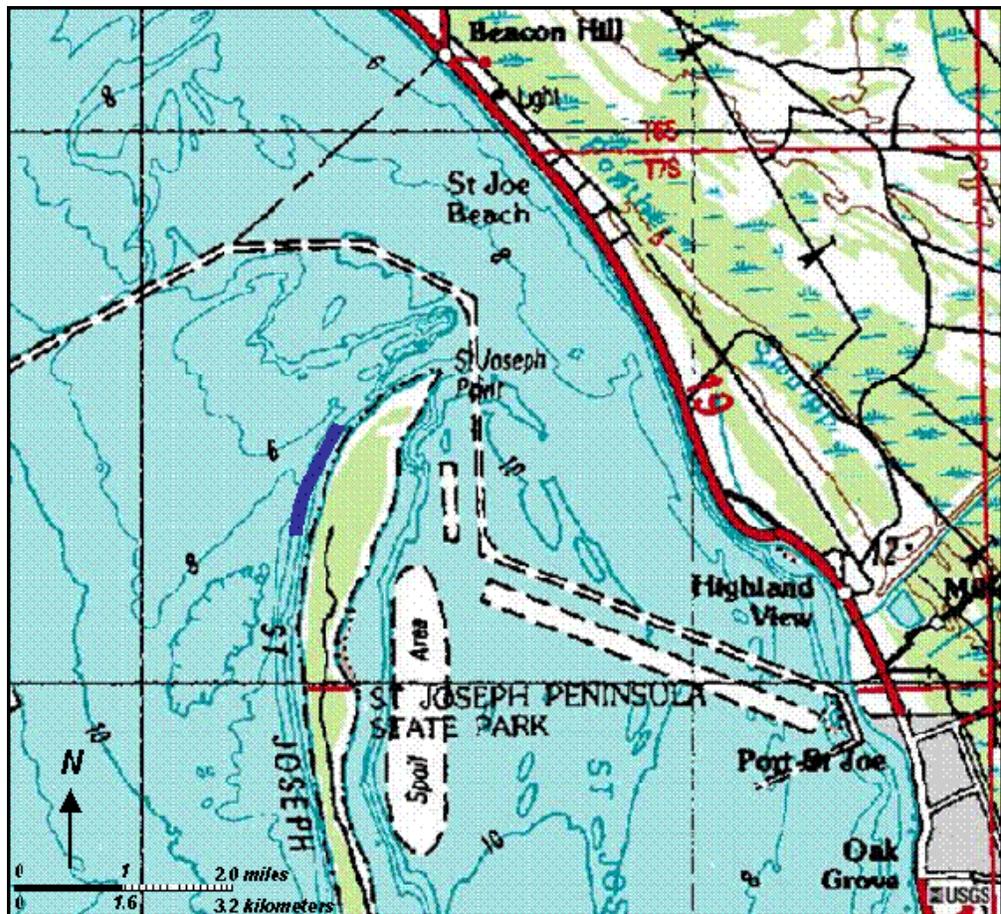


Figure 13. FL-6 St. Joseph Peninsula, Florida. Surveyed areas shown with blue line.

FL-7 Cape San Blas

Piping Plovers seen: None

Banded Piping Plovers seen: None

Date: 1 March 2003; 2 March 2003

Description of surveyed area: From tip of Cape Sand Blas (Eglin AFB), eastward ~2 km. Access arranged by Patricia Kelly, Panama City Field Office, USFWS

Survey type: foot

Weather: 1 March: onshore winds and very heavy fog reduced visibility to almost nothing.
2 March: partly sunny **Tide:** low-mid and rising

Description of habitat: Sand beach with several elevated mudflat backwater areas; many shells and beached jellyfish.

Comments and observations: Beach is used by PIPLs although none were observed either day. Access by public is heavier than expected, including vehicle and ATV beach driving from access point further east. Several beachgoers noted, including dog walking (no leash). Habitat more promising for PIPLs than that observed in St. Joseph State Park.

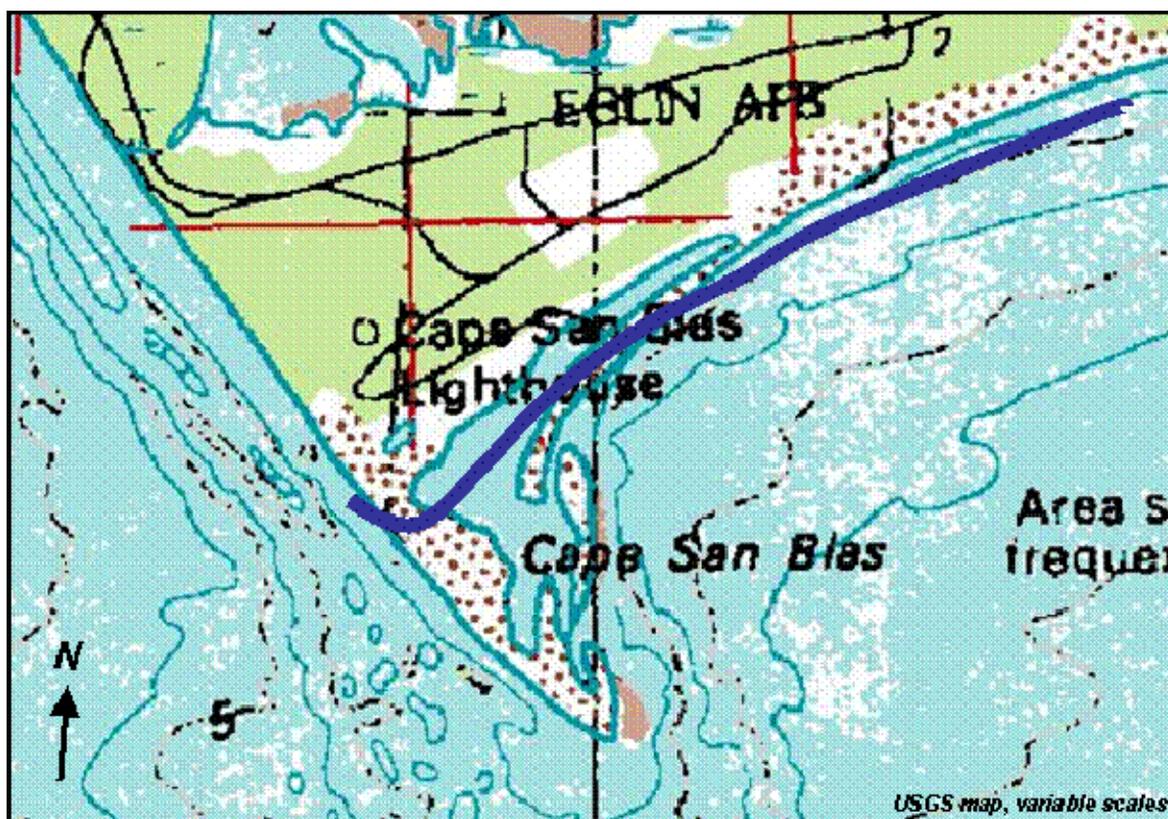


Figure 14. FL-7 Cape San Blas, St. Joseph Peninsula, Florida. Surveyed areas shown with blue line.

FL-11 Carrabelle Beach

Piping Plovers seen: None

Banded Piping Plovers seen: None

Date: 1 March 2003

Description of surveyed area: scanned area from rest stop to west, and walked past rest area on private land ~500 m before thunderstorm; scanned most of beach toward point

Survey type: foot

Weather: thunderstorm and rain, low clouds, 16°C (60°F) **Tide:** mid-high to high & rising

Description of habitat: 15m wide sand beach relatively flat with herbaceous dune area before houses or rest area. Trees come close to beach further east toward point. Status of mudflats at Carrabelle Point is unknown.

Comments and observations: This area may have broader mud flats at low tide which could hold some potential habitat.

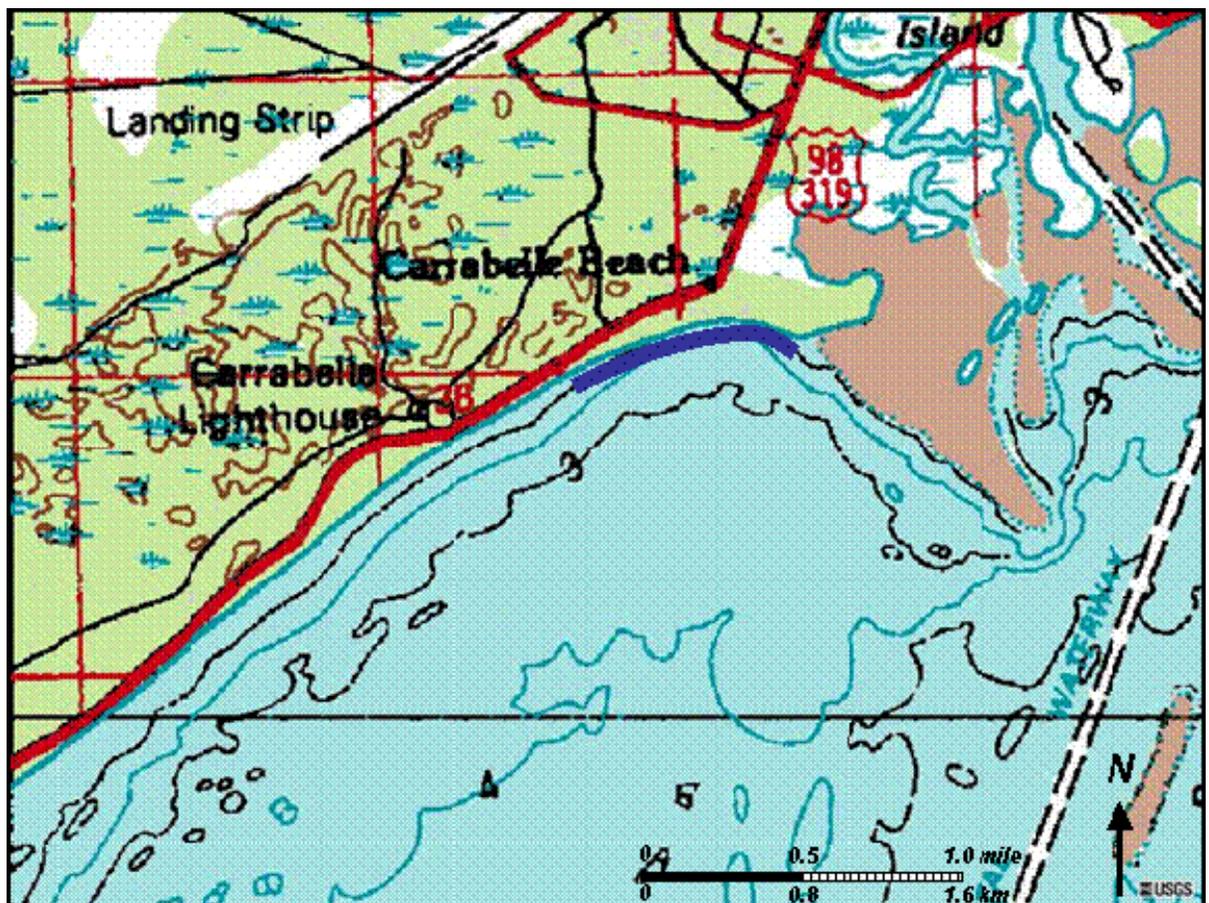


Figure 15. FL-11 Carrabelle Beach, Florida. Surveyed areas shown with blue line.

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