

# Wintering Piping Plover Surveys 2006-2007

East Grand Terre, LA to Boca Chica, TX

December 20, 2006 - January 10, 2007

Final Report, Contract KA511-06-0928



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**Cover photo:** Canadian Great Plains Piping Plover observed on the Gulf beach at Mustang Island, TX, January 6, 2007. For higher resolution files of the pictures in this report, please contact the author.



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## Summary

Surveys to locate banded Piping Plovers (*Charadrius melodus*) were conducted on the Gulf Coast from December 20, 2006, to January 10, 2007. Twenty-five locations were visited from East Grand Terre, Louisiana, to Boca Chica Beach, Texas, with one of the locations visited twice. Twenty-two of 25 survey locations were fully or partially within areas designated in 2001 by the U.S. Fish and Wildlife Service as wintering range critical habitat for the Piping Plover. However, in 2006, the critical habitat designation for 19 critical habitat units in Texas was vacated and remanded to the U.S. Fish and Wildlife Service for a new rulemaking; four of the 19 vacated units included seven survey locations.

There were 938 observations of Piping Plovers, with 725 in Texas and 213 in Louisiana. There were 106 observations of banded Piping Plovers, with 78 in Texas and 28 in Louisiana. Of the 106 observations of banded Piping Plovers, the general location (population and country) could be identified for 100. Eighty-one were from the Canadian Great Plains, eighteen from the United States Great Plains, and one from the Great Lakes. Eight uniquely marked individuals were observed twice; in all instances, the re-sighted birds were observed in close proximity to the original observation location, such as on the bay and Gulf sides of an island, adjoining islands, or survey locations with adjoining boundaries.



## Introduction

The Piping Plover (*Charadrius melodus*) is a small shorebird (11-18 cm long, 43-63 g) with a short, stout bill, pale upperparts, and orange legs (Haig 1992). Piping Plovers spend eight months or more on the wintering grounds (USFWS 2003), with the known wintering range including the U.S. Atlantic and Gulf coasts from North Carolina to Texas, northeastern Mexico, Cuba, the Bahamas, and other Caribbean islands (Ferland and Haig 2002, Haig 1992).

Piping Plovers can be difficult to locate in winter as they are cryptic, found interspersed with other wintering plovers and shorebirds, and are widely distributed at low densities (Stucker et al. 2003). Of 118 sites where Piping Plovers were found during the 2001 International Piping Plover Winter Census, 56.8% contained 1-10 birds, 35.6% had 11-50 birds, and less than 8% of sites had more than 50 birds (Ferland and Haig 2002). Despite intensive winter census efforts that were conducted in 1991, 1996, and 2001, a large proportion (35-60%) of the overall breeding population of Piping Plovers has not been tallied in previous census efforts (Ferland and Haig 2002).

Over the last decade, scientists in Canada and the United States have conducted studies of Piping Plovers on the breeding grounds that include banding adults, chicks, or both, with various combinations of color bands, color flags, or metal bands. While banding programs provide helpful demographic data, such programs also provide valuable data on migration timing and stopover locations, wintering locations and site fidelity, and movements within the wintering home range of individual birds. This survey effort is a continuation of a series of surveys on the wintering grounds initiated by the Canadian Wildlife Service (CWS) in December, 2002 (Stucker et al. 2003).

## Methods

This survey effort specifically focused on finding and identifying banded Piping Plovers at known wintering habitats on the Gulf of Mexico in Louisiana and Texas. Survey locations were selected based on the number of Piping Plovers seen during the International Piping Plover Winter Census in 2006 (Elise Elliot-Smith, pers. comm. 2006), 2001 (Ferland and Haig 2002), or 1996 (Plissner and Haig 1997) and wintering range critical habitat designations (USFWS 2001a). Critical habitat refers to locations in the United States that were designated using a formal rulemaking process by the U.S. Fish and Wildlife Service (USFWS) pursuant to the Endangered Species Act of 1973. These specific geographic areas are essential for the conservation of a threatened or endangered species and may require special management consideration or protection. "Designating critical habitat

is a tool to identify areas that are important to the recovery of a listed species. It is also a tool used to notify Federal agencies of areas that must be given special consideration when they are planning, implementing, or funding activities. Federal agencies are required to consult with the Service on actions they carry out, authorize, fund, or permit, that may affect critical habitat. A critical habitat designation has no effect when a Federal agency is not involved" (USFWS 2001b). In addition, recommendations from people who were familiar with particular areas were considered in selecting survey locations.

Twenty-five locations were searched during 20 full or partial survey days; one location was surveyed twice to see if differing tidal conditions on the bayside would influence the Gulf-side survey result. Thirteen of the 25 locations were surveyed on foot. Seven locations were surveyed by a combination of driving and foot searches. Four locations were surveyed by driving. One location was surveyed in an airboat and the birds that were observed were approached on foot to look for bands. Of the 25 survey locations, 10 were accessible only by boat or airboat. Two scheduled survey days in Texas and one day in Louisiana were not completed due to the survey truck and all terrain vehicle (ATV) being stolen.

I conducted surveys by myself on 18 of the days, though Ann McArthur assisted with piloting the boat for the Louisiana surveys. Leo Gustafson from Laguna Atascosa National Wildlife Refuge assisted on the Padre Island bayside survey; Robin Cobb, Chad Stinson, and David Stringo assisted on the Shoalwater Bay survey; Tony Amos assisted with the San Jose Island survey; and Eric Baca of the Louisiana Division of Fish and Wildlife provided assistance on one day with navigating the maze of marshes in Louisiana.

Due to limited available time, surveys were conducted under a range of conditions. Surveys were conducted regardless of tidal stage and at any time during daylight hours. Surveys were conducted under a range of weather conditions including windy days or light rain, but were not conducted in heavy rain. The Louisiana portion of the survey effort was plagued by poor weather conditions. Two full survey days in Louisiana were missed due to heavy rain. In addition, the choice of survey locations was influenced by high winds which limited the barrier island locations that could be safely accessed by boat.

In determining survey boundaries at specific locations, I considered not only critical habitat boundaries, but also which areas were more likely to contain Piping Plovers based on a quick

assessment in the field of the presence of high quality foraging habitats. Suggestions from individuals who had local knowledge of sites where Piping Plovers were likely to be found also were considered.

On all surveys, a Swarovski 80 mm spotting scope with 20-60 zoom eyepiece and tripod and 10 x 42 Leica binoculars were used. A Trimble Geo-XH unit was used to obtain global positioning system (GPS) locations using a Universal Transverse Mercator (UTM) map projection and the WGS84 datum. A GPS location was taken of the general area where a banded Piping Plover was seen. If multiple birds were observed together, one location was taken. A Speedtech Instruments SM-18 was used to record wind speed in knots and temperature in Kilometers/hour (km/hr) and Celsius (C) degrees. A Silva 515 Ranger compass was used to obtain wind direction.

The primary purpose of this survey was to locate and accurately identify banded Piping Plovers. Thus, I did not attempt to maximize the number of Piping Plovers that I saw, nor did I count the total number of birds over the entire survey route first and only afterwards return to observe banded birds. Instead, each time a Piping Plover or a group of Piping Plovers was observed, an attempt was made to scan the legs using a spotting scope before the survey continued. However, it was not always possible to see and record the full color band combination as the bird may have been roosting with the bands not visible, or the bird could be flushed by others before the band combination could be determined. For some banded birds, it could take five or ten minutes or more to approach slowly and successfully observe the band combination. For all observed banded birds, band color, type, and location on the leg were recorded on paper data sheets.

At certain points during the survey, digital photography was used to record relevant information. Where conditions allowed, a photograph was taken of the bands to document band colors. Usually, the picture was taken after the Piping Plover had been observed in the spotting scope and all data had been recorded. The photography equipment for this survey included a Canon 1Ds Mk II body and either a Canon 600 mm f4 lens with a 2X teleconverter (effective length 1200 mm) or a Swarovski 80 mm spotting scope with a Swarovski camera adapter (effective length 1100mm). However, it was not always possible to take a picture given appropriate buffer distances or other factors.

At certain locations, additional photographs were taken of habitat conditions, Piping Plover habitat use, or management measures using a Canon 35 mm f1.4 lens. The CR.2 digital file was opened using Adobe Bridge, downsized using bicubic resampling to produce a .jpg file, sharpened using unsharp mask, and dust spots were removed using the healing brush tool.



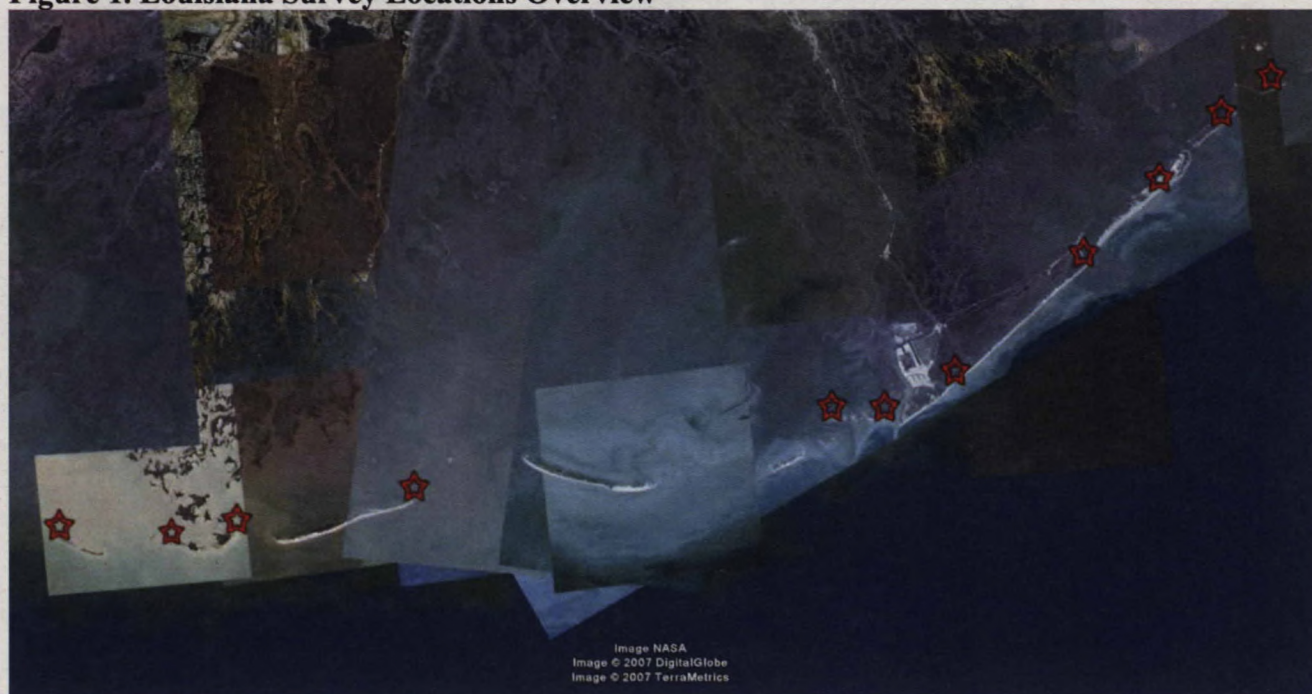
The Survey Route maps were constructed using Google Earth Pro satellite photography. The satellite photography provides a general illustration of the survey locations and site conditions. However, the photography may illustrate habitat conditions that are slightly different from conditions observed during the survey; if so, such differences are noted in the site discussion. The approximate survey route is illustrated with a red line.

Ownership status for land above the mean high tide line at the survey locations is categorized as: federal, state, county, city, private, or private conservation. Ownership status was determined by consulting the wintering range critical habitat rule (USFWS 2001a) or by speaking with state or federal officials or other professionals who are familiar with the status of the particular area.

## Results

Twenty-five locations were searched for Piping Plovers; one of the survey locations was searched twice. Of these survey locations, 11 were in Louisiana and 14 were in Texas. The general locations of the survey areas in Louisiana are shown in Figure 1.

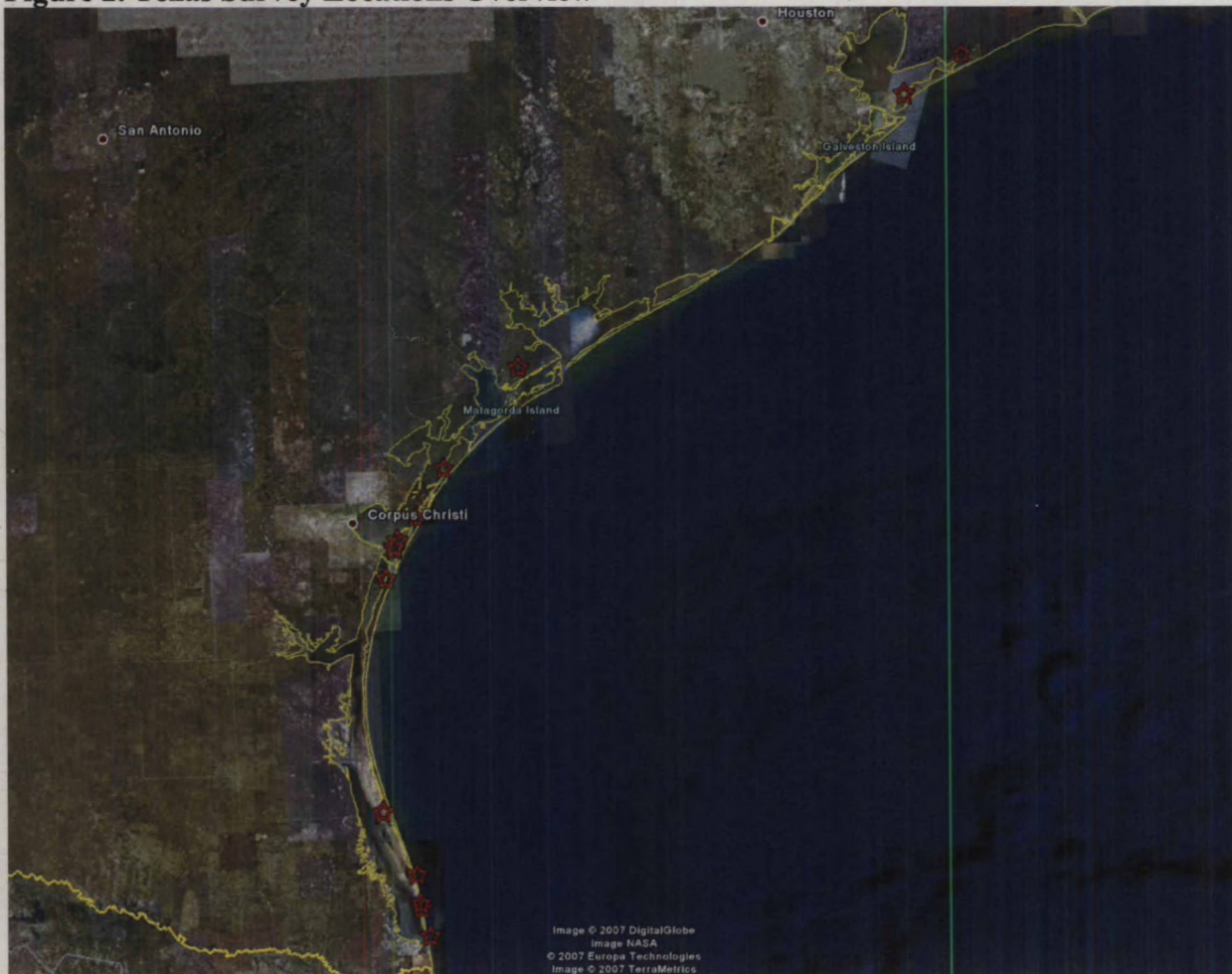
**Figure 1. Louisiana Survey Locations Overview**





The general locations of survey areas in Texas are shown in Figure 2. However, due to the close proximity of certain survey sites, not all sites are visible.

**Figure 2. Texas Survey Locations Overview**



Twenty-two of 25 survey locations were fully or partially within areas designated in 2001 by the USFWS as wintering range critical habitat units for the Piping Plover. However, on July 26, 2006, the critical habitat designation for 19 of the 37 Texas units was vacated and remanded to the USFWS for a new rulemaking as a result of a lawsuit (Texas General Land Office 2006). Of those 19 critical habitat units that were vacated, four were visited during these surveys, representing seven survey locations.

In Table 1, information on the survey date, survey location, critical habitat unit, total number of Piping Plover, and number of banded Piping Plovers is presented. "ND" means not designated. "V" means the critical habitat unit was vacated and remanded to the USFWS pursuant to the lawsuit.

**Table 1. Location, Critical Habitat Unit, and Observations of Piping Plovers and Banded Piping Plovers**

<b>Date</b>	<b>Location</b>	<b>Critical Habitat Unit</b>	<b>Total number of PIPL</b>	<b>Number of banded PIPL</b>
	<b>Louisiana</b>			
12/20/06	East Grand Terre Island	LA-5	26	4
12/21/06	Grand Isle	LA-5	0	0
12/23/06	Sandbar northeast of East Timbalier	LA-5	24	1
12/23/06	West Belle Pass	LA-5	0	0
12/25/06	Fourchon Beach	LA-5	38	5
12/26/06	East Elmers Island	LA-5	5	1
12/27/06	Raccoon Island, West End (Dernieres)	LA-4	49	4
12/28/06	Whisky Island West End	LA-4	43	6
12/28/06	Whisky Island East End	LA-4	5	0
12/28/06	Wine Island East End	LA-4	11	5
12/29/06	Grand Terre	ND <sup>1</sup>	12	2
			<b>213</b>	<b>28</b>
	<b>Texas</b>			
12/30/06	Beach East of Haulover	ND	9	1
12/31/06	Bolivar Flats	TX-36	158	13
1/1/07	Corpus Christi Beach to PINS No ORV Area	TX-3 (V) <sup>2</sup> , ND	3	0
1/2/07	Convention Center Bay Flats	TX 3 (V), ND	28	4
1/2/07	Windsurfing Beach Bay Flats and North	TX-3 (V)	58	12
1/3/07	Boca Chica Beach	TX-1	3	0
1/4/07	South Padre Island Beach, Atwood to Jetty	TX-3 (V)	14	2
1/5/07	South Padre Island Bayside	TX-3 (V)	229	16
1/6/07	Mustang Island Beach	TX-7 (V), 8 (V)	39	5
1/7/07	Corpus Christi Beach to PINS No ORV Area	TX-3 (V), ND	78	9
1/7/07	Mollie Beattie Bayside South	TX-6	33	7

<sup>1</sup>"ND" means critical habitat was not designated for part of the survey area or all of the survey area.

<sup>2</sup>"V" means the critical habitat unit was vacated.



<b>Date</b>	<b>Location</b>	<b>Critical Habitat Unit</b>	<b>Total number of PIPL</b>	<b>Number of banded PIPL</b>
1/8/07	Mollie Beattie Bayside North	TX-6	56	6
1/8/07	Corpus Christi Pass Bayside Flats	TX-6, ND	0	0
1/9/07	San Jose Island Beach	TX-16 (V)	7	0
1/10/07	Shoalwater Bay	ND	10	3
			<b>725</b>	<b>78</b>
<b>Total</b>			<b>938</b>	<b>106</b>

There were 106 observations of banded Piping Plovers. Seventy-eight observations were in Texas and 28 were in Louisiana.

The general location (population and country) where the Piping Plovers were banded could be identified for 94% (n=100) of the 106 observations. Eighty-one observations were from the Canadian Great Plains, eighteen from the United States Great Plains, and one from the Great Lakes. Additional details about the banding locations and the state where the banded bird was observed on the wintering grounds are provided in Table 2.

**Table 2. Observations of Piping Plovers by Banding and Wintering Location**

<b>Breeding Population</b>	<b>Louisiana</b>	<b>Texas</b>	<b>Total</b>
Great Plains Canada	15	66	81
Great Plains US	9	9	18
Great Lakes	1	0	1
Unknown	3	3	6
Total Each State	28	78	106

Of the 106 observations, there were eight individuals that were uniquely marked that were observed twice. In all instances, the re-sighted birds were observed in close proximity to the original observation location, such as on the bay and Gulf sides of an island; adjoining islands; or survey locations with adjoining boundaries.

The 106 observations of banded birds are listed in Table 3 with information about date, location, critical habitat unit number, breeding population, Province or State where the bird was banded, band combination, and UTM coordinates. The following abbreviation system identifies the band combination:

- Band location on the leg is listed in the following order: left tibia, left tarsus: right tibia, right tarsus.
- If there were two bands on a tibia or tarsus, the band combination is presented as top band first and bottom band second, with no coma in between the bands.
- Band or flag colors are: R = red, G = dark green, g = light green; B = dark blue, b = light blue, W = white, A = gray, S = salmon, P = Pink, O = orange, Y = yellow, and L = black. If a faded band was observed, the color as observed in the field is listed first, and the original, non-faded color is listed in parentheses.
- A split band is indicated with a forward slash and a triple split band has two forward slashes; the colors of the split are listed from the top to bottom of the band on the leg. For example, L/W means a black over white split band.
- Band types are: X for metal band, – for no band, N for not able to observe if a band was present (e.g., leg tucked up); a single letter means a plastic band unless f is added after the letter, which means flag (e.g., Of = orange flag).

As an example of a full band string, X,L:Of,Yg/O/g indicates: left tibia metal band, left tarsus black plastic band; right tibia orange flag, right tarsus yellow plastic band over light green/orange/light green triple split band.

In the table below, banding location is given with the following abbreviations: GP US is Great Plains United States, GP C is Great Plains Canada, GL is Great Lakes, and ? is unknown. The following abbreviations are used for Provinces or States: AB is Alberta, SK is Saskatchewan, SD is South Dakota, and MI is Michigan.

**Table 3. Location, Critical Habitat Unit, Population, Province, Band String, and GPS Coordinates**

Date	Location	State	Pop.	Province or State	Band String	UTM Zone	E	N
12/20/06	East Grand Terre	LA	GP C	AB	X,-:L/W,O	16 R	219704	3245587
12/20/06	East Grand Terre	LA	GP C	SK	X,gB:Wf,-	16 R	219704	3245587

Date	Location	State	Pop.	Province or State	Band String	UTM Zone	E	N
12/20/06	East Grand Terre	LA	GP C	SK	Lf,O:X,gR	16 R	219704	3245587
12/20/06	East Grand Terre	LA	GP US	SD	-,WL:Gf,GL	16 R	219704	3245587
12/23/06	Bar NE of E Timbalier	LA	GP C	AB	X,-:-,L/W	15 R	765347	3221917
12/25/06	Fourchon Beach	LA	GP US	SD	N,WR:Gf,LA	15 R	774830	3223840
12/25/06	Fourchon Beach	LA	GP C	SK	Lf,Rg:N,XO	15 R	775224	3224137
12/25/06	Fourchon Beach	LA	GP US	SD	N,BG:Gf,-	15 R	775231	3224149
12/25/06	Fourchon Beach	LA	GP C	SK	Lf,-N,-	15 R	775306	3224174
12/25/06	Fourchon Beach	LA	GP US	SD	N,YR:Gf,LW	15 R	775319	3224185
12/26/06	Elmers Island, east end	LA	GP US	SD	-,RL:Gf,LG	15 R	787058	3232695
12/27/06	Raccoon Island, west end	LA	GL	MI	Of,Og:X,B	15 R	700172	3216460
12/27/06	Raccoon Island, west end	LA	GP US	SD	-,GG:Gf,LY	15 R	699796	3216736
12/27/06	Raccoon Island, west end	LA	GP C	SK	X,g:Lf,OY	15 R	699638	3216808
12/27/06	Raccoon Island, west end	LA	?		N,-N,B	15 R	699596	3216850
12/28/06	Whisky Island, west end	LA	GP C	SK	X,R:Lf,LL	15 R	709920	3215399
12/28/06	Whisky Island, west end	LA	CP C	SK	W,X:-,-	15 R	709822	3215460
12/28/06	Whisky Island, west end	LA	GP C	SK	Lf,gR:X,O	15 R	709746	3215530
12/28/06	Whisky Island, west end	LA	GP US	SD	-,AG:Gf,GL	15 R	709554	3215662
12/28/06	Whisky Island, west end	LA	GP C	SK	Lf,B:X,LB	15 R	708617	3215953
12/28/06	Whisky Island, west end	LA	GP C	SK	X,GO:Wf,B	15 R	708113	3216002
12/28/06	Wine Island, east end	LA	GP C	SK	X,g:Wf,RY	15 R	729249	3218066
12/28/06	Wine Island, east end	LA	GP C	SK	-,RX:Wf,YG	15 R	729266	3218059
12/28/06	Wine Island, east end	LA	GP US	SD	-,GY:Gf,LY	15 R	729284	3218057
12/28/06	Wine Island, east end	LA	?		-,:-,X	15 R	729297	3218064
12/28/06	Wine Island, east end	LA	?		O,X:-,-	15 R	729335	3218105
12/29/06	Grand Terre	LA	GP C	SK	Lf,O:X,gR	16 R	216263	3243075
12.29/06	Grand Terre	LA	GP US	SD	-,WL:Gf,GL	16 R	215863	3242916
12/30/06	Beach east of Haulover	TX	GP C	SK	Lf,B:X,LY	15 R	360353	3267527
12/31/06	Bolivar Flats	TX	GP US	SD	-,YA:Gf,GL	15 R	332877	3251651
12/31/06	Bolivar Flats	TX	GP C	SK	X,B:Lf,GG	15 R	332567	3250914
12/31/06	Bolivar Flats	TX	GP C	SK	O,W:Y/L(g/G),RX	15 R	332015	3249558
12/31/06	Bolivar Flats	TX	GP C	SK	X,Og:Lf,B	15 R	331349	3249738
12/31/06	Bolivar Flats	TX	GP C	SK	X,-:Lf,-	15 R	331321	3249773
12/31/06	Bolivar Flats	TX	GP C	SK	X,B:Lf,RG	15 R	331300	3249810
12/31/06	Bolivar Flats	TX	GP US	SD	-,RY:Gf,LW	15 R	331270	3249782



Date	Location	State	Pop.	Province or State	Band String	UTM Zone	E	N
12/31/06	Bolivar Flats	TX	GP C	SK	X,B:Lf,OG	15 R	331182	3249763
12/31/06	Bolivar Flats	TX	GP C	SK	X,-:WF,-	15 R	331166	3249786
12/31/06	Bolivar Flats	TX	GP C	SK	W,YR:-,X	15 R	331160	3249769
12/31/06	Bolivar Flats	TX	GP C	SK	Lf,O:X,gO	15 R	331142	3249803
12/31/06	Bolivar Flats	TX	GP C	SK	Lf,B:X,BO	15 R	331213	3249825
12/31/06	Bolivar Flats	TX	GP C	SK	X,-:Lf,-	15 R	331167	3249722
1/2/07	Convention Center	TX	GP C	AB	-,:L/W,X	14 R	682238	2892216
1/2/07	Convention Center	TX	GP C	SK	W,X:O,-	14 R	682211	2892183
1/2/07	Convention Center	TX	GP C	SK	Lf,B:X,OG	14 R	682185	2891964
1/2/07	Convention Center	TX	GP C	SK	X,Y:Lf,OO	14 R	682179	2891847
1/2/07	Windsurfing Beach	TX	GP C	SK	X,Y:Wf,GY	14 R	681810	2893681
1/2/07	Windsurfing Beach	TX	GP C	SK	X,LL:Lf,g	14 R	681806	2893681
1/2/07	Windsurfing Beach	TX	GP C	SK	Lf,RR:X,R	14 R	681922	2893802
1/2/07	Windsurfing Beach	TX	GP C	SK	W,X:-,OO	14 R	681827	2896156
1/2/07	Windsurfing Beach	TX	GP C	SK	X,GG:Wf,G	14 R	681498	2896917
1/2/07	Windsurfing Beach	TX	GP C	SK	Y/L(g/G),X:O,B	14 R	681391	2897192
1/2/07	Windsurfing Beach	TX	GP C	SK	W,-:X,R	14 R	681391	2897192
1/2/07	Windsurfing Beach	TX	GP US	SD	-:YL:Gf,LG	14 R	681391	2897192
1/2/07	Windsurfing Beach	TX	GP C	SK	Lf,OX:N,GL	14 R	681391	2897192
1/2/07	Windsurfing Beach	TX	GP C	SK	Lf,B:X,OG	14 R	681814	2895644
1/2/07	Windsurfing Beach	TX	GP C	SK	X,O:Lf,OO	14 R	681814	2895644
1/2/07	Windsurfing Beach	TX	GP C	SK	W,X:O,-	14 R	681814	2895644
1/4/07	S Padre Island Beach	TX	GP C	SK	Lf,B:X,gY	14 R	672925	2935955
1/4/07	S Padre Island Beach	TX	GP C	SK	Lf,RB:X,B	14 R	680042	2910355
1/5/07	S Padre Island Bayside	TX	GP US	SD	-:LR:Gf,LW	14 R	670444	2939082
1/5/07	S Padre Island Bayside	TX	?		-:,-:b	14 R	670264	2938978
1/5/07	S Padre Island Bayside	TX	GP US	SD	-:RL:Gf,GL	14 R	666418	2938106
1/5/07	S Padre Island Bayside	TX	GP C	SK	Lf,Yg:-,YX	14 R	666418	2938106
1/5/07	S Padre Island Bayside	TX	GP C	SK	Lf,B:X,gB	14 R	666418	2938106
1/5/07	S Padre Island Bayside	TX	GP C	AB	X,-:L/W,-	14 R	666418	2938106
1/5/07	S Padre Island Bayside	TX	GP C	SK	X,-:Wf,-	14 R	666418	2938106
1/5/07	S Padre Island Bayside	TX	GP C	SK	X,Y:Wf,Bg	14 R	666418	2938106
1/5/07	S Padre Island Bayside	TX	GP C	SK	X,G:Wf,YR	14 R	666418	2938106
1/5/07	S Padre Island Bayside	TX	GP C	SK	Lf,BR:X,O	14 R	666418	2938106

Date	Location	State	Pop.	Province or State	Band String	UTM Zone	E	N
1/5/07	S Padre Island Bayside	TX	GP C	SK	-,OX:Lf,RL	14 R	666418	2938106
1/5/07	S Padre Island Bayside	TX	GP US	SD	-,AY:Gf,LA	14 R	666418	2938106
1/5/07	S Padre Island Bayside	TX	GP C	SK	W,LL:-,X	14 R	666418	2938106
1/5/07	S Padre Island Bayside	TX	GP C	SK	Lf,RY:-,OX	14 R	666418	2938106
1/5/07	S Padre Island Bayside	TX	GP C	SK	Lf,O:X,BL	14 R	666418	2938106
1/5/07	S Padre Island Bayside	TX	?		X,OG:-,-	14 R	666418	2938106
1/6/07	Mustang Island Beach	TX	GP US	SD	-,WA:Gf,LG	14 R	688615	3075619
1/6/07	Mustang Island Beach	TX	GP C	SK	X,B:Wf,gG	14 R	686069	3071881
1/6/07	Mustang Island Beach	TX	GP C	SK	Lf,-X,-	14 R	685705	3071304
1/6/07	Mustang Island Beach	TX	GP C	SK	X,B:Lf,GB	14 R	681517	3064175
1/6/07	Mustang Island Beach	TX	GP C	SK	Lf,YG:N,OX	14 R	677705	3056672
1/7/07	Corpus Christi Beach	TX	GP C	SK	Lf,O:X,GB	14 R	676626	3054267
1/7/07	Corpus Christi Beach	TX	?		N,X:O(?),R	14 R	674714	3050008
1/7/07	Corpus Christi Beach	TX	GP C	SK	-,OX:Lf,LG	14 R	674387	3049273
1/7/07	Corpus Christi Beach	TX	GP C	SK	Lf,YO:-,OX	14 R	674311	3049100
1/7/07	Corpus Christi Beach	TX	GP C	SK	Y/L(g/G),RX:Y,Y	14 R	674281	3049037
1/7/07	Corpus Christi Beach	TX	GP C	SK	Lf,RB:X,Y	14 R	674261	3048984
1/7/07	Corpus Christi Beach	TX	GP C	SK	X,-:Wf,-	14 R	672389	3044774
1/7/07	Corpus Christi Beach	TX	GP C	AB	L/W,X:-,W	14 R	372036	3043988
1/7/07	Corpus Christi Beach	TX	GP C	SK	W,YX:-,-	14 R	670622	3040643
1/7/07	Mollie Beattie S	TX	GP C	SK	Lf,O:X,OG	14 R	676416	3057122
1/7/07	Mollie Beattie S	TX	GP US	SD	-,GG:Gf,LL	14 R	676363	3057281
1/7/07	Mollie Beattie S	TX	GP C	SK	X,Y:Wf,LG	14 R	676405	3057276
1/7/07	Mollie Beattie S	TX	GP C	AB	-,L/W,gX	14 R	676405	3057276
1/7/07	Mollie Beattie S	TX	GP C	AB	L/W,X:-,-	14 R	676361	3057272
1/7/07	Mollie Beattie S	TX	GP C	SK	Lf,O:X,GB	14 R	676423	3057269
1/7/07	Mollie Beattie S	TX	GP C	SK	Lf,-X,-	14 R	676423	3057269
1/8/07	Mollie Beattie N	TX	GP C	AB	-,L/W,X	14 R	676352	3057930
1/8/07	Mollie Beattie N	TX	GP C	AB	-,LW,GX	14 R	676352	3057930
1/8/07	Mollie Beattie N	TX	GP C	SK	Lf,YG:-,OX	14 R	676344	3057938
1/8/07	Mollie Beattie N	TX	GP C	SK	Lf,O:X,OG	14 R	676320	3057955
1/8/07	Mollie Beattie N	TX	GP US	SD	-,GG:Gf,LL	14 R	676320	3057955
1/8/07	Mollie Beattie N	TX	GP C	SK	X,Y:Wf,LG	14 R	676320	3057955
1/10/07	Shoalwater Bay	TX	GP C	SK	Lf,-X,-	14 R	735557	3137853



Date	Location	State	Pop.	Province or State	Band String	UTM Zone	E	N
1/10/07	Shoalwater Bay	TX	GP C	SK	X,g:Lf,gL	14 R	735557	3137853
1/10/07	Shoalwater Bay	TX	GP C	SK	Lf,LR:X,Y	14 R	735557	3137853

## Survey Site Reviews

In this section, each survey location is discussed in more detail. Information is provided on the survey route, habitat conditions, ownership status, and management. Pictures illustrating habitat conditions are included for certain sites. For all sites, a satellite photograph is included that shows the general survey route.

### East Grand Terre Island, LA, Critical Habitat Unit LA-5



**Photograph 1. East Grand Terre Island, LA, looking northwest towards feeding area.**

**Total Piping Plovers seen:** 26

**Banded Piping Plovers seen:** 4

- Left tibia metal band, left tarsus no band; right tibia black over white split band, right tarsus orange (Great Plains Canada)
- Left tibia metal band, left tarsus light green over blue; right tibia white flag, right tarsus no band (Great Plains Canada)
- Left tibia black flag, left tarsus orange; right tarsus metal, right tibia light green over red (Great Plains Canada)
- Left tibia no band; left tarsus white over black; right tibia green flag, left tarsus green over black (Great Plains US)

**Survey Date:** December 20, 2006

**Description of survey area:** Starting at the northeast corner of the island on the bayside, walking south to the Gulf Beach, then west along the ocean beach while checking overwash fans on the bayside, then to the northwest corner of the island.

**Ownership Status:** Public.

**Survey type:** Walking

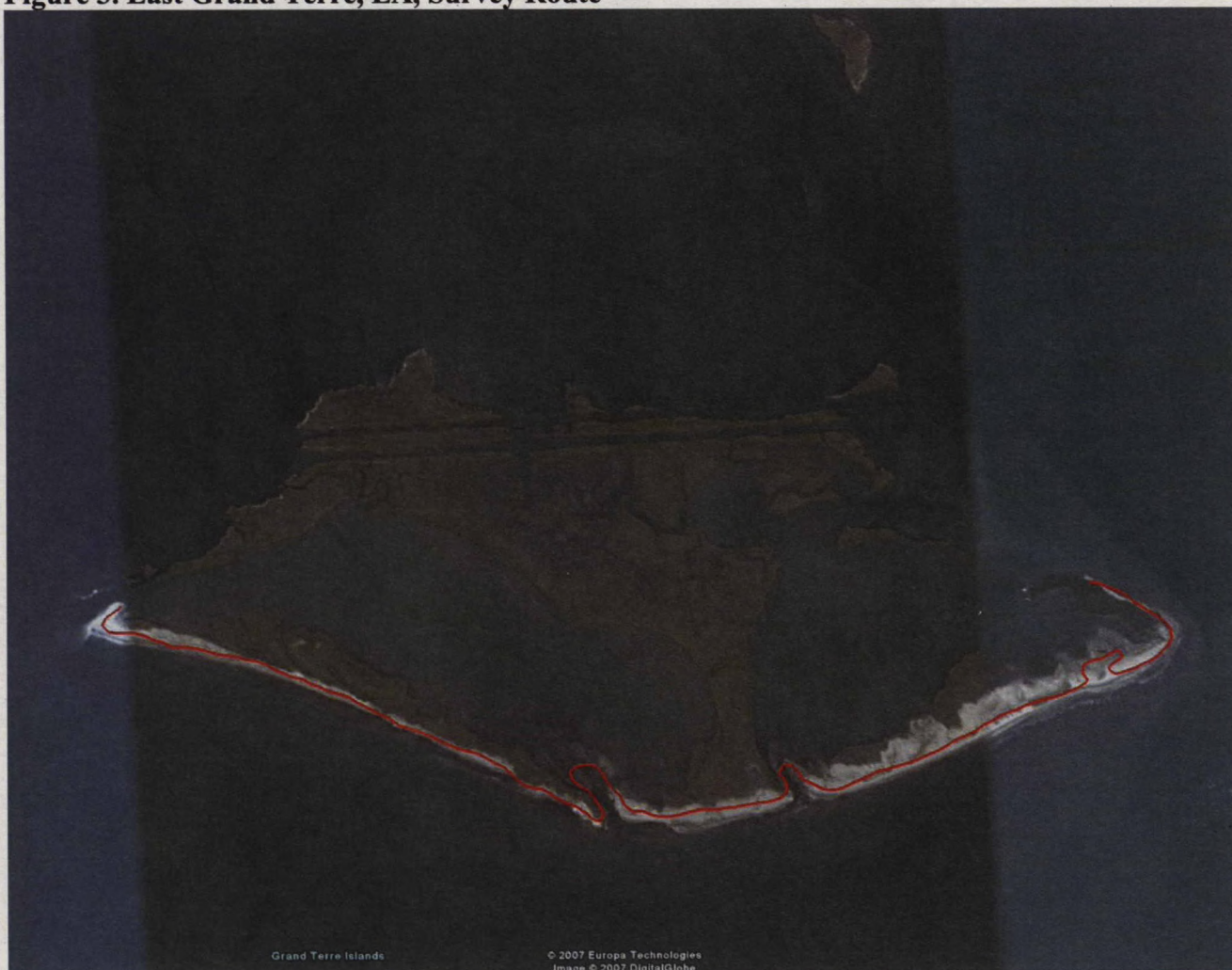
**Weather:** Cloudy, wind SE 11.8 km/hr, 19.3° C.

**Description of habitat:** Gulf barrier island with narrow sandy shoreline on the Gulf side, multiple overwash fans with low energy feeding habitat in the lagoon area, and two small inlets that could be waded across on foot using the flood bar flats.

**Comments and observations:** All of the Piping Plovers but one were located together on flood bar flats of an inlet that was in the middle of the island.



**Figure 3. East Grand Terre, LA, Survey Route**





## Grand Isle, LA, Critical Habitat Unit LA-5

**Total Piping Plovers seen:** 0

**Banded Piping Plovers seen:** 0

**Date:** December 21, 2006

**Description of survey area:** Starting on the NE corner of the island on the bayside, walking south to the Gulf, then west to the west end of the island, then north to where the bayside habitat ended.

**Ownership Status:** Public, State (Grand Isle State Park) on east end and Private.

**Survey type:** Walking

**Weather:** Cloudy, wind SE 9 km/hr, 20.1° C.

**Description of habitat:** Developed island with sandy Gulf beach, artificial berm on the ocean beach for much of the island, offshore breakwaters for part of the eastern half of the island, and very limited bayside habitat on either end of island.

**Comments and observations:** This location was selected for a survey due to threatening weather conditions which precluded use of the boat to access higher quality habitat on the remote islands. Disturbance was low on the survey day.

**Figure 4. Grand Isle, LA, Survey Route**





## **Sandbar northeast of East Timbalier Island, Critical Habitat Unit LA-5**



**Photograph 2. Sandbar northeast of East Timbalier Island, LA, looking north, feeding habitat.**

**Total Piping Plovers seen:** 24

**Banded Piping Plovers seen:** 1

- Left tibia metal band, left tarsus no band; right tibia no band, right tarsus black over white split band. (Great Plains Canada)

**Date:** December 23, 2006

**Description of survey area:** Entire area of exposed sandbar.

**Ownership Status:** Public, State.

**Survey type:** Walking

**Weather:** Sunny, wind NNE 15.4 km/hr, 18.5° C.

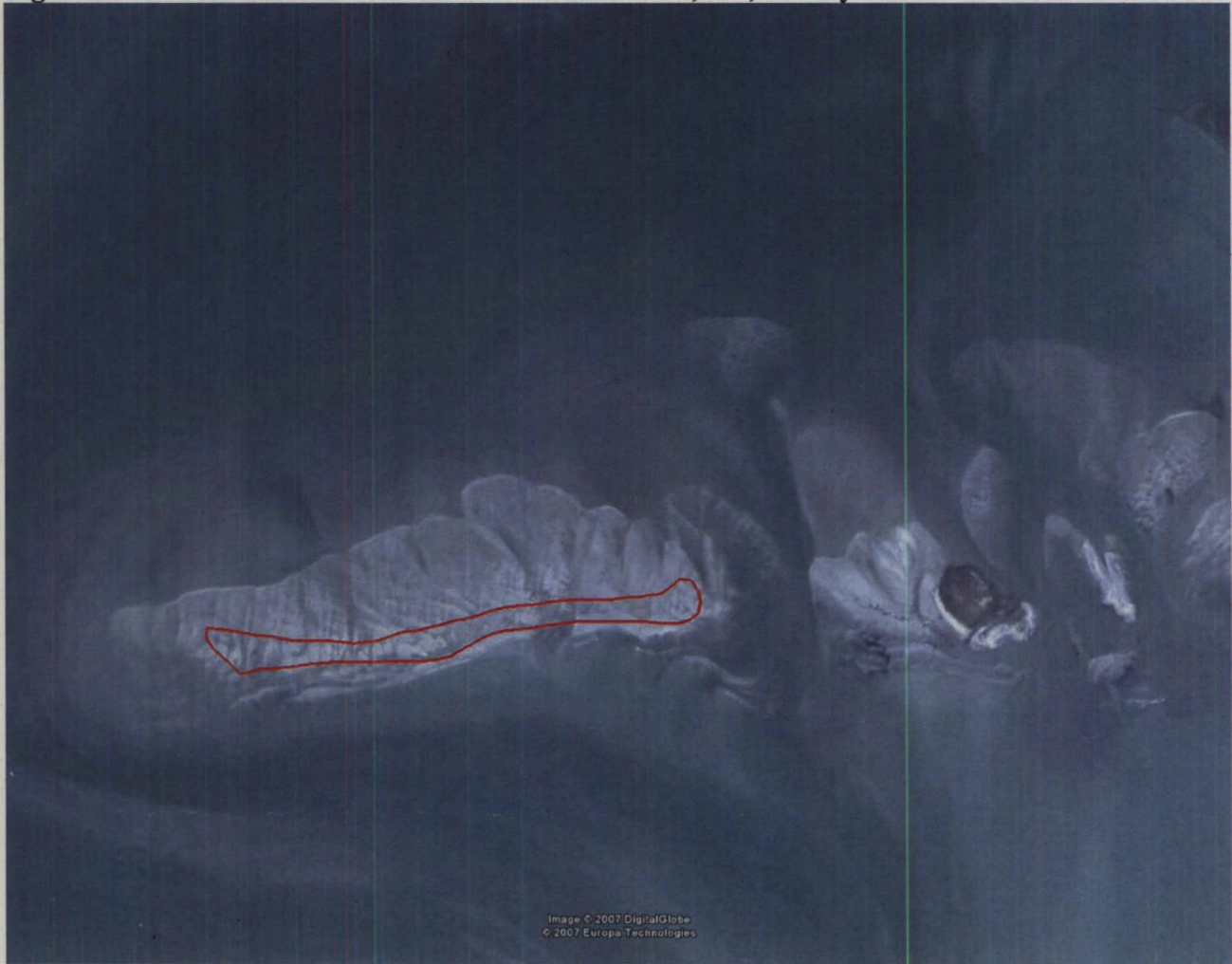
**Description of habitat:** A large, low elevation sandbar that would flood completely at high tide.

**Comments and observations:** This area had numerous shorebirds feeding on the lower energy (north) side of the sandbar along the edge of the water. At high tide, the island to the southwest (East



Timbalier) or east (Bell Pass) should be searched, as these are the closest areas that could provide high tide roosting habitat. Large numbers of shorebirds also could be seen on the sandbar to the east that is located to the northwest of a small island, but it was not possible to survey that area due to a shallow sandbar, deep channel, shallow sandbar combination which blocked access at low tide by boat or wading.

**Figure 5. Sandbar northeast of East Timbalier Island, LA, Survey Route**





## **West Belle Pass, Critical Habitat Unit LA-5**

**Total Piping Plovers seen:** 0

**Banded Piping Plovers seen:** 0

**Date:** December 23, 2006

**Description of survey area:** Starting on the west side of island at the spit, then walking east along the Gulf beach and bayside washover fans, to the jetty.

**Ownership Status:** Private.

**Survey type:** Walking

**Weather:** Sunny, wind NNE 17.6 km/hr, temperature 16.8 ° C.

**Description of habitat:** A peninsula with good habitat including large bayside sand/mud bars and flats, roosting habitats in old washover fans that are undergoing succession, and Gulf beach roosting and feeding habitats.

**Comments and observations:** The survey was conducted below the high tide line. The east end of the island has a large dual jetty to stabilize the channel for Port Fourchon. There are multiple overwash fans into marsh or bayside habitats. As this location was searched near low tide, when the shorebirds were out feeding on exposed sandbars, a count in this area at high tide may result in a larger number of birds being observed.

**Figure 6. West Belle Pass, LA, Survey Route**





## **Fourchon Beach, Critical Habitat Unit LA-5**



**Photograph 3. Fourchon Beach, LA, overwash area, looking east.**

**Total Piping Plovers seen: 38**

**Banded Piping Plovers seen: 5**

- Left tibia not seen, left tarsus white over red; right tibia green flag, right tarsus black over gray (Great Plains US)
- Left tibia black flag, left tarsus red over light green; right tibia not seen, right tarsus metal over orange (Great Plains Canada)
- Left tibia not seen, left tarsus blue over green, right tibia green flag, right tarsus no band (Great Plains US)
- Left tibia black flag, left tarsus no band; right tibia not seen, right tarsus no band (Great Plains Canada)



- Left tibia not seen, left tarsus yellow over red; right tibia green flag, right tarsus black over white (Great Plains US).

**Date:** December 25, 2006

**Description of survey area:** starting at where the road meets the beach, scan the beach to the west, then walk east, to east end of the large overwash fan

**Ownership Status:** Private.

**Survey type:** Walking

**Weather:** Cloudy, winds W 41.4 km/hr, temperature 11.8° C.

**Description of habitat:** the western end of the survey route is a narrow beach with sandbags, interlocking brick, and offshore breakwaters. However, to the east, the habitat value is much higher due to the large overwash area with extensive intertidal feeding habitat on the low energy side.

**Comments and observations:** A survey was started on this area on 12/24/07, but prematurely stopped due to heavy rain. On 12/25/07, winds were very high during the survey but the area was searched due to limited available time. All of the Piping Plovers were observed feeding in the overwash area, which has excellent quality feeding habitat for Piping Plovers.

**Figure 7. Fourchon Beach, LA, Survey Route**





## **Elmers Island (East End), Critical Habitat Unit LA-5**



**Photograph 4. Elmers Island, LA, looking west towards fresh wrack roosting location.**

**Total Piping Plovers seen: 5**

**Banded Piping Plovers seen: 1**

- Left tibia no band, left tarsus red over black; right tibia green flag, right tarsus black over green (Great Plains US)

**Date:** December 26, 2006

**Description of survey area:** Northeast tip of island, covering flats area and bayside intertidal habitats, then southwest towards Gulf beach, then west along beach and wading across small inlet, then further west along beach, surveying existing habitat on bay and Gulf sides.

**Ownership Status:** Private.

**Survey type:** Walking.

**Weather:** Sunny, wind NW 23.4 km/hr, temperature 8.9° C.



**Description of habitat:** A relatively narrow barrier island with roosting habitat at the point near the inlet and moderate sized flats northeast of the island; a small inlet west of the larger inlet also provided nice habitat.

**Comments and observations:** The survey was conducted below the high tide line. Birds were roosting on the ocean beach in fresh rack near a small pond that is not shown in the aerial photograph below; the pond was located just west of the inlet. The sandflats just NE of the island also were surveyed but no Piping Plovers were seen there. A banded snowy plover (N,RBX:N,-) also was seen at this location.

**Figure 8. Elmers Island (East End), LA, Survey Route**





## **Raccoon Island (West End), LA, Critical Habitat Unit LA-4**



**Photograph 5. Raccoon Island, LA, looking towards intertidal feeding habitat.**

**Total Piping Plovers seen: 49**

**Banded Piping Plovers seen: 4**

- Left tibia orange flag, left tarsus orange over light green; right tibia metal, right tarsus blue (Great Lakes)
- Left tibia no band, left tarsus green over green; right tibia green flag, right tarsus black over yellow (Great Plains US)
- Left tibia metal, left tarsus light green; right tibia black flag, right tarsus orange over yellow (Great Plains Canada)
- Left tibia not seen, left tarsus no band; right tibia not seen; right tarsus blue (unknown).

**Date:** December 27, 2006



**Description of survey area:** East on Gulf side to vegetated area, then north to bayside, then west along bayside to west end of island.

**Ownership Status:** State lease (25 years) and management.

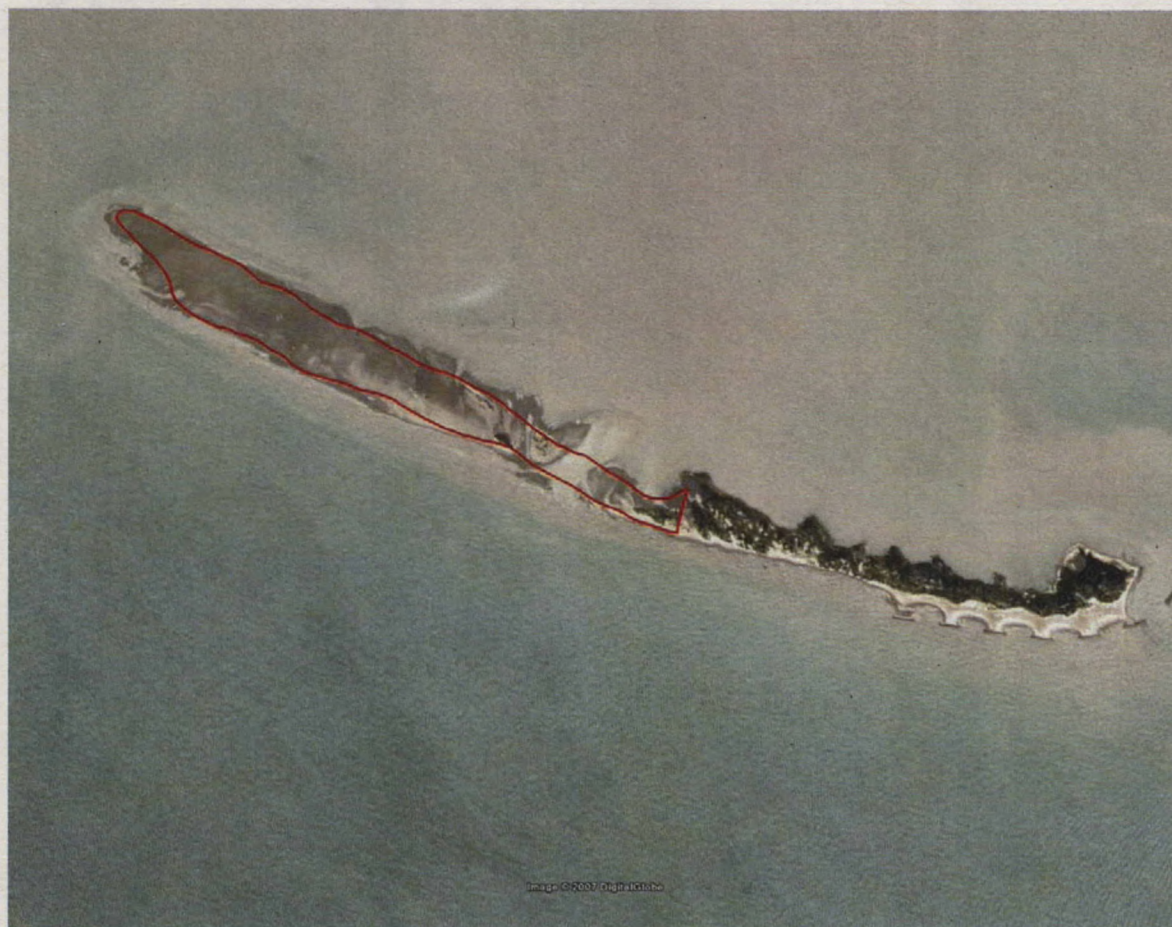
**Survey type:** Walking

**Weather:** Sunny, wind NE 9 km/hr, temperature 14.3° C.

**Description of habitat:** A barrier island, accessible by boat only, with very large, unvegetated spit at the west end of the island; east of the spit, the island is vegetated and there are offshore breakwaters.

**Comments and observations:** Excellent intertidal feeding habitat at the spit on the bayside of the island.

**Figure 9. Raccoon Island (West End), LA, Survey Route**





## Whisky Island (West End), LA, Critical Habitat Unit LA-4



**Photograph 6. Whisky Island, LA, looking towards feeding habitat between marsh and water.**

**Total Piping Plovers seen: 43**

**Banded Piping Plovers seen: 6**

- Left tibia metal, left tarsus red; right tibia black flag, right tarsus black over black (Great Plains Canada)
- Left tibia white, left tarsus metal; right tibia no band, right tarsus no band (Great Plains Canada)
- Left tibia black flag, left tarsus light green over red; right tibia metal, right tarsus orange (Great Plains Canada)
- Left tibia no band, left tarsus gray over green; right tibia green flag, right tarsus green over black (Great Plains US)
- Left tibia black flag, left tarsus blue; right tibia metal, right tarsus black over blue (Great Plains Canada)



- Left tibia metal, left tarsus green over orange; right tibia white flag, white tarsus blue (Great Plains Canada).

**Date:** December 28, 2006

**Description of survey area:** West end of unvegetated spit, Gulf and bayside, east to vegetated area.

**Ownership Status:** State lease (25 years) and management.

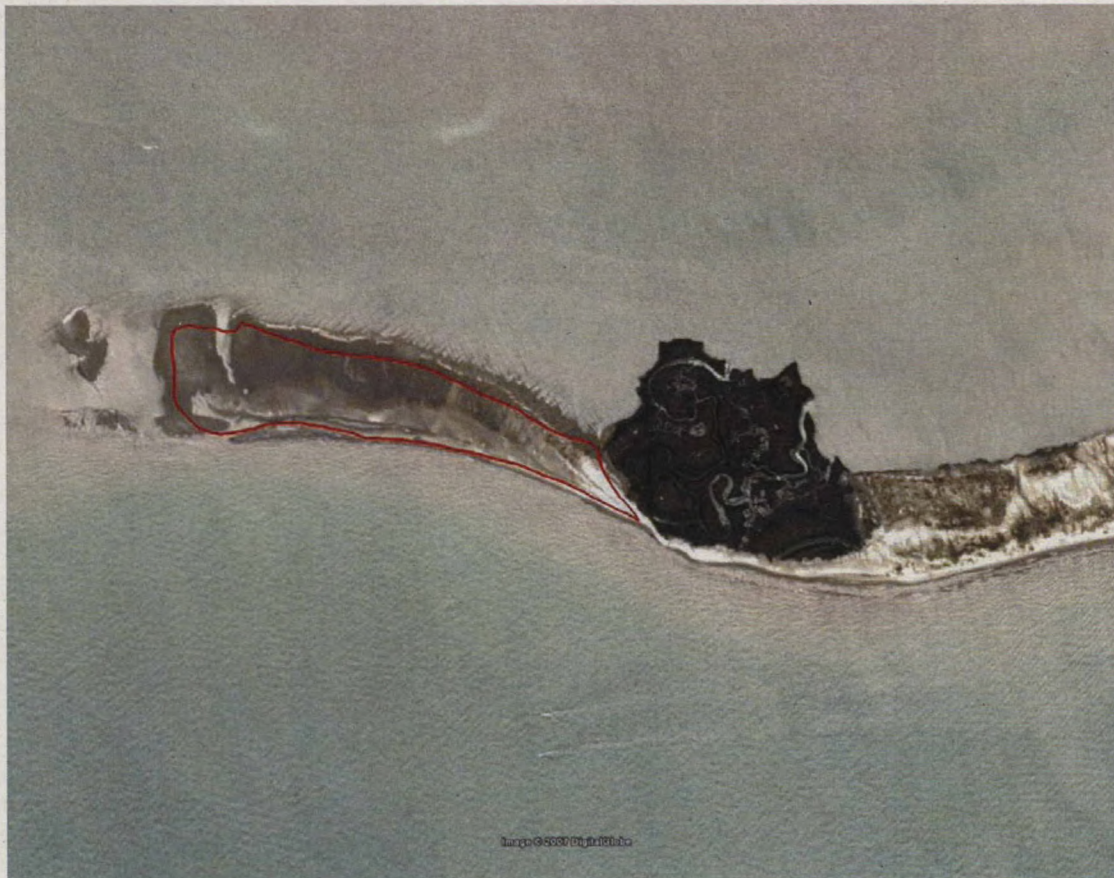
**Survey type:** Walking

**Weather:** Partly cloudy, good survey conditions.

**Description of habitat:** A barrier island, accessible by boat only, with a large spit on the west end; the middle of the island is vegetated.

**Comments and observations:** The aerial image shows less vegetation than at the time of the survey, when the interior of the island was vegetated (Photograph 6). The west spit has excellent feeding habitat.

**Figure 10. Whisky Island (West End), LA, Survey Route**





## **Whisky Island (East End), LA, Critical Habitat Unit LA-4**

**Total Piping Plovers seen:** 5

**Banded Piping Plovers seen:** 0

**Date:** December 28, 2006

**Description of survey area:** starting at the north end of spit, then southwest along the spit to the vegetated area on Gulf beach, then return, covering bay and Gulf sides.

**Ownership Status:** State lease (25 years) and management.

**Survey type:** Walking

**Weather:** Partly cloudy, good survey conditions.

**Description of habitat:** A moderately sized, unvegetated spit, with an intertidal area in mud/sand substrate and narrow Gulf beach.

**Comments and observations:** The spit and beach were not as large as the aerial image suggests.

**Figure 11. Whisky Island (East End), LA, Survey Route**



## **Wine Island (East End), LA, Critical Habitat Unit LA-4**

**Total Piping Plovers seen: 11**

**Banded Piping Plovers seen: 5**

- Left tibia metal band, left tarsus light green; right tibia white flag, right tarsus red over yellow (Great Plains Canada)
- Left tibia no band, left tarsus red over metal; right tibia white flag, right tarsus yellow over green (Great Plains Canada)
- Left tibia no band, left tarsus green over yellow; right tibia green flag, right tarsus black over yellow (Great Plains US)
- Left tibia no band, left tarsus no band; right tibia no band, right tarsus metal (unknown)
- Left tibia orange, left tarsus metal; right tibia no band, right tarsus no band (unknown)

**Date:** December 28, 2006

**Description of survey area:** Starting on bayside, east to end of spit, then west along Gulf side of spit to where beach narrows into dunes, then across island to bayside.

**Ownership Status:** State lease (25 years) and management.

**Survey type:** Walking

**Weather:** Partly cloudy, wind 16.5 km/hr, temperature 18.2° C.

**Description of habitat:** A barrier island accessible by boat only, with a moderately sized spit on the east end, vegetated interior areas to the west, including dune stabilization efforts west of spit.

**Comments and observations:** No disturbance was observed during the visit. The aerial image suggests the east end of the island is wetter than what was observed during the survey; the area was dry sand on the day it was visited except for the intertidal edges. Most of the plovers were at the far NE corner of the spit on the bayside.



**Figure 12. Wine Island (East End), LA, Survey Route**





## Grand Terre Island, LA



**Photograph 7. Grand Terre Island, LA, Gulf beach.**

**Total Piping Plovers seen: 12**

**Banded Piping Plovers seen: 2**

- Left tibia black flag, left tarsus orange; right tibia metal, right tarsus light green over red (Great Plains Canada)
- Left tibia no band, left tarsus white over black; right tibia green flag, right tarsus green over black (Great Plains US).

**Date:** December 29, 2006

**Description of survey area:** Available Piping Plover habitat on island, Gulf and bayside, east to west ends.

**Ownership Status:** State and private.

**Survey type:** Walking

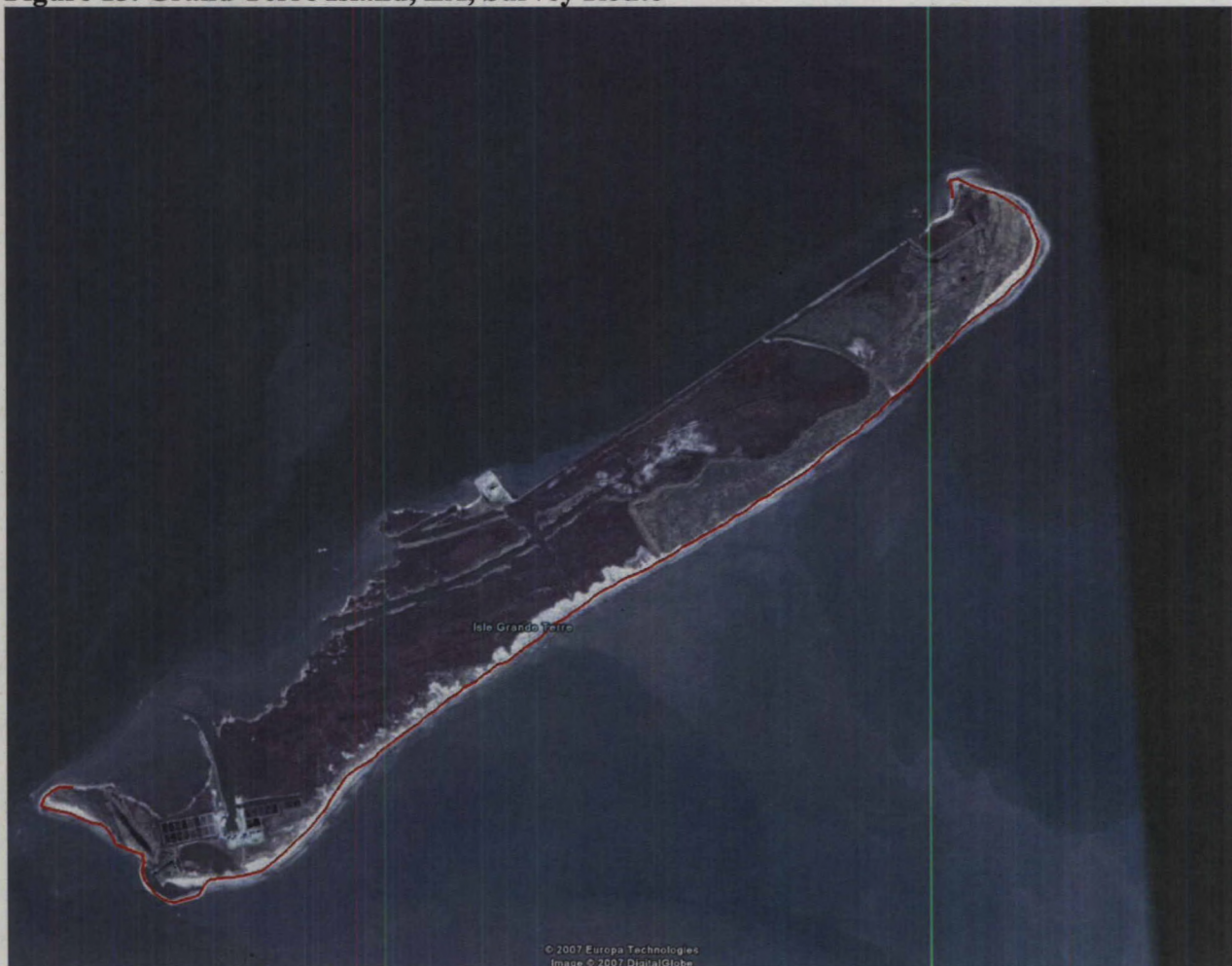


**Weather:** Partly cloudy, wind ESE 20.5 km/hr, temperature 19.4° C.

**Description of habitat:** Barrier island with very limited development, accessible by boat only, a fort and jetty at the west end, multiple overwash fans, and Gulf beach that is narrow in width in some areas but wider in the overwash fans.

**Comments and observations:** The narrow beach pictured in Photograph 7 was the feeding location for one of the Piping Plovers that was observed during the survey. Both banded birds observed on Grand Terre previously were observed on East Grand Terre Island on 12/20/06. Grand Terre was picked for a survey due to weather conditions. Originally, the survey was scheduled for the Dernieres chain but high winds/waves resulted in the survey being shifted to this island, which was safer to access by boat.

**Figure 13. Grand Terre Island, LA, Survey Route**





## Beach East of Haulover, TX

Total Piping Plovers seen: 9

Banded Piping Plovers seen: 1

- Left tibia black flag, left tarsus blue; right tibia metal, right tarsus black over yellow (Great Plains Canada).

Date: December 30, 2006

Description of survey area: Gulf beach from Zone 15 R, E 362078, N 3268235 to E 358482, N 3266722.

Ownership Status: Private

Survey type: Driving.

Weather: Cloudy, winds W 4.3 km/hr, temperature 15.8° C.

Description of habitat: Gulf beach with artificial berm, a road just behind the berm, off-road vehicle (ORV) use on the beach, and nearby development.

Comments and observations: This location had zero Piping Plovers when a similar survey was conducted one season earlier over a slightly longer route (Maddock 2006). In contrast, on this day, wind was offshore, so bayside habitats just to the northwest would have had higher water on the south side of the bay.

Figure 14. Beach East of Haulover TX, Survey Route





## **Bolivar Flats, TX, Critical Habitat Unit TX-36**



**Photograph 8. Bolivar Flats, TX, Piping Plovers Roosting In Wrack.**

**Total Piping Plovers seen: 158**

**Banded Piping Plovers seen: 13**

- Left tibia no band, left tarsus yellow over gray; right tibia green flag, right tarsus green over black (Great Plains US)
- Left tibia metal, left tarsus blue; right tibia black flag, right tarsus green over green (Great Plains Canada)
- Left tibia orange, left tarsus white; right tibia yellow over black split (light green over green), right tarsus red over metal (Great Plains Canada)
- Left tibia metal, left tarsus orange over light green; right tibia black flag, right tarsus blue (Great Plains Canada)

- Left tibia metal, left tarsus no band; right tibia black flag, right tarsus no band (Great Plains Canada)
- Left tibia metal, left tarsus blue; right tibia black flag, right tarsus red over green (Great Plains Canada)
- Left tibia no band, left tarsus red over yellow; right tibia green flag, right tarsus black over white (Great Plains US)
- Left tibia metal, left tarsus blue; right tibia black flag, right tarsus orange over green (Great Plains Canada)
- Left tibia metal, left tarsus no band; right tibia white flag, right tarsus no band (Great Plains Canada)
- Left tibia white, left tarsus yellow over red; right tibia no band, right tarsus metal (Great Plains Canada)
- Left tibia black flag, left tarsus orange; right tibia metal, right tarsus light green over orange (Great Plains Canada)
- Left tibia black flag, left tarsus blue; right tibia metal, right tarsus blue over orange (Great Plains Canada)
- Left tibia metal, left tarsus no band; right tibia black flag, right tarsus no band (Great Plains Canada).

**Date:** December 31, 2006

**Description of survey area:** From just east of the wetland creek on the Gulf beach west along the shoreline to inside the Sanctuary including the intertidal flats.

**Ownership Status:** Private Conservation (Houston Audubon Society) and private lands (to the east).

**Survey type:** Walking (inside sanctuary and certain areas to east) and driving (certain areas to east).

**Weather:** Sunny, winds NW 20.1 km/hr, temperature 14.4° C.

**Description of habitat:** Excellent intertidal feeding habitat on the flats inside the sanctuary, though unvegetated beach roosting habitat is limited. ORV use is allowed outside of the Sanctuary on the Gulf beach and disturbance can be high in the ORV area.

**Comments and observations:** One of the Piping Plovers (X,B:Lf,GG) was first observed outside of the Houston Audubon Sanctuary area on the Gulf beach and later, at a lower tide, was observed on the flats inside the sanctuary. In addition, two different birds with the combination X,-:Lf,- were observed; both could be seen at the same time.



Just over seven hours were spent at this location, with most of this time spent inside the Sanctuary on the flats. A complete count was not attempted as the priority was locating and identifying as many banded birds as possible. The count of 158 is the number of Piping Plovers that were seen in a one-time scan of the area. As the entire area could not be seen from the location where the scan occurred, this number very likely is an undercount of the Piping Plovers using the area.

**Figure 15. Bolivar Flats, TX, Survey Route**





**Corpus Christi Beach to Padre Island National Seashore No ORV Area, TX, Critical Habitat Unit TX-3 (Vacated) and Not Designated**



**Photograph 9. Corpus Christi beach, looking north towards Packery Channel jetty.**

**Total Piping Plovers seen:** 3

**Banded Piping Plovers seen:** 0

**Date:** January 1, 2007

**Description of survey area:** Gulf beach between the jetty at Packery Channel on north and the north end of "Closed Beach" (the no-ORV area) at Padre Island National Seashore.

**Ownership Status:** Private and Public (federal, Padre Island National Seashore, and Padre Balli Park, Nueces County).

**Survey type:** Driving.

**Weather:** Sunny, winds NE 10.7 km/hr, temperature 15.6° C.

**Description of habitat:** Gulf beach with highly developed area on the east end of the survey route and National Seashore on the west end; ORV use on beach; portions of the beach raked to remove wrack; and a large berm/dune for almost the entire length of the survey route.



**Comments and observations:** This area was selected for a survey as a previous survey had a large number of observed Piping Plovers (Gratto-Trevor 2006), and its location allowed a survey to be completed on what otherwise would have been a full travel day driving from east to west Texas. There was high human disturbance on the east end of the survey area, and moderate to high disturbance to the west end of the area.

**Figure 16. Corpus Christi Beach to Padre Island National Seashore No ORV Area, TX**





**Convention Center Bayside Flats, South Padre Island, TX, Critical Habitat Unit TX-3 (Vacated) and Not Designated**



**Photograph 10. Convention Center Bayside Flats, South Padre Island, TX, looking south.**

**Total Piping Plovers seen: 28**

**Banded Piping Plovers seen: 4**

- Left tibia no band, left tarsus no band; right tibia black over white split band, right tarsus metal band (Great Plains Canada)
- Left tibia white, left tarsus metal; right tibia orange, right tarsus no band (Great Plains Canada)
- Left tibia black flag, left tarsus blue; right tibia metal, right tarsus orange over green (Great Plains Canada)
- Left tibia metal, left tarsus yellow; right tibia black flag, right tarsus orange over orange (Great Plains Canada).

**Date: January 2, 2007**



**Description of survey area:** Bayside flats from the dredged channel south of the Convention Center dock north to the dredged channel for a new bayside development.

**Ownership Status:** Public, County, and Private.

**Survey type:** Walking and driving.

**Weather:** Sunny, winds NE 18 km/hr, temperature 19.9° C.

**Description of habitat:** A public park in the center, with development on the north and south ends; large intertidal bayside flats.

**Comments and observations:** The Piping Plovers were south of the Convention Center. A new development with a dredged bayside channel was under construction on the north end of the route.

**Figure 17. Convention Center Bayside Flats, TX, Survey Route**





**Windsurfing Beach and North, Bayside, South Padre Island, TX,  
Critical Habitat Unit TX-3 (Vacated)**



**Photograph 11. Windsurfing Beach, TX, looking north.**

**Total Piping Plovers seen: 58**

**Banded Piping Plovers seen: 12**

- Left tibia metal, left tarsus yellow; right tibia white flag, white tarsus green over yellow (Great Plains Canada)
- Left tibia metal, left tarsus black over black; right tibia black flag, right tarsus green (Great Plains Canada)
- Left tibia black flag, left tarsus red over red; right tibia metal, right tarsus red (Great Plains Canada)
- Left tibia white, left tarsus metal; right tibia no band, right tarsus orange over orange (Great Plains Canada)



- Left tibia metal, left tarsus green over green; right tibia white flag, right tarsus green (Great Plains Canada)
- Left tibia yellow over black split (light green over green), left tarsus metal; right tibia orange, right tarsus blue (Great Plains Canada)
- Right tibia white, right tarsus no band; right tibia metal, right tarsus red (Great Plains Canada)
- Left tibia no band, Left tarsus yellow over black; right tibia green flag, right tarsus black over green (Great Plains US)
- Left tibia black flag, left tarsus orange over metal; right tibia not seen, right tarsus green over black (Great Plains Canada)
- Left tibia black flag, left tarsus blue; right tibia metal, right tarsus orange over green (Great Plains Canada)
- Left tibia metal, left tarsus orange; right tibia black flag, right tarsus orange over orange (Great Plains Canada)
- Left tibia white, left tarsus metal; right tibia orange, right tarsus no band (Great Plains Canada)

**Date:** January 2, 2007

**Description of survey area:** Starting at the south end of Windsurfing Beach, then north along the intertidal area to Zone 14 R, E 681419, N 2897232.

**Ownership Status:** Private

**Survey type:** Driving and Walking

**Weather:** Partly cloudy, wind NE 15.4 km/hr, temperature 20.1° C.

**Description of habitat:** Bayside beach with ORV use and extensive sand/mud and dried and wet algal mat substrates.

**Comments and observations:** A windsurfer granted permission to enter the area to conduct the survey. Outside of Windsurfing Beach, the survey was conducted below the high tide line and upland areas were not entered.



**Figure 18. Windsurfing Beach and North, Survey Route**





## **Boca Chica Beach, TX, Critical Habitat TX-1**



**Photograph 12. Boca Chica, TX, looking south.**

**Total Piping Plovers seen: 3**

**Banded Piping Plovers seen: 0**

**Date: January 3, 2007**

**Description of survey area:** Gulf beach from the Rio Grande River, then north until the jetty, then west along the shoreline; interior areas off the beach were not surveyed.

**Ownership Status:** Federal, U.S. Fish and Wildlife Service, and private.

**Survey type:** Driving and walking.

**Weather:** Rain, NE at 1 km/hr, temperature 23.1° C.

**Description of habitat:** A Gulf beach with varying width, ORV use on the beach, and limited overwash fans; a jetty is on the north end of the survey route and a river on the south end.



**Comments and observations:** This area was selected because a high Piping Plover count occurred here in 1996, but other recent counts have been lower (Gratto-Trevor 2006). With rain on the survey day in 2007, the Gulf beach still could be surveyed by vehicle and foot despite the weather. One possibility for future surveys is the interior intertidal area located west of the beach and south of the channel shown in the aerial photograph; this area appears to have suitable plover habitat.

**Figure 19. Boca Chica Beach, TX, Survey Route**





**South Padre Island Beach, Atwood Park to Jetty, Critical Habitat Unit  
TX-3 (Vacated)**



**Photograph 13. South Padre Island, TX, intertidal habitat, wrack, and overwash fan.**

**Total Piping Plovers seen: 14**

**Banded Piping Plovers seen: 2**

- Left tibia black flag, left tarsus blue; right tibia metal, right tarsus light green over yellow (Great Plains Canada).
- Left tibia black flag, left tarsus red over blue; right tibia metal, right tarsus blue (Great Plains Canada)

**Date:** January 4, 2007

**Description of survey area:** Gulf beach, from the Atwood Park ORV entrance north until the jetty at the north end of South Padre Island, including the intertidal area, wrack, and the Gulf side of overwash fans; interior and bayside of overwash fans were not searched.



**Ownership Status:** Public, Cameron County (Edwin K. Atwood Park); Public, federal (Laguna Atascosa National Wildlife Refuge); and Private.

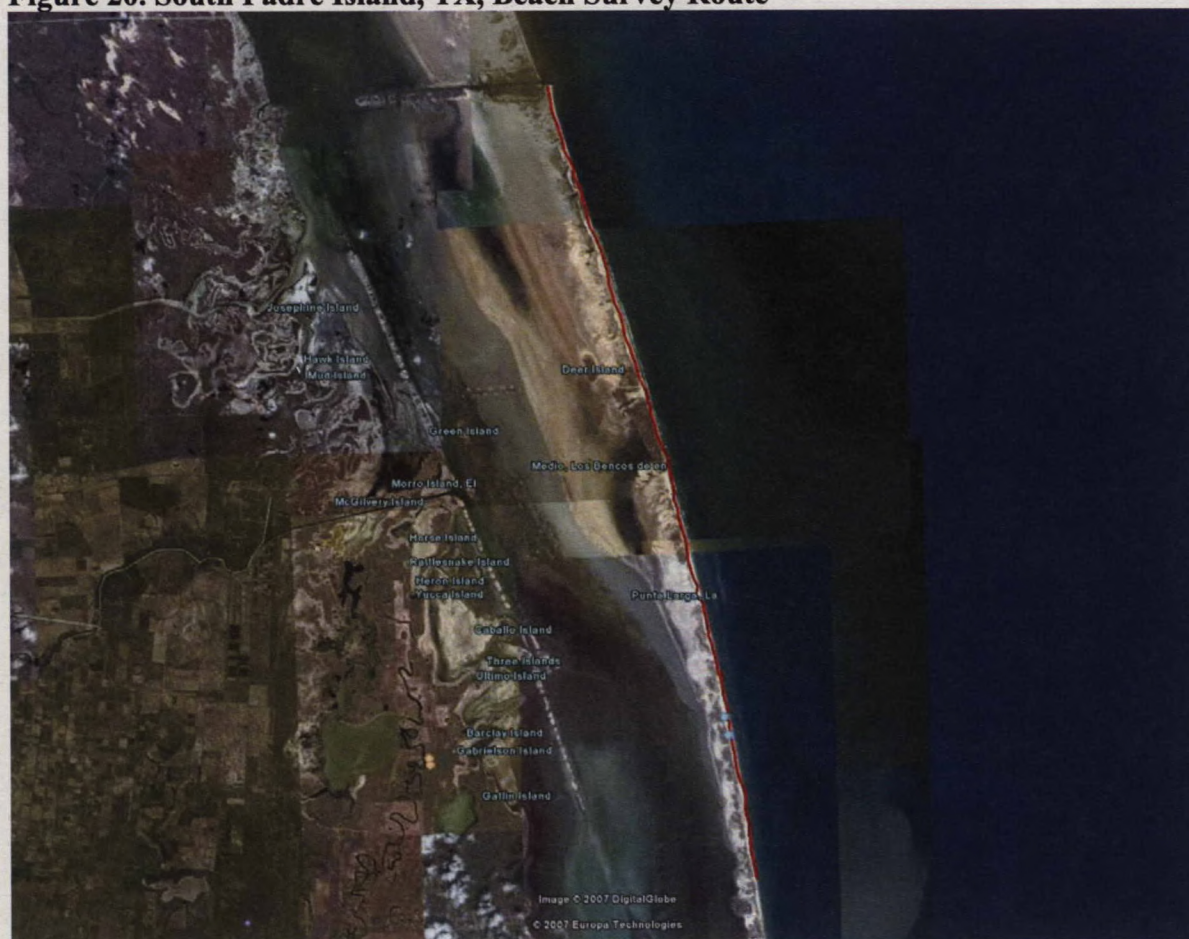
**Survey type:** Driving.

**Weather:** Rain, light wind.

**Description of habitat:** A Gulf beach with varying width and numerous washover fans; a large jetty is on the north end of the route.

**Comments and observations:** High levels of ORV disturbance were observed on the south end of the survey route.

**Figure 20. South Padre Island, TX, Beach Survey Route**





## **South Padre Island Bayside, TX, Critical Habitat Unit TX-3 (Vacated)**



**Photograph 14. South Padre Island, TX, bayside, looking northwest towards algal mat.**

**Total Piping Plovers seen: 229**

**Banded Piping Plovers seen: 16**

- Left tibia no band, left tarsus black over red; right tibia green flag, right tarsus black over white (Great Plains US)
- Left tibia no band, left tarsus no band; right tibia no band, right tarsus light blue (unknown)
- Left tibia no band, left tarsus red over black; right tibia green flag, right tarsus green over black (Great Plains US)
- Left tibia black flag, left tarsus yellow over light green; right tibia no band, right tarsus yellow over metal (Great Plains Canada)
- Left tibia black flag, left tarsus blue; right tibia metal, right tarsus light green over blue (Great Plains Canada)



- Left tibia metal, left tarsus no band; right tibia black over white split band, right tarsus no band (Great Plains Canada)
- Left tibia metal, left tarsus no band; right tibia white flag, right tarsus no band (Great Plains Canada)
- Left tibia metal, left tarsus yellow; right tibia white flag, right tarsus blue over light green (Great Plains Canada)
- Left tibia metal, left tarsus green; right tibia white flag, right tarsus yellow over red (Great Plains Canada)
- Left tibia black flag, left tarsus blue over red; right tibia metal, right tarsus orange (Great Plains Canada)
- Left tibia no band, left tarsus orange over metal; right tibia black flag, right tarsus red over black (Great Plains Canada)
- Left tibia no band, left tarsus gray over yellow; right tibia green flag, right tarsus black over grey (Great Plains US)
- Left tibia white, left tarsus black over black; right tibia no band, right tarsus metal (Great Plains Canada)
- Left tibia black flag, left tarsus red over yellow; right tibia no band, right tarsus orange over metal (Great Plains Canada)
- Left tibia black flag, left tarsus orange; right tibia metal, right tarsus blue over black (Great Plains Canada)
- Left tibia metal, left tarsus orange over green; right tibia no band, right tarsus no band (Unknown)

**Date:** January 5, 2007

**Description of survey area:** From base of jetty at the north end of South Padre Island, west along the jetty, then south to southern side of the dredge islands, then west along the bayside shoreline.

**Ownership Status:** Public, federal, Laguna Atascosa National Wildlife Refuge.

**Survey type:** Driving ATV (along the jetty) and foot (majority of the available Piping Plover habitat).

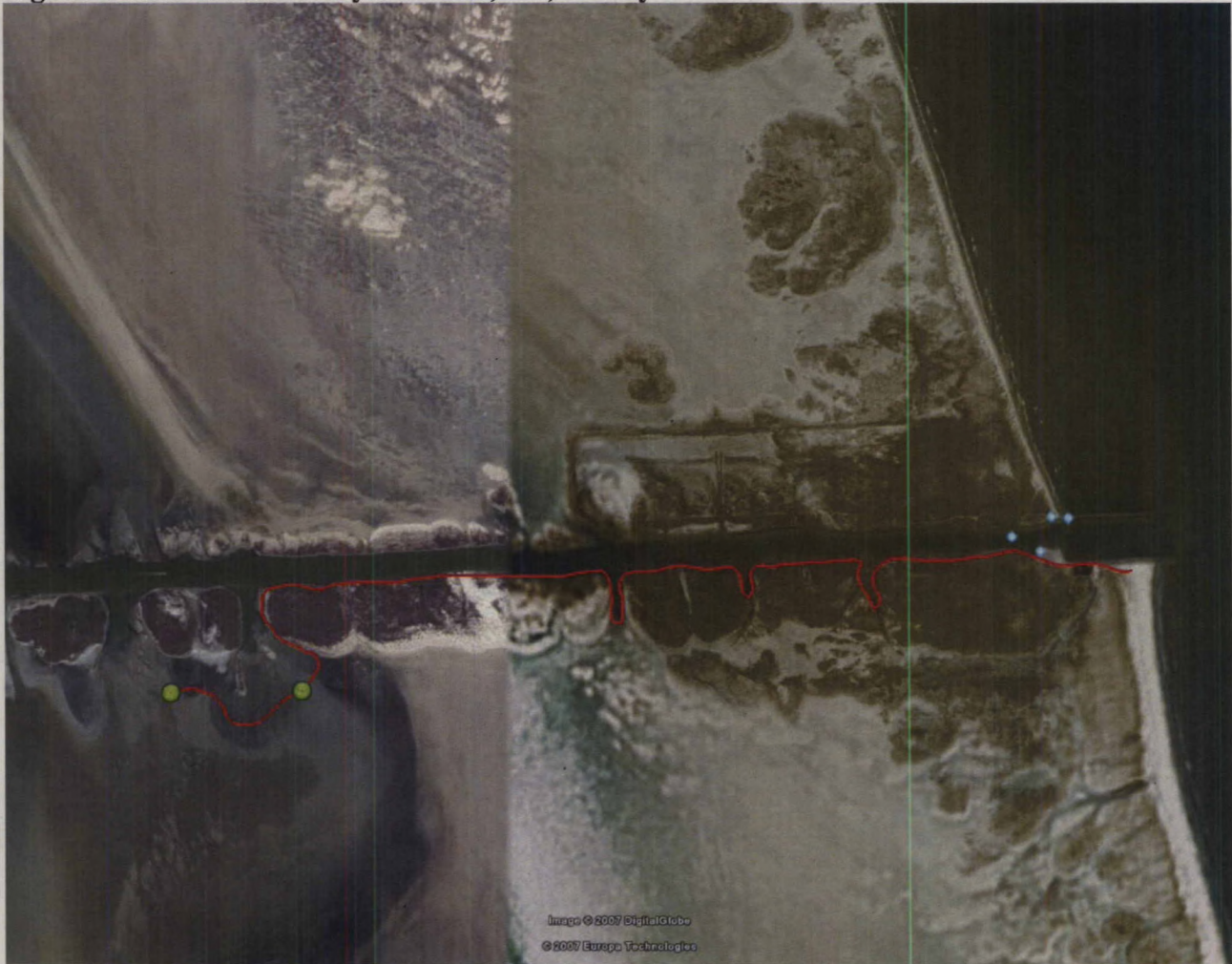
**Weather:** Sunny, wind S 20.5 km/hr, temperature 25° C.

**Description of habitat:** Bayside intertidal habitat with massive algal mats and some areas of sand/mud substrate.



**Comments and observations:** A single day result of 229 Piping Plovers is very high. As a majority of the birds were observed feeding on an algal mat in under a mile of bayside habitat (shown in Figure 21 as the area between the green dots), the density was extremely high. This location should be a priority for future surveys, to see if the survey result is consistent. However, this location is difficult to access. This location also had large numbers of Snowy Plovers using the same area.

**Figure 21. Padre Island Bayside Flats, TX, Survey Route**





**Mustang Island Beach, Critical Habitat TX-Units 7 (Vacated) and 8 (Vacated)**



**Photograph 15. Mustang Island Beach, TX, bulldozed beach sand into berm.**

**Total Piping Plovers seen: 39**

**Banded Piping Plovers seen: 5**

- Left tibia no band, left tarsus white over gray; right tibia green flag, right tarsus black over green (Great Plains US).
- Left tibia metal, left tarsus blue; right tibia white flag, right tarsus light green over green (Great Plains Canada)
- Left tibia black flag, left tarsus no band; right tibia metal band, right tarsus no band (Great Plains Canada)
- Left tibia metal, left tarsus blue; right tibia black flag, right tarsus green over blue (Great Plains Canada)



- Left tibia black flag, left tarsus yellow over green; right tibia not seen, right tarsus orange over metal (Great Plains Canada)

**Date:** January 6, 2007

**Description of survey area:** Gulf beach from the north end of the area where ORVs are allowed (just north of the pier at Port Aransas) south to the Packery Channel jetty.

**Ownership Status:** Public (Mustang Island State Park) and Private.

**Survey type:** Walking (no driving areas) and driving (areas open to vehicles).

**Weather:** Cloudy, wind N 20.8 km/hr, temperature 19° C.

**Description of habitat:** A Gulf beach moderate width, relatively flat slope, artificial berm and beach scraping in certain areas.

**Comments and observations:** ORV disturbance was high in certain areas.

**Figure 22. Mustang Island, TX, Survey Route**





**Corpus Christi Beach to Padre Island National Seashore No ORV Area,  
TX, Critical Habitat Unit TX-3 (Vacated) and Not Designated**



**Photograph 16. Corpus Christi Beach to Padre Island National Seashore No ORV Area.**

**Total Piping Plovers seen: 78**

**Banded Piping Plovers seen: 9**

- Left tibia black flag, left tarsus orange; right tibia metal, right tarsus green over blue (Great Plains Canada)
- Left tibia not seen, left tarsus metal; right tibia orange (?), right tarsus red (unknown)
- Left tibia no band, left tarsus orange over metal; right tibia black flag, right tarsus black over green (Great Plains Canada)
- Left tibia black flag, left tarsus yellow over orange; right tibia no band, right tarsus orange over metal (Great Plains Canada)
- Left tibia yellow over black split (light green over green); left tarsus red over metal, right tibia yellow, right tarsus yellow (Great Plains Canada)



- Left tibia black flag, left tarsus red over blue; right tibia metal, right tarsus yellow (Great Plains Canada)
- Left tibia metal, left tarsus no band; right tibia white flag, right tarsus no band (Great Plains Canada)
- Left tibia black over white split, left tarsus metal; right tibia no band, right tarsus white (Great Plains Canada)
- Left tibia white, left tarsus yellow over metal; right tibia no band, white tarsus no band (Great Plains Canada).

**Date:** January 7, 2007

**Description of survey area:** Gulf beach between the jetty at Packery Channel on north and the north end of "Closed Beach" (the no-ORV area) at Padre Island National Seashore.

**Ownership Status:** Private and Public (federal, Padre Island National Seashore, and Padre Balli Park, Nueces County).

**Survey type:** Driving.

**Weather:** Sunny, winds NW 16.9 km/hr (blocked by dunes), temperature 13° C.

**Description of habitat:** Gulf beach with highly developed area on the east end of the survey route and National Seashore on the west end; ORV use on beach; portions of the beach raked to remove wrack; and a large berm/dune for almost the entire length of the survey route.

**Comments and observations:** This location was selected for a second survey covering the same area previously surveyed on 1/1/07 (see Figure 16, Corpus Christi Beach to Padre Island National Seashore No ORV Area Survey Route) because a cold front passing through provided offshore winds that raised water levels on bayside intertidal habitats; a decision was made to see if more Piping Plovers would be using the Gulf beach under these changed conditions. The survey had 78 Piping Plovers traveling south, but when the same section of beach was covered driving north to return to the starting point, only 17 (and two of the same banded birds) were counted. By this time, wind levels had dropped and more people were on the beach. Photograph 16 was taken early in the morning, before disturbance levels increased; in the photograph, Piping Plovers are feeding at the edge of the wet sand.



**Mollie Beattie Coastal Habitat Community, TX, Critical Habitat Unit  
TX-6**



**Photograph 17. Piping Plover feeding on Algal Mat, Mollie Beattie Coastal Habitat Community.**

**Total Piping Plovers seen: 33 (south) and 56 (north)**

**Banded Piping Plovers seen: 7 (south) and 6 (north)**

- Left tibia black flag, left tarsus orange; right tibia metal, right tarsus orange over green (Great Plains Canada)(1/7/07, 1/8/07)
- Left tibia no band, left tarsus green over green; right tibia green flag, right tarsus black over black (Great Plains US)(1/7/07, 1/8/07)
- Left tibia metal, left tarsus yellow; right tibia white flag, right tarsus black over green (Great Plains Canada)(1/7/07, 1/8/07)
- Left tibia no band, left tarsus no band; right tibia black over white split, right tarsus light green over metal (Great Plains Canada)(1/7/07, 1/8/07)



- Left tibia black over white split, left tarsus metal; right tibia no band, right tarsus no band (Great Plains Canada)(1/7/07)
- Left tibia black flag, left tarsus orange; right tibia metal, right tarsus green over blue (Great Plains Canada)(1/7/07)
- Left tibia black flag, left tarsus no band, right tibia metal; right tarsus no band (Great Plains Canada) (1/7/07)
- Left tibia no band, left tarsus no band; right tibia black over white split, white tarsus metal (Great Plains Canada)(1/8/07)
- Left tibia black flag, left tarsus yellow over green; right tibia no band, right tarsus orange over metal (Great Plains Canada)(1/8/07)

**Date:** January 7, 2007 (south) and January 8, 2007 (north).

**Description of survey area:** Bay shoreline from south corner of Mollie Beattie Coastal Habitat Community north along shoreline to UTM 14 R, E 676131, W 3058840.

**Ownership Status:** Public, Texas General Lands Office.

**Survey type:** Walking.

**Weather:** Sunny, wind NW 20.5 km/hr, temperature 18.5° C (1/7/07); Sunny, wind N 12.6 km/hr, temperature 12.1° C (1/8/07).

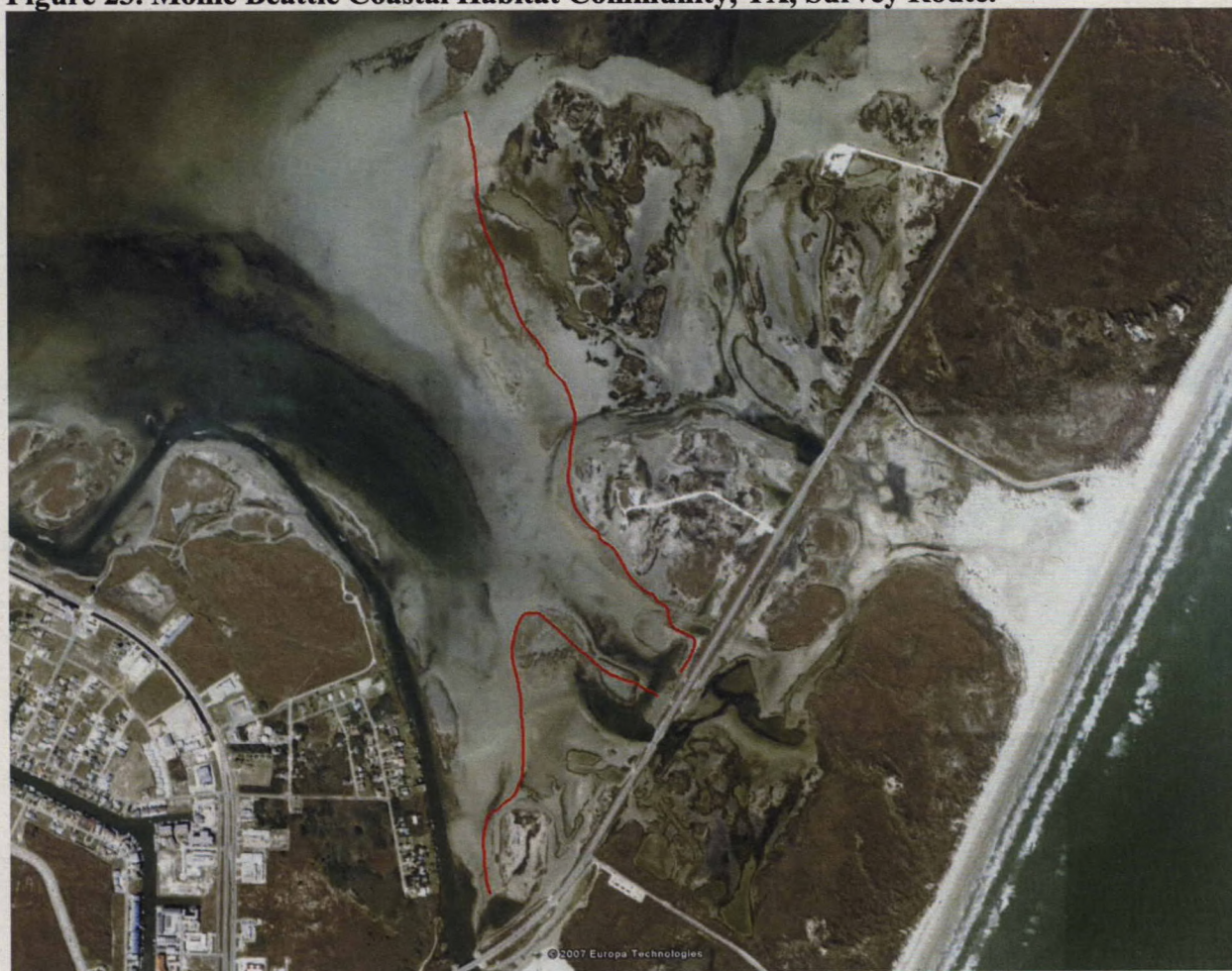
**Description of habitat:** A bayside shoreline with large wet and dry algal mats.

**Comments and observations:** The Mollie Beattie Coastal Habitat Community was searched on two separate days due to the first survey being cut short by darkness. On the first day, the southern part was searched and on the morning of the second day, the remaining shoreline to the north was searched. Four of the banded plovers seen on the first day were resighted on the second day, so they had moved north between the surveys. The results from both days are listed together, with the survey route map showing both days as separate lines.

A small flock of Piping Plovers from Mollie Beattie Coastal Habitat Community was observed with the spotting scope flying northwest out into the bay; the birds were followed for quite a distance but they were lost while still flying away.



**Figure 23. Mollie Beattie Coastal Habitat Community, TX, Survey Route.**





## **Corpus Christi Pass Bayside Flats, TX, Critical Habitat Unit TX-6 and Not Designated**

**Total Piping Plovers seen:** 0

**Banded Piping Plovers seen:** 0

**Date:** January 8, 2007.

**Description of survey area:** Bay shoreline north and south of Corpus Christi Pass.

**Ownership Status:** Private and Public (Mustang Island State Park).

**Survey type:** Driving (ATV) and walking

**Weather:** Sunny, wind ENE 4.5 km/hr, temperature 21.7° C.

**Description of habitat:** A bayside shoreline with large wet and dry algal mats and intertidal aquatic vegetation areas.

**Comments and observations:** This area was selected for survey due to the large number of Piping Plovers observed in a previous CWS survey. Over a thousand waterfowl were visible offshore but no plovers were seen. Habitat quality appeared very high even though no plovers were seen.



**Figure 24. Corpus Christi Pass Bayside Flats Survey Route.**





## **San Jose Island, TX, Critical Habitat Unit TX-16 (Vacated)**



**Photograph 18. San Jose Island, TX, Gulf beach.**

**Total Piping Plovers seen:** 7

**Banded Piping Plovers seen:** 0

**Date:** January 9, 2007.

**Description of survey area:** Gulf beach from the south end of the barrier island at the jetty to the north end of the barrier island at the inlet area.

**Ownership status:** Private.

**Survey type:** Vehicle (large ATV).

**Weather:** Partly cloudy, winds NNW 13.6 km/hr, temp. 14.2° C.

**Description of habitat:** A barrier island, accessible by boat, with moderate width beach area and relatively flat Gulf beach.

**Comments and observations:** Beach had very low disturbance on south end and no disturbance on center and north end of the survey route. The count number was surprisingly low given the high



habitat value of the area and could be due to birds moving to the bayside of the island on the survey day.

**Figure 25. San Jose Island, TX, Survey Route**





## Shoalwater Bay, TX



**Photograph 19. Shoalwater Bay, looking south towards feeding habitat.**

**Total Piping Plovers seen: 10**

**Banded Piping Plovers seen: 3**

- Left tibia black flag, left tarsus no band; right tibia metal band, right tarsus no band (Great Plains Canada)
- Left tibia metal, left tarsus light green; right tibia black flag, right tarsus light green over black (Great Plains Canada)
- Left tibia black flag, left tarsus black over red; right tibia metal, right tarsus yellow (Great Plains Canada)

**Date:** January 10, 2007

**Description of survey area:** From the west end of the Shoalwater Bay area to the east end of the Dewberry Island area.



**Ownership status:** State.

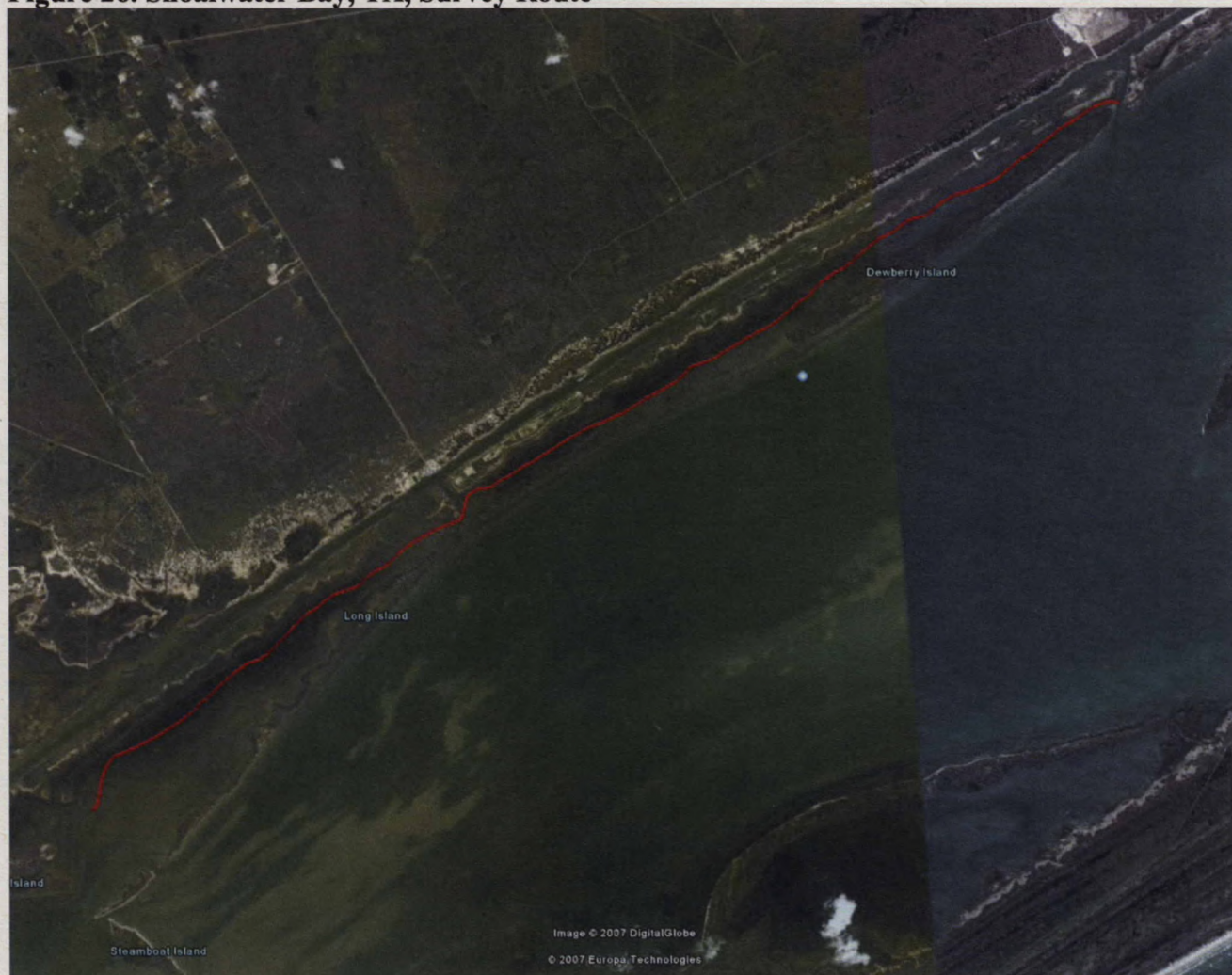
**Survey type:** Airboat and limited walking.

**Weather:** Sunny, wind ESE 15.1 km/hr, temperature 18.4° C.

**Description of habitat:** A very shallow bay area (a few inches deep for large areas), accessible by airboat only, with mud and mud/sand substrates; scattered oyster beds also were visible.

**Comments and observations:** No disturbance was observed during the visit. This area was selected due to the high number of Piping Plovers observed in the 2006 International Piping Plover Winter Census. However, on this day, high water levels may have influenced survey results.

**Figure 26. Shoalwater Bay, TX, Survey Route**





## Discussion

This survey is a continuation of efforts funded by the CWS to locate wintering ground locations for Piping Plovers that were banded on breeding grounds of the Great Plains of Canada. In one 2006 survey effort (Maddock 2006), there were 78 observations of banded Piping Plovers. In this 2007 season series of surveys, there were 106 observations of banded Piping Plovers. It is believed the larger number of band observations is due to surveys being scheduled in the South Padre Island, Texas area, which is a known for high numbers of wintering plovers. For example, on the bayside of the north end of South Padre Island, there were 229 Piping Plovers observed in one day on 1/5/07. Such a result is extraordinary, as the majority of plovers were observed in less than a mile of bayside shoreline.

At the same time, this survey effort underscores the potential challenges in conducting surveys for nonbreeding Piping Plovers. On 1/1/07, three Piping Plovers were observed between the Corpus Christi beach and the No-ORV area of Padre Island Seashore. On 1/7/07, seventy eight Piping Plovers were observed over the same survey route. In addition, as the survey route was retraced to return to the original starting point, only 17 Piping Plovers were observed, a considerable drop after only a short time. Despite limited survey days, this particular location was selected for a second survey because the night before the survey was conducted, a cold front moved through and moderately strong offshore winds had flooded certain areas of habitat on the bayside, which would have caused movements to the Gulf beach. However, as the day went on, the wind speed dropped, additional people came out on the beach raising disturbance levels, and the plovers moved off the beach. Thus, considerable variability in survey results may not be unusual for certain survey locations.

Even though Piping Plovers are known to exhibit fidelity to wintering sites, detection can be difficult due to movements within the mosaic of habitats that Piping Plovers utilize. Thus, an individual Piping Plover may have a wintering territory that includes bayside and Gulf side beaches or two adjoining barrier islands. During this survey for example, two uniquely banded birds were observed using adjoining barrier islands, once on East Grand Terre, LA on 12/20/06, and again on Grand Terre, LA on 12/29/06. If the survey days had been reversed, both birds might have been missed. Gulf beach to bayside movements of uniquely banded birds also were observed during this survey. Lf,O:X,GB was seen early in the day at Corpus Christi Beach and later the same day at Mollie Beattie Coastal Habitat Community; Lf,YG:-,OX was observed on the Mustang Island Gulf beach and two days later on the bayside at Mollie Beattie Coastal Habitat Community. Another uniquely banded



bird (X,g:Lf,gL) was observed at Shearwater Bay on the north side of Matagorda Bay during this survey and at the Matagorda Peninsula in the fall of 2007 (Cheri Gratto-Trevor, pers. comm. 2007), an interesting north south movement across Matagorda Bay. Under differing tide, weather, or disturbance conditions, or at different times of the year (migration vs. wintering periods), even for field personnel who are experienced with nonbreeding Piping Plover surveys, there may be considerable differences in the number of Piping Plovers that are observed. Care should be exercised when evaluating the importance of a site to Piping Plover conservation when only a single survey or a few surveys have been conducted at a site.

This survey effort also illustrates the important role that weather conditions play in conducting Piping Plover surveys. In 2006, it was suggested that to "get a more complete picture of distribution of banded Piping Plovers, survey efforts should include remote locations that are difficult to access" (Maddock 2006). One goal of this survey was to visit remote Louisiana barrier islands. Eight full or partial survey days were conducted in Louisiana. However, 2 additional survey days were completely missed due to heavy rain, and on two other days, lower priority, backup locations were surveyed as poor weather conditions precluded use of the boat to access more remote barrier islands with higher habitat quality. With limited survey time, it is not clear how this challenge can be avoided.

Despite the weather conditions in Louisiana, twenty-eight banded Piping Plovers were observed there. Twenty-one banded Piping Plovers were uniquely identifiable; of those, 19 had not been seen before on the wintering grounds (Cheri Gratto-Trevor, Dan Catlin, and Olivia LeDee, pers. comm. 2007). Even with a limited survey window, relatively high numbers of banded Piping Plovers can be found in Louisiana. In addition, with 49 Piping Plovers observed on Raccoon Island, 48 on Whisky Island, and 38 on Fourchon Beach, Louisiana clearly still has very valuable wintering habitat, despite the considerable impacts of recent hurricanes.

While certain coastal habitats in Louisiana clearly are not suitable (e.g., vegetated marsh dropping directly into water), areas of known high quality Piping Plover habitat could not be surveyed during this trip due to insufficient time. When previous International Piping Plover Winter Census results are considered, it is likely that additional banded birds exist but have yet to be observed in Louisiana.

In choosing future survey locations, scientists will have to balance the goal of obtaining large numbers of band observations against the goal of obtaining a more complete knowledge of the distribution of banded Piping Plovers. Clearly, large numbers of Piping Plovers winter in Texas. Thus,



it is likely that experienced surveyors will observe large numbers of banded birds there. However, locations outside of Texas may have relatively fewer Piping Plovers, yet nevertheless be important to recovery efforts.



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## Résumé<sup>1</sup>

Des campagnes de recensement des Pluviers siffleurs (*Charadrius melodus*) portant une bague de marquage ont été effectuées sur la côte du Golfe du Mexique entre le 20 décembre 2006 et le 10 janvier 2007. Vingt-cinq sites ont été visités (dont un à deux reprises) sur le territoire compris entre East Grand Terre (Louisiane) et Boca Chica Beach (Texas). Vingt-deux des vingt-cinq sites recensés se trouvaient en tout ou en partie dans des secteurs désignés en 2001 (U.S. Fish and Wildlife Service) comme habitats d'hivernage critiques pour le Pluvier siffleur. En 2006, dix-neuf sites du Texas ont fait l'objet d'une suspension de leur désignation d'habitat critique et ont été soumis au processus de révision de leur statut d'hivernage critique par le U.S. Fish and Wildlife Service; sept des aires recensées étaient concernées par quatre des sites en cours de révision. Au total, 938 Pluviers siffleurs ont été observés, dont 725 au Texas et 213 en Louisiane. De ce nombre, 106 étaient bagués (78 pour le Texas et 28 pour la Louisiane), et on a pu établir la provenance (population et pays) de 100 individus parmi ces derniers : 81 étaient des Prairies canadiennes, 18 des Prairies américaines et 1 des Grands-Lacs. Huit individus portant une marque individuelle ont été observés à deux reprises, chaque fois à proximité du site d'observation initial, par exemple dans la baie et du côté Golfe d'une île, d'îles contiguës ou de sites de recensement contigus.

<sup>1</sup> Added by Environment Canada (February 2009).



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