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SHOREBIRD OCCURRENCE AT THREE SITES IN FRANKLIN COUNTY, FLORIDA: 1994-2005

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Abstract.—Between March 1994 and February 2005, I surveyed shorebirds at Bald Point, Carrabelle Beach, and Yent Bayou in Franklin County of the Florida panhandle. A total of 96,259 individuals of 23 shorebird species were counted, with Dunlins (*Calidris alpina*) accounting for 28% of the individuals, followed by Sanderlings (*C. alba*) at 17%. Each site had a distinct seasonal pattern, with Carrabelle Beach and Yent Bayou being most heavily used in winter, Bald Point most used in spring, and all sites used least in summer.

Florida is home to 22 wintering shorebird species (Sprandel et al. 2000) and seven breeding species (FWC 2003). Although migrant shorebirds use coastal Florida in both spring and fall, periods of occurrence and abundance are not well documented. Following a statewide winter shorebird survey in 1993 (Sprandel et al. 1997), I continued surveying three Franklin county sites on the Gulf Coast, to look at seasonal occurrence and abundance.

STUDY SITES AND METHODS

Study sites.—Three sites in Franklin County were surveyed for shorebirds: Bald Point (29°56.8'N, 84°20.5'W), Carrabelle Beach (29°50.0'N, 84°40.5'W), and Yent Bayou (29°47.4'N, 84°45.5'W), (Fig. 1). All sites were tidal with mixed sand and mud flats, and had an incoming stream nearby. At all sites shorebird usage was concentrated in a ~200-m stretch of beach. Bald Point had a prominent mollusk reef at low- to medium tide and Carrabelle Beach had exposed mollusk reefs at very low tide. Bald Point was a county park at the start of the survey, but in 1996 it passed into private ownership. It was purchased by the state with the Conservation and Recreation Land funds in 2001

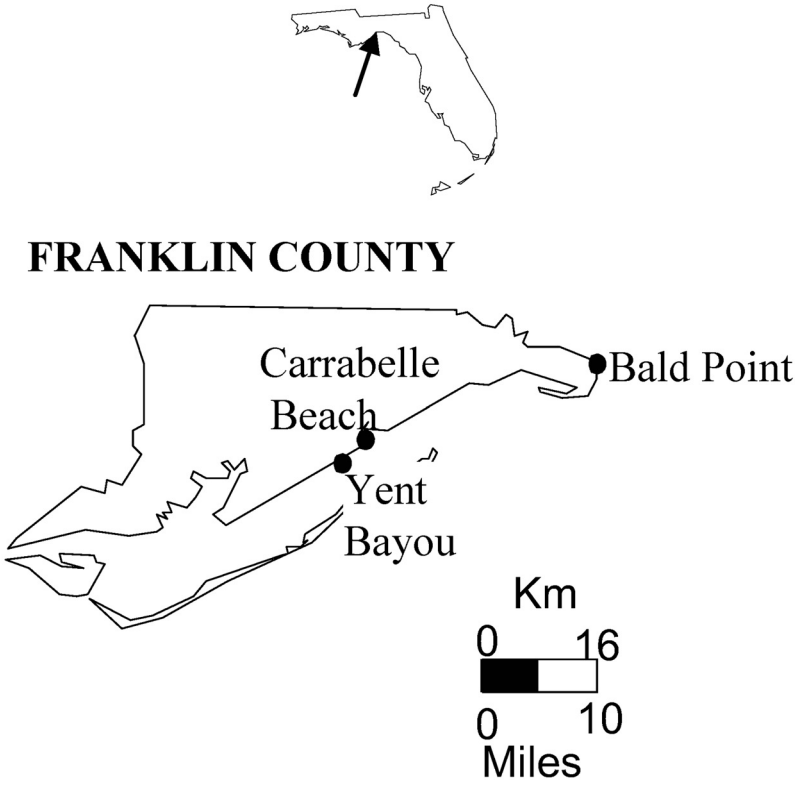

Figure 1. Shorebird survey sites in Franklin County, Florida, 1994-2005.

and became Bald Point State Park. Carrabelle Beach is a county park. Yent Bayou is private property, and in 1997 houses began to be developed in the area.

C*ount methods*.—I visited all sites every 3 weeks from 2 March 1994 through 28 February 2005. Visits occurred during daylight hours and lasted ≥30 min even if few birds were present. Generally, all three sites were visited on the same day. The count included any arriving birds and continued until numbers stabilized. Based on analysis of counts from Sprandel et al. (1997), visits were conducted when highest shorebird usage occurred: Carrabelle Beach and Yent Bayou at low tide and Bald Point between low and high tide. I identified birds to species and counted individuals (See Table 1 for English and scientific names). Western Sandpiper and Semipalmated Sandpiper were grouped together (Veit and Jonsson 1984) and all dowitchers were counted as dowitcher spp.

I plotted total shorebird occurrence by month, and summarized species occurrences by site and season (winter: December-February, spring: March-May, summer: June-August, and fall: September-November).

RESULTS

A total of 96,259 individuals of 23 different shorebird species were counted in 674 visits to the 3 shorebird sites. An average of 37 min was

Table 1. Average number of shorebirds, standard deviation, and number of visits by month at Bald Point, Carrabelle Beach, and Yent Bayou, Franklin County, Florida from 1994-2005.

Month/Site	Bald Point	Carrabelle Beach	Yent Bayou
January	94 ± 64 (23)	267 ± 97 (23)	176 ± 59 (23)
February	111 ± 81 (14)	282 ± 102 (15)	188 ± 68 (15)
March	134 ± 107 (23)	262 ± 114 (24)	246 ± 91 (23)
April	267 ± 215 (17)	234 ± 228 (17)	264 ± 152 (17)
May	127 ± 101 (21	142 ± 99 (21)	161 ± 149 (20)
June	37 ± 32 (17)	30 ± 26 (14)	17 ± 19 (14)
July	30 ± 13 (21)	72 ± 42 (20)	35 ± 31 (21)
August	35 ± 23 (15)	97 ± 46 (15)	80 ± 36 (14)
September	44 ± 25 (21)	120 ± 47 (20)	114 ± 48 (20)
October	56 ± 36 (24)	156 ± 85 (19)	157 ± 59 (19)
November	85 ± 67 (20)	200 ± 89 (20)	266 ± 59 (20)
December	73 ± 45 (16)	310 ± 150 (14)	177 ± 93 (14)

spent on each visit to a site, with a maximum of 142 min. All sites were least used in summer (Fig. 2), with Bald Point and Carrabelle Beach averaging 30 shorebirds in June and Yent Bayou only 17 (Table 1). Bald Point was most heavily used in spring migration, with an average of 267 shorebirds in April. Carrabelle Beach and Yent Bayou were most heavily used in winter, with Carrabelle averaging 310 in December, and Yent Bayou 266 in November.

Overall, Dunlins were the most common shorebird, accounting for 28% of the individuals, followed by Sanderlings (17%), Willets (14%), dowitcher spp. and Red Knots at 9%. Maximum counts for each species varied greatly from average seasonal counts at each site (Table 2). Dunlins had the highest average count for all sites during winter and were the most common species in spring at Carrabelle Beach and Yent Bayou. At Bald Point in spring, Sanderlings were most common. In summer, Willets were the most common species at all sites, probably reflecting the local breeding in nearby marshes (FWC 2003). During fall, Sanderlings were the most common species at Bald Point and Yent Bayou, whereas at Carrabelle Beach, the Red Knot was the most common species.

I saw Ospreys (*Pandion haliaetus*) on 116 visits but never observed them disturbing shorebirds. Other raptors were seen on 94 visits (14% of visits) and often caused either departure or flushing of shorebirds. Bald Eagles (*Haliaeetus leucocephalus*) were seen on 70 visits, but disturbed only those shorebirds directly below them. Peregrine Falcons (*Falco peregrinus*) or Merlins (*F. columbarius*) were seen on 16 visits, and flushed most of the shorebirds present. Bald Point in fall had the most raptors, and is a known raptor migration area (FWC, unpublished data).

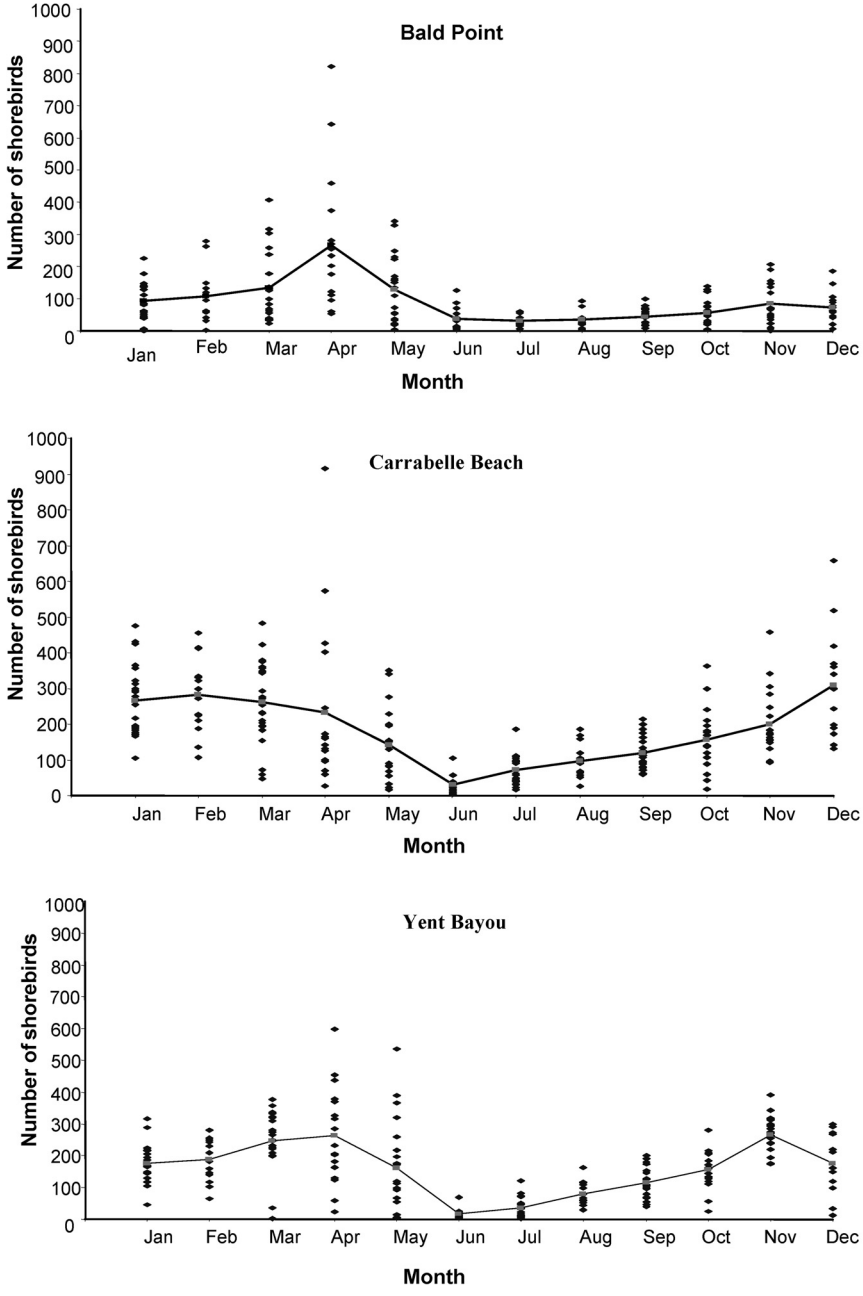

Figure 2. Number of shorebirds counted and 11-year mean by month at Bald Point, Carrabelle Beach, and Yent Bayou in Franklin County, Florida from 1994-2005.

Table 2. Highest and average seasonal shorebird counts at Bald Point, Carrabelle Beach, and Yent Bayou, Franklin County, Florida from 1994-2005. "—" indicates that the species was not seen in that season. Winter is December-February; Spring, March-May; Summer, June-August; and Fall, September-November.

Species	Site	High count	Date	Winter	Spring	Summer	Fall
Black-bellied Plover *Pluvialis squatarola*							
	Bald Point	20	2/18/1996[a]	4.4	4.8	1.7	4.4
	Carrabelle Beach	14	1/22/2000	4.7	4.1	2.0	3.7
	Yent Bayou	12	1/21/2001	4.6	4.1	2.0	4.6
Snowy Plover *Charadrius alexandrinus*							
	Bald Point	2	12/6/2003	0.0	—	—	0.0
	Carrabelle Beach	7	11/6/1994	0.6	0.1	0.1	0.5
	Yent Bayou	24	1/25/2003	7.4	0.8	—	2.7
Wilson's Plover *Charadrius wilsonia*							
	Bald Point	2	7/26/1997	0.0	—	0.1	—
	Carrabelle Beach	4	6/21/2003	0.0	0.3	0.5	0.0
	Yent Bayou	1	8/18/2001	—	—	0.0	—
Semipalmated Plover *Charadrius semipalmatus*							
	Bald Point	29	1/22/2000[b]	3.1	2.3	1.3	4.8
	Carrabelle Beach	33	3/5/2000	3.5	3.8	1.8	3.7
	Yent Bayou	34	11/27/1998	9.5	7.6	2.8	10.8
Piping Plover *Charadrius melodus*							
	Bald Point	5	12/12/2004[c]	0.6	0.0	0.1	0.2
	Carrabelle Beach	4	11/6/1994[c]	0.6	0.2	0.0	0.5
	Yent Bayou	14	1/11/1997	3.9	1.3	—	2.1
Killdeer *Charadrius vociferous*							
	Bald Point	12	11/27/1999	0.9	0.0	—	0.3
	Carrabelle Beach	114	12/10/1995	2.8	0.0	—	0.4
	Yent Bayou	25	12/10/1995	1.8	0.0	—	0.4
American Oystercatcher *Haematopus palliatus*							
	Bald Point	28	12/18/1999	2.3	3.2	5.7	1.0
	Carrabelle Beach	13	7/13/1994[d]	2.5	1.8	2.8	2.4
	Yent Bayou	1	7/18/1998[e]	0.0	—	0.0	—
Black-necked Stilt *Himantopus mexicanus*							
	Yent Bayou	1	5/21/1994	—	0.0	—	—
American Avocet *Recurvirostra americana*							
	Bald Point	6	5/3/1996	—	0.2	—	—
	Carrabelle Beach	2	12/9/2001	0.1	—	—	—
	Yent Bayou	1	11/24/2001	—	—	—	0.0
Greater Yellowlegs *Tringa melanoleuca*							
	Bald Point	4	3/29/1997	0.1	0.1	—	0.0

[a]20 also 3/29/2003.
[b]29 also 10/14/200.
[c]This number was also observed on other dates.
[d]13 also 10/4/2003.
[e]14 also 1/29/2000.

Table 2. (Continued) Highest and average seasonal shorebird counts at Bald Point, Carrabelle Beach, and Yent Bayou, Franklin County, Florida from 1994-2005. "—" indicates that the species was not seen in that season. Winter is December-February; Spring, March-May; Summer, June-August; and Fall, September-November.

Species	Site	High count	Date	Winter	Spring	Summer	Fall
	Carrabelle Beach	24	11/24/2002	2.8	1.4	0.1	1.3
	Yent Bayou	4	2/28/1998[c]	0.8	0.2	0.1	0.6
Lesser Yellowlegs *Tringa flavipes*							
	Bald Point	1	12/11/1994[c]	0.1	—	—	0.0
	Carrabelle Beach	63	2/19/2000	8.1	1.4	0.1	0.6
	Yent Bayou	3	11/27/1999[c]	0.2	0.1	0.1	0.3
Solitary Sandpiper *Tringa solitaria*							
	Bald Point	1	5/1/2004	—	0.0	—	—
	Carrabelle Beach	10	8/3/1996	—	—	0.2	0.0
	Yent Bayou	2	8/11/2003	—	—	0.1	0.1
Willet *Tringa semipalmata*							
	Bald Point	112	4/19/2003	6.4	16.8	8.8	8.8
	Carrabelle Beach	231	3/5/1994	40.0	25.4	19.3	39.8
	Yent Bayou	86	4/22/1995	10.7	13.4	18.2	29.3
Spotted Sandpiper *Actitis macularius*							
	Bald Point	1	8/13/1994[c]	—	—	0.1	—
	Carrabelle Beach	2	7/30/1994[c]	—	0.0	0.1	—
	Yent Bayou	2	8/27/1994	—	0.0	0.1	—
Whimbrel *Numenius phaeopus*							
	Carrabelle Beach	1	8/17/1996	—	—	0.0	—
Marbled Godwit *Limosa fedoa*							
	Bald Point	6	3/20/1999	0.0	0.4	0.3	0.0
	Carrabelle Beach	50	3/5/2000	10.1	5.3	5.1	4.0
	Yent Bayou	5	8/31/2003	0.1	0.1	0.2	0.2
Ruddy Turnstone *Arenaria interpres*							
	Bald Point	110	5/12/2002	7.3	16.4	4.2	4.3
	Carrabelle Beach	14	10/15/1995[e]	1.8	1.4	1.0	1.0
	Yent Bayou	20	4/2/1994	1.8	2.1	0.5	1.6
Red knot *Calidris canutus*							
	Bald Point	210	4/3/1999	0.2	9.8	4.0	0.3
	Carrabelle Beach	239	4/20/1997	22.0	29.2	8.1	21.8
	Yent Bayou	167	4/20/1997	19.0	22.4	0.2	8.7
Sanderling *Calidris alba*							
	Bald Point	372	4/19/2003	14.8	46.2	2.9	17.0
	Carrabelle Beach	106	12/6/2003	23.8	22.4	8.2	20.4
	Yent Bayou	179	3/10/1996	33.2	24.3	6.9	60.2

[a]20 also 3/29/2003.
[b]29 also 10/14/200.
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Table 2. (Continued) Highest and average seasonal shorebird counts at Bald Point, Carrabelle Beach, and Yent Bayou, Franklin County, Florida from 1994-2005. "—" indicates that the species was not seen in that season. Winter is December-February; Spring, March-May; Summer, June-August; and Fall, September-November.

Species	Site	High count	Date	Winter	Spring	Summer	Fall
Western Sandpiper *Calidris mauri*; Semipalmated Sandpiper *Calidris pusilla*							
	Bald Point	20	5/13/1995	0.4	2.3	0.4	0.4
	Carrabelle Beach	17	5/10/1997	1.4	2.3	1.0	0.9
	Yent Bayou	12	5/10/1997	0.6	1.5	0.6	1.1
Least Sandpiper *Calidris minutilla*							
	Bald Point	12	5/6/2000	0.3	0.6	0.1	0.4
	Carrabelle Beach	70	5/7/1994	0.5	1.9	0.2	0.2
	Yent Bayou	10	5/7/1994	0.2	0.3	0.2	0.1
Dunlin *Calidris alpina*							
	Bald Point	182	2/28/2003	43.6	29.5	0.1	14.8
	Carrabelle Beach	287	12/6/2003	91.0	59.7	0.2	20.7
	Yent Bayou	244	1/25/2004	80.3	92.5	0.3	42.5
Short-billed Dowitcher *Limnodromus griseus*; Long-billed Dowitcher *Limnodromus scolopaceus*							
	Bald Point	86	4/20/1997	0.0	16.2	1.5	0.2
	Carrabelle Beach	331	4/20/1997	17.0	37.6	14.9	17.0
	Yent Bayou	156	5/3/1996	0.7	26.1	6.7	8.5

[a]20 also 3/29/2003.
[b]29 also 10/14/200.
[c]This number was also observed on other dates.
[d]13 also 10/4/2003.
[e]14 also 1/29/2000.

I observed four banded birds. Three Piping Plovers banded in Saskatchewan in 2002 or 2003 were observed: at Carrabelle Beach on 25 January 2003, on 4 October 2003 at Carrabelle Beach and at Bald Point on 6 November 2003. On 16 November 2003 at Yent Bayou a Red Knot banded as a juvenile on 11 September 2001 at the mouth of the Altamaha River in Georgia was observed, and may reflect part of a Florida wintering population (Harrington et al. 1988).

DISCUSSION

Although the sites were surveyed by the same observer under similar tidal conditions within each season, counts for a species at the same site within a season varied greatly, and the average coefficient of variation (Snedecor and Cochran 1967) was 57% of the mean count. This high variability means that it would be difficult to detect multi-year population

trends (Cobb et al. 1996). The sites may not be strictly independent, and Gabbard et al. (2001) documented movements of 17 km of Willets in Franklin County, large enough to allow some movement between these sites.

Yent Bayou was a site important to the listed Piping Plover and Snowy Plover (FWC 2006) in both fall and winter, a reflection of the importance of the Gulf Coast to these wintering plovers (Sprandel et al. 2000). Piping Plovers seen in June or July could be north- or southbound migrants (Haig 1992). American Oystercatchers use of Bald Point in summer probably reflects the availability of mollusk reefs to oystercatchers breeding in the area (FWC, unpublished data). For other species, non-breeding birds observed in the summer may be nonmigratory, non-breeding juveniles. The high usage of Bald Point in spring by Sanderlings and Ruddy Turnstones, seemed dependent upon plentiful horseshoe crab (*Limulus polyphemus*) eggs that were observed on 20 spring visits (see also Rudloe 1980).

Few year-round studies have looked at shorebird usage at sites in Florida (the first being Longstreet 1934). Stolen (1999) surveyed a broad stretch of Atlantic beach and found the most common species to be the Sanderling (79%), followed by the Ruddy Turnstone; few Dunlins were observed. The lack of Dunlins on the Atlantic beach may reflect the species' preference for mud flats; there is high usage of Dunlins at nearby Merritt Island impoundments (Sprandel et al. 1997). Stolen (1999) reported highest shorebird usage in fall, a sharp contrast to my study in which there was a more prominent spring peak. For Sanderlings, my study showed both a peak in spring and fall, whereas Stolen (1999), had a more prominent peak in fall. This difference may reflect a different migration pattern between the Gulf and Atlantic Coast (Myers et al. 1990). Analysis of International Shorebird Survey data (Howe et al. 1989, Harrington 1999) provides a source for some regional comparison of timing of peak abundance. For the southeast shorebird region, for "oceanfront" and for "mud-marine" sites they report a peak in mid-March and decline in the summer as I found, but do not show wintering numbers.

Knowledge and conservation of migratory shorebirds is a high priority in Florida (Millsap et al. 1990) but we are a long way from the goal of statistically monitoring populations (Brown et al. 2001). With the lack of comprehensive studies of shorebird migration in Florida and the potential importance of Florida sites to transient shorebirds (Myers 1983), I recommend that others publish results of year-round studies (e.g., Below 1983) and contribute data to the International Shorebird Survey (Howe et al. 1989).

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