

Winter Distribution and Habitat Utilization of Piping Plovers in South Carolina

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The Piping Plover (*Charadrius melodus*), a migratory shorebird endemic to North America, has been protected under the Endangered Species Act since 1985 (USFWS 1985). This species breeds in three geographic regions: the Atlantic Coast from Maritime Canada to North Carolina (and recently in South Carolina, Murray and McDavit 1993); along rivers, alkali lakes and wetlands of the Northern Great Plains; and in northern Michigan (Haig and Plissner 1993). The Atlantic breeding population is believed to follow a narrow strip along the Atlantic Coast during spring and fall migrations (Dyer et al. 1987). In South Carolina, it is more common during the migrations (March-May and August-October) (Sprunt and Chamberlain 1970) and is rare in summer. Most Atlantic breeding birds winter on the South Atlantic and along the Gulf Coast of the United States and Mexico. In winter, most individuals are found on ocean beaches and sand or algae flats in protected bays from the Carolinas to Yucatan, with a few occurrences being reported in the Caribbean Islands (Haig and Plissner 1993).

Historical information suggests that the Atlantic population has been decreasing since 1955 or earlier (Haig and Oring 1985). This trend was attributed to habitat loss and degradation, disturbance by humans and domestic animals, increased predation and water management practices (Haig et al. 1988, Dyer et al. 1987).

Historical information about the status of the Piping Plover population on its wintering grounds is sparse. Haig and Oring (1985) conducted the first two winter surveys, one which covered the Texas coastline in 1983 and the other, the Gulf Coast beaches from Mexico to Florida in 1984. These surveys represented the first field assessments of Piping Plover winter populations. Only 25% of the total breeding population was represented, and a significant portion of the winter range, including the Atlantic Coast, was not surveyed. In 1987-88, a total of 221 Piping Plovers were observed on the Atlantic Coast (14% of the Atlantic breeding population) and 1,508 were found on the Gulf Coast (56% of Great Lakes/Great Plains breeding population) (Nicholls and Baldassare 1990a).

Most of the Piping Plovers' life cycle is associated with wintering habitat. Because only a small percent of the Atlantic nesting Population has been found wintering along the Atlantic coast emphasizes the need to identify major winter sites. Nicholls and Baldassare (1990a) concluded that additional surveys were especially needed in South Carolina and Louisiana. During Nicholls' survey of South Carolina (1987-88), she found 41 Piping Plovers at 8 of 22 sites. Due to heterogeneity of the South Carolina coastline and the many coastal islands that create an array of microhabitats, prospects of more Piping Plovers being located in the region were good.

Our objective was to identify wintering sites of Piping Plovers along the South Carolina coast during 1990-93. We defined habitat characteristics of sites, determined the status of important wintering sites, and censused wintering Piping Plovers in South Carolina. Additional information on habitat

type, site ownership, and numbers of wintering Piping Plovers found at each site is documented/presented.

CENSUS METHODS

Fifteen volunteers were assembled for assistance in censusing. Sites were surveyed initially based on records of previous Piping Plover sightings made by active birders, recent Christmas Bird Counts, and from preliminary surveys conducted in November-December of each year. Each census was conducted between 12–20 January 1990–93.

Counts were made near high tide when birds were concentrated on roosts. Most sites were accessed initially by boat and then surveyed by foot. Binoculars and telescopes were used to identify birds. Observers recorded the number and location of each Piping Plover seen. Surveyed areas that did not contain Piping Plovers were also noted. In January 1991, these surveys were coordinated with the International Piping Plover winter census, which included the Gulf Coast of the U.S. and Mexico, the southern Atlantic coast of the U.S., the coast of Cuba and several other Caribbean countries (Haig and Plissner 1993).

RESULTS AND DISCUSSION

COUNTS

A cumulative total of: 11 Piping Plovers was located at 6 sites in 1990, 51 at 8 sites in 1991, 51 at 6 sites in 1992, and 53 at 5 sites in 1993 (Table 1). Eleven of 35 sites surveyed were used by Piping Plovers at least once during the four years. Only Huntington Beach and North Island were used all four years. Except for 1990 (N=11), Piping Plover numbers were remarkably stable each January. The low number of wintering birds in 1990 may have been influenced by Hurricane Hugo, a category 4 hurricane that came ashore on the north central South Carolina coast in September 1989. Beach profiles surveyed before and after the hurricane showed that elevations had decreased by 1–1.5 m in some areas (Marsh and Wilkinson 1991). This may have affected Piping Plover food availability in those areas. In addition to potential effects caused by the hurricane, the temperature during December 1989 was below normal on 21 days and the minimum temperature was $\leq 0^{\circ}\text{C}$ for 14 consecutive days. Further, coastal beaches were covered by ≥ 30 cm snow in late December 1989 (Marsh and Wilkinson 1991).

In January 1991, a winter census was conducted at all known U.S. Piping Plover wintering sites and some other Gulf sites. This cooperative census resulted in the highest number (N=3451) of wintering Piping Plovers ever recorded (Haig and Plissner 1993). The majority of birds (55%) were found in Texas and Louisiana (22%) (Haig and Plissner 1993). In South Carolina, all potential Piping Plover wintering habitat was censused. This was the first thorough census of this species for the state. The number of Piping Plovers found probably represents the majority of wintering Piping Plovers in the state during January of those years.

Although the 1991 international census resulted in discovery of more wintering birds than had been previously reported, a large portion of the nesting population was not found in the winter census (Haig and Plissner 1993). The

Table 1. Results of the South Carolina Piping Plover Winter Survey:
Jan. 1990–1993.

Site	County	1990	1991	1992	1993	Previous Count	Sub- strate	Owner- ship
Waties Isl.	Horry		2	4	1			St.
Huntington Beach	Georgetown	3	6	8	6	12/1987 (1)	A/S/M	St.
Litchfield Beach	Georgetown							
North Isl.-N end	Georgetown	1	7	6	6	12/1987 (1)	A/S/M	St.
Sand Isl.	Georgetown							
South Isl.	Georgetown			1				St.
No. Santee Inlet	Georgetown							
Cedar Isl.	Georgetown							
Murphy Isl.	Charleston							
Cape Isl.	Charleston		3	7	8	3.1987 (1)	S/M	Fed.
Lighthouse Isl.	Charleston	1						Fed.
Raccoon Key	Charleston							
Bulls Bay	Charleston							
Bull Isl.	Charleston							
Prices Inlet	Charleston							
Capers Inlet	Charleston							
Deweese Inlet	Charleston							
Sullivan's Isl.	Charleston	1					S	Priv.
Bird Key Stono	Charleston							
Kiawah Isl.	Charleston							
Capt'n Sam's Inlet	Charleston							
Deveaux Bank	Charleston		20	25	26		A/S/M	St.
Botany Bay Isl.	Charleston							
Edingsville Bch	Charleston							
Otter Isl. Inlet	Colleton							
Harbor Isl.	Beaufort	3	5		6		S	
Hunting Isl.	Beaufort					8/1987 (1)	S	St.
Fripp Inl.	Beaufort							
Fripp Isl.	Beaufort							
Skull Inlet	Beaufort							
Pritchards Inl.	Beaufort							
Little Caper's Isl.	Beaufort		2			3/1987 (1)	S	Priv.
Morse Creek	Beaufort							
Joyner Bank	Beaufort							
Hilton Head Isl.	Beaufort	2	6			20/1984 (2)	S	Priv.
Annual Totals		11	51	51	53	N/A		

(1) = Nicholls 1989 (2) = Christmas Bird Count 1984
A/S/M = Algae/Sand/Mud, S = Sand, S/M = Sand/Mud

largest discrepancy between nesting and wintering birds occurred in the Atlantic population. Only 11% of the Atlantic nesting population was accounted for in the 1991 winter census of the U.S. South Atlantic Coast and

the Caribbean (Haig and Plissner 1993). Additional surveys along the Atlantic coast are unlikely to resolve this large discrepancy. Genetic studies may reveal that a large portion of the Atlantic coast breeding population winters along the Gulf of Mexico (Sue Haig pers. comm.).

SITES

Deveaux Bank, located near the mouth of the North Edisto River, was the most important Piping Plover wintering site in South Carolina during 1991–1993. Forty-nine percent of the Piping Plovers surveyed in 1992 and 1993 were located there. Deveaux Bank washed away in 1979 following Hurricane David. The island gradually reformed approximately 1.5 km southeast of the 1979 site. In the mid 1980's, a large (≥ 25 hectare) sand/algae/mud tidal lagoon formed in association with the island that appeared to be suitable Piping Plover foraging habitat. Piping Plovers were not found wintering there until 1991 but, this may be due to inadequate surveys.

During winter distribution surveys on the Atlantic Coast (1986–1987), important habitat features affecting the presence of Piping Plovers were the proximity of large inlets associated with sand flats, sandy mud flats, and habitat heterogeneity. Also, Piping Plovers were most often found associated with other species of shorebirds or with other Piping Plovers (Nicholls and Baldassarre 1990b).

All eleven wintering sites found in South Carolina during our surveys, were adjacent to open, sandy beaches near inlets associated with shallow tidal lagoons. Four sites which had the largest shallow lagoons; Huntington Beach, North Island, Cape Island, and Deveaux Bank, had 71–90% of Piping Plovers located during 1991–1993. Substrates associated with these wintering sites included sand, algae/sand/mud, and sand/mud (Table 1). Huntington Beach and North Island were the most consistent wintering sites, while Hilton Head has shown the greatest decline, with no birds present in 1992 and 1993. Many areas where Piping Plovers were found are isolated or on state or federally protected land, which suggest that the critical factors presently affecting wintering Piping Plover distribution in South Carolina may not be related to human use. Huntington Beach, a site consistently used by wintering Piping Plovers, has high human use. This suggests that some human presence may not prevent use of a site by wintering birds.

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LITERATURE CITED

- Dyer, R.W., A. Hecht, C. Raithel, K. Terrwilliger, and S. Melvin. 1987. Atlantic Coast Piping Plover recovery plan. U.S. Fish & Wildlife Service, Newton Corner, MA. 77 pp.
- Haig, S.M. 1992. Piping Plover. in Poole, A., P. Stettenheim II, and F. Gill, eds. *The Birds of North America*. No. 2. The Academy of Natural Sciences, Philadelphia; American Ornithologists' Union, Washington, D.C.
- Haig, S.M. and L.W. Oring. 1985. Distribution and status of the Piping Plover throughout the annual cycle. *J. Field Ornithol.* 56:334-345.
- Haig, S.M. and W. Harrison, R. Lock, L Pfannmuller, E. Pike, M. Ryan, and J. Sidle. 1988. Recovery plan for Piping Plovers of the Great Lakes and Northern Great Plains. U.S. Fish and Wildlife Service, Twin Cities, MN 160 pp.
- Haig, S.M. and J.H. Plissner. 1993. Distribution and abundance of Piping Plovers: results and implications of the 1991 International census. *Condor* 95:145-156.
- Marsh, C.P. and P.M. Wilkinson. 1991. The impact of Hurricane Hugo on coastal bird populations. *J. Coastal Res.* SI 8:327-334.
- Murray, R. and M.W. McDavit. 1993. First nesting records of Piping Plover in South Carolina. *Chat* 57:10-11.
- Nicholls, J.L. 1989. Distribution and other ecological aspects of Piping Plovers (*Charadrius melodus*) wintering along the Atlantic and Gulf Coasts. M.S. thesis, auburn Univ., Auburn, Alabama
- Nicholls, J.L. and G.A. Baldasarre. 1990a. Winter distribution of Piping Plovers along the Gulf and Atlantic Coast of the U.S. *Wilson Bull.* 102:400-412.
- Nicholls, J.L. and G.A. Baldasarre. 1990b. Habitat selection and interspecific associations of Piping Plovers wintering in the United States. *Wilson Bull.* 102:581-590.
- Sprunt, A., Jr. and E.B. Chamberlain. 1970. *South Carolina Birdlife*. Univ. S.C. Press. Columbia. 655 pp.
- U.S. Fish and Wildlife Service. 1985. Determination of endangered and threatened status for the Piping Plover. *federal Register* 50(238):50.720-34.
- South Carolina Wildlife & Marine Resources Department, Samworth WMA, Star Rt. 1, Box 226, Georgetown, SC 29440.*

