

**PIPING PLOVER (*CHARADRIUS
MELODUS*) RESEARCH ON THE GULF
COAST OF ALABAMA**

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INTRODUCTION

The Piping Plover (*Charadrius melodus*) is a small shorebird found only in North America, breeding locally in suitable habitat throughout its range. The two major breeding populations on the continent occur along the east coast from Virginia to Newfoundland and in the prairies of Nebraska, the Dakotas, and Minnesota northward into the prairie provinces of Canada; a very small population occurs locally along the shores of the Great Lakes. The major winter areas are along the Atlantic Coast from Virginia southward and along the Gulf Coast (see Haig and Oring 1985).

Piping Plovers resemble a small Killdeer (*Charadrius vociferus*), with both sexes similar in size and appearance. Adults average about 55 g in weight and have an average wing length of 117 mm. The back is pale gray-brown while the forehead, cheeks, throat, and underparts are white (Johnsgard 1981).

Adult males in breeding plumage have a dark bar across the forecrown and black shoulder patches that often extend across the breast. The bill is yellow-orange with a black tip and the legs are the same orange color as the bill. In winter, Piping Plovers lack the dark forecrown, the breastband is reduced to lateral gray patches, and the bill is all black.

Unregulated hunting during the Market Hunting Era brought this species to the verge of extinction by the early 1900's, but the population eventually recovered under protection of the Migratory Bird Treaty Act of 1918. However, Piping Plovers began another serious decline in the 1940's, this time because extensive development of beachfront areas destroyed or disturbed breeding and wintering habitats. Indeed, recent surveys indicate fewer than 2000 breeding pairs remain in the United States and Canada (see Sidle 1984). Accordingly, in January 1986 the U.S. Fish and Wildlife Service designated the Piping Plover as endangered along the Great Lakes and threatened throughout its remaining

range.

Despite this precarious status, however, there are few detailed studies of Piping Plovers and most research addresses breeding ecology (Wilcox 1959, Cairns 1982, Haig and Oring 1988). Studies during winter are few, yet Piping Plovers may spend 9 months of the year on wintering sites. This lack of winter data is significant because substantial annual mortality in migrating shorebirds occurs on sites away from their breeding grounds. Thus, knowledge of Piping Plover ecology during winter is essential before effective plans to increase Piping Plover populations can be formulated and then implemented.

Such data can be collected along the barrier beaches of coastal Alabama because this area is among the important wintering sites for Piping Plovers in North America. For example, Christmas Bird Counts indicate that coastal Alabama has always supported a winter population of Piping Plovers; winter surveys as recently as 1985 have tallied over 100 individuals.

Winter studies of Piping Plovers in Alabama were initiated during the fall/winter of 1984-85 and were completed in the winter of 1987. The objectives of these studies were to determine: (1) activity patterns of Piping Plovers during winter; (2) habitat use patterns; and (3) the return rate of wintering Piping Plovers to coastal Alabama.

STUDY AREA

The 3 major areas used by Piping Plovers in coastal Alabama are: (1) a 3-km-long beach and mudflat area located on the north side of Dauphin Island and known locally as St. Stevens Point; (2) the west end of Little Dauphin Island; and (3) Sand Island (Fig. 2). The north side of the west end of Dauphin Island was a key feeding site for Piping Plovers prior to September 1985 when Hurricane Elena destroyed this area. However, this site should recover in future years and thus should still be considered a key area for Piping Plovers in coastal Alabama.

METHODS

Activity patterns of Piping Plovers were determined from September through April 1984-85 and October through April 1985-86 by observing individual birds for 5-15 minutes each and recording their behavior at 15-second intervals (see Johnson 1987). Piping Plovers also were banded and color-marked to provide information on local movements and fidelity to the area in subsequent winters.

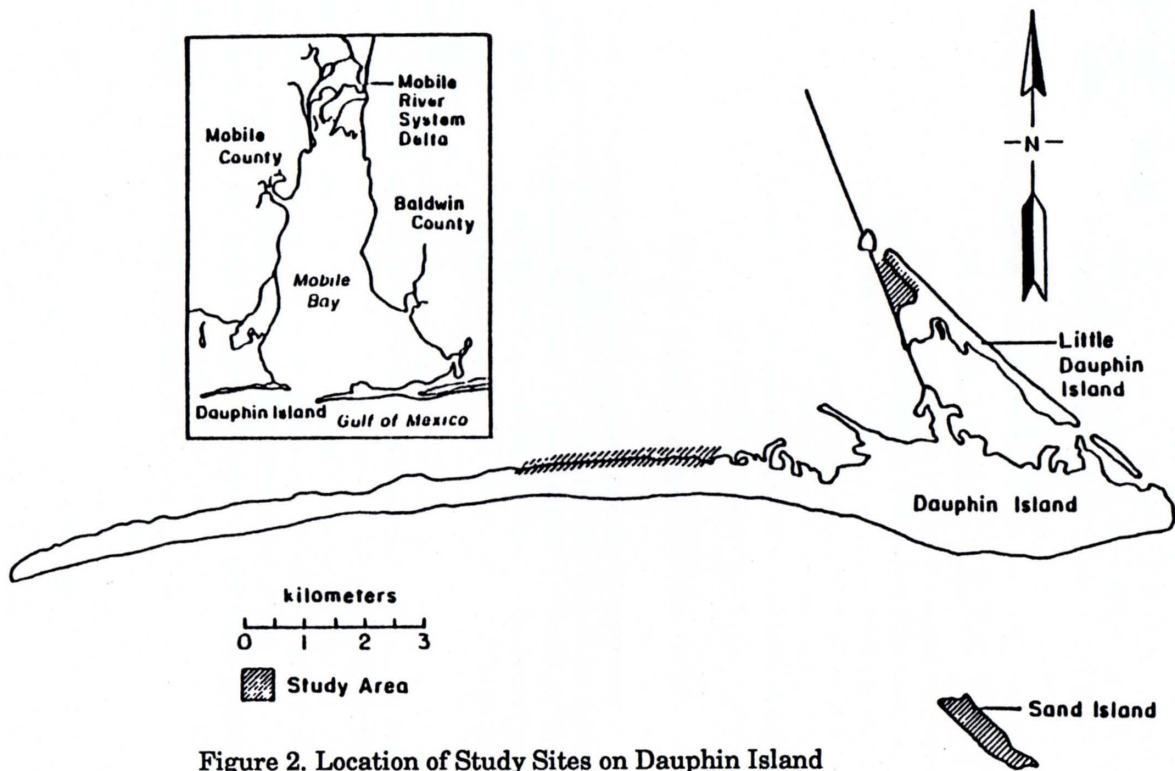


Figure 2. Location of Study Sites on Dauphin Island and Adjacent Areas in Coastal Alabama

In January 1986, a total of 14 Piping Plovers was captures and fitted with miniature (2.5 g) back-mounted radio transmitters. These birds were then tracked daily from 28 January to 1 March to determine patterns of habitat use among the study areas (see Zivojnovich 1987).

RESULTS AND DISCUSSION

Activity patterns of Piping Plovers on the Alabama coast were determined by observing individual birds for a total of 192 hours. Feeding was the dominant behavior, averaging 76% of activity throughout winter; feeding activity was highest (90%) during December. Resting was the other major winter activity.

One reason why Piping Plovers may spend such a high amount of time feeding is that they are "sight predators." This means that they pick prey items visible on the surface of mudflats rather than probe below the surface as do many other shorebirds. Thus, their feeding opportunities are restricted to daylight hours, which causes a high amount of feeding activity during that time as the plovers seek to obtain necessary energy to survive winter. It thus becomes important to protect birds from disturbance during the daylight hours because feeding sites appear to be limited in coastal Alabama, as was indicated by patterns of habitat use.

The habitat use data were obtained from 594 radio locations of 14 Piping Plovers that were monitored from January 28 to March 1, 1987. Of these locations, 81% were from Little Dauphin Island, 10% were from Dauphin Island, and 3% were from Sand Island.

These locations appeared to be primarily a response to availability of foraging sites. For example, from 28 January through 1 February, good foraging conditions (mudflats) occurred on Dauphin and Little Dauphin Islands and 12 of 14 radio-marked plovers were located at these sites. Conversely, as foraging habitat conditions deteriorated due to rising tides, only 2 plovers were located on these sites by 4 February. Habitat conditions then improved from 7 to 12 February and 13 of 14 plovers returned to study sites on Dauphin and Little Dauphin Islands. This pattern of use indicates that Piping Plovers concentrate at the few sites where feeding conditions can become optimal, but otherwise disperse within Mobile Bay.

Overall, the preponderance of radio-locations on Little Dauphin Island (81%) would indicate that this area is the primary feeding site of Piping Plovers using Mobile Bay at this time. Indeed, during optimal mudflat conditions on Little Dauphin Island, as many as 50 Piping Plovers were observed using the area.

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It is important to protect prime feeding sites because Piping Plovers apparently return to the same wintering area year after year. For example, of 19 Piping Plovers color-banded during the 1984-85 individuals were still present in early April. However, resightings of color-marked Piping Plovers indicated that most individuals did not leave the study areas from late November to late January, thus monitoring of winter populations may best be accomplished by surveying populations during this time period.

Studies of Piping Plovers are continuing on both breeding and wintering sites in order to obtain the data that will be necessary to implement practices designed to increase populations. The studies in coastal Alabama not only provide information for use in the state, but can be applied in other Piping Plover wintering areas. Of obvious importance will be to protect key feeding areas (e.g., Little Dauphin Island) not only from habitat destruction but from human disturbance as well. If this can be done in Alabama, it will not only insure that habitat conditions exist for wintering Piping Plovers but will also provide suitable habitats for a variety of other coastal birds (Baldassarre 1986).

ACKNOWLEDGEMENTS

These studies were supported by the Dauphin Island Sea Lab and the Nongame Wildlife Program of the Alabama Division of Game and Fish. Funding was also provided by the Mississippi-Alabama Sea Grant Fellowship Program and the Walter F. Coxe Research Fund of the Birmingham Chapter of the National Audubon Society. This is publication No. 15-881755P of the Alabama Agricultural Experiment Station.

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