

## Incidental Impact to Nesting Wilson's Plovers During The Sea Turtle Nest Monitoring Season

MARC EPSTEIN

*U.S. Department of the Interior Fish and Wildlife Service  
Merritt Island National Wildlife Refuge  
P.O. Box 6504, Titusville, Florida 32782*

The coastal beach and dune system is critical habitat for many nesting species. In Florida, this system is exceedingly vulnerable to shoreline disturbance and modification, and is important to many species including threatened or endangered sea turtles, Snowy and Piping Plover (*Charadrius melodus* and *C. a. tenuirostris*, respectively), endemic species (e.g., Florida Beach Mice, *Peromyscus polionotus* sp.), and colonial nesting shorebirds (Charadriiformes) (Johnson and Barbour 1990, Millsap et al. 1990). Wilson's Plover (*C. wilsonia*) may nest with or near other species of shorebirds using this system, but commonly nest singly or in loose associations with nests spread a good distance from each other (Sprandel 1996). Nesting commonly occurs from April through June (Cruickshank 1980) during a period when human use of the beach begins to increase. Some nesting also occurs in March and July (Stevenson and Anderson 1994). Because nesting may not be obvious, the potential for incidental impact is high.

The Wilson's Plover is classified as a Federally listed species of special management concern (Office of Migratory Bird Management 1995). The species is dependent on habitat that is vulnerable to human development, recreation, contaminants and other forms of disturbance or alteration. The Wilson's Plover has received special attention because of its vulnerability to habitat alteration and destruction (Millsap et al. 1990, Cox et al. 1994, Sprandel 1996) and included as a breeding and wintering priority species (North American Wetlands Conservation Council 1999).

Wilson's Plovers were observed nesting on Merritt Island National Wildlife Refuge (MINWR) beaches in 1996. Plovers and sea turtles use the same beach habitat for nesting at MINWR. During spring and summer of 1997 and 1998, we located and marked plover nests to avoid impacts associated with the sea turtle nest monitoring program. Here, I describe the characteristics of Wilson's Plover nesting at Merritt Island NWR. The results illustrate how conservation activities of one species can have a negative impact on another species, and augments the need for awareness and identification of plover nests and chicks on beaches by individuals monitoring nesting sea turtles.

I conducted this study in Brevard County on MINWR, which is an overlay of NASA's Kennedy Space Center (56,667 ha). The undeveloped 11-km barrier beach within the MINWR extends from the south boundary of Canaveral National Seashore (CNS) to the north boundary of Cape Canaveral Air Station (CCAS). The beach has a generally stable, low energy profile; however, wave energy varies between the north or south ends. The higher energy section has erosion and the marine scrap extends to the dune face and/or into transitional scrub. The lower energy sites have typical beach and dune fore-shore development with a low erosion upper beach. The upper beach is largely unvegetated, except for isolated beach plants (e.g., sea rocket, *Cakile* spp.). The dunes are vegetated primarily with sea oats (*Uniola paniculata*), morning glories (*Ipomoea* sp.), and typical dune grasses (Johnson and Barbour 1990).

In this study, survey habitats included the intertidal zone (area between low and high tide line below the drift line); the upper beach (the area from the drift line to the

foot of the primary/foredune); the foredune face (from the dune foot to the dune crest); and the foredune crest (top of dune). The beach was divided into 11, 1-km sections as established by the sea turtle nest monitoring program.

From April through August 1997 and April through July 1998, one survey per week was performed by three individuals to locate and mark Wilson's Plover nests along the beach. We marked the nests to make them more visible to individuals monitoring nesting sea turtles and to help those individuals recognize and avoid plover nest locations. We rode ATVs down the intertidal zone at a moderate speed (19-24 kph), focusing on a distance about 46 m or more ahead to see plovers standing at nest sites. When a plover was observed on the upper beach or foredune, a search of the area was conducted. Plovers with nests consistently performed nest protection behavior (Bergstrom 1988), such as nest site diversion, broken wing display, agitated calling, or a flyby (either overhead or within 15-20 m) with agitated calls. If plovers displayed this behavior, an intensive search was performed to locate the nest. Adult plovers became more agitated as our proximity to the nest became closer. This was valuable in locating nest sites. If a nest was found, it was marked by driving two or three small wooden markers into the sand about 9-12 m away from the nest. If a nest or chicks were not found, a record of the adult behavior, location, and date was made. Time did not permit recording chronological development of individual nests. Data recorded were: date, nest location, clutch size, number of chicks, adult behavior, habitat, observer, and comments. I observed nest subsequent to marking to insure the marking did not induce nest abandonment or predation. Location and general observations of fledged chicks using beach habitats were also recorded.

During April through August 1997, we located and marked nine Wilson's Plover nests along the 11-km beach. We found all nest within the southern, contiguous 3-km section of low energy beach, which had good upper beach and dune development. No nests were located in June, July, or August. I observed eggs and neonatal chicks in six and three of the nests, respectively. Clutch size ranged between one and three eggs. I did not see any nest with more than two neonatal chicks. Nesting habitats varied: four nests were on the upper beach, three were on the vegetated dune face, and two were on the vegetated primary dune crests. Among the four nests on the high beach, two were in bare sand/shell, and two were in close proximity to vegetation. All of the nests on the dune face and crest were associated with vegetation. I did not locate any nest in 1998; however, I observed one chick with a pair of adult plovers, and three pairs were observed using the beach in May. No additional data will be presented for the 1998 season.

Bird behavior (broken wing display, agitated calling, and/or other nest protection behavior) consistently confirmed sites where nests were located. However, plovers performed this behavior at eight additional sites where nests and/or chicks were not located. Five of these sites were located in June, July, or August when no new nests were confirmed. We did not observe nest abandonment or depredation from marking activities. During a May storm, three of seven marked nests were destroyed by a storm surge (two on the upper beach and one at the foot of the dune face).

From May through August, we observed seven chicks in various beach habitats, either alone or with an adult plover. Chicks used the intertidal zone for feeding and also were seen on the upper beach and dune face. In June, one chick was killed from impact with an ATV operated by an individual conducting a sea turtle survey. This chick was in the low intertidal zone when killed. Ironically, we had asked the sea turtle monitoring team to use the intertidal zone to avoid impacting plover nests on the beach. We also observed ATV tire tracks in close proximity (1-2 m) to plover nests on the upper beach prior to locating and marking. The low mortality rate observed may have been the result of our marking of known plover nest. We did not observe any sea turtle crawl disturb a nest during this study; however, some fresh crawls were just a few meters away from Wilson's Plover nests on the upper beach and dune face.

Brevard County beaches, especially the Canaveral-Merritt Island conservation complex, are listed as some of Florida's best preserves (Johnson and Barbour 1990). Wilson's Plover historically nested on Brevard County beaches but populations are thought to be declining (Cruikshank 1980). In addition to the beach-dune system, Wilson's Plovers also nest in open, sandy high marsh sites (D. Breininger pers. comm.) and on sandy islands. I observed plovers nesting in high marshes along the emergent-shrub transitional ecotone of the Matanzas River in St. Johns County; however, they do not commonly nest in thick vegetation (Tomkins 1944).

During this study, plovers were found nesting in all habitats of the beach-dune systems, except the intertidal zone. The secondary dune field is not well represented along the NWR beach and was not inspected for nesting plovers during this project. Largely, there is a quick transition from the primary dune to a denser, transitional scrub habitat.

Sandifer et al. (1980) and Tomkins (1944) reported nests on beaches and in the dune along edges of foredunes. Five of nine nests during this study were associated with dune habitat and two were located on the crest of the primary dune. Birds nesting on the upper beach habitat were more susceptible to disturbance from storm surge and other activities occurring in this habitat. Personnel monitoring sea turtle nesting activity at CNS and CCAS were notified after confirming plover nesting on the NWR. Subsequently, CCAS confirmed 2 Wilson's Plover nests on their beach in 1997 (K. Herpich pers. comm.). There may be seasonal variation in the number of plovers breeding on these beaches as indicated by the difference between our observations in 1997 and 1998 at MINWR, although the data are limited. Interestingly, a plover nest must survive the crawling activity of nesting sea turtles, about 53% of which occurs by July. Thus, it may be advantageous for plovers to nest early before the peak nesting by sea turtles.

During spring and summer, the Florida Department of Environmental Protection coordinated a statewide sea turtle nest monitoring program. Individuals from a variety of agencies and organizations participate by marking nests and collecting data on nesting and production. A common procedure is to use an ATV or other vehicle to survey the beaches and perform the monitoring. Participants are usually conservation-minded and will minimize impacts that might occur from their activity, but Wilson's Plovers are hard to detect and thus, susceptible to disturbance. The cryptic chicks often lay flat and motionless when approached, which makes them susceptible to impact before they are detected.

Our data suggest that additional awareness of plover nesting characteristics is prudent. Impact of marked and unmarked nests was not compared; however, it is felt that marking nests assisted in avoiding potential impacts, it increased our awareness of interspecific habitat use, and added to an insubstantial data base on Wilson's Plover in Florida. To avoid incidental impacts to nesting plovers, agencies or individuals participating in sea turtle programs or similar beach habitat monitoring programs should be aware of plover nesting and fledgling habitat use. It is recommended that plover nest surveys be conducted to determine if nesting is present. If nesting is occurring, a system of locating and monitoring nest sites should be established. Additional data on simple presence or absence of Wilson's Plovers on beaches would augment our knowledge of the species distribution in Florida substantially. Sensible use of ATVs is encouraged. Operators should be alert and aware of possible nests and fledglings and adjust ATV speed according to the site and circumstances. Nests and fledglings may occur on the upper beach and dunes. Fledglings also use the intertidal area, perhaps for feeding. ATV speed should not exceed the ability to recognize nests and fledglings and avoid impacts ( $\leq 10$ - $12$  mph). Common sense should play an important role in ATV operation.

For areas open to the public, additional efforts may be necessary to protect Wilson's Plovers from human disturbances. Educational programs to increase awareness of critical habitats may enhance the public's understanding and appreciation of the value and fragility of Florida's coastal resources.

ACKNOWLEDGMENTS.—Special thanks to the turtle monitoring staff at Merritt Island NWR for assisting in this project and for their appreciation of our coastal resources. M. Legare, D. Myers, S. Adams, and W. Lindsey assisted with data collection and nest location. E. Stolen, B. Bolt, J. Collazo, G. Sprandel, and J. Gore provided comments to an earlier draft. I thank C. Kelly and two anonymous reviews for helpful comments to the manuscript.

## LITERATURE CITED

- BERGSTROM, P. W. 1988. Breeding displays and vocalizations of Wilson's Plovers. *Wilson Bulletin* 100(1):36-49.
- COX, J., R. KAUTZ, M. McLAUGHLIN, AND T. GILBERT. 1994. Closing the gaps in Florida's wildlife habitat conservation system. Office of Environmental Services, Florida Game and Fresh Water Fish Commission, Tallahassee.
- CRUICKSHANK, A. D. 1980. The birds of Brevard County. Helen Cruickshank, Ed., Appenda Robert Barber. Florida Press, Orlando.
- JOHNSON, A. F. AND M. B. BARBOUR. 1990. Dunes and maritime forest. Pages 429-480 *in* Ecosystems of Florida (Myers, R. L. and J. Ewel, Eds.). University of Central Florida Press, Orlando.
- MILLSAP, B. A., J. A. GORE, D. E. RUNDE, AND S. I. CERULEAN. 1990. Setting priorities for the conservation of fish and wildlife species in Florida. *Wildlife Monographs* 111.
- NORTH AMERICAN WETLANDS CONSERVATION COUNCIL. 1999. United States standard grant application instructions. North American Wetlands Conservation Act. US Fish and Wildlife Service, Arlington.
- OFFICE OF MIGRATORY BIRD MANAGEMENT. 1995. Migratory nongame birds of management concern in the United States: the 1995 list. Office of Migratory Bird Management, U.S. Fish and Wildlife Service, Washington, D.C.
- SANDIFER, P. A., AND J. V. MIGLARESE. 1980. D. R. Calder, et al. (Eds.). Ecological characterization of the Sea Island coastal region of South Carolina and Georgia. Vol. III: Biological Features of the characterization area. US Fish and Wildlife Service, OBS, Washington, D.C. FWS/OBS-79/42.
- SPRANDEL, G. L. 1996. Wilson's Plover. Pages 497-506 *in* Rare and endangered biota of Florida (Rogers, J. A., Jr., H. W. Kale, and H. T. Smith, Eds.), Vol. V: Birds. University Press of Florida, Gainesville.
- STEVENSON, H. M. AND B. H. ANDERSON. 1994. The birdlife of Florida. University Press of Florida, Gainesville.
- TOMKINS, I. R. 1944. Wilson's Plover in its summer home. *Auk* 61:259-269.