Ground survey techniques for shorebirds in seagrass and mudflats

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None of the field methods for censusing wintering shorebirds developed prior to a statewide survey proved effective on the broad intertidal seagrass beds and mudflats that occur in the Florida panhandle. In an attempt to record more accurate counts, two different approach techniques were tried: "Mudders", a shoe attachment similar in principle to a snowshoe, and a "Poke Boat", a flat-bottomed kayak. We found that the best method to access a shorebird site depends on water level and substrate consistency. The "Mudders" and "Poke Boat" can be used at sites where there is at least 45 cm of mud or at least 15 cm of water respectively. However, in Florida Bay these conditions did not exist and the best method of getting accurate counts was found to be spending the time (at least 2 hours) to complete as thorough a count as possible, census under calm win conditions and be willing to return for multiple counts under different conditions within a few days.

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INTRODUCTION

Field methods for censusing wintering shorebirds have been developed by Hicklin (1987), Howe and Collazo (1989), Kasprzyk and Harrington (1989), Marsh and Wilkinson (1991), and in the International Shorebird Survey (ISS) instructions (Manomet Bird Observatory unpubl., 1996). However, on broad intertidal seagrass beds or mud flats that occur in the Panhandle of northern Florida, United States and in Florida Bay, at the southern tip of Florida (Gore 1992) none of those techniques proved effective during a statewide survey initiated by the Florida Game and Fresh Water Fish Commission (FGFWFC) (Sprandel *et al.* 1996). Extensive mud flats prevent both foot and power boat access near enough to allow accurate identification and censusing, and propeller-driven watercraft, such as air boats or the Go-Devil (Go-Devil Manufacturers of Louisiana, Inc., Bainbridge, Ga., 31717, U.S.A.), create too much disturbance to feeding shorebirds to allow effective censusing, and would cause propeller damage to seagrass beds (Clark 1995, Sargent *et al.* 1995). Identification of smaller shorebirds would also be difficult from an airplane. Further complicating census work, birds move around in varying patterns over these flats depending upon wind, tide, or disturbance.

METHODS AND STUDY AREA

During the winter of 1993-94, sites were visited [3] 4 times on the ground and counts of individual shorebirds by species, estimated distance to birds, behaviour, and disturbances were recorded. Sites were homogenous distinct areas such as tips of peninsulas, sandbars, isolated mudflats, or shore usually limited to 1 km, and complete counts were made of the site. If birds could not be identified with certainty with a 20-power spotting

scope, they were classified as unidentified; Western Sandpipers *Calidris mauri* or Least Sandpipers *C. minutilla* that could not be identified to species were grouped as "peeps." Semipalmated Sandpipers *C. pusilla* were not identified, partly due to their close resemblance to Western Sandpipers, and we assumed that they wintered south of Florida (Phillips 1975). Observers were instructed to spend ³ 30 minutes per visit, even if few birds were present.

During the winter of 1993-94 access to sites was either by foot or by power boat. When surveying offshore or island sites with a power boat, a landing area was searched for that would not disturb the birds. If landing was impossible, surveying from the boat was attempted and a second anchor was often used. If the birds were on oyster bars, surrounded by deep enough water (> 20 cm), the engine was turned off and the boat allowed to drift alongside.

In an attempt to record more accurate counts, we tried 2 different approach techniques in the winter of 1995-96. The first technique involved the use of "Mudders" (Amrack Inc., Merrimack, N.H., 03054, U.S.A.). These shoe attachments, similar to snowshoes, distribute body weight allowing the surveyor to walk without sinking as deep in the mud as when using regular shoes. The second technique involved use of a "Poke Boat" (Phoenix, Berea, Ky., 40403, U.S.A.), a flat bottomed kayak with a 7-12 cm draft with a load of 90 kg. The techniques were initially applied at sites in the Florida Panhandle in northern Florida, U. S. A. in seagrass beds (East of Bay North, Franklin County, Florida 29° 55.6' N, 84° 26.1' W) and on mud flats and oyster bars (Hickory Mound, Taylor County, 30° 1' N, 83° 52' W), and next tested in Florida Bay at Snake Bight (Monroe County, Florida 25° 8.1' N, 80° 53.8' W), an area of seagrass (with soft mud bottom) covered with 10 cm of water and Lake Ingraham (Monroe County, Florida 25° 8.7' N, 81° 5.0' W), an area with 1 m deep mud. Flats extended up to 3 km perpendicular to shore, with birds scattered throughout the flats.

Although the surveys were conducted in different years and knowledge of true population fluctuation is limited, we used total count, coefficient of variation (CV= standard deviation / mean) of the total count, percentage of unidentified birds, distance from the farthest birds, and access rate, as objective indices to compare the techniques. We also subjectively rated the techniques based on how well they allowed us to approach and survey the birds. The objective indices were applied most to the north Florida sites, since these sites had the same observer and a greater number of visits.

RESULTS AND DISCUSSION

At East of Bay North, the Mudders worked well in the 45-60 cm deep mud and allowed access to seagrass beds, with movement averaging about 25m/minute. With normal shoes, this site could only be surveyed from the edge. The average count in 1993-94 of 4 counts was 311 versus 399 in 1995-96 (t = 0.63, P = 0.55), and the CV dropped from 70% to 44%. The average percentage of unidentified shorebirds for 4 visits in each year dropped from 36% in the 1993-94 survey to 21% in 1995-96 using the Mudders (t = 0.82, P = 0.44). The average estimated distance from the farthest birds dropped from 136 m to 72 m (t = 0.99, P = 0.34). At Lake Ingraham and Snake Bight, the mud was ca. 50 cm deeper and had a stickier consistency (similar to modelling clay). Under these conditions, the Mudders did prevent some sinking, but movement averaged just 1m/minute, and balancing with a spotting scope prevented an effective survey.

The Poke Boat worked well at Hickory Mound where shorebirds roosted on oyster bars surrounded by water approximately 15 cm deep. Using the Poke Boat to approach the birds at ca. 25 m/minute was contrasted with surveying by foot from shore, since the oyster bars and surrounding shallow water, prevented approach from a larger power boat. The Poke Boat allowed a more thorough count; the average in 1993-94 of 2 counts was 124 shorebirds versus an average in 1995-96 of 512 shorebirds (t = 4.23, P = 0.05), and the CV dropped from 105% to 3%. Additionally, there was an average 24% unidentified in 1993-94 contrasted with 2% unidentified with the Poke Boat (t = 2.28, P = 0.14). The estimated distance from the farthest birds dropped from 90 to 15 m (t = 1.97, P = 0.14), and using the Poke Boat, allowed observation of a tip not visible from the shore. At Snake Bight, we tried the Poke Boat with mixed success. At high tide, the Poke Boat could be used to reduce the distance from the main body of birds by one-half. At low tide, the water depth was only 5-8 cm, which did not allow the Poke Boat to float, but using a pole to slide it along the muddy bottom was slow (2 m/minute) and we risked stranding due to a dropping tide.

Although both the Mudders and Poke Boat allowed closer access to the shorebirds at the sites in Florida Bay, the birds moved rapidly and flushed, particularly "peeps." We then tried simply to get the most comprehensive count with the least number of unidentified birds. At Lake Ingraham it was possible to observe both banks from the power boat in the channel and a reasonable count could be made with a 20-power spotting scope, given sufficient time, and calm wind conditions (£ 5 kph). One had to carefully scan the flats, particularly for peeps, but the channel did allow for accurate identification of both nearby small shorebirds and farther away larger shorebirds, and, under good light and wind conditions, provided reasonable counting conditions for all individuals. Reasonable counts were made in approximately 2 hours as compared to the average of just 34 minutes spent during the statewide survey of 1993-94. At Snake Bight at high tide, the birds may be separated from observers by 1,500 m of shallow water, and a Poke Boat could reduce the distance by one-half. At low tide, the birds ranged from 10 m to 1,500 m away, but at good light conditions (especially morning light) and calm wind, birds could be seen and

counted. The key at Snake Bight was to take at least 2 hours and count the birds at low tide. This contrasted with the average of just 18 minutes taken during the statewide survey. We had average wind speed of just 3 kph in 1995-96, which allowed use of the 20-power spotting scope from the boat, versus 18 kph in the winter of 1993-94.

In testing these techniques, we made some noteworthy counts. At Snake Bight we counted 11,600 "peeps" in a single count, whereas the high count for "peeps" during the statewide winter survey of 1993-94 for all sites was 4,080 at Lake Ingraham and 3,000 at Snake Bight. Using the estimated Western Atlantic Flyway population of 76,545 for Western Sandpiper and 26,463 for Least Sandpiper (Harrington *et al.* 1989), we estimated 11% of the Atlantic flyway population of "peeps" wintered at Snake Bight. Enroute to these sites we incidentally observed 2,550 Willets *Catoptrophorus semipalmatus* at Flamingo (25° 8' N, 80° 55.5' W), compared with a high of 900 at Snake Bight in the winter of 1993-94. The ISS total for Willets was just 10,466, so this represented perhaps 24% of the Western Atlantic Flyway population.

CONCLUSIONS

The best method to access a shorebird site depends on water level and substrate consistency (Table 1). The Mudders and Poke Boat can be used at sites where there is at least 45 cm of mud or at least 15 cm of water, respectively. In Florida Bay, however, we did not find these conditions and these tools were not effective. The key to getting accurate counts in the broad mud flats and seagrass beds in Florida Bay is to spend the time (at least 2 hours) to complete as thorough a count as possible, census under calm wind conditions, and be willing to return for multiple counts under different conditions within a few days. We would be interested in hearing other person's experiences under similar difficult conditions.

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REFERENCES

Clark, P. A. 1995. Evaluation and management of propeller damage to seagrass beds in Tampa Bay, Florida. *Fla. Sci.* 58:193-196.

Gore, R. H. 1992. *The Gulf of Mexico.* Pineapple Press, Inc. Sarasota, Fla.

Harrington, B. A., J. P. Myers, and J. S. Grear. 1989. *Coastal refueling sites for global bird migrants.* Pages 4293-4307 *in* O. T. Magoon, H. Converse, D. Miner, L. T. Tobin, and D. Clark, eds. Coastal Zone '89. Proc. of the sixth symposium on coastal and ocean management, Omni Hotel, Charleston, South Carolina, July 11-14, 1989. Am. Soc. Civil Eng., Salem, Mass.

Hicklin, P. W. 1987. The migration of shorebirds in the Bay of Fundy. *Wilson Bull.* 99:540-570

Howe, M. A, and J. Collazo. 1989. *Census and survey techniques for shorebirds.* Pages 168-174 *in* N. M. Wells, compiler. Proc. nongame migratory bird workshop. U.S. Fish and Wildl. Serv., Ft. Collins, Colo.

Kasprzyk, M. J., and B. A. Harrington. 1989. *Shorebird field manual.* Manomet Bird Observatory, Manomet, Mass.

Marsh, C. P., and P. M. Wilkinson. 1991. The significance of the central coast of South Carolina as critical shorebird habitat. *Chat* 55(4):69-91.

Phillips, A. R. 1975. Semipalmated Sandpiper: identification, migrations, summer and winter ranges. *Am. Birds* 29:799-806.

Sargent, F. J., T. J. Leary, D. W. Crewz, and C. R. Kreur. 1995. *Scarring of Florida's seagrasses: assessment and management options.* FMRI Tech. Rep. TR-1, Fla. Mar. Res. Inst., St. Petersburg.

Sprandel, G. L. , J. A. Gore, and D. T. Cobb. *1996. Winter shorebird survey.* Fla. Game and Fresh Water Fish Comm. Nongame Wildl. Prog. Final Perf. Rep., Tallahassee.

Table 1. Methods used to access shorebird sites.

Method	Conditions	Notes
Power Boat	Requires 20-60 cm water	
Airboat	Requires no water	Greatly disturbs birds
Go-Devil Boat	Requires about 20 cm water	Causes propeller damage in seagrass.Not allowed in Florida Bay
Poke Boat		Beware a falling tide. In 8-10 cm it may be pushed
Mudders	Works in 45 cm firm mud	Supports person in 1 m mud but movement is very slow
Boots	Works in mud flats with £ 15 cm mud	
Mountain bike	Works on moist sand just below high tide line	Allows coverage of lareg area of beach