

# SANDERLINGS DO NOT DRIVE ACROSS THE GULF OF MEXICO

by J.P. Myers

A long-standing debate has riveted the attention of migration biologists ever since the magnitude of the trans-Gulf bird migration was perceived (by Lowry (1945)). The debate focuses on the mechanism by which birds actually cross the Gulf of Mexico. Under one hypothesis, birds fly nonstop from staging sites on the Yucatan Peninsula (for passerines) or Venezuela (for waders). The competing hypothesis is that they drive, an idea with its champions but scant empirical support. Given the strong selective advantages of successful crossing and the extreme, unlikely behaviors which sometimes result from undiluted selection, this alternative cannot be eliminated on logical grounds alone. I therefore set out to test this idea directly following procedures adapted from Heyerdahl (1950, 1971).

## METHODS

The experiment was conducted on 11 April 1985, without replication, approximately 15 km SW of Johnson's Bayou, Cameron Parish, Louisiana.

I used a 4-wheel drive 1983 Mitsubishi Montero purchased 7 days previous to the experiment. It was fully outfitted with large, macho tires and a complete assortment of accessories, including a tape deck playing Veprintsev's *Birds of the Soviet Union: Waders*. In order to duplicate the weight load of departing migrants I loaded the vehicle fully with assorted equipment and a large jar of Dead Smith's Crunchy Peanut Butter. The gas tank was full.

Prevailing winds at the time of departure were onshore but less than 15 kph. The tide was out, revealing a mud bar camouflaged by a thin crust of sand. No special driving techniques were employed, other than placing the vehicle in 4-wheel drive. A course was selected that would carry us south from the Louisiana coast.

## RESULTS

Upon reaching the mudbar the vehicle sank to its hubcaps instantly, coming to rest upon its bottom plate. Forward or reverse motion thereafter became impossible. Within 12 hr the tide rose to a height approximately equal to the level of the dashboard. High tide the subsequent day rose approximately 0.5 m higher. Waves rocking the vehicle through the high tide periods worked the body deeper into the flat.

The Mitsubishi remains *in situ* for independent confirmation by any doubting the experimental results.

## DISCUSSION

These results reject definitively the possibility that Sanderlings drive across the Gulf of Mexico. While I recognize that unreplicated experiments warrant careful scrutiny, the results in this case are unambiguous. Moreover, I find it interesting that the transit foundered so early in the attempt, much earlier than predicted by a mechanism positing fuel limitations to migration distances (e.g. Davidson 1984). These predictions (modifying Davidson's equations appropriately to reflect the different efficiencies of movement of Mitsubishi vs-

wader) would have allowed a southward path to approximately 600 km offshore, given that the tank was filled shortly before departure.

The results also offer new insight into the importance of substrate type for waders. Heretofore, investigations have concentrated upon the relationships of substrate quality to foraging efficiency (e.g. Myers *et al.* 1980, Pienkowski 1981, 1983, 1984, Pienkowski and Evans 1984, Pienkowski and Knight 1977). This study suggests that migratory mechanism and perhaps even migratory pathway may be influenced by substrate penetrability. The depths of this issue await further probings.

## ACKNOWLEDGEMENTS

I thank Geoffrey LeBaron for technical assistance in performing the experiment and the staff of the Museum of Zoology, Louisiana State University, particularly Dr. J.V. Remsen for recommending the study site and Dr. Robert Zink, who fended off moas. The work was funded by an insurance company that best remain anonymous. I also thank Dwight for demonstrating how to shoot cows at midnight in a Louisiana bayou and several police officers of Cameron Parish who reveled in our plight.

## LITERATURE CITED

- Davidson, N.C. 1984. How valid are flight range estimates for waders? *Ringing and Migration* 5: 49-64.
- Heyerdahl, T. 1950. Kon-tiki. International Collectors Library, New York. 308 pp.
- Heyerdahl, T. 1971. The Ra Expeditions. Allen and Unwin, London. 334 pp.
- Lowry, G.H. 1945. Trans-Gulf spring migration of birds and the coastal hiatus. *Wilson Bull.* 57: 92-121.
- Myers, J.P., Williams, S.L. and Pitelka, F.A. 1980. An experimental analysis of prey availability for Sanderlings (Aves: Scolopacidae) feeding on sandy beach crustaceans. *Can. J. Zool.* 58: 1564-74.
- Pienkowski, M.W. 1981. How foraging plovers cope with environmental effects on invertebrate behavior and availability. In *Feeding and survival strategies of estuarine organisms*, ed. N.V. Jones & W.J. Wolff, pp 179-192. Plenum Press, NY.
- Pienkowski, M.W. 1983. Changes in the foraging pattern of plovers in relation to environmental factors. *Anim. Behav.* 31: 244-264.
- Pienkowski, M.W. 1984. Breeding biology and population dynamics of Ringed Plovers *Charadrius hiaticula* in Britain and Greenland: nest predation as a possible factor limiting distribution and timing of breeding. *J. Zool. Lond.* 202: 83-114.
- Pienkowski, M.W. and Evans, P.R. 1984. Migratory Behavior of shorebirds in the Western Palearctic. *Behav. Marine Organ.* 6: 73-123.
- Pienkowski, M.W. and Knight, P.J. 1977. La migration postnuptiale des limicoles sur la cote atlantique du Maroc. *Alauda Rev. Int. Ornithol.* 45: 165-190.

J.P. Myers, Academy of Natural Sciences, 19th and the Parkway, Philadelphia, PA 19103, USA.