SHOREBIRD STUDIES AT MANOMET BIRD OBSERVATORY, MASSACHUSETTS

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Massachusetts lies on the autumn migration route of more than 25 species of North American shorebirds. Fortuitously, the Manomet Bird Observatory is situated near a major stopover area, the Plymouth/Duxbury/Kingston Bay complex near the base of Cape Cod, so it is natural that shorebird banding began at the Observatory during its first operational year, 1969. The banding program continues today on a more modest scale, with most capturing done at Plymouth Beach, a long sandy peninsula jutting into Plymouth Bay.

The principal methods used for shorebird catching at MBO are mist nets for "peeps" by night, and rocket nets for larger shorebirds by day. Mist nets are used only during falling tides, particularly during the first three to four hours following high tide. As shorebirds, especially Semipalmated Sandpipers, leave their resting flocks they begin to forage along the beachfront, catching small invertebrate animals stranded by the receding tides. Mist nets are strung in sets of two nets on three poles, and erected in an L-shape with one net parallel to the beach in about 6-8 inches of water, and the second set roughly perpendicular to the first. Special care is taken to sink the poles securely into the sand so that nets will not fall. Nets must be moved about every 45 minutes as the tide falls.

Once formed on the beachfront, shorebird flocks are herded slowly upwind towards a net, and are rushed when about 20 meters from the nets. A loud shout given just as the flock approaches the net causes many birds to swoop lower, thus improving the catch. Our highest single night's catch was about 175 birds, made in about three hours with six double sets of nets. Captured birds are held in a well-ventilated 0.5 cu. metre box constructed of pegboard and divided into four compartments, and later are carried 7 km to the Observatory for processing.

Using rocket nets in the Plymouth region requires a good deal of planning and preparation, and a large labour force. The most important factors to be considered at the shorebird resting site locations, the wind direction and speed, the tide height, the slope of the beach, and other human use of the beach. Our net is made of a 1-inch*square, knotless nylon, and is carried by four rockets. This is not quite satisfactory, as it is somewhat slow, and cannot be used against any headwind - five rockets would be more suitable. The net and rockets are set up and camouflaged an hour or two before shorebirds leave foraging flats. The site is guarded against tampering and disturbance by one or two workers until about an hour before high tide, at which time the army of students and volunteers arrives, and is properly placed at all of the favored roosting sites except the one where the net is placed. Somehow the shorebirds seem to

* 1 inch = 2.54 cm

quickly catch on to this strategy, and even when disturbed elsewhere are reluctant to land near the rocket net. However, on most days they eventually do land, and the firing rockets alert everyone to come help remove birds. On rather less successful days the birds fly to another beach three miles across the bay. We rarely attempt firings in the Plymouth area more than once a month.

The choice of firing sites is critical. Our region has 9-11 foot* tides, so a hundred foot* expanse of shallow-sloping beach can become inundated in fifteen minutes. Our ability to coordinate events is not nearly this precise, so we are forced to set up on steeply sloping beaches where a 40* foot expanse (the width of the rocket net) may require two hours to become inundated. Secondly, a tail wind is helpful, and any other wind is difficult if not impossible. Thirdly, the chosen firing area must be relatively free of disturbances, and must not have vulnerable objects in the line of fire in the unlikely event that a rocket or part of a rocket comes free when fired. Fourth, the firing must be planned so that birds are not drowned or otherwise come to harm. Our most successful firing netted about 700 Red Knot, less successful attempts caught no birds, and our most disturbing attempt occurred when a rocket came free and fell short of hitting a fishing boat! (An amazing number of prayers can be spoken in the time required for a broken-free rocket to exhaust its forward motion!).

Our shorebird banding score from 1969-1977 is tallied below (Table 1). As in the Old World, many recoveries of shorebirds are at sites distant from the banding site. More banded shorebirds from Manomet have been recovered in South America (as far as southern Brazil) than in North America. A very high proportion have been resighted in the area where they were originally banded, up to 80% for some colour-banded plovers, showing that most species traditionally use the same stopover areas year after year.

TABLE 1

Species	No. Banded	No. Recovered	No. Controls
Black-bellied Plover	217	-	-
Semipalmated Plover	97	-	-
Piping Plover	27	-	-
Ruddy Turnstone	66	-	-
Spotted Sandpiper	6	-	-
Red Knot	428	4	1
Least Sandpiper	36	-	-
Dunlin	216	-	-
Short-billed Dowitcher	53	1	-
Semipalmated Sandpiper	4,572	10	3
Western Sandpiper	19	-	-
Sanderling	228	-	-

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* 1 foot = 0.305 m.