

A concentration of Greater Shearwaters in the western North Atlantic

*"substantial numbers of nonbreeding Greater Shearwaters
gather in the western North Atlantic [in autumn] . . ."*

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WHILE MAKING SEABIRD OBSERVATIONS aboard the *R/V Anton Dohrn* in the western North Atlantic, a concentration of Greater Shearwaters, *Puffinus gravis*, estimated to exceed 200,000 birds was found. The sighting was made November 11, 1977 at 1300 hours EST on southeastern Georges Bank (40°58'N, 67°00'W) approximately 230 km southeast of Cape Cod, Massachusetts. The sky was 70 per cent overcast and winds were 20 knots from the west. The observer's eye was 14 m above the water, wave heights were 1.5 m, and the horizon was visible. This observation is notable because it indicates that substantial numbers of nonbreeding Greater Shearwaters gather in the western North Atlantic before migrating south; it also allows a minimum size estimate of the nonbreeding population.

The perimeter of the concentration was visible and did not extend to the horizon. The size of the concentration was estimated by counting "blocks" of approximately 1000 birds. Although some of the birds were flying, the majority were sitting in rafts of several thousand. Many were sleeping with heads tucked under wings. When disturbed by the approaching vessel, the birds either attempted to dive — unsuccessfully — or to fly. Many had difficulty taking off, and disgorged their stomach contents. Mostly small fish and fish parts were noted in the regurgitated matter, while algae and trash (e.g., vinyl plastic, toilet paper) were seen incidentally.

A surface and subsurface plankton tow were made in the vicinity of the shearwaters, but did not show any unusual abundance of prey. No fishing vessels were sighted by the observer. Although two Northern Fulmars, *Fulmarus gla-*

cialis, two Great Black-backed Gulls, *Larus marinus*, two Herring Gulls, *L. argentatus*, and one Black-legged Kittiwake, *Rissa tridactyla*, were with the shearwaters, no interactions between species were observed.

ROWAN (1952) FOUND that Greater Shearwaters begin to arrive at Nightingale Island, in the Tristan da Cunha group in late August, and by late September seemingly all nesting burrows were occupied. Thus birds seen in the North Atlantic during October and November could not have been breeders. R. G. B. Brown (pers. comm.) observed a feeding flock of at least 1000 Greater Shearwaters October 19, 1977, along the southeastern edge of Georges Bank enroute from Halifax, Nova Scotia to Panama. Distribution maps by Brown *et al.* (1975) indicate an abundance of Greater Shearwaters in eastern Canadian waters in October. Voous and Wattel (1963) cited an observation of thousands of Greater Shearwaters November 9, 1954, off the coast of Nova Scotia. Rankin and Duffey (1948) found a general movement of Greater Shearwaters to the western side of the North Atlantic in October. Although Wynne-Edwards (1935) suggested that the majority of Greater Shearwaters return south from the high northern latitudes in October close to the European coast, he recognized a separate population which migrated over the Grand Banks. These data and literature support our contention that there is a large autumn gathering of non-breeding Greater Shearwaters in the western North Atlantic.

Rowan (1952) estimated that a minimum of four million Greater Shear-

waters breed on Nightingale Island Elliott (1957) and Elliott (1970) estimated that at least one and one-half million Greater Shearwaters breed on Gough and Inaccessible Islands. Although Woods (1970) documented nesting of a single pair of Greater Shearwaters in the Falkland Islands, no further direct evidence of a colony existing in the area has been found. Since 200,000 birds were estimated in the North Atlantic during the egg-laying period, at least 3.5 per cent of the total population are non-breeders (probably juveniles and sub-adults). The inclusion of Greater Shearwaters elsewhere in the North Atlantic at this time could only inflate this minimum estimated percentage of nonbreeders.

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