

number, the manner in which it is banded, the field number and its marital and ancestral relationships, but for everyday use all that is needed is the shortest form of the field number. This scheme of nomenclature is convenient in practice and distinctive for each bird; it shows sex, and mates each year, and when necessary can give all known information as to progenitors.

Now that we have the Biological Survey bands that tell us whether individuals return and the celluloid bands that enable us to recognize them in the field, the way is open for endless possibilities in life-history studies.

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## FURTHER BANDING NOTES FROM TERN ISLAND, MASSACHUSETTS<sup>1</sup>

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THE seventh season's work among the Common Terns (*Sterna hirundo*) and the Roseate Terns (*Sterna dougalli*) at Tern Island, Chatham, Massachusetts, began on July 5th of this year. Prior to that date, in June and July, 1930, many immature birds of both species were banded by Warden Everett Eldridge, Jr., and a member of the Northeastern Bird-Banding Association. Upon the writer's arrival on the 5th most of the young were flying and could be observed about the island and near-by beaches in large numbers. The first day was spent in banding the young, and 704 Common and 101 Roseate Terns were handled. There were few nests with eggs or young, and the number of dead seemed unusually small, which indicated that the weather had been favorable for the successful rearing of thousands of young Terns (June was a month of warm weather with little rain), that the adults were finding food in abundance and were able to keep the young well fed, and that the birds in this rookery were not subject to the enemies that attacked those in many of the near-by colonies. At Billingsgate Island, lying approximately twenty-five miles northwest, the Terns were robbed of their eggs in 1929 by a party of egg-

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<sup>1</sup> For previous papers on banding operations on this island, see *Bulletin Northeastern Bird-Banding Association*, Vol. I, p. 58; Vol. II, pp. 32 and 68; Vol. III, p. 95; Vol. IV, p. 125; and Vol. V, pp. 43 and 144.

hunters, and their young were killed and carried away.<sup>2</sup> It is believed that this raid was made by a few foreigners from a fishing colony on the mainland. At the Pamet River colony, five miles east and close to the mainland, the residents and summer visitors with dogs were a source of constant annoyance and undoubtedly caused many casualties among the young and considerable destruction of eggs. Large ants killed some of the newly hatched, and deaths from disease and exposure were not infrequent in 1929. This year it appeared that these agencies of destruction were absent and the breeding-season on Tern Island was a success.

The objects of this year's operations were, in the order of their importance, to trap as many of the adults as possible and thus take what we could of the terns of previous years' banding, to obtain some definite knowledge of the food eaten by old and young, and to devote such time to the banding of immature birds as would not interfere with our other work.

The time to trap the adults with the greatest possibilities of success is during the period when full sets of eggs have been laid or the young are small and need the constant protection of the parents from the sun's heat or rain and fog. Early hatching made the trapping more difficult, and fewer birds were taken per hour than in previous years. Some were just beginning nesting for the second time this year, and there were few nests with more than one egg and not a newly hatched chick was seen. Instead, therefore, of capturing the adults in large numbers each day, with the exception of the first day, there were times when we averaged less than two adults an hour. After working in one place a limited time we moved to the next to give the birds access to their nests. Common Terns prefer the open sand; Roseate Terns select the long grass in which to conceal their eggs, while the Arctic Tern mingles with the Common Tern or accepts the middle ground. Years ago the island was without vegetation, and the old inhabitants of Chatham state that many Herring Gulls nested here, far outnumbering the terns. The island has been slowly fertilized by the birds, and the gulls have vacated, leaving terns in complete possession. At the present time there are only three or four open places on the island such as the Common Terns prefer, and it will be interesting to note in years to come whether or not because of the complete covering of the island

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<sup>2</sup>Austin, Oliver L. Jr., *Bulletin of the Northeastern Bird-Banding Association*, Vol. V No. 4, p. 126.

by vegetation the Roseate Terns will increase and the other species gradually decrease.

We trapped over the open spaces, using simple wire drop-traps placed over eggs or young and operated from a distance by long pull-strings running to a common center where the operator sat. The birds were tame the first day, and we captured 172 Common and one Roseate, the latter the only one of this species taken, and of these ten proved to be returns. Two were banded in July, 1925; three in July, 1926; one in July, 1927, and one in July 1929. The 1929 Tern, a Roseate, was sitting on eggs when captured, and this is the first record of the breeding of a bird of this species during the first year of its life. The second day's trapping produced only thirty-five birds, among which were two returns, and the catch dwindled until our total for the last day was seven, all of them unbanded.

The operator of a battery of traps has opportunity to study the terns at close range and observe every movement and reaction of the colony as well as the individuals of each nest. After the traps were set, the birds settled down and came slowly back to their nests. One under our immediate observation alighted in the sand before the trap, paused a moment, and then entered the trap. Another flew over the trap in circles, finally alighted, but almost instantly flew off again. This performance was repeated many times before the bird finally went to its nest. Another bird, after circling about in the air for some time, alighted on the top of the trap, where it balanced awkwardly and pecked at the wire, all the time scolding and quite unable to solve the problem of finding an entrance. It remained on the trap until frightened, when it continued its circling flight, returning at length to the top of the trap. This performance was repeated time and time again, until we removed the trap and gave up trying to capture it. Still another, after recovering from its fright, dropped to the ground in the rear of the trap and walked back and forth, pecking at the wire.

Fears have been expressed by ornithologists that with the advent of airplanes as a growing means of transportation many water-birds, such as terns, gulls, geese, and ducks, would not become reconciled to their noise and presence, thus being frightened away from the territory where airplanes are flown. Such has not been the case, however, on this island, for we witnessed the unusual sight of a small airship, commonly known as a "blimp," sailing low over the island one morning about nine o'clock. We observed the action of the terns closely and were surprised to note that there were no

signs of alarm or sudden flight. The birds, on the contrary, paid no attention to the passing of the silvery airship that sailed the length of the island and back again at a very low altitude.

It is generally believed that the food of terns is composed in greater part, if not entirely, of sand-eels and small fish known by fishermen as "bait" or "sperling"—two names that refer to the small fish that run in large schools and are preyed upon by several species of fish eaten by man. In order to determine exactly what serves as food for these birds, we collected all the specimens possible that were in sufficiently good condition to be identified. The fish were found on the ground near the nests, where they were dropped or cast up by the birds when alarmed. These were examined and identified by William C. Schroeder, of the Museum of Comparative Zoölogy at Cambridge, Massachusetts. We secured fifty-six specimens, representing the following species, which are all common on the Atlantic Coast:

Silverside ( <i>Menidia notata</i> ) . . . . .	3 specimens
Sea Herring ( <i>Clupea harengus</i> ) . . . . .	8 "
Butterfish ( <i>Poronotus triacanthus</i> ) . . . . .	19 "
Sand-eel ( <i>Ammodytes americanus</i> ) . . . . .	8 "
Squirrel Hake ( <i>Urophycis chuss</i> ) . . . . .	12 "
Killifish ( <i>Fundulus heteroclitus</i> ) . . . . .	6 "

The results of this seventh year's work were a goodly number of adults trapped and banded, with interesting returns, in addition to banding several thousand immature terns. One return is the first on record of the breeding of a Roseate Tern when one year old. The view held by me in 1929 that neither Common nor Roseate Terns breed when one year old (see *Bulletin of the Northeastern Bird-Banding Association*, Vol. V, pp. 147 and 148) is shown by this return to be incorrect so far as the latter species is concerned. Definite information was obtained concerning the species of fish which comprise in large part the food of young and old at this season of the year.

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