

for some of the South Shore trapping area is shallower (usually less than 30 feet) than many parts of the lagoon and sounds. There is tentative evidence pointing to an inward migration, or at least a lack of females, from deeper waters of the shelf and of the slopes since traps in these depths (on the South Shore) have caught only males. This breeding migration to the South Shore apparently follows the first mating and precedes the hatching of eggs.

A migration of considerable magnitude has been cited by a reputable local fisherman who witnessed the event in the fall "several years ago." He could give no information as to direction of movement. This might be comparable to a migration seen by C. M. Breder, Jr., at Bimini in October, 1950 (personal communication). In this case the lobsters were coming in from deeper water in great numbers. This lasted only a day.

LITERATURE CITED

- BRADSTOCK, C. A. 1950. *A study of the marine spiny crayfish Jasus lalandii* (Milne-Edwards). Zool. Pub. Victoria Univ. College No. 7:1-38.
- CRAWFORD, D. R., AND W. J. J. DE SMIDT. 1922. The spiny lobster, *Panulirus argus*, of southern Florida; its natural history and utilization. Bull. Bur. Fish. 38:281-310.
- CREASER, EDWIN P. 1950. *Repetition of egg-laying and number of eggs of the Bermuda spiny lobster*. Proc. Gulf and Carib. Fish Inst., Second Ann. Sessions :30-31.
- LEWIS, JOHN B. 1951. *The phyllosoma larvae of the spiny lobster Panulirus argus*. Bull. Mar. Sci. Gulf Carib. 1(2):89-103.
- SMITH, F. G. WALTON. 1948. *The spiny lobster industry of the Caribbean and Florida*. Carib. Research Council, Fish. Series No. 3:1-49.
- _____. 1951. *Results of Caribbean crawfish research*. Proc. Gulf and Carib. Fish. Inst., Third Ann. Session :128-134.
- TEMPLEMAN, W. 1934. *Mating in the American lobster*. Contr. Canadian Biol. Fish. 8(45) :421-432.
- _____. 1936. *Local differences in the life-history of the lobster (Homarus americanus) on the coast of the maritime provinces of Canada*. Jour. Biol. Bd. Canada 2(1) :41-87.

A Preliminary Report on the Biology and Economics of the Spiny Lobster in Puerto Rico

N. T. MATTOX, *College of Agriculture & Mechanical Arts, Mayaguez, Puerto, Rico.*

THE SPINY LOBSTER, *Panulirus argus* (Latreille), is an important item in the local fish markets of Puerto Rico and is greatly in demand wherever taken. The most important method of taking these animals in Puerto Rico is by the use of wire traps supported by a framework of wood, ordinarily mangrove wood. These traps are of the same type used to take fish and are approximately 4 feet by 3 feet by 2 feet in size with an opening on one of the short sides. Some lobsters are taken with spears, but these are not included in the data of this report. During the past year the collection of data was begun to determine the extent of this fishery and to obtain notes on the biology of this species. This represents a preliminary report on this work now being carried on.

The Division of the Fish and Wildlife Service of the Department of Agriculture and Commerce of Puerto Rico, under the direction of Mr. Felix Inigo, conducted a contact survey of the local fishermen as to their catch of both fish and lobsters. There were 213 fishermen who reported a catch of lobsters, some only a few pounds which were incidental to their catch of fish. The results of this survey indicated a catch of 466,800 pounds of lobster annually. This represents a catch of approximately 200,000 lobsters. The value

of this catch to the fishermen varied from 15 to 25 cents per pound with an average of about 18 cents per pound. This represents a total value of nearly \$100,000 per year to the fishermen. The market price to the consumer averaged 25 cents per pound. These data probably represent minimum numbers and it is probable that the total annual catch of lobsters in Puerto Rico is much higher.

Working with the market catch of lobsters at various fishing centers, data have been collected as to the size, sex, and reproductive state of the animals taken for market. It has been noted that the length-weight ratio varies extremely among the average catch. For example, 2 pound lobsters may vary from 11 inches to 12½ inches in total length, and 3 pound lobsters may vary from 12½ to 14¼ inches.

The average total length of the market lobsters examined was 12.02 inches. The average for the females was 11.96 inches and for the males 13.01 inches in total length. The average for the Florida lobsters, as given by Dawson and Idyll (1951), was 9.5 inches for the females and 10.5 inches for the males. The average male lobsters in the local market catch were also heavier than the females, the females averaging 2.11 pounds and the males 3.01 pounds. The size group which occurred at the greatest frequency for the females was 20 per cent at the 1½ pound size. For the males, the greatest frequency was 17 per cent for the 2¼ pound size. In the Florida lobsters the greatest frequency was at 20 per cent for the 1¼ pound size for the females, and 22 per cent for the 1½ pound size for the males.

Sex ratio data are not available for the entire year at this time. However, some data are available for the months of September and October. During September, 1951, the market catch examined was composed of 43 per cent males and 57 per cent females. In October the females were also more numerous, 37 per cent males and 63 per cent females. For these same months the average Florida ratios given for September were 54.5 per cent males and 45.5 per cent females, and for October 53.6 per cent males and 46.4 per cent females. With only these data, no significance can be placed on the greater percentage of females in the local catch.

Even though there is a local law which states, "it is prohibited to kill or destroy, or to possess or sell female lobsters with eggs attached during any month of the year," there have been female lobsters with eggs observed in the market during all months. Definite data are again available for only two months as to the percentages of market females with eggs and spermatophores. During the month of September of the female lobsters observed at one market center, 54 per cent were carrying spermatophores and 22 per cent had eggs. During the month of October, at this same center, 30 per cent had spermatophores and 18 per cent were carrying eggs. In the records of the Florida lobsters observed by Dawson and Idyll for these same months, 0.9 per cent had spermatophores and zero per cent had eggs during September, and for October 8.4 per cent had spermatophores and 0.6 per cent were carrying eggs. This suggests a much more extensive breeding period here than in the Florida waters.

These observations on the spiny lobster in Puerto Rico are being continued in order to complete the picture for the entire year.

LITERATURE CITED

- DAWSON, CHARLES E. JR., AND CLARENCE P. IDYLL—1951—Investigations on the Florida spiny lobster, *Panulirus argus* (Latreille). Fla. Board of Conserv. Tech. Ser. No. 2: 1-39.