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THE EFFICIENCY OF THE CORNISH POT AND THE SCOTTISH CREEL  
IN THE CAPTURE OF LOBSTERS AND CRABS

H. J. Thomas, B.Sc., Ph.D.

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## 1. INTRODUCTION

Differences existing in the relative efficiencies of various modifications of the Scottish type creel have been demonstrated by Thomas (1952) who has discussed their possible significance in the estimation of population statistics. The differences investigated were small when compared with the wide variation in gears employed in the capture of lobsters and crabs in other parts of Britain, as well as in other countries. It may be that a trap which is well suited to a particular coast will prove less well adapted for use in some other area where tide, depth of grounds, bottom, quantities of seaweed, etc. may require a considerable variation in design. Furthermore, from the fishermen's standpoint, workability - a factor which is very difficult to assess - is of considerable importance.

Two main types of trap are used in the capture of lobsters and crabs in Britain. The Cornish type pot is the principal device employed off the south and west coasts of England. Around the remainder of the coast of Britain a braided network trap is employed, basically similar to the Scottish creel as used by Thomas (1952).

The present investigations into the relative efficiencies of the Cornish pot and the Scottish creel were carried out by the Fishery Research Vessel "KATHLEEN", of the Scottish Home Department, working in Orkney waters during September in 1951 and 1952.

Thanks are due to Mr. J. A. Tople of the Marine Laboratory, Aberdeen, for his assistance in the statistical treatment of the results.

## 2. MATERIALS AND METHODS

Cornish pots are roughly hemispherical in shape. They are built of wicker-work, usually from hazel or willow. The flat base is circular, of close basket-work, of diameter 2'3". The sides are formed from wands which are brought upwards and then inwards, and finally bound downwards

centrally to form an eye at the top of the pot; the height of the pot is 1'6" and the depth of the eye 7", its diameter 8". Wands forming the sides of the pot are at a separation of 1 1/2" and bound together by a spiral of willow twigs, which generally circle the creel twice in passing from the base to the eye. The eye itself is closely bound by twigs to form a funnel leading into the top of the pot.

Bait is secured in the creel by means of skewers, made of wood and 15" in length. The bait is fixed to the skewer which is then passed through the mouth of the creel and the point of the skewer is inserted in the close basket-work of the funnel, so that the point of the skewer projects downwards and inwards to the centre of the funnel. Generally three such baited skewers are used. The points of the three skewers converge to the centre point of the funnel; sometimes four or even five skewers may be used. Fishermen hold that, providing the closed fist can be thrust into the space between the skewers, ample room is left for the lobster to enter the pot. The skewers not only secure the bait but prevent escape from the pot, particularly during hauling.

Pots of this type were obtained from a Cornish fisherman.

The design of the Scottish creel is described in "Practical Hints for Lobster Fishermen" (Scottish Home Department, 1952). The variant employed in these experiments was the double open-eyed type with the eye inlet lined with fine mesh netting, as used by Thomas (1952). These were obtained from a Berwickshire fisherman.

Twenty-four Cornish pots and a similar number of Scottish creels were used in each fishing, the forty-eight traps being shot in six fleets each of eight traps. The arrangement of the pots and creels in each fleet was randomised. Fleets were shot in about 6 - 8 metres and were distributed along the coast-line with an interval of about a quarter of a mile between fleets. The period of fishing was, in general, about twenty-four hours. A variety of baits was employed but in any one fishing the traps were baited similarly.

During 1951 both Scottish type creels and Cornish pots were baited equally, using a whole salted mackerel or an approximately equivalent amount of other bait. It is customary for fishermen who normally use the Cornish

pot, to bait each skewer so that, in general, about three times the quantity of bait is employed as would be employed by the fishermen using the Scottish type creel. The possible effect of this variation in the amount of bait was investigated during 1952 when each trap, both Cornish and Scottish, in three of the six fleets were baited with one and a half salted mackerel whilst the traps of the remaining three fleets were baited with half a salted mackerel.

All lobsters caught were measured from the tip of the rostrum to the end of the telson, excluding the setae, with the abdomen fully extended. Crabs were measured at the maximum width of the carapace. The statistical treatment of results followed the procedure employed by Thomas (1952).

### 3. RESULTS

Fishings were made during 1951 with the Cornish pots and Scottish creels equally baited. The total catch of lobsters, by fleets, at each fishing by all traps of each type is shown in Table I.

TABLE I

Total number of marketable sized lobsters caught by Scottish creels and Cornish pots, respectively, by fishings.

| Fishings       | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | Total |
|----------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|-------|
| Scottish creel | 4 | 2 | 4 | 1 | 6 | 4 | 1 | 3 | 3 | 7  | 4  | 8  | 9  | 3  | 59    |
| Cornish pot    | 6 | 1 | 2 | 4 | 8 | 4 | 1 | 1 | 1 | 4  | 3  | 3  | 4  | 3  | 45    |

An analysis of variance was carried out, the results of which indicate that there is no significant difference in the numbers of lobsters caught by the two kinds of trap.

Table II gives the number of crabs caught by the Scottish creels and Cornish pots, respectively, in each of thirteen fishings.

TABLE II

Total number of marketable sized crabs caught by Scottish creels and Cornish pots, respectively, by fishings.

| Fishings       | 1  | 2  | 3 | 4 | 5 | 6  | 7 | 8  | 9 | 10 | 11 | 12 | 13 | Total |
|----------------|----|----|---|---|---|----|---|----|---|----|----|----|----|-------|
| Scottish creel | 10 | 11 | 1 | 0 | 0 | 10 | 4 | 13 | 6 | 3  | 2  | 4  | 2  | 66    |
| Cornish pot    | 16 | 11 | 6 | 2 | 3 | 7  | 1 | 10 | 1 | 0  | 9  | 2  | 1  | 69    |

As in the case of lobsters, there is no significant difference in the numbers of crabs caught by the two types of trap.

Statistical analysis of the lengths of lobsters taken by the Scottish creel and Cornish pot also reveals no significant difference between the two traps. On the other hand, analysis of the difference in the carapace width of marketable sized crabs shows that the Cornish pot took a significantly larger mean size than did the Scottish creel, the average mean widths being 13.85 cm. and 13.14 cm., respectively. The statistical test shows the difference of 0.71 cm.  $\pm$  0.31 cm. to be significant at the 5 per cent. level.

During September 1952 a test was carried out in which each trap of three fleets was baited with one and a half salted mackerel (triple baiting) as normally employed in the use of Cornish pots, and the other three fleets were baited with half a salted mackerel (single baiting). The results of this experiment are shown in Table III.

TABLE III

Total number of lobsters caught by Scottish creels and Cornish pots with single and triple baiting, respectively, by fishings.

| Fishing Baiting | 1  |   | 2  |    | 3 |   | 4  |    | 5 |   | 6 |   | Total Single Baitings | Total Triple Baitings | Over-all Total |
|-----------------|----|---|----|----|---|---|----|----|---|---|---|---|-----------------------|-----------------------|----------------|
|                 | S  | T | S  | T  | S | T | S  | T  | S | T | S | T |                       |                       |                |
| Scottish creel  | 7  | 3 | 6  | 7  | 0 | 2 | 2  | 7  | 5 | 5 | 2 | 6 | 22                    | 30                    | 52             |
| Cornish pot     | 6  | 2 | 4  | 7  | 0 | 4 | 10 | 7  | 2 | 3 | 6 | 2 | 28                    | 25                    | 53             |
| Total           | 13 | 5 | 10 | 14 | 0 | 6 | 12 | 14 | 7 | 8 | 8 | 8 | 50                    | 55                    | 105            |

An analysis of variance was carried out, the results of which indicate that the differences between Scottish creels and Cornish pots with both single and triple baitings are not significant, nor is the overall difference between single and double baitings, taking both types of creel together, significant.

#### 4. DISCUSSION

The experiments show that under specified fishing conditions in Orkney waters during September, the difference between the catching power of the Scottish creel and the Cornish pot was negligible. On the other hand, a generalisation to this effect could not be made without a corresponding test being carried out in Cornish waters, whilst fishing at other seasons and under different conditions is also desirable.

The efficiency of a trap in the capture of lobsters and crabs is only one of several factors in the efficiency of the fishery. It is suggested in "Practical Hints for Lobster Fishermen" (Scottish Home Department, 1952) that, in general, boats of 30 - 35 ft. keel length, manned by two or three fishermen, each fishing 100 - 150 traps shot in fleets of 20 - 50 creels, constitutes probably the most efficient fishing method. This presupposes suitable grounds and conditions. The smaller the trap the more can be carried in a given size of boat, and, provided entry of lobsters is not impaired, a corresponding increase in efficiency should be possible.

The ability of the trap to withstand weather is an important factor. Barrel-shaped traps supposedly have an advantage in this respect. It is claimed that the two-compartment trap, such as the Nova Scotia creel, has an advantage in diminishing the number of escapes. Local conditions, and even the season, may also be a factor in determining the relative efficiency of the various designs.

A comprehensive test of the factors governing the overall efficiency of the fishery using various types of trap is desirable. However, notwithstanding the results of any such experiment, the local availability of materials, as well as tradition, will inevitably continue to be a determining factor in the methods which are adopted.

5. SUMMARY

(i) Under specified fishing conditions no significant difference exists in the efficiency of the Scottish creel and the Cornish pot in the capture, by number, of either lobsters or of crabs. This result applies even though Cornish pots are baited with three times the quantity of bait used in the Scottish creels.

(ii) No significant difference exists in the size of lobsters caught by the two types of trap. The Cornish pot catches crabs of a slightly larger size than does the Scottish creel.

(iii) Some of the factors governing the overall efficiency of lobster and crab fishing when using certain varieties of traps are discussed.

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