Lobster escape hatches in Selsey.

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Introduction

There exists an important lobster *(Homarus gammarus)* fishery, inshore, off Selsey (West Sussex). A fleet of fourteen full-time fishing vessels operates from the fishing station utilising offshore moorings which are afforded protection from the prevailing south-westerly wind by Selsey Bill. The fleet chiefly targets lobsters and crabs and, recently, whelk. In addition, 20 or so part-time boats occasionally use pots.

This fishery is managed locally by a byelaw of the Sussex Sea Fisheries District Committee whereby 300 pots per vessel maximum are permitted within the 0-3nm. part of the District.

Previous studies by the Sea Fisheries Committee have shown that a high proportion of the pot caught lobsters at Selsey are less than the minimum legal size of 87mm carapace length and are subsequently returned to the sea when the pots are retrieved and cleared.

Evidence suggests that the entrapment and subsequent return of lobsters can result in damage and mortality. This damage/mortality is associated with:

1) Lobsters infighting within the pots; lobsters are highly territorial and it is common at Selsey to entrap 10 lobsters per parlour pot.

2) Retrieval of pots and the clearing of undersized lobsters results in damage and increases stress on the animal.

3) Moving lobsters around the fishing grounds during the clearing process increases the likelihood of predation and lost territory.

Research shows that the fitting of escape hatches to allow small lobsters to escape from lobster pots can be beneficial; see Lovewell, S., et. al., Krouse, 1978. Fogarty, M, J and Borden, V.D. 1980. Brown, 1982. Lovewell, S.R. and Addision, J.T. Unpub. Lovewell, S.R. and Addision, J.T., 1991. Brown, C.G., 1979.

The role of the Sussex Sea Fisheries District Committee

As one of the twelve Sea Fisheries Committees (SFCs) around the coast of England and Wales the Sussex Sea Fisheries Committee aims “To regulate, protect and where appropriate develop sea fisheries within the Sussex District in order to ensure their sustainability both now and into the future, and to balance the needs of the fisheries in the context of a sustainable marine environment”.

The Committee engages local stakeholders in the management of stocks as the Committee is composed of 20 Committee members, 10 members are County Councillors who represent the constituent authorities that fund the Committee. 9 members are appointed by the Department for Environment, Food and Rural Affairs. 1 member is appointed by the Environment Agency. Together the Committee members bring together a diverse range of skills and experience in inshore fisheries management.

Importantly Committee members do not represent their own interests but the needs of the fishery as a whole; they utilise their understanding and experience of the fishery in the consideration of the management techniques. The Committee currently employs 6 full time Fishery Officers and 2 part-time administrators.

Aims

Recognising the potential benefit of using escape hatches in lobster pots at Selsey, the Sussex Sea Fishery Committee worked with the Selsey Fisherman's Association and with a grant provided by Seafish with the aim to:

a) improve the selectivity of lobster pots;
b) reduce the mortality of lobsters below the minimum legal size;
c) reduce the time associated with clearing pots;
d) to deliver the scheme on a voluntary basis in partnership with the Selsey Fishermen's Association.

Materials

6,000 lobster escape hatches and 48,000 cable ties were purchased with the Seafish grant and distributed by the Selsey Fishermen's Association. Lovewell, S.R. and Addision, J.T., 1991 describes the use of escape hatches and the optimum size for their design.

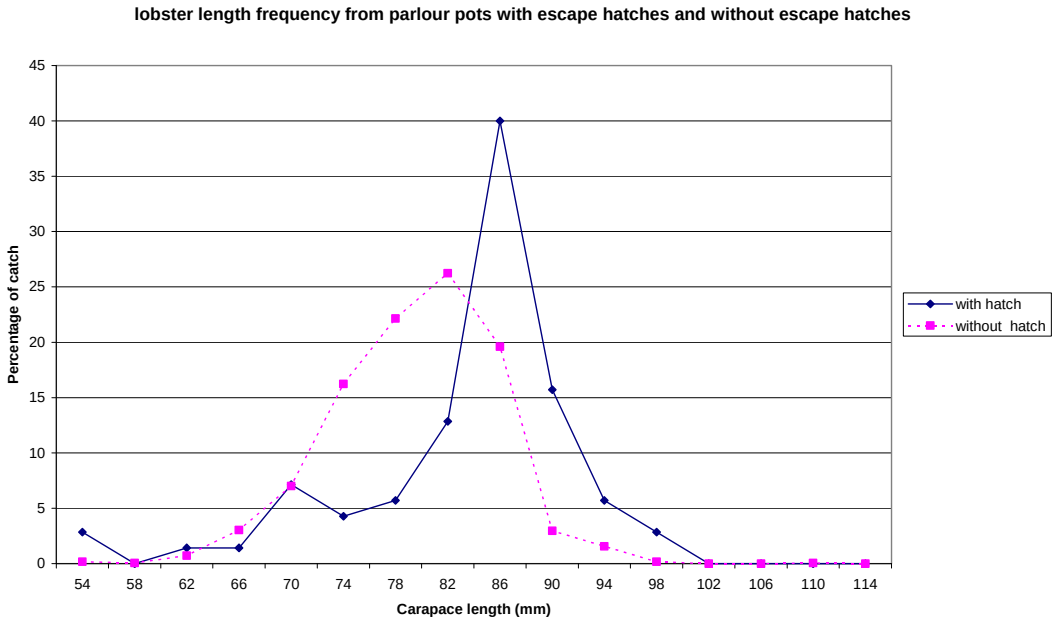
Following a meeting with the Fishermen's Association a design with an inner hole size of 80mm x 45mm which facilitates the entrapment of lobsters of 85mm and above was agreed. Though the minimum legal size of lobsters is 87mm carapace there is some debate as to the ability of legally sized lobsters to escape through hatches larger than the 80mm x 45mm size. Recognising there is a possibility that the minimum legal size might be increased, a hatch was manufactured that could be 'cut-out' to a larger size of 84mm and 46mm.

Methods

To assess the effectiveness of the escape hatches a survey of the catchable lobster population structure was undertaken. The carapace length of all lobsters entrapped in pots with escape hatches was recorded. The carapace length frequency which described the catchable structure was then compared to a study conducted on the same fishing grounds prior to the fitment of the pots, the objective to detect variance in the number of sub-minimum legal size lobsters caught.

This assessment was achieved by comparing the average size of the catchable lobsters in the pre- and post-hatch studies using a two-tailed Student T-test and by comparing the length frequency distribution of the catchable population using a Kolmogorov-Smirnov test.

Results



The average carapace length of the lobsters in the pots fitted with escape hatches was larger (mean ± SE: 81.88 ±1.065), than those not fitted with escape hatches (mean ± SE 77.84 ± 0.14).

The average size of lobsters entrapped in pots differs significantly between pots fitted with escape hatches and pots not fitted with escape hatches; $t(1848) = 5.34$, $p<.001$.
The catchable sample of the lobster population differs significantly between pots fitted with escape hatches and pots not fitted with escape hatches (K-S 0.455 P=<0.001).

Discussion
The increase in the average size of lobsters caught in pots using escapes hatches achieves the aims of the study to
a) improve the selectivity of lobster pots by reducing the number of undersized lobsters entrapped to be subsequently returned to the sea.
b) reduce the mortality of lobsters below the minimum legal size by reducing the effects of those factors listed in the introduction of the report.
c) reduce the time associated with clearing pots as the number of lobsters per trap reduced (C.P.U.E. pers. Obs.)
The delivery of this project in partnership with the Selsey Fishermen's Association achieved the final aim of the project to deploy the traps on a voluntary basis.

Conclusions
The fitment of escape hatches to the Selsey fleet has increased the average size of lobsters that are retained in pots and this should in turn reduce the mortality associated with the capture and return of undersized lobsters.
By delivering this project with funds from Seafish and in partnership with the Selsey Fishermen's Association the Sussex Sea Fisheries Committee instigated this conservation measure on a voluntary basis. This study highlights how localised management measures can be used to effect conservation gain.

Acknowledgements
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