

Lobster escape hatches in Selsey.

Robert Clark
Sussex Sea Fisheries District Committee
Unit 6 Highdown House, Shoreham-by-Sea,
West Sussex. BN43 5PB
Tel. 01273 454407
Email rclark@sussex-sfc.gov.uk

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 is comprised of 20 members who are stakeholders in local fisheries and communities. Ten members are County Councillors who represent the funding constituent authorities, Nine 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.

Introduction

There exists an important inshore fishery off Selsey (West Sussex, U.K.) for the lobster, *Homarus gammarus*. A fleet of 14 full-time fishing vessels operate from the fishing station utilising offshore moorings which are afforded protection from the prevailing southwest winds by Selsey Bill. In addition 20 or so part-time boats occasionally fish in this area. The fleets' main targets are lobster, crab and whelk. The lobster and crab fishery is managed locally by a byelaw from the Sussex Sea Fisheries District Committee (SSFDC); a maximum of 300 pots per vessel are permitted within 0-3nm of the district.

Previous studies by Sea Fisheries Committees (SFCs), and CEFAS showed a high proportion of the pot caught lobsters off Selsey are less than the minimum legal size (87mm carapace length). After the pots have been retrieved undersized individuals are returned to the sea. Evidence suggests that the entrapment and subsequent return of lobsters can result in damage and mortality. This damage/mortality is associated with:

- 1) Fighting within the pots; lobsters are highly territorial and it is common off Selsey to entrap ten lobsters per parlour pot.
- 2) Retrieval and the clearing of the pots; this can cause physical damage and stress to the animal.
- 3) Relocation; individuals are not returned to the same place on the fishing ground; this relocation can result in a loss of territory and increases the likelihood of predation.

Research shows that the fitting of escape hatches to allow small lobsters to escape from lobster pots can be beneficial; see Lovewell (UnPub.), Krouse (1978), Fogarty & Borden (1980), Brown (1982), Lovewell & Addison (Unpub), Lovewell & Addison (1991) and Brown (1979).

The inshore pot fishery off Selsey is associated with a limited bycatch of other crustacean, notably edible crab (*Cancer pagarus*) but there is no significant velvet crab (*Necora puber*) bycatch.

Aim

To investigate the potential benefit of using escape hatches in lobster pots off Selsey; specifically to:

- a) improve the size selectivity of the lobsters caught.
- b) reduce the mortality of lobsters below the minimum legal size.
- c) decrease the sorting time to remove undersized lobsters from the catch.

d) deliver this research in partnership with the Selsey Fisherman's Association as a voluntary scheme.

Materials

The SeaFish grant enabled 6,000 lobster escape hatches and 48,000 cable ties to be purchased. These were then distributed by the Selsey Fisherman's Association. The use of lobster pot escape hatches, their design and optimum size has been described by Lovewell and Addison (1991). Following a meeting with the Selsey Fisherman's Association a hatch design with an inner hole size of 80mm x 45mm, with a marked cut-out-point of 84mm and 46mm, was chosen. A hatch of 80mm x 45mm facilitates the entrapment of lobsters > 85mm in carapace length, even though the minimum legal size of lobsters is 87mm. This design was chosen for two reasons. Firstly, there is some debate as to the ability of legally sized lobsters to escape through hatches larger than the 80mm x 45mm size. Secondly, it recognises the possibility that the minimum legal size might be increased in the future: a hatch of these dimensions could be 'cut-out' to a larger size of 84mm and 46mm if required.

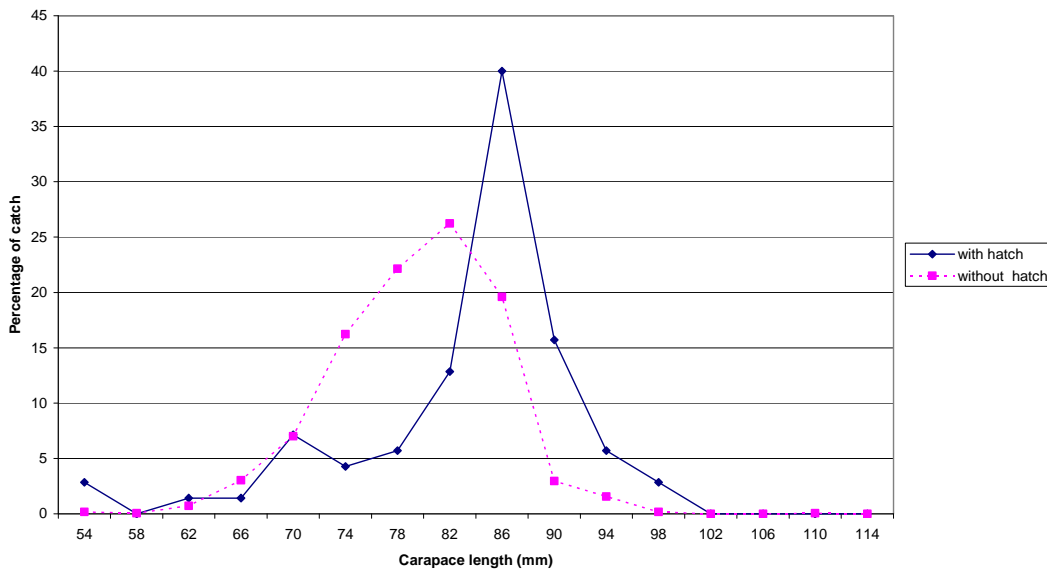
Methods

A survey of the Selsey lobster fishery was conducted to measure the carapace length of lobsters caught in parlour pots with escape hatches. To examine the effectiveness of the escape hatch the length frequency of entrapped lobsters was compared to data collected in a previous study (conducted on the same fishing grounds), this research recorded the length frequency of lobster caught prior to the fitment of the escape hatches. The assessment was undertaken by comparing the average size of the catchable lobsters in the pre- and post-hatch studies using a Wilcoxon Test and by comparing the length frequency distribution of the catchable population using a Kolmogorov-Smirnov test.

Results

	With hatches	Without hatches	Total
N	70	1779	1849
Mean	81.88	77.84	78.00
Var	79.46	36.90	39.07
Median	85	78	79

lobster length frequency from parlour pots with escape hatches and without escape hatches



The average carapace length of the lobsters in the pots fitted with escape hatches was larger (mean \pm SE: 81.88 \pm 1.065), than those not fitted with escape hatches (mean \pm SE 77.84 \pm 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; $t(1848) = 6.360$, $p < .001$. 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 $P = < 0.001$). There is variation in sample effort. Pots without escape hatches ($N = 1779$) and with escape hatches ($N = 70$). The samples were also not taken in the same year. It is possible that these factors could influence the results

Conclusion

This study has shown there are a variety of advantages to using escape hatches in the inshore Selsey lobster fishery. Fitting escape hatches to lobster pots reduces the number of sub-legal size lobsters retained. In this study, in pots fitted with escape hatches, fewer undersized lobsters were caught and the average size of lobsters retained in the pots was bigger. This could result in reduced damage and mortality of sub legal lobsters. It could also increase the marketable value of legal lobsters by reducing damage to them. Furthermore catching fewer undersized lobsters decreases the time to clear the pots.

There is a need to revisit the study to increase the sample effort from pots with escape hatches fitted. Ideally pots should be sampled in the same year to reduce sample error. Alternatively a study to examine the change in catchable population structure (using non hatched pots) would have the added benefit of describing changes in the population structure over time.

The study demonstrates how stock conservation techniques can be applied on a voluntary basis; by quantifying the results the value of such measures can be communicated to the project partners.

This project was delivered with funds from SeaFish in partnership with the Selsey Fisherman's Association the Sussex Sea Fisheries Committee. This highlights how localised management measures can be used for conservation gain and how conservation measures can be instigated voluntarily.

Acknowledgements

On behalf of the Sussex Sea Fisheries Committee thanks are extended to all the commercial fishermen who made this study possible, and who kindly allowed the conducting of the research aboard their vessels. Without their assistance such a study would not be possible. The study was funded by a SeaFish Inshore Fisheries and Aquaculture Technology Innovation and Development Grant. Steve Lovewell, CEFAS, also provided much needed advice.

References

- Lovewell, S., Addison, J., Dapling, T., and Dillon, B, Unpub. Joint study on the effect of escape gaps in crab and lobster pots in candidate Special Area of Conservation on the north-east coast of England and Wales.
- Krouse, 1978. Effectiveness of escape vent shape in traps for catching legal-sized lobster, *Homarus americanus*, and harvestable-sized crabs, *Cancer borealis* and *Cancer irroratus*. Fishery Bulletin. Vol, 76, No 2.
- Fogarty, M, J and Borden, V.D. 1980. Effects of trap venting on gear selectivity in the inshore Rhode Island American Lobster, *Homarus americanus*, fishery. Fishery Bulletin: vol. 77. No. 4
- Brown, 1982. The effect of escape gaps on trap selectivity in the United Kingdom crab (*Cancer pagarus* L.) and lobster (*Homarus gammarus* (L.)) fisheries. J. Cons. Int. Explor. Mer. 40:127-134.
- Lovewell, S.R. and Addison, J.T. Unpub. Escape gap experiments in a lobster and crab fishery off the east coast of England. Report to the ICES Shellfish Committee CM 1989/K:29
- Lovewell, S.R. and Addison, J.T., 1991, Size composition and pot selectivity in the lobster (*Homarus gammarus* (L.)) and crab (*Cancer pagarus* L.) fisheries on the coast of east England. Ices J.Mar. Sci., 48:79-90
- Brown, C.G., 1979 Trials with escape gaps in lobster and crab pots. Fish Not., Maff Direct Fish. Res., Lowerstoft, 62, 9pp