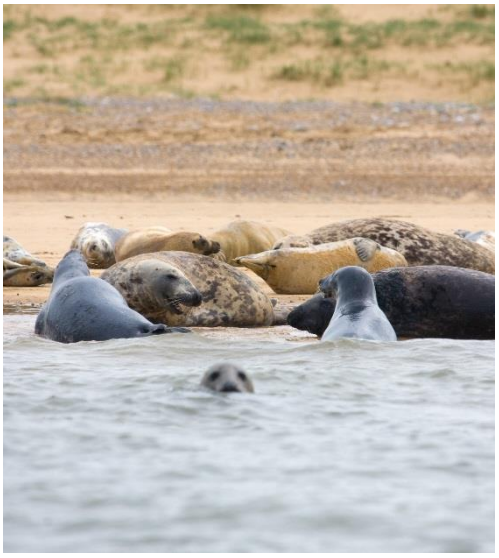
Marine Management Organisation

Assessing Non-Lethal Seal Deterrent Options [MMO1131]

Aim

Interactions between seals and fisheries include eating of fish catches by seals and entanglement of seals in fishing gear. This project explored how to deter seals from around fishing nets to avoid the associated risks to seals. This project is based on three aims;

- review available literature and data to understand the nature of interactions between seals and fisheries, the factors which influence these interactions, and potential non-lethal deterrent methods and their effectiveness
- undertake a programme of stakeholder engagement through a fishermen's survey and a workshop to gain a detailed understanding of the issue of seal depredation and by-catch in fisheries throughout England, and inform on the potential for at-sea trials of a deterrent
- conduct at-sea trials of a seal deterrent in a capture fishery, to determine its effectiveness and identify any issues for at-sea deployment



Introduction and methodology

Interactions between seals and fisheries include depredation of fish catches by seals and bycatch of seals in fishing gear. Throughout England, particularly in the south-west, north-east and east, depredation is an issue for static net fisheries in particular, that can lead to significant economic costs to fishermen from loss of commercial catch, increased gear handling times and gear damage. Interactions can also lead to seal mortality through either legal shooting ('Netsmen's Defence') or as a result of accidental bycatch.

The Marine Management Organisation (MMO) commissioned this project to understand the interactions between seals and fishing gear and to examine non-lethal deterrent options such that the MMO is better able to offer advice that can reduce the negative interactions between seals and the fishing industry.

The project met these objectives through four main tasks. These are reported on in detail through three individual reports.

1) Desk-based literature and data review - Inform understanding of the nature of fishing gear/seal interactions, the factors which influence these interactions and potential non-lethal deterrent methods and their effectiveness
2) A programme of stakeholder engagement through survey and interview - Gain a detailed understanding of the issue of seal depredation and by-catch in fisheries throughout England
3) Expert/steering group workshop - Review the above outputs and inform on the preferred deterrent to be trialled, the geographic area for the trials and the trial design
4) At-sea trials of the chosen deterrent method - Determine the effectiveness of the deterrent and identify issues for at-sea deployment

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Results

A combination of literature review and engagement suggest that stagic gear fisheries experienced the largest seal fishery interactions, that interactions reflected the distribution of seal populations around the country, and that interactions peaked over the summer months possibly as a result of higher level of fishing activity in this season.

Influences of depredation rates include how long and how deep nets are soaked, where and when fishing occurs and the type of fishing gear. Gear modifications and fishing tactic changes were explored for their potential to avoid or minimise negative seal-fishery interactions but little evidence was found for their efficacy. The report also explored deterrent techniques such as Acoustic Deterrent Devices (ADDs) that were the most documented method of preventing depredation particularly in aquaculture. Because changes to fishing tactics and avoidance measures tried by fishermen had not been successful stakeholders wished to explore at-sea trials of emerging ADDs technologies.

The Genuswave Acoustic Startle Device (ASD) was selected for the trials. The device triggers an insitinctive startle response that causes a seal to move away from the sound. The device is not at commercial readiness for deployment at sea and required some development for this trial. Trials were conducted in a mackerel net fishery in Torbay and appears to have increased fish catch by an average of 74% compared to the net without the ASD. Due to technical difficulties deploying the prototype ASD at sea there was a high variability in catches and the effectiveness of the ASD, with the modelled increase in catch ranging from 5% to 189%.

Conclusions and recommendations

Fishermen report experiencing interactions with seals leading to depredation losses. Changes to fishing practices have not been shown to be effective although ADDs can be at least partially effective. Of the ADDs, the Acoustic Startle Device inducing a startle reflex in seals shows promise for increasing catches by reducing seal depredation as shown in the static net fishery in Torbay. However, further development is required. The technical issues encountered, and the characteristics of the Torbay fishery (shallow depth, overnight soak times) mean that the results may not be generalisable to different locations or fisheries. Further testing and improvements are required - to increase robustness, ease of handling, and applicability to other fisheries - for the ASD to be considered a viable non-lethal deterrent. Interactions between seals and fisheries are likely to continue as seal populations increase, and a viable solution is needed for the benefit of both the fishermen and the seals.

MMO comments

This report has been valuable in describing currently available non-lethal deterrent options and exploring detterent effectiveness. This work will MMO improve the advice MMO can give. MMO will continue to support the development of technical solutions such as acoustic startle devices.

Further information

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