Project UK, Fisheries Improvement – SW Crab & Lobster

Alternative management & gear measures, P2 Reducing Bycatch

*‘There is a need to review alternative management measures to minimise UoA-related mortality of all non-target primary and secondary species caught by this fishery’.*

Conduct review of alternative management measures for non-target species.

Background

Review of measures to further reduce such catches is relevant, but is likely to have minimal impact of the status of these species.

When looking at the crab pre-assessment with relation to bycatch the levels can be seen to be very low as a percentage of total catch weight with only Lobster, which is a secondary commercially valuable species, totalling over 1%. Bycatch is seen to be occasional only and with the exception of whelk all other species total less than 0.5%. Species which are bycaught include velvet & spider crab, wrasse, conger eel and some mixed ray species. In order to improve the scoring of P2.1.2 a review to further reduce such catches is seen as relevant.

No mainsecondary species have been identified for this fishery, but a range of very low volume (<½%) bycatch species can be identified as minor secondary species. These secondary minor species are – whelk; velvet crab; spider crab; crawfish; pollock; wrasse; starfish; green crab; conger; blonde ray; small-eyed ray. Only one of these, whelk (also the subject of a high volume targeted fishery that uses quite different gear), may involve a slightly higher volume (at <1%)

Review of alternative management measures

Gear measures to reduce bycatch

In the main Crab’s and lobsters are targeted and caught using set pots/traps. These pots will have a range of designs depending on a variety of factors including the area being fished; the size of the vessel and in many cases the skipper’s preference. Crab and lobsters are also caught, generally as a bycatch, in static nets and during demersal trawling. In terms of reducing bycatch in the pot fishery there are a number of measures that could be adopted to help reduce bycatch.

* Escape gaps – These are mandatory within certain fisheries. These were designed mainly to allow undersized crab and lobsters to escape but are also effective in reducing unwanted bycatch.
* Mesh size – increasing the mesh size used in pot construction, and moving from double to single netted pots would increase the size of the escape opportunities for juvenile fish/crab bycatch.
* Parlour pots – these pots are designed to assist in the retention of crab/lobsters by removing the opportunity to escape which will also be true of the larger bycaught species. Removing the parlour element of the pots would allow greater opportunity for escape of the bycaught species. Though would also directly affect the retention of target species particularly during longer soak times. There could be a possible to redesign the parlour entrance to further reduce bycatch.
* Entrance design (soft eye, bucket, hard eye) as with the parlour design the type of entrance used will affect the retention of both target and bycaught species.
* Pot base design- some designs of pots use a plastic base rather than the more common steel bar design. This could restrict the opportunity for escape of species such as rays during the hauling process.

Management measures to reduce bycatch

There is a suite of management measures available to reduce effort with shellfish fisheries. Some of the management measures are listed below:

* Shellfish permits & Licencing
* Effort restrictions such vessel size and power (Kw Days)
* Size & Power limitations of vessels
* MLS
* Pot limitations & tagging of pots
* Fleet lengths
* Seasonal Closures
* Area closures & gear restrictions
* Real time reporting
* Avoidance areas

Any restrictions on effort directed at reducing catches of target species will have an obvious knock on effect on the levels of bycatch. More appropriate management measures, with respect to bycatch, may be the likes of seasonal closures or real time reporting and avoidance areas where bycatch in the fishery is highlighted as a greater issue.

Levels of Management

Management of shellfish fisheries is not only imposed at an EC level but also at a national level by the Marine Management Organisation (MMO) and regionally, in England by the Inshore Fisheries Conservation Authorities (IFCA’s).

The measures imposed at an EC level generally relate to the Minimum landing size of Shellfish and the level to which detached claws can be landed as a percentage of weight and a by catch limit.

National legislation managed by the MMO restricts the number of shellfish licences available (in England & Wales) and also prohibits the landing of berried or soft crab in certain areas.

IFCA measures vary depending on the area fished a table of measures used by the IFCA’s is show below:

**Matrix of measures from the IFCA’s**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Title of Byelaw**  | **Northumberland** | **North Eastern** | **Eastern** | **Kent & Essex** | **Sussex** | **Southern**  | **Devon & Severn**  | **Cornwall**  | **Isles of Scilly** |
| **Shellfish Permits**  | Yes  | Yes\*  | Yes\*  | No | Yes  | No  | Yes  | Yes  | No |
| **Minimum Landing Size**  | No  | Yes – 140mm  | Yes – 115mm  | No | No  | No  | Yes, 160mm formales | Yes, 150mm (females),160mm (male)  | No |
| **Maximum Pot Limit**  | Yes - 800  | No  | No  | No | Yes  | No  | No | No  | No |
| **Escape Gaps**  | No  | Yes\*  | Yes\*  | Yes | No  | No  | Yes  | Yes  | No |
| **Maximum Vessel Length**  | Yes -12m  | Yes - 16m  | No  | Yes – 17m | Yes – 14m  | Yes - 12M  | Yes - 15.24M  | Yes - 16.46M  | Yes - 11M |
| **Towed Gear Restrictions**  | No  | No  | Yes  | No | No  | No  | Inshore PottingAgreement Area  | No  | No |
| **Prohibits the Use of Crab for Bait**  | Yes  | Yes  | Yes  | Yes | No  | No  | No  | No  | No |
| **Prohibits the Removal of Parts of Crabs**  | Yes  | Yes  | Yes  | Yes | No  | No  | Yes  | Yes  | No |

Ghost fishing & the retrieval of lost Gear

Ghost fishing with pots has the capability of effecting the level of bycatch caught in the fishery. Efforts need to be put inplace to minimise the possible impact of lost or un-retrieved gear. In discussions with SW fishermen regarding lost gear and the methods used to retrieve it. The majority of shellfish fishermen working pots, carry or have access to a ‘creep’ which is heavy metal bar which has angled teeth to pick up any rope. The creep will be towed by the vessel across at right angles to the area where the lost gear was recorded as being set in the hope of snagging the back line of the string of pots.

Fishermen have a vested interest in ensuring that they not only retrieve any lost gear but also mark their gear and accurately record its position in the first place due to the costs involved. An individual pot can cost upwards of £50 each with many vessels working strings with up to 100 pots the cost of any lost gear is substantial. Older pots that are nearing the end of their useful life are generally brought ashore as element of the pots such as the entrances and hooks/ties will be stripped and reused. Another factor that has influenced how skippers deal with older pots is the introduction of an EMFF grant fund for the replacement of fishing gear where older pots that are replaced with newer more selective pots are subject to up to 80% funding. This has led to many fishermen bringing in their old pots and replacing them with the assistance of the grant.

Pots lost during adverse weather conditions are generally searched for by fishermen to prevent the financial loss and the need to replace them. The weather can also have a dramatic effect on the gear itself with many pots damaged beyond repair and certainly beyond being capable of catching further shellfish or fish.

The use of a device to open the pot after a given length of time when submerged could assist in reducing the impact of any pot lost on the seabed. There will generally be a cost associated with fitting such a device.

Recording

Improved recording of information on bycatch species by skippers would assist in a clearer understanding about the levels and reasons behind the bycatch. This could possibly included as a more formal entry on the logbooks currently filled out by skippers for both the MMO & IFCA’s.

Recording App

Cornwall IFCA worked with a local app developer to develop the i-catch app for vessels fishing in the Cornwall IFCA district. The ability to enter national Shellfish returns has recently been enabled by the MMO. Digital returns by fishermen may also assist in improving bycatch recording.

Table of the effects of gear modifications

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Effectiveness of minimising mortality of unwanted catch** | **Effect on Crab/Lobster Catch & impacts on vessel & crew safety** | **Impact on other species or Habitats**  | **Cost** |
| **Escape Gaps**  |   |   |   |   |
| **Restricted use of parlour pots** |   |   |   |   |
| **Pot Base design** |   |   |   |   |
| **Mesh Size**  |   |   |   |   |

Escape Gaps

Escape gaps as used in many pot fisheries around the UK are seen as an effective way of minimising the mortality and damage of unwanted catch and reducing sorting time by allowing undersized specimens to escape. This reduction in the number of crabs remaining in the pots will have a positive effect on crew safety by reducing the weight of the pots being handled. It will also have a positive impact of other species as it may also provide them with the opportunity to escape. There is a capital cost associated with buying the escape gaps and the time spent by fishermen to fit them. Depending on the size of the escape gap there may be some loss of the commercial catches.

Restricted use of parlour pots

Parlour pots or pots with parlour type entrances are commonly used by UK fishermen and now make up the majority of pots currently deployed by fishermen. The advantage of a parlour pot design or parlour type entrance is that once the crab/lobster has entered the pot there is very little chance of escape. Unlike the traditional inkwell design were the crab/lobster enters the pot through a bottomless bucket, over time the crab/lobster is quite capable of finding its way out. The same will apply to the bycatch species particularly fish who will find it very easy to swim in and out of a bucket type entrance but be restricted by the one way design of the parlour pot.

The other advantage that a parlour pot will give fishermen is that as catches are generally retained they do not have to haul the gear as often as they might with a standard inkwell design. This will improve catch per unit effort and avoid them having to work in weather conditions they might otherwise have gone to sea in if they thought their catch was likely to escape.

The downside of the parlour pot is that mortality of species catch in this style of gear is increased due to longer soak times and increased risk of predation amongst the captured animals. The introduction on limits on parlours will also have a negative impact on profitability due to reduced catches per unit of effort.

Pot base design

There are a variety of pot base designs in operation the most common are either a solid plastic base or a metal ‘grill’ design. The use of a grill design base could improve selectivity as it is more likely to let the smaller fish and shellfish escape between the bars particularly when the pot is being hauled. There would be a high cost associated in adapting solid base pots to a grill design both in the capital cost of the bases and the time required to make the adaptations.

Mesh size

Currently the industry uses a standard size mesh when designing and making pots. Some of the designs also include double meshing the pots to ensure that if one mesh breaks you have a back-up avoiding a hole in the pot. There may be an opportunity to look at the current mesh sizes being used in the industry and optimise the size of the mesh to improve the selectivity of shellfish and fish. This would be more applicable to the design of new pots as to change mesh size of a currently manufactured pot would be restrictively expensive.