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Reducing discards of fish at sea: a review of European pilot projects

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ABSTRACT

This paper is about improving the viability of discard-reduction pilot projects. One way to address the problem of wasteful discarding of fish at sea is to initiate pilot projects to trial potential solutions, such as selective gear, area closures, discard bans and data enhancement, which could subsequently be adopted by the fishing industry, either voluntarily or through regulation. However, such pilot projects are often difficult both to set up and to sustain through to completion and implementation. This study reviewed 15 discard-related pilot projects to find out what were the most important determinants of their success or lack of it, and to recommend ways in which the prospects of future pilots could be improved. The review identifies the seven most important factors associated with the viability of the pilot projects - fisheries crises; incentivization; funding; expertise; leadership; and enforcement - and shows how fisheries regulators could take steps to reinforce these factors – by faster responses to crises; more incentives and funding; greater use of fishers' knowledge and leadership; and better enforcement mechanisms.

1. Introduction

Discarding is a common practice in commercial fisheries, yet there is widespread agreement that the discarding of fish and other marine organisms by fishers has both a damaging ecological impact (Anon, 2004; Cook, 2001; Kelleher, 2005) and a negative economic effect on commercial fisheries (Pascoe, 1997; Alverson et al., 1996). Many steps have been taken during the past 30 years to lower discard rates, with varying degrees of success (Suuronen and Sarda, 2007; Valdemarsen, 2003; Lart, 2002; Pascoe, 1997; Cappell, 2001). One step has been pilot projects to test discard-reduction techniques, but, disappointingly, few pilots have been initiated, completed and implemented (Kennelly and Broadhurst, 2002). In 2006, in an attempt to promote these projects, the EU funded a study to analyse the 'difficulties of setting up pilots to reduce or eliminate discards in cooperation with the fishing industry' (Catchpole, 2008). This paper is a review of the findings of that study.

The study examined 15 discard-reduction pilot projects [hereafter referred to as 'pilots'] (Table 1), three each from England and Ireland, two each from Scotland and France, and one each from Sweden, Germany, the Netherlands, Italy, and the Baltic Sea – all of them involving large-scale fisheries. Nine of the pilots trialled selective gears, including coverless trawls, large diamond meshes, separator panels, square mesh panels, grids, square-mesh codends, codend windows, and beam-trawl modifications. The other six pilots trialled data enhancement, data self-sampling, data monitoring, real-time closures, and a discard ban. In the paper, reasons why some pilots were more successful than others are identified and discussed, in order to improve the planning of such pilots in future. Section 2 explains the review method used in the paper; Section 3 outlines the 15 pilots; Section 4 discusses the findings of the review; Section 5 presents recommendations for the conduct of future pilots; and Section 6 summarizes the paper.

2. Method

To obtain the data necessary for this study, questionnaires were sent to 210 fishing industry organizations, 20 scientific institutes and 20 regulatory bodies, across nine EU Member States, though only 31 returns were received (an 11% return). In addition, 62 interviews were conducted. The total of 93 responses came from 43 industry members, 31 scientists, 17 regulators, and two NGO representatives, located in 13 EU Member States. Also, use was made of documentary material, including scientific papers, technical reports, project reports, project proposals, Regional Advisory Council (RAC) communications, and EU Commission publications.

In interpreting the data, a template was constructed from two sources. The first source was a framework developed out of work conducted in Australia by Kennelly and Broadhurst (1996, 2002) for

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Table 1
List of the 15 pilots, their titles, objectives and sources of information.

Titles	Objectives	Source of information
Swedish *Nephrops*	Developing a selection grid and square-mesh codend to reduce fish catches in a *Nephrops norvegicus* fishery	Interviews with pilot participants; Valentinsson and Ulmestrand (2008)
French *Nephrops*/hake	Developing trawl modifications to reduce the capture of small hake in a *Nephrops* fishery	Interviews with pilot participants; Guigue (2007)
Irish Sea data-enhancement	Fishers self-sampling and increased observer coverage to improve information of discard patterns	Interviews with pilot participants; project proposals
French *Nephrops*	Developing trawl modifications to reduce the capture of undersized *Nephrops*	Interviews with pilot participants; Guigue (2007)
Dutch self-sampling	Fishers collecting independent data on plaice and cod discards in the North Sea beam-trawl fishery	Interviews with pilot participants; Aarts and van Helmond (2007), Dekker and van Keeken (2004; 2005)
Scottish real-time closures	Voluntary real-time managed closed areas to avoid catching juvenile cod in North Sea whitefish fishery	Interviews with pilot participants; <www.scotland.gov.uk/Topics/Fisheries/Sea-Fisheries/COMPLIANCE/closures;
English *Nephrops*	Marketing live *Nephrops* caught using the selective coverless trawl design	Interviews with pilot participants; project proposal; Revill et al. (2006)
German discard ban (not yet started)	Mandatory landing of all catches including undersized and non-target fish to motivate more selective fishing	Interviews with pilot participants
Scottish self-sampling	Collecting independent catch data on Clyde Sea *Nephrops* trawl fishery	Interviews with pilot participants; Anon (2006a)
Italian square-mesh codend	Testing a square-mesh codend in commercial conditions in the Anconian trawl fishery	Interviews with pilot participants; Lucchetti et al. (2006)
Northern Irish *Nephrops*	Three projects: collecting independent catch data; developing selective trawls; switching to creels	Interviews with pilot participants; Anon (2006b; 2007)
English beam-trawl	Improving beam trawl selectivity by chartering vessels, piloting designs and running a competition	Interviews with pilot participants; Revill (2003; 2007), Revill and Jennings (2005)
English self-sampling	Fishers collecting independent catch data on cod caught in the North Sea	Interviews with pilot participants; project proposal; Large et al. (2007)
Irish *Nephrops*/cod	Developing the inclined separator trawl to reduce catches of cod in the Irish Sea *Nephrops* fishery	Interviews with pilot participants; Rihan and McDonnell (2003)
Baltic Sea BACOMA	Develop trawl modifications to increase the selectivity to the Baltic cod trawl fishing fleet	Interviews with pilot participants; Suuronen et al. (2007)

addressing by-catch problems, which specified "five key steps" for "the successful development and adoption of solutions to improve selection in problematic gears" (Broadhurst et al., 2007: 2). The second source was work that identified the most important factors affecting the success of marine environmental projects in the Philippines and Indonesia: White et al. (2005) studied 17 integrated coastal management (ICM) projects and listed nine major factors; Pollnac et al. (2001) studied 45 community-based marine protected areas (MPAs) and listed five major, and 27 other, factors; Pomeroy and Carlos (1997) studied 43 community-based coastal management programmes and listed 11 factors; and Pollnac and Pomeroy (2005) studied 11 ICM sites and listed 16 factors. From these sources, seven factors stood out as most important to the rate of success of marine fisheries projects: 1) a perceived crisis in the fishery; 2) economic incentives; 3) stakeholder participation; 4) funding; 5) expert knowledge; 6) leadership; and 7) enforcement. The present review of the levels of success in the pilots is based on the template afforded by these seven factors (Table 2). The definition of 'success' is the extent to which a pilot achieves its objectives, which vary in content from one project to another, but which are divisible into four categories: first, *initiating* the pilot trial; second, *completing* the pilot; third, *validating* the trialled technique; and fourth, *implementing* the validated technique. The contrast between one project and another was often not success versus failure, but different degrees of success in initiation; completion; validation; and implementation. In Table 3, these degrees of success are given an arbitrary score out of 10 (where 1 = lowest; and 10 = highest).

3. Outline of pilots

The 15 pilots reviewed are as follows:

3.1. Swedish Nephrops pilot

To allow *Nephrops* trawling to continue during a Swedish national ban on all cod fishing in 2002, this pilot was initiated by scientists and fishers to find a technical solution to minimize the by-catch of fish. The Nordmore grid was trialled successfully, and it became compulsory in 2004 for *Nephrops* trawling by Swedish vessels in areas of Swedish waters agreed with the fishing industry, providing near-complete protection for adult round fish to trawl fisheries. Additional incentives to skippers to adopt the grid and square-mesh codend included partial financing for the gear; exclusive access to otherwise closed areas for trawling; and unlimited days fishing, which resulted in over 90 vessels (out of 110) using the gear in 2006. But lack of similar incentives in other EU Member States meant that the take-up rate by non-Swedish vessels was very low. For example, no Danish vessel uses this grid today.

3.2. French Nephrops/Hake pilot

To reduce the high level of hake discarding by *Nephrops* trawlers in the Bay of Biscay, in 2002 the European Commission instituted a hake recovery programme in which the minimum mesh size (MMS) was raised from 70 to 100 mm, but agreed to the French government's request for a two-year derogation to allow time for the industry to develop alternative solutions. The pilot, which was initiated by the industry, trialled various gears, and found that the most effective device for reducing hake by-catch was the 100 mm square mesh panel (SMP). By agreeing to use it, the French *Nephrops* fleet persuaded the Commission to allow them access to the 100 mm closed box for 12 months (annually requestable). Because the National *Nephrops* Committee (NNC) made the use of the SMP a condition of obtaining a licence, its take-up rate has been high.

3.3. Irish Sea data-enhancement pilot

In 2006, the Commission proposed that where a stock's spawning stock biomass (SSB) or fishing mortality was poorly known, a 25% default reduction in TACs and (where applicable) fishing effort would be applied. This stimulated the North Western