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Short communication

The survival of discarded lesser-spotted dogfish (*Scyliorhinus canicula*) in the Western English Channel beam trawl fishery

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Abstract

A large number of lesser-spotted dogfish (*Scyliorhinus canicula*) are caught and discarded in the Western English Channel beam trawl fishery. Using onboard survival aquaria, the survival rate of such fish discards was estimated to be very high (98%). The fish had been subjected to harsh conditions during the capture, towing and deck-sorting processes suggesting that the species is relatively resilient to such rigours.

Keywords: Lesser-spotted dogfish; *Scyliorhinus canicula*; Discards; Elasmobranch; Survival; Beam trawl; Western English Channel

1. Introduction

In many trawl fisheries a large number of non-target species are captured alongside the target species (e.g. Hall, 1996; Crowder and Murawski, 1998; Stobutzki et al., 2001a,b). Unwanted by-catches and discarding are regarded as an unacceptable waste of natural resources, and may have a variety of adverse population, food-web, ecosystem and conservation consequences. Determining the survival rates of discards is a key stage towards understanding these wider consequences.

In the mixed catches of the Western English Channel beam trawl fishery, a large number of lesser-spotted dogfish (*Scyliorhinus canicula*) are caught (ca. 55,700 fish in 1158 observed hauls). Most fish are discarded (>99%), but we could find no information on their survival rate in this fishery. Understanding discard survival alongside other sources of mortality and mortality patterns will contribute to a better understanding of their population dynamics (Bonfil, 1994; Stevens et al., 2000).

The Western English Channel is located in ICES rectangle VIIe and supports a diverse demersal fish assemblage (Rogers et al., 1998, 1999). The fishing grounds are regularly exploited by a number of beam trawlers, primarily from the English ports of Brixham and Plymouth.

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The aim of this work was to determine the survival rates of discarded lesser-spotted dogfish in the Western English Channel beam trawl fishery that had been exposed to the commercial processes of capture, towing and deck-sorting.

2. Materials and methods

2.1. Location, time of study and vessel

The study was conducted aboard a commercial beam trawler working south of Devon in the Western English Channel in ICES statistical rectangles 29 E6 and 29 E7 (Fig. 1) during winter 2002 and summer 2003. Fewer trials were completed during winter than in summer owing to the poor weather conditions in winter, which made ship-borne aquarium trials problematic. The commercial beam trawler 'Jacoba' (BM77) (length overall, 27 m; gross tonnage, 108; main engine, 537 kW) was chartered for the duration of the study. The vessel was rigged for twin 8 m beam trawling using chain matrix ground gears and trawls with a codend mesh opening of 80 mm. It is a vessel typical of the fleet.

2.2. Tows and catch processing

All tows were conducted in a manner reflecting normal commercial practice. The tows were 2 h long and conducted at a towing speed of 4–5 knots over the ground in waters 60–80 m deep. The catches were emptied directly onto a purpose-sectioned area of the deck and the crew sorted the catch in the usual manner, selecting for target species (primarily flatfish).

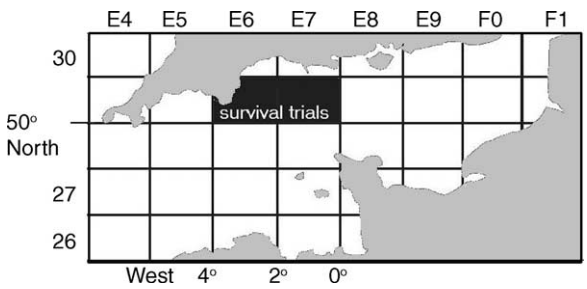

Fig. 1. Location of the survival trials and beam trawl surveys in Western English Channel.

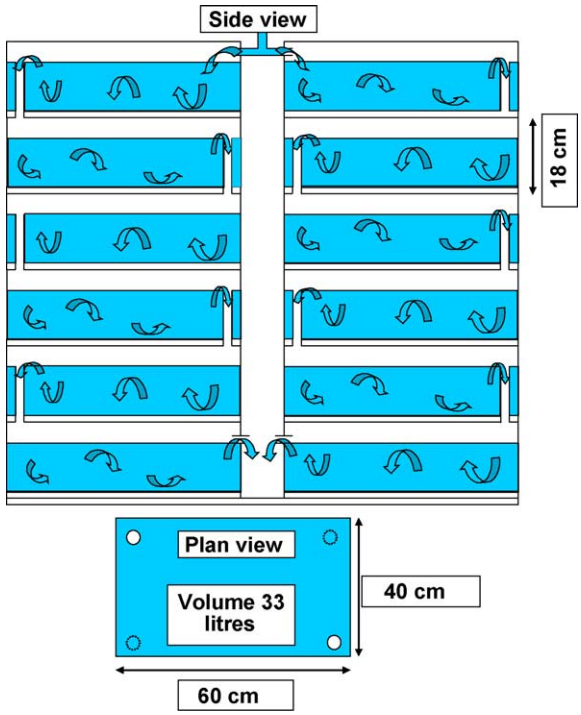

Fig. 2. Schematic of the survival tanks. The upper portion shows a front view and the lower portion shows a view of one tank from the top.

This invariably involved the crew walking among and over many discard fish. After 20 min of sorting, lesser-spotted dogfish were removed from the catch and transferred to a rack-mounted system of plastic survival tanks (Fig. 2). There were no control fish.

2.3. Sampling

Four fish were randomly removed from each tow during six separate tows until the tank system was full, with 24 dogfish. The 12 tanks were stocked at a density of two fish per compartment and contained no substratum material. They were supplied with a constant flow of fresh seawater (10–15 l/min) and no feeding took place during the subsequent observation period (Table 1). The average observation period was 48 h. The tanks were secured inside the forward shelter deck and were therefore subject to some vessel motion. The whole procedure was repeated a total of five times, providing survival data from 120 fish taken from 30