



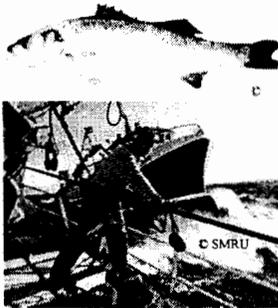
Investigations into Dolphin Bycatch in a Pelagic Trawl Fishery

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Introduction:

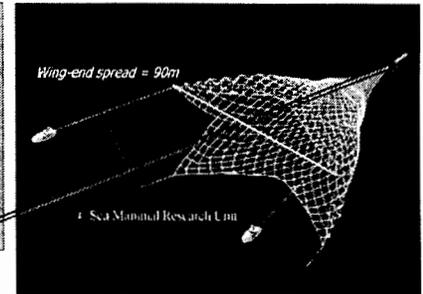
Dolphin bycatch has been reported in many trawl fisheries around the world, but because such events usually occur very rarely, it is very difficult to study how or why they occur, or to find solutions that can be demonstrated to work. We have been studying dolphin bycatch in one small pelagic trawl fishery since 2001. The work is a collaborative study with some of the fishermen involved. Funding agencies are listed below.

Sea bass - *Dicentrarchus labrax*



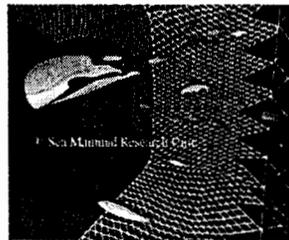
The Fishery for Bass:

Bass is an economically important fish. UK Pelagic pair trawls take about 7% (112 tonnes in 2003) of UK bass landings. The UK offshore pair trawl fishery consists of between 2 and 7 pairs of Scottish boats that fish in the Channel - mainly in March. A schematic diagram of the fishing operations is shown at the right. Vessels shown at the left are 15m. Dolphin bycatch rates are highly variable (a factor of 10) year to year. Initially all recovered dolphins were found in the extension piece near the cod end.



We found that:

- Core body temperatures of bycaught dolphins showed that they can get caught *at any time* during the ~7hr tow.
- Many tows are carried out by steaming in a straight line for 6 to 7 hours, so *course changes* are not associated with bycatch.
- Bycatches occur during both *day and night* tows.

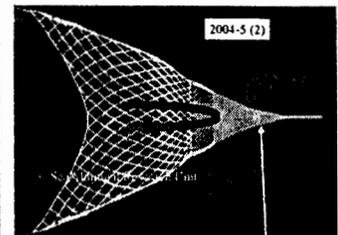
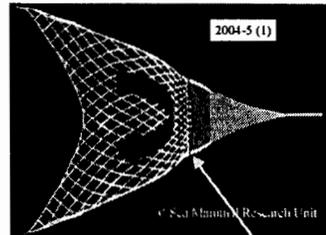
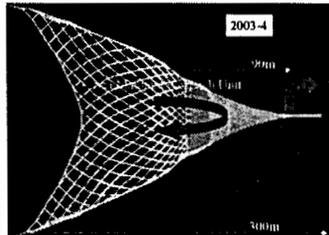


It is not possible for dolphins to get caught in the front part of the net where *meshes are at least 4m*. Dolphins almost certainly enter the net, at the least some of the time, in order to *feed on small fish* such as sardines and mackerel as they are corralled through the net. Using a *specially designed video monitoring system*, we have observed dolphins, apparently feeding, at the front of the extension piece.

A rigid steel grid with an escape hatch and cover net was used to keep dolphins from the last net sections. In 2002-3 one pair with a grid took 2 dolphins in 41 tows, while 32 observed tows in 2 other pairs took 28 dolphins. We assumed dolphins had either escaped or been deterred from the back of the net.

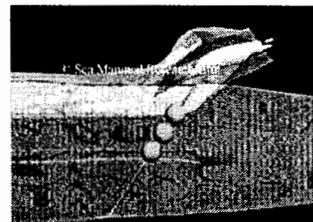
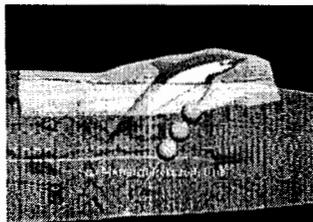
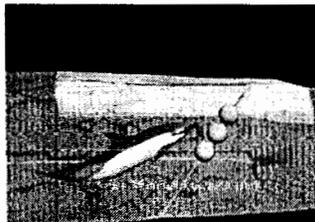


We tested two different escape hatch designs in 2003-4. One with a larger (2.3m long) escape hole and a 5mm cover net had a **60% lower by-catch rate** than the other. We assume the larger hole was easier to escape from. Bycatches occurred further forward.



In 2004-5 a 20cm mesh net barrier was used to exclude dolphins from the mid section. No dolphins were caught, but **fish catches were reduced by 90%**.

We then moved the grid forward to ~40m in front of the extension piece; **9 dolphins were seen to escape here**, but **33 more still died** in the mid-section, further forward.



We are sure that dolphins are capable of identifying a hatch and manoeuvring through it. We will now make the escape hatches more obvious and easier to escape through, while keeping fish in. We will also see how far we can move the barrier forwards before it begins to affect fish catches or towing speeds. Although not yet working adequately, bycatch rates have been substantially reduced. Minimising dolphin bycatch means *understanding their behaviour*.

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