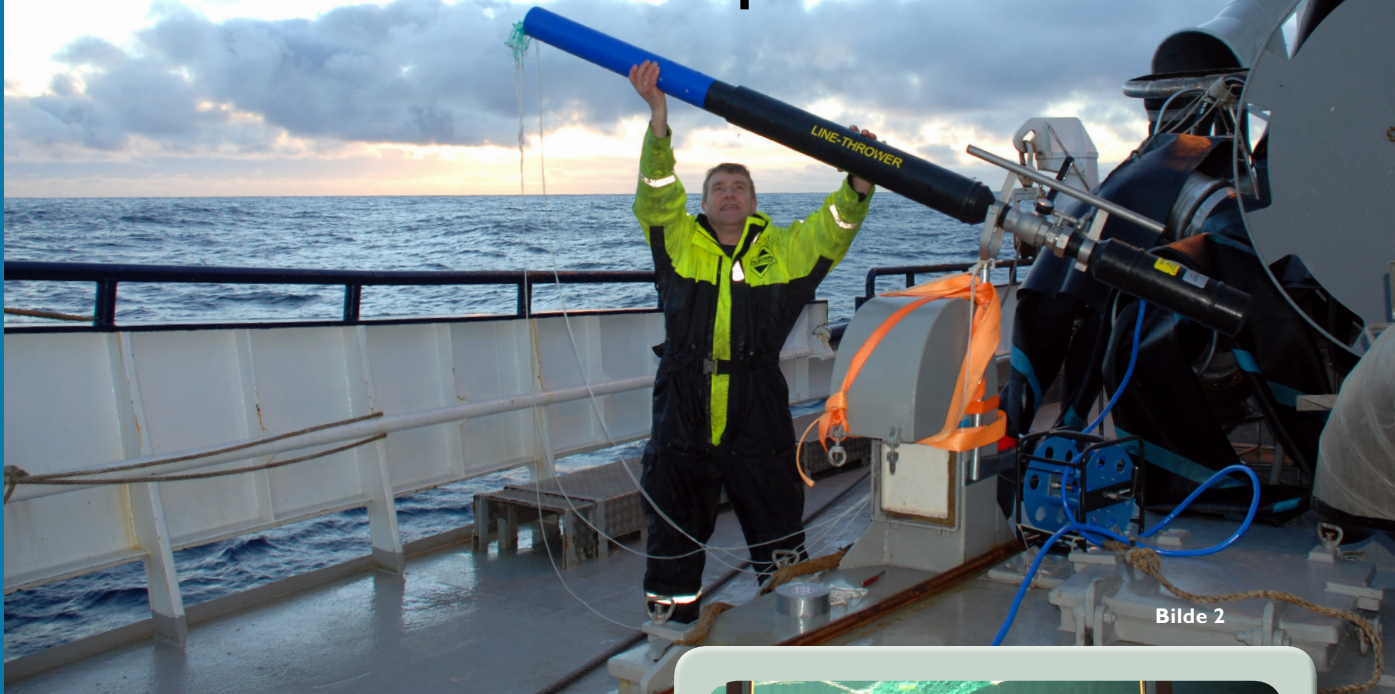


Fish sampling by shooting a “mini-trawl” into the purse seine



Bilde 2

When purse seining for pelagic species, it is often desirable to get a sample of the catch during the early phase of pursing. The Institute of Marine Research and SINTEF have now jointly developed a method that may revolutionise that sampling process: using a modified line thrower to shoot a mini-trawl into the purse seine.

BY BJØRNAR ISAKSEN

Since size and quality have a big impact on the price obtained for pelagic species, it is important to determine the contents of the catch at an early stage of each haul. Given new knowledge about how crowding can harm pelagic species and raise their mortality rates, there is every reason to believe that traditional sampling techniques may be prohibited, as they involve crowding the fish, taking a sample and then discarding the catch after determining the size and quality of the target species.

IMPORTANCE OF FLEXIBILITY

In 2010, The Institute of Marine Research was allocated R&D funding by the Fishery and Aquaculture Industry Research Fund for its project on “Environmentally and resource friendly purse seine technology”. One of the subsidiary goals of the project was to develop a method for taking samples during the early phase

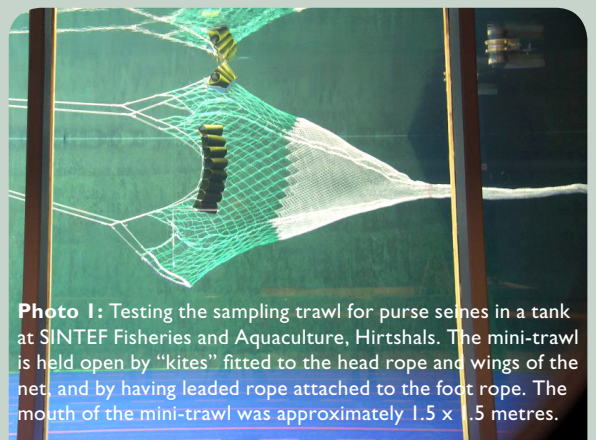


Photo 1: Testing the sampling trawl for purse seines in a tank at SINTEF Fisheries and Aquaculture, Hirtshals. The mini-trawl is held open by “kites” fitted to the head rope and wings of the net, and by having leaded rope attached to the foot rope. The mouth of the mini-trawl was approximately 1.5 x 1.5 metres.

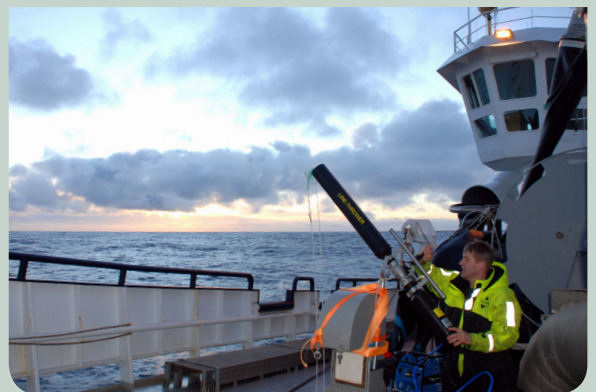
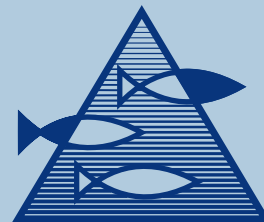


Photo 3: The mini-trawl is stuffed into a plastic pipe that in turn is put into the barrel of a modified pneumatic line thrower. When the pressure in the air chamber (back part of the line thrower) is 10 bar, the pipe containing the trawl is shot around 30 metres into the net. The line thrower is ready to shoot the pipe containing the sampling trawl; here it can be seen seconds before being fired.





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►► Fish sampling by shooting a “mini-trawl” into the purse seine

of pursing. Initial experiments involving false bulges in the net wall and transparent areas to simulate holes revealed that it is difficult to obtain a reliable sample from each haul.

After two years of work, we have reached the conclusion that it must be possible to deploy the sampling device at any point during the haul, rather having it permanently fitted to the net. The size and shape of the catch varies on haul-by-haul basis, and the sample must therefore be taken at whatever moment is appropriate for the haul in question.

TAKING SAMPLES USING A MINI-TRAWL

In 2012, The Institute of Marine Research and SINTEF Fisheries and Aquaculture, Hirtshals jointly developed a method that involves “shooting” a small sampling trawl (Photo 1), or “mini-trawl”, into the main net. The mini-trawl is held open using “kites” on the side and top panels, while the foot rope has leaded rope attached. If hauled at the right speed, and if the kites are the right size, the mouth of the mini-trawl is approximately 1.5 x 1.5 metres.

The mini-trawl is stuffed into a pipe that is in turn put into the barrel of a modified pneumatic line thrower (Photo 2). The line thrower is then pressurised to approximately 10 bar, and the pipe containing the mini-trawl is shot around 30 metres into the net (Photo 3). The length of the rope ensures that the trawl is pulled out of the pipe before the pipe hits the water. The trawl, with the pipe at its back end, is then allowed to sink at a speed of around 20 cm/sec to the desired depth, before being hauled back aboard the vessel (Figure 1).

During a recent trip with the “Endre Dyrøy”, the equipment was tested on three hauls, and good samples were obtained in all three cases. The best sample contained 135 North Sea herring from a 25-30 tonne catch (Photo 4), and the sample was taken when around 7/8 of the net had been hauled in (cf. the “white buoy” rule). The length distribution of the herring closely matched the length distribution of herring samples taken from the main catch when it was hauled aboard. This demonstrates that samples taken by a mini-trawl have the potential to be one of several decision-making tools used by captains when deciding whether to discard or keep a catch. To date the

equipment has only been tested in the dark, and we do not know to what extent it also works in daylight. Testing and development of the equipment will continue through 2013

INTERNATIONAL INTEREST

As soon as we returned from the test trip, the world’s largest producer of fish meal and oil, TASA, expressed its interest in testing the equipment in its purse seine fishery for anchovetas in Peru. TASA owns and operates more than 80 small and medium-sized purse seiners, as well as 16 fish meal factories. Like Norway, Peru has introduced strict rules on bycatches in fisheries for pelagic species. More specific: When fishing for anchovetas, the fishing vessels are fined if and according to what extent their catch contain a certain amount of fish below minimum landing size. Other measures may be realtime closures of fishing ground (RTC) as practiced in Norway.

To help avoid triggering these rules, the purse seiners are very keen to find out the size distribution of fish during the early phase of pursing, while it is still legal to release the catch. Primo January 2013, in collaboration with SINTEF, The Institute of Marine Research performed some initial test on demand from TASA. Daylight fishing on a fast-swimming species like anchovetas revealed that the sampling technique has to be improved with bigger minitrawl, and a faster towing speed.



Photo 4: Sampling trawl containing 135 North Sea herring in the size range 21-25 cm.

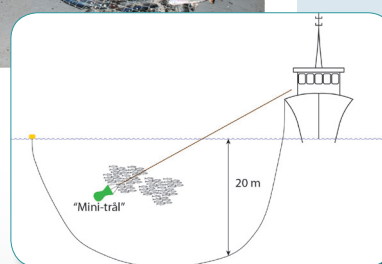


Figure 1: The sampling trawl is shot around 30 metres into the purse seine, and sinks to the desired depth at a speed of approximately 20 cm/sec. During the initial experiments it was hauled in at a speed of 1.5-2.0 knots.

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