Southern Seabird Solutions

Seabird Smart Solutions
A Collaborative Approach

Integrated Weighted Line

Sinking lines fast

In 2002 new line-weighting standards were brought in by CCAMLR[1] for Antarctic vessels using automated baiting/setting systems. These were to reduce the risk of seabirds becoming caught on baited hooks.

The line-weighting regime meant vessels had to attach heavy weights one by one as they set the line, and then take them off again as they hauled the line.

There must be a better way

Malcolm McNeill was managing several autoline vessels for the company New Zealand Longline Ltd at the time. Malcolm was determined to find a better solution than adding weights. On the other side of the world, Australian Antarctic Division seabird ecologist Graham Robertson was carrying out line weighting trials in Alaska's longline fishery with Washington Sea Grant scientist Ed Melvin.

They found that the line and hooks close to the weights sank quickly but those further away remained close to the surface for longer. This meant seabirds could still be caught.
Ed and Graham tried wrapping lead around lengths of line and then dropping this behind the boat to see how quickly it would sink. They found this achieved fast sink rates and a linear sinking profile.

Collaboration

Malcolm heard Graham and Ed talk about their trials at the 2001 International Fishers' Forum in New Zealand. Inspired by the idea of integrating lead into the line itself, he spoke with the fishing gear suppliers Fiskevegn, whose line-makers went to work figuring out how to put lead into a line without compromising the line's strength and durability.
In 2002, a trial of integrated weighted (IW) longline was carried out with various amounts of weight. The work was a collaborative experiment, with funding from the Australian Antarctic Division, Sealord, NZ Longline Ltd, International Association of Antarctic Tour Operators (IAATO) and fishing gear distributor Gourock. Fishing gear manufacturer Fiskevegn

[1] Commission for the Conservation of Antarctic Marine Living Resources

supplied four sample ‘magazines’, each containing a differently weighted line – 25, 50, 75 and 100 grams/metre (as had been recommended by Graham).
These initial trials showed the 50-gram line performed the best – coiling consistently on the magazines and passing through the autoline system with fewer difficulties that traditional gear.

Proof of Concept

A second experiment of the 50 gram/metre IW line was carried out on the NZ Longline vessel Janas later in 2002. These trials were arranged by Neville Smith through the New Zealand Ministry of Fisheries and undertaken in southern New Zealand at a time of year renowned for having large numbers of hungry white-chinned petrels – a diving species that are particularly hard to mitigate against. Graham, Malcolm and Neville all knew that if IW line worked here, it would work anywhere. Around 1.1 million hooks were set during these experiments. They showed a 94% to 99% reduction in catch of white-chinned petrels and 61% to 100% reduction in catch of sooty shearwaters when using IW line compared to unweighted line. Catch rates of target and non-target fish were reported to be similar for both lines.

Fishing Advantages

The IW line has many advantages over added weights: the line is easier to handle when setting and stowing; IW line is safer than handling heavy weights in rough seas; and IW line catches more fish – because the crew don’t need to spend time putting weights on and taking them off. Also, because IW line sinks more quickly that conventional line, baits reach the bottom sooner to begin fishing.

Line of choice

For all these reasons, IW line has become the line of choice for autoline vessels fishing for toothfish in CCAMLR waters. In 2012, CCAMLR fisheries involved 18 such vessels, 17 of which used IW line.

Collaboration

Malcolm believes that if you took away any one of the parties that was involved in developing IW line – the fishing company, the government, the scientists or the gear manufacturer, then the whole thing wouldn’t have got off the ground. Everybody put in time and some money and this allowed the concept to develop into commercially available fishing gear.