

# Fast-sinking lines reduce seabird mortality in longline fisheries



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*Buller's and white-capped albatrosses fight over fish lost from a longline.*

Longline fisheries are implicated in the decreases of many albatross and petrel species worldwide. Seabirds die when they attack baited hooks when lines are being set, become hooked or entangled, pulled underwater and drown. In many longline fisheries seabird fatality is part of 'normal' commercial fishing operations, though the number of birds accidentally killed can vary greatly with location, time of year and type of fishing gear used. We have been addressing this problem by collaborating with fishing industries to develop fishing gear and practices that reduce seabird mortality.

The risks to seabirds are increased by longlines that sink too slowly. Typically, when longlines enter the water they 'float' just beneath the surface, being held aloft by propeller turbulence and wave action. Depending on the vessel and gear type, they might remain in this lofted position for 20 seconds or so and be 50 metres or more astern before they start sinking, making baits easy targets for seabirds. Ideally longlines

should start sinking the instant they enter the water and sink as fast as possible.

Longlines with integrated weight (beads of lead woven into the fabric of the line) have the capacity to meet these requirements. To test the effectiveness of longlines with integrated weight the Australian Antarctic Division teamed together with New Zealand Ling Longline (a NZ fishing consortium), Fiskevegn A.S. of Norway (a major longline manufacturer) and the New Zealand Department of Conservation and Ministry for Fisheries. We chose the amount of weight to be inserted into the longline from a previous trial of the sink rates, operational effectiveness and fish catch success of samples of line containing 25 g/m, 50 g/m, 75 g/m and 100 g/m integrated weight. The 50 g/m line performed best – it sank instantly, sank 2.5 times faster than normal line, did not affect fishing efficiency and was easy to use. The next step was to test the performance of the line while under attack from seabirds.

We tested the new line in November

2002 in the ling fishery near Solander Island, south of New Zealand. This was an ideal area for the test because it is frequented by large numbers of shearwaters, albatrosses and white-chinned petrels, species that regularly get killed on longlines. It was important to have white-chinned petrels in the trial because their attacks on longlines are very hard to prevent: they're strong, manoeuvrable fliers and excellent divers and – unlike albatrosses and shearwaters – are caught equally in the day and night. These traits place them at the top of the list of longline-vulnerable seabirds.

We conducted the trial on the F/V *Janas*, a 46.5 m Norwegian-built autoline vessel (hooks are baited automatically) commercially operated as part of New Zealand Ling Longline. The *Janas* fishes with thirty 1,800 m-long magazines of longline which carry a total of 36,000 hooks. We replaced 15 magazines of normal (unweighted) line with 15 magazines of integrated weight line and fished with both longline types side by side. We deployed a bird scaring streamer line over

the longline on all sets to keep seabird mortality on the unweighted longline at levels normally experienced in the fishing operation.

Before each set we collected information on environmental conditions known to affect seabird interactions with gear, such as wind strength and direction, sea state, moon phase and time of day. We recorded the number of seabirds around the *Janas*, attacks on the line by different seabird species, number of seabirds caught on each type of longline and longline sink rates. We also recorded catch rates of ling and non-target fish species, the size of fish caught and incidence of damage from sea lice (marine insects that sometimes eat fish caught on longlines) to demonstrate the effects, if any, of the integrated weight longline on commercial aspects of the fishing operation.

After 16 days fishing and 400,000 hooks set and hauled the work was finished. The results were promising. Although up to 1,200 seabirds surrounded the boat and repeatedly dived on both types of longline (though more so on unweighted gear) the integrated weight longline caught only one seabird compared to 82 by the unweighted longlines. All birds caught were white-chinned petrels except for one sooty shearwater; no albatrosses were caught. Catch rates of ling and non-target fish species on both types of longline were similar, as were the sizes of fish landed. Clearly, the integrated weight longline had greatly reduced seabird mortality while not affecting fishing efficiency, and we had potentially saved the lives of over 80 birds.

The prognosis for the new line looks good, though more research is needed. Fishermen tend to be suspicious of suggested changes to gear, particularly to something as fundamental to fishing as the longline.



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*The FV Janas hits a wave over the ling grounds off southern New Zealand.*

To alleviate concerns it is necessary to fully understand the efficacy of the gear as seabird deterrent and effects on the economics of fishing. We need to further test the gear and determine the longevity of the line. It is also important to observe underwater interactions between diving seabird species and baited hooks to develop ways to reduce the incidence of 'foul' hooking, which occurs when birds are hooked accidentally in parts of the body other than their bills. We also need to test all aspects of the line in the Patagonian toothfish fishery, which operates in deeper water and on much rougher grounds than the ling fishery.

If further testing yields positive results then at an appropriate time in the future the use of integrated weight longlines will be promoted in other autoline fisheries where vulnerable species of seabird range. These fisheries occur in South Africa, subantarctic

France, Australia, New Zealand and various South American nations.

Finally, in the field of seabird by-catch mitigation research, it is rare to develop a technique that could have positive spin offs for both seabird conservation and fishing efficiency. The success achieved thus far is a tribute to the collaborators involved, especially New Zealand Ling Longline. Their commitment to the development of seabird-safe fishing practices is commendable and shows the way forward to longline fishing operators in other regions of the world where vulnerable seabirds range. Work with fisheries in other parts of the world is ongoing to minimise the tragic and unnecessary deaths of beautiful seabirds.

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## STOP PRESS: IUU hot spot

Despite the Australian Government's efforts, including fisheries patrols like *Operation Rushcutter* – the first armed civilian fisheries patrol of Australian waters which concluded in May 2003 – illegal, unregulated and unreported (IUU) fishing of the prized Patagonian toothfish in the waters around Australia's Heard Island continues. Legitimate fishing by Australian flagged vessels in Southern Ocean waters outside the Heard Island EEZ were recently compromised with an unexpected encounter by IUU vessels.

The latest incident was as recent as late June 2003 when an Australian flagged fishing vessel, *Janas*, leaving the Heard Island region, sighted a longline fishing vessel within the CCAMLR Area. The vessel was sighted at night and immediately blacked out its lights while radar images indicated that it continued along its course – presumably to haul in its fishing gear. *Janas* later encountered another longline fishing vessel and at least one other vessel engaged in longline fishing in FAO Statistical Area 57, adjacent to the CCAMLR Area. The longline fishing vessel stopped the *Janas* from setting its fishing lines and contributed to the decision to return to port in Tasmania earlier than planned.

Three days later, a second Australian flagged fishing vessel, *Southern Champion*, encountered two longline fishing vessels about 100 m outside the EEZ but still within CCAMLR waters. Both fishing vessels took evasive action to ensure that they were not recognised. The vessels had blanked out their home and port name and their vessel call sign and flag were not visible.

Member States of CCAMLR are investigating evidence to determine the identity of the IUU operators sighted. Australia is continuing its efforts within CCAMLR for strong measures to stamp out IUU fishing in the Southern Ocean.