

# FISH

# THE SEA

# NOT

# THE SKY

HOW TO AVOID BY-CATCH OF  
SEABIRDS WHEN FISHING  
WITH BOTTOM LONGLINES



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SEABIRDS WHEN FISHING  
WITH BOTTOM LONGLINES

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This book is produced in the official languages  
of the Commission: English, French, Russian and Spanish.

Copies are available from the CCAMLR  
Secretariat at the above address.



**D**

**EAR READER,**



The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) was established in 1982 by a number of nations to ensure that waters of the Antarctic would always remain abundant in fish and other marine animals, and be used rationally by many generations to come. CCAMLR is a unique international organisation in that its Convention requires that the utilisation of marine resources should take into account the impact of fishing on all marine animals in the Antarctic, not only on those fished.

For the past few years a significant decline has been recorded in populations of several species of the most remarkable of seabirds - albatrosses. This decline has been widely attributed to fishing with longlines. Seabirds feed on longline baits, get hooked and drown. As soon as the first disturbing news about the decline of populations of albatrosses became known, CCAMLR joined the international effort to tackle the problem.

In 1992, CCAMLR adopted its first conservation measure on the reduction of incidental mortality of seabirds in the course of longline fishing. The current version of this CCAMLR conservation measure combines a set of very simple techniques which don't restrict fishing activities and don't require any expensive equipment.

This book is based on techniques recommended by CCAMLR, but is not limited to them. Some of the ideas and innovations described in the book still need to be extensively trialed at sea. A single method which prevents all birds from feeding on longline baits has not yet been invented. However, using the available techniques in combination with each other, the number of birds killed can be reduced by 80% or more.

This book has been widely distributed to all CCAMLR's Member Nations and many international fisheries organisations. CCAMLR Members have undertaken to make every possible effort to ensure that this book will be made available on board each and every vessel fishing under their flags in the Southern Ocean.



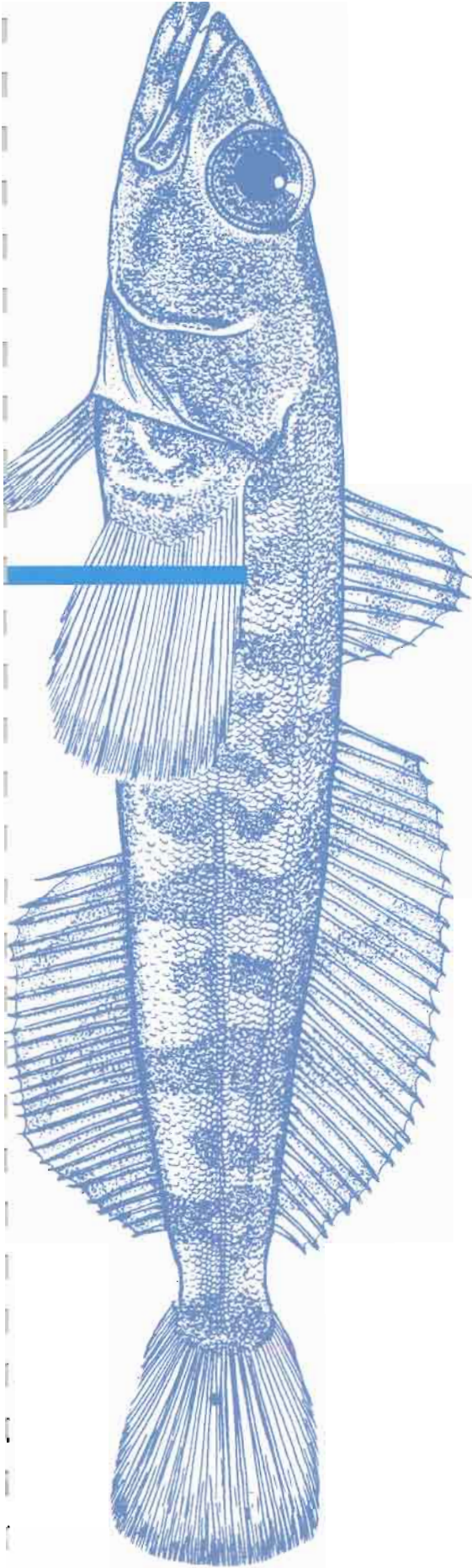
# Summary Advice

## YES OUI ДА СИ

- USE A BIRD LINE EVEN WHEN SETTING LONGLINES AT NIGHT
- USE A PROPERLY CONSTRUCTED BIRD LINE
- USE APPROPRIATE WEIGHTS ON LONGLINES
- THAW BAITS PROPERLY BEFORE SETTING LONGLINES
- DISCHARGE OFFAL CORRECTLY
- MINIMISE LIGHTING AT THE STERN OF THE SHIP WHEN SETTING LONGLINES

## NO NON НЕТ

- DON'T SET LONGLINES DURING DAYLIGHT HOURS
- DON'T TENSION THE LONGLINE ASTERN DURING SETTING, IT BRINGS BAITS BACK TO THE SURFACE
- DON'T USE A FISH FOR BAIT IF IT RETAINS AIR IN ITS SWIM BLADDER
- DON'T USE HOOK BOXES WHICH ARE IN POOR REPAIR AND ENTANGLE HOOKS DURING SETTING THE LONGLINE
- NEVER LEAVE HOOKS IN DISCARDED BY-CATCH AND FISH HEADS



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**T**HE PURPOSE of this book is to inform you about seabird by-catch and its effect on seabird populations and the economics of your fishing industry, and to advise you on methods to overcome the problem.

What do you think when you see birds taking bait from your hooks? Are you annoyed that each bait taken by a bird means one less fish caught - perhaps one worth a great deal of money? And as yet another dead bird is thrown overboard do you wonder how long it will be before there are no birds left?

There is no doubt that your profits from fishing are greatly reduced because birds take baits. This alone is a good reason to stop catching birds. Although a few fishermen may not be concerned by the prospect of the extinction of albatrosses, others do care!

There is strong world-wide concern about the survival of seabirds. So, in preventing bait loss to birds, you not only make more money, but you will also help your industry to avoid conflict with those concerned about seabirds. Such conflict, which is inevitable unless the killing of seabirds is prevented, could place much greater financial pressures upon your livelihood than birds already do by taking baits.

There is one factor common to all longline fisheries with a bird problem - birds are bad for business. Birds take bait from hooks, and hooks without bait do not catch fish. Also, in recent times the bright business prospects of longline fishing have become clouded by conservation issues, so it makes good business sense to tackle these. You are in a fortunate position because there are solutions to the problem of seabird by-catch, solutions that benefit you financially. This has not been the case for driftnet fishermen, for example, who have lost their business because satisfactory solutions could not be found. It is up to you to accept the challenge, use the solutions to wildlife by-catch, protect your livelihood and increase your profits.


The choice is yours. Don't jeopardise your fishery by doing nothing to prevent seabirds being killed.

**T**HE RATE AT WHICH SEABIRDS ARE BEING KILLED ON FISH HOOKS IS CAUSING A NOTICEABLE DECLINE IN POPULATIONS OF SOME SPECIES WORLDWIDE. UNLESS FISHING PRACTICES ARE CHANGED IN A WAY THAT WILL PREVENT LARGE NUMBERS OF SEABIRDS BEING CAUGHT,




THE SURVIVAL OF SOME SEABIRD POPULATIONS IS DOUBTFUL.

YOU CAN MAKE CHANGES TO YOUR FISHING GEAR, ITS USE AND



YOUR VESSEL LAYOUT WHICH WILL LEAD TO YOU CATCHING FEWER OR NO BIRDS, WHILE AT THE SAME TIME IMPROVING YOUR FISH CATCH RATES.

A CORRECTLY MADE AND SET BIRD LINE, SETTING LONGLINES AT NIGHT, REDUCED DECK LIGHTING DURING LINE SETTING, CORRECT DISCHARGE OF OFFAL FROM FISH-



PROCESSING PLANTS, WEIGHTED LINES AND A WELL-INFORMED CREW CAN MEAN NO BIRDS AND MORE FISH BEING CAUGHT.



# Bait *loss* and bird deaths *can* be prevented

**T**HERE ARE many ways to prevent seabirds from taking bait, getting hooked and being drowned. No solution is totally effective on its own, but combinations of solutions can almost completely prevent bait loss and the killing of birds. This is most important for several species of seabirds, in particular, albatrosses, many populations of which have started to decline rapidly in the Southern Hemisphere. Longline fisheries are widely held to be a major cause of this decline.

Just which solutions for preventing seabirds from taking baits are most applicable to you will depend on your vessel, your crew, the weather, and where and when you fish. Economic advantage and minimal or no disruption to fishing were important factors in the choice of solutions discussed here. Most of these solutions are not detrimental to fishing efficiency and the benefits of using them are obvious.

The solutions which follow may not be the only ones which will work, but they are a start. Are all these solutions acceptable? Are they all necessary? Try them, find out, improve them. This is a challenge for you.

We encourage you to record observations on incidental catch of seabirds in your fishing logbooks.

It is time to demonstrate that we have a real commitment to reducing the number of seabirds killed in longline fisheries, and that this is achievable. This cannot be done if you ignore the problem.

If you catch no seabirds, or very few, please contact CCAMLR at the address given on the title page of the book. We need to learn about your fishing methods so that others may use them to reduce seabird by-catch.

If your vessel catches seabirds and you are unable to avoid this, please contact us as we would welcome the opportunity to assist.

Write to CCAMLR to ask for more information. We will welcome your interest. We need your help.

While it is your problem others want to help you solve it. We must try to put an end to bait loss and the killing of birds. Help secure the future of your fishery rather than jeopardise it.

**T**HE EASIEST and single most effective solution - line setting at night - will eliminate bait loss and albatross by-catch in some fishing grounds and greatly reduce it in others. This is because albatrosses feed mostly during daylight hours.

Where possible, line setting should be conducted only in the hours of complete darkness. Setting is best confined to the period between one hour after dark and three hours before dawn because seabirds of all species are least active during this time. For high latitude areas, though, this practice would not be possible during the southern summer season. However even in this case, setting longlines during the hours of nautical twilight causes much fewer problems with birds than setting during day time.

Albatrosses will occasionally take baited hooks set at night if the moon is full. Also, some smaller species of seabirds such as grey petrels, white-chinned petrels and shearwaters search for baits behind ships at any time, day or night. As a result, certain birds may continue to be caught even when setting takes place at night. Lines set at night, however, are still far less likely to catch birds than lines which are set partly or wholly during the daylight.

Birds rely on their vision to find baits, so floodlights which brightly illuminate a large area astern assist them to do this. Only the minimum ship's lighting necessary for safety should be used. Decrease the amount of light shining over the water astern and you will reduce your bait loss to birds.

Many longline vessels already confine line setting to night-time with great results. Although night setting is an excellent and simple way of reducing bait loss and bird by-catch, under some circumstances it is inadequate as a solution on its own. Night setting should be combined with the use of a well-designed bird line, particularly on moonlit nights and summer nights at high latitudes, and with appropriate combinations of other methods discussed in this chapter.

## Night Setting





**A** BIRD LINE is a simple device which makes it harder for birds to seize baits. It consists of a pole mounted on the stern of a vessel and a line, with streamers attached, which is towed astern directly above the area where baits enter the water.

How does a bird line assist in reducing bait loss? Every bait can be taken by a bird immediately after it is thrown from the ship and before it has had sufficient time to sink more than 4 m below the surface. Birds take baits mostly within the first 50 m astern of the ship. A bird line prevents birds from having access to this area. By using a well-designed bird line, bait loss to birds may be reduced by up to 80%, and you will also spare the lives of a large number of birds.

The design of the bird line affects how well baits are protected from birds. It is essential for the line itself to be above the area in which baits enter the water, so positioning of the pole from which the line trails astern is very important. Pole height above the water determines how far astern baits can be protected - the higher the better. More height also prevents fishing gear becoming tangled with the bird line. Aim to get the line as high as possible and positioned so that it is suspended over baits as they leave the stern of the vessel.

The material from which the line is made largely determines how effectively birds are scared away from baits. If it is too conspicuous and has a predictable motion (for example, a heavy line with too many streamers), birds soon become used to it and continue feeding on baits.

An illustration of a bird line, together with a full list of materials needed and instructions on its construction, can be found at the end of this book.

If you notice that one line does not provide the required protection and many birds still have access to baits, consider using two bird lines, each set from a pole 1 to 2 m each side of the longline.

## Use of *bird lines*



Bird line deployed during longline setting

Bird lines offer seabirds even better protection in bottom longline fisheries than in pelagic longline fisheries. In pelagic longline fisheries the area over which a bird line offers effective protection is often too small because the longline is set at high boat speed and the sink rate of baits is slow. In the bottom longline fishery, however, the boat moves slower and baits sink faster. As a result, most bait loss to birds occurs within 50 m astern. In this

fishery, hooks leave the ship directly astern, making it easy to ensure that the bird line is deployed right where it is needed - directly over the baits.



The bird line prevents birds from taking baits

ALL VESSELS WITH THE POTENTIAL TO  
CATCH BIRDS SHOULD USE BIRD LINES  
AS STANDARD PRACTICE ON EVERY SET.  
THEY ARE INEXPENSIVE, EASY TO

CONSTRUCT AND DEPLOY AND, WHEN USED CORRECTLY IN  
COMBINATION WITH NIGHT SETTING, THEY WILL  
SERVE NOT ONLY TO REDUCE FISHING-  
RELATED SEABIRD DEATHS, BUT WILL HELP FISHERMEN AVOID  
CONSIDERABLE BAIT LOSS.



REMEMBER THAT USING A BIRD LINE HAS  
BECOME A REQUIREMENT FOR ALL LONGLINE FISHING IN THE CCAMLR  
CONVENTION AREA.

YOU WILL ELIMINATE OR GREATLY REDUCE BAIT LOSS

AND ALBATROSS BY-CATCH IF YOU:



AVOID SETTING LONGLINES DURING

DAYLIGHT HOURS;

USE BIRD LINES AS STANDARD PRACTICE ON EVERY SET EVEN WHEN

SETTING AT NIGHT; AND

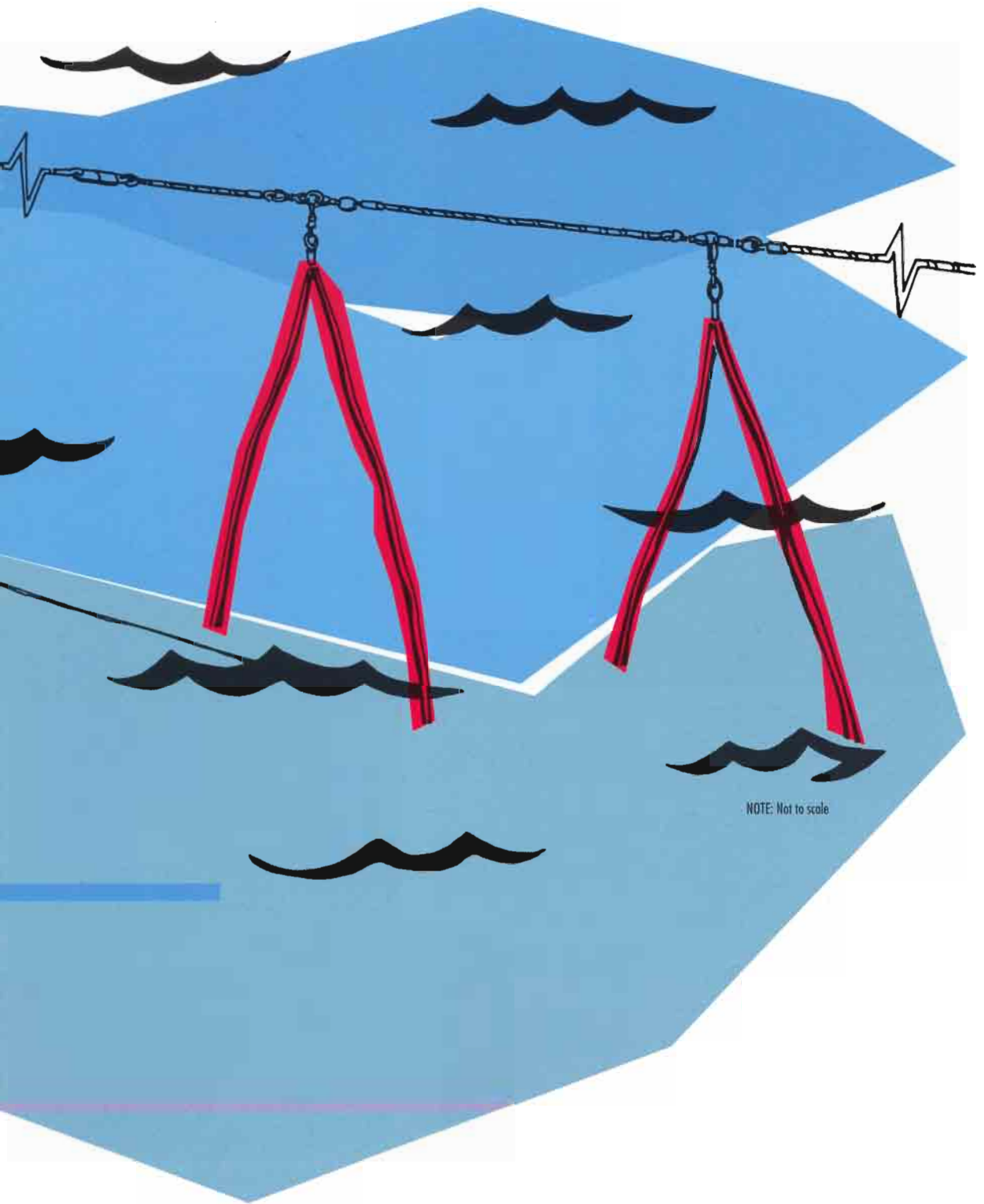


DECREASE THE AMOUNT OF DECK LIGHT SHINING OVER THE WATER



ASTERN WHEN SETTING AT NIGHT.





O

BVIOUSLY with more weight on the main line or branch lines, baits will sink faster. Weights reduce the time during which baits are available to birds.

The amount and distrib-

## Weights on

## the line

ution of weight on the line is particularly important.

Depending on the longline construction, the following two ways of weighting the line are recommended:



**FOR CONVENTIONAL LONGLINES WITH A SINGLE MAIN LINE, BAIT SINK RATES ARE INCREASED BY THE ADDITION OF 20 TO 40 G LEADED SWIVELS TO BRANCH LINES NEAR EACH HOOK.**

**FOR THE 'SPANISH', DOUBLE-LINE TYPE OF LONGLINES, EXPERIMENTS SUGGEST THAT WEIGHTS (STONES) SHOULD BE**

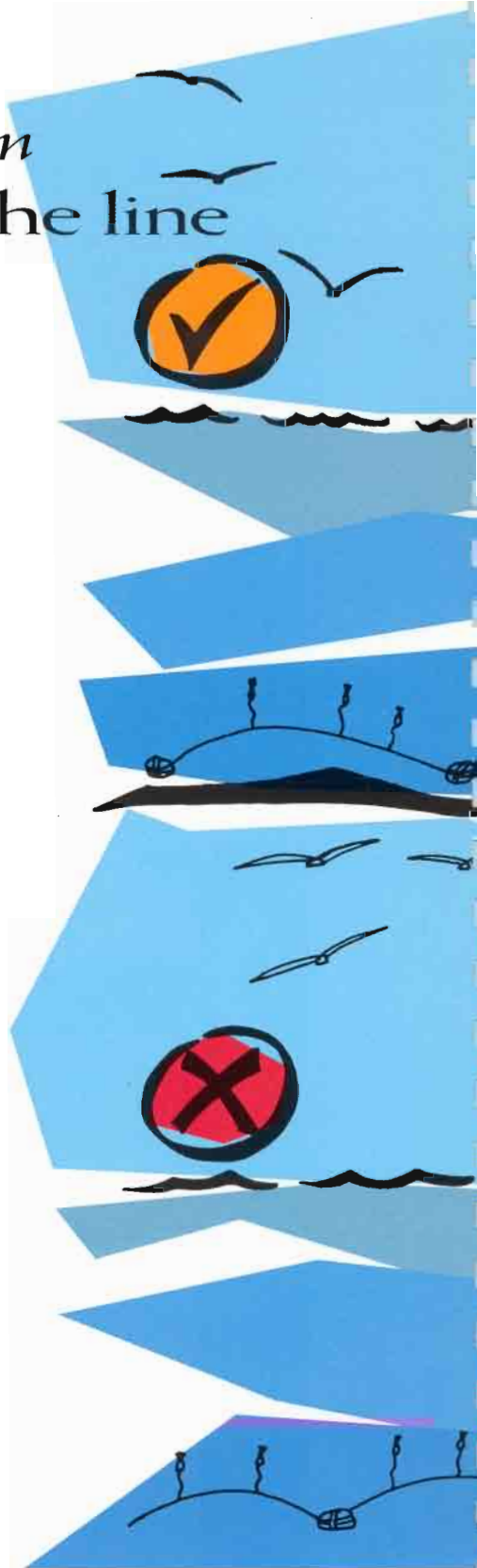
**ATTACHED TO THE FISHING LINE ABOUT**



**20 M APART. TWENTY-METRE INTERVALS BETWEEN STONES ALLOW SUFFICIENT TIME TO ATTACH THE STONES TO THE LINE DURING SETTING. EACH STONE SHOULD WEIGH A MINIMUM OF 6 KG.**

The way in which stones leave the ship during setting can increase catch rates of birds and decrease catch rates for fish. If, after being tied on to the fishing line during setting, all stones are merely left at the edge of the ship's stern until tension from the fishing line aft pulls them into the water, the fishing line astern will be pulled tight. This pulls many hooks back to or above the sea surface and line sinking is delayed. So great is this force that baited hooks also jerk or spin about violently, causing considerable bait loss and posing a greater threat of entanglement to birds flying by.

In order to overcome this disastrous effect on bird and fish catch rates, it is essential to consider pushing each stone by hand (or by some other means) from the ship before fishing line tension astern occurs.







NOTE: Not to scale

**T**HE MATERIAL from which hook boxes are constructed and their methods of construction have a great impact on your fishing profitability and also on the numbers of birds caught. Every time a hook becomes accidentally stuck in a hook box, the

likelihood of a bird being caught is increased significantly. This is because the hook-up causes line tension astern, bringing baits to the surface and delaying the sink rate of hooks. Such hook-ups may result in a major line tangle and a whole box of hooks being lost overboard. Such line tangles occur frequently during line setting and this increases the catch rate of birds and reduces the catch rate of fish. Line tangles also occur when the knots that join line sections together become caught in the loose joints of wooden boxes. The use of plastic boxes does not seem to reduce hook-ups, perhaps because the type of plastic used is not resistant to

continuous hook wear, which eventually produces a roughened surface which hooks catch on. You may find other more suitable material from which to construct hook boxes. Until then, at least maintain in good condition the ones you have. Don't let the joints in the wooden hook boxes open up.

In addition to the problem with joints, the sheet-tin liners used in wooden boxes can detach from the wood, leading to more hook-ups. The sheet tin should extend to the very edge of the compartment opening to reduce the opportunity for hooks to become embedded in the wood.

## Hook Boxes



Baiting hooks

**S**EVERAL different types of hooks are used in bottom longline fishing. It has not been proven that birds are more likely to be caught by one type of hook than another. Nevertheless, the general opinion is that smaller hooks and hooks with curved shanks catch more birds. Why? Possibly because smaller hooks are easier to swallow, and hooks with a curved shank, unlike hooks with a straight shank, tend to pivot upward when pulled, thus increasing the chances of birds being caught.



Various hooks used for bottom longlines

## Hook Type

**A**VOID dumping fish offal while longlines are being set or hauled because this increases the number of birds following the ship and encourages them to search intensively for baits. When problems with bird

by-catch are severe, some fishermen throw bait or fish offal

overboard on the side opposite the one on which line setting and hauling take place, to entice the birds away from the line. This may seem to work at the time, but in the long term the problem gets worse because more birds are attracted to longline boats and the plentiful food supply. Preventing the birds from having access to baits or fish offal is a much better solution.

Seabirds have learned that offal discharge takes place more often during line hauling than line setting. Many birds congregate to take advantage of the abundance of food during hauling, and as a consequence are frequently hooked or tangled in the line. If offal discharge is unavoidable during

hauling the line, this should take place on the opposite side of the vessel to that where the longline is set and hauled. If your vessel, like most, has been designed to discharge offal adjacent to the line hauling position, then it is essential that you divert the discharge to the opposite side.

In certain weather conditions the problem becomes worse when discharged offal remains alongside the ship. Birds are wary about flying alongside during hauling, but will do so in certain wind conditions, such as a strong headwind. Therefore, avoid discharging offal during hauling when there is a strong headwind.

## Dumping *Offal*



It is easy to find food around the vessel

The likelihood of birds being caught by incoming hooks also becomes acute on the many occasions when the fishing line has broken (in 'Spanish'-type gear). Line breaks result in sections of the fishing line floating away on the surface with hooks attached before parallel hauling of main and fishing lines starts again. Some of these hooks often still have bait on them - a further target for birds.

Any bird that is caught during line hauling will most likely be alive when it comes aboard, and the usual routine followed by crews is to release the bird after hook removal or simply to cut the bird free, leaving the hook with the bird. In the appendix section of this book you will find advice on how to remove the hook from the bird to give the bird a better chance of surviving.



Birds feeding on offal discharge from the vessel

**B**ECAUSE hooks are lost both in discarded fish and the heads of processed fish, it is highly likely that hooks found in breeding colonies have been ingested by birds whilst scavenging. Each vessel loses about 120 hooks per day with discarded fish which are available to birds to scavenge.

These hooks may kill adult birds or chicks if transferred to chicks during feeding.

Why is it that discarded items retain hooks? If the force required to rip the hooks out of the fish is stronger than the breaking strain of the line material used for branch lines, then the line will break, leaving the hook in the fish. The crew rarely, if ever, bothers to recover such lost hooks. This contribution to increased operating expenses should not be overlooked, as in the course of one fishing voyage the equivalent of a whole longline of hooks (10 000) can be lost in this way. Remove hooks from all by-catch fish and the heads of processed fish before discarding them. This helps you to reduce the number of hooks lost in your fishery and spare the lives of more birds.

## Discarding fish *by-catch*





**T**HERE ARE two types of bait which may either float or cause hooks to sink slowly: bait fish which retain air in the swim bladder and frozen bait. Remember that the longer the bait remains on the surface, the greater the chance that a bird will get hooked. This is particularly true in pelagic longline fisheries where the potential economic loss resulting from this problem is known to be considerable. This may also be the case in other longline fisheries. At the very least, when buying bait avoid the types of fish which retain air in their swimming bladders, and thaw bait thoroughly before setting.

## Choice of Bait

**U**NDERWATER setting of longlines and hauling through a hull well in the centre of the vessel, or use of a line-setting pipe to enable lines to be set from an aft hatch are among the latest developments which could contribute considerably to reducing the incidental by-catch of seabirds.

## Other solutions

In an effort to avoid problems with seabirds, the Norwegian company O. Mustad & Son A.S. has introduced new underwater line setting equipment for vessels using the Mustad Autoline system. It has been developed over two years of commercial fishing trials.

The line is shot through a specially constructed funnel fixed aft at the setting hatch, which channels the line into the water 1.5 to 2 m below the surface.

The company claims that this equipment will eliminate the problem with bait-snatching seabirds and increase daily catch, providing considerable additional income for fishermen.



A funnel developed by O. Mustad & Son A.S. for underwater setting of longline astern of the vessel





Q. WHY IS NIGHT SETTING OF LONGLINES SO EFFECTIVE IN REDUCING ALBATROSS BY-CATCH?

A. ALBATROSSES RARELY FEED AT NIGHT.

Q. SOME PETRELS CAN BE  RESPONSIBLE FOR SIGNIFICANT BAIT LOSS DURING BOTH DAY AND NIGHT SETTING. HOW CAN THIS BE REDUCED?

A. BY NIGHT SETTING. THIS WILL GREATLY REDUCE BAIT LOSSES, AS WILL THE USE OF MINIMAL SHIP'S LIGHTING ON THE WATER ASTERN. WHENEVER POSSIBLE, SETTING OF LINES SHOULD BE COMPLETED AT LEAST THREE HOURS BEFORE SUNRISE. BE SURE TO USE A BIRD LINE FOR PROTECTING BAITS DURING NIGHT SETTING AND DO SO EVEN DURING SUMMER NIGHTS AT HIGH LATITUDES.



Q. IF YOU SET LINES AT NIGHT, WHAT ELSE SHOULD YOU DO TO AVOID CATCHING BIRDS?

A. ON MOONLIT NIGHTS OR DURING SUMMER NIGHTS AT HIGH LATITUDES USE A BIRD LINE AND PAY CAREFUL ATTENTION TO ENSURE THAT THE LONGLINE SINKS RAPIDLY BY USING ADEQUATE WEIGHTS SPACED AT APPROPRIATE INTERVALS.

Q. CAN BIRD PROBLEMS BE  OVERCOME BY ADDING MORE WEIGHT TO LINES?

A. YES, BECAUSE WITH MORE WEIGHT THE LINE SINKS FASTER, MAKING THE BAITS AVAILABLE TO BIRDS FOR A SHORTER TIME.



Q. HOW MUCH WEIGHT IS NEEDED TO IMPROVE BAIT SINKING RATES?



A. FOR 'SPANISH' DOUBLE-LINE LONGLINES, WEIGHTS OF AT LEAST 6 KG AND SPACED AT 20-M INTERVALS SHOULD BE USED ON THE FISHING LINE. FOR CONVENTIONAL SINGLE-LINE GEAR USE 20 TO 40 G LEADED SWIVELS ON BRANCH LINES NEAR EACH HOOK.

Q. HOW EFFECTIVE IS A BIRD LINE IN REDUCING BAIT LOSS AND THE NUMBER OF BIRDS KILLED?

A. A REDUCTION OF UP TO 80% IN BAIT LOSS AND BIRD BY-CATCH CAN BE



ACHIEVED BY A WELL-DESIGNED AND CORRECTLY SET BIRD LINE.

Q. WHY SHOULD YOU AVOID DUMPING OFFAL DURING LINE SETTING?

A. BECAUSE THIS ATTRACTS BIRDS AND ENCOURAGES THEM TO SEARCH MORE INTENSIVELY AROUND THE VESSEL, SO MORE BAITS WILL BE LOST AND MORE BIRDS KILLED.

Q. HOW CAN YOU REDUCE THE ADVERSE EFFECT OF OFFAL DISCHARGE DURING LINE HAULING?



DISCHARGE DURING LINE

HAULING?

A. BIRDS CAN BE DISTRACTED FROM THE LINES BEING HAULED IF OFFAL IS DISCHARGED FROM THE OPPOSITE SIDE OF THE SHIP, I.E. ON THE SIDE AWAY FROM THE LINE-HAULING POSITION.

**P**UT IN simple terms, seabirds that follow fishing vessels do so because scavenging is an extension of their natural feeding behaviour. Many albatrosses feed on squid which die after spawning and float on the surface. The reason for scavenging is not that birds cannot find their own food or that there is a shortage of natural food.

So why do birds persist in following fishing vessels when so many die as a result? While it is possible that some individuals have learned through experience to be wary of taking baits, most birds caught on a hook do not get a second chance - they die.

Although many birds caught in some fisheries are young, this does not mean that the older birds have become wise through experience. Young birds are perhaps more susceptible to being caught because, unlike adults which must regularly attend chicks, young birds are free to spend their first five or more years entirely at sea. This means that there is a higher chance for them to find baited hooks.

Most birds get caught when baited hooks first enter the water, and have not yet sunk to a depth at which they are no longer visible. Birds following the vessel continuously in search of food seize any baits they can get. Larger bird species are more aggressive and can swallow whole baits, hook included, and so are more easily caught.

In bottom longline fisheries, at a line-setting speed of 8 knots, up to 20 hooks can remain accessible to birds for between 10 and 15 seconds, which represents a distance of around 50 m between the stern and the point where baits sink out of reach of birds. About 60% of bait loss occurs within this distance.

Again, do not forget that all baits have to sink to a safe depth, and no matter how short the distance behind the vessel at which they sink out of reach of birds, they are all vulnerable to attack during that brief 10 to 15 second period.

In the 'Spanish' system of bottom longlining, the main line is highly buoyant and relies entirely upon the weight of the fishing line to sink it. This is a slow process, as even up to 500 m astern the main line remains on the surface. After about 2 minutes the fishing line has most likely sunk to the full extent of the railings (30 m) connecting it to the main line. At times when species such as white-chinned petrels, grey petrels and shearwaters are present in

# Why and how birds take baits



Another bait located... another bird killed?

large numbers, more baits will be lost well beyond 50 m astern because these species are capable of diving to depths of 25m or more. As a result, more birds are getting hooked and being drowned.

Most species of albatross cannot dive deeper than 10 m and the largest albatrosses do not really dive at all, but feed by dipping

below the surface of the water. It is important for us to know to what extent the different species use their sight to locate baits if we are to eliminate the bird-by-catch. Grey petrels, white-chinned petrels and shearwaters are able to take baits easily because, apart from being able to dive deeper, they search for baits by swimming on the surface with their heads underwater. In contrast, albatrosses search while flying, which is a less effective way of locating baits. As a consequence, albatrosses

rely heavily upon smaller birds to locate a bait first. Considering the number of baits that smaller seabirds take, their death rate is considerably lower than that of albatrosses. Smaller species have difficulty swallowing a whole bait and need to break it into pieces. During this process the hook frees itself and poses no danger to the bird. This is certainly the case with cape petrels, which are caught less frequently, yet play an important role in bait loss. They are poor divers but good at locating baits and showing other species where to dive for bait. Bird lines are effective in reducing the ability of cape petrels to find bait.



One that got away, but will it survive?

**T**HERE IS one aspect of bird by-catch which is very important to fishermen - the number of baits that birds take. For each bird caught during line setting, between 15 and 20 baits may be lost in pelagic longline fisheries and up to nine baits in bottom longline fisheries.

Calculating precisely the effect this bait loss to birds has on fishermen's profits is very complicated. A small percentage of your total

number of hooks may be struck on a particular day by birds but, as is often the case, a high percentage of baits can be lost in a particular section of the longline. Weather conditions are also a complication to be considered. For example, a change in wind direction or vessel course during the set, even for a short time, may allow birds to take many more baits.




Generally there is a strong relationship between bird abundance during line setting and bait loss - more birds equals more bait loss. However this does not always apply, because certain combinations of bird species following fishing vessels behave differently.

You should not assume that because only a few birds are following your vessel during line setting that bait loss will not be a problem. For example, in pelagic longlining the presence of one skua along with only a few albatrosses can lead to high bait loss simply because skuas are very good at finding baits which are then taken by the albatrosses. The skua, having been deprived of its food by an albatross, searches for another bait which it again invariably loses to an albatross. Each albatross can eat up to 10 baits. This same process occurs even amongst the various species of albatrosses. The small, light-mantled sooty albatross is efficient at recovering baits by diving below the surface, following which the larger more aggressive species of albatrosses may successfully fight for these baits.

## How many baits *do birds take?*

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- Q. WHEN DO SEABIRDS GET CAUGHT ON HOOKS?
- A. MOSTLY DURING LINE  SETTING, BUT SOMETIMES DURING LINE HAULING. IN FACT, ANY TIME BAIT IS NEAR THE SURFACE AND UNPROTECTED.
- Q. HOW MANY OF THE BAITS ARE AVAILABLE FOR BIRDS?
- A. EVERY BAIT IS VULNERABLE AS IT FIRST ENTERS THE WATER. MORE THAN 5% OF BAIT CAN BE TAKEN BY BIRDS AND IN SOME CIRCUMSTANCES AS MUCH AS 60%.
- Q. HOW LONG IS A BAIT AT HIGH RISK OF BEING TAKEN BY  A BIRD?
- A. USUALLY IN THE FIRST 10-15 SECONDS AFTER IT ENTERS THE WATER, WITHIN 50 M OF THE VESSEL.
- Q. WHY ARE MORE BAITS TAKEN BY THE SMALLER SEABIRDS THAN BY ALBATROSSES?
- A. SMALLER SPECIES ARE BETTER AT SEARCHING FOR BAITS AND DIVE MORE EFFICIENTLY TO RECOVER THEM.
- Q. ARE MORE BAITS LOST TO BIRDS THAN BIRDS CAUGHT ON HOOKS?
- A. YES, EACH BIRD CAUGHT ON THE LINE MEANS 15-20 BAITS LOST FOR PELAGIC AND UP TO 7-9 BAITS FOR BOTTOM LONGLINES. 
- Q. DOES HIGH BIRD ABUNDANCE MEAN HIGH BAIT LOSS?
- A. IF BAITS ARE UNPROTECTED, YES - BUT EVEN A FEW BIRDS CAN RESULT IN HIGH BAIT LOSS.

# W

HEN YOU haul in your longline you may find the occasional dead bird on a hook. And you may feel that the number of birds you catch is insignificant, particularly if you compare the number of birds caught to the number of birds following astern.

You are mistaken.

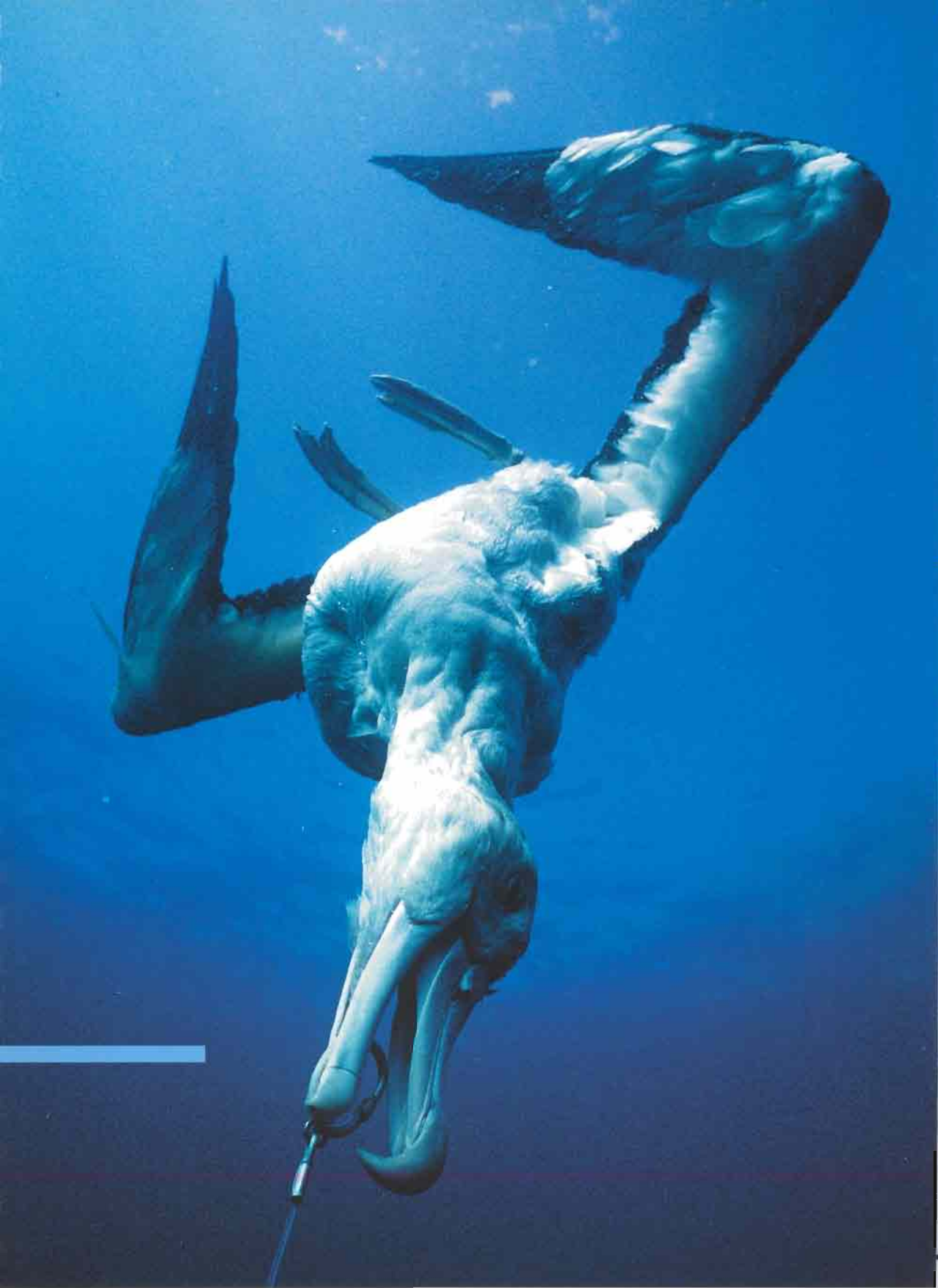
In the past, over 40 000 albatrosses alone are estimated to have died annually in longline tuna fisheries south of 30°S. This number may seem surprising, even shocking, but the real number killed each year by longliners is in fact much higher when all types of longline fisheries are taken into account.

So, what does the death of this many birds mean to the survival of seabird populations? The answer is found in studies carried out by Australian, British, French, Japanese, New Zealand and South African scientists over many years. They show that some populations have declined seriously. There is no doubt that 'just a few birds here and there' caught by individual vessels results in a large number for a fleet over a season, enough to cause some seabird populations to decline.

Strangely, some of the seabird species which are most often caught by fishing vessels are not necessarily the most abundant. Because of this, the immediate threat from longline fishing is greater for some species than it is for others. For example, the wandering albatross is relatively few in number but is caught most often. It is estimated that each year 10% of the world population of wandering albatrosses are killed on longline hooks. Another species, the black-browed albatross, is one of the most frequently caught of all seabirds in the Southern Ocean. With an estimated total population of about 500 000 pairs, this species as a whole may not be immediately threatened by fishing, but, if present catch rates continue, it will be. Even now some populations of black-browed albatross are declining rapidly. The smallest population of black-browed albatrosses is on Macquarie Island where there are only about 50 breeding pairs. Even birds from this small colony are known to have been caught on longline hooks in Australian waters.

Many  
birds  
have  
already  
been  
killed








Counts of birds observed as having been caught during line setting indicate that about 30% of those hooked do not actually get hauled aboard. What happens to these birds? Perhaps some escape, others get eaten by sharks, and occasionally they are cut off by the crew during hauling. Regardless of the reason for their disappearance, it is certain that more birds are actually caught than come aboard each ship. Therefore, all seabird catch rates recorded on fishing vessels are conservative.

More than 20 bird species (most of which are illustrated at the end of the book), are caught on longline hooks. Because seabirds cover vast distances searching for food, it is possible to catch them in many fishing grounds, although a few species do have a restricted distribution at sea and will only be caught in certain areas. In the Southern Hemisphere, seabirds tend to be most abundant south of 30°S where the weather is suitable and adequate food can be found. Problems with birds are not of the same magnitude on all fishing grounds, and because many vessels only visit specific fishing grounds, each vessel's experience with seabird catches and the species caught may be different.

With the increasing awareness of the plight of seabirds in recent times, deliberate changes have been made on some longliners to reduce the by-catch of birds. Such changes as setting lines only at night and using bird lines have reduced both bait loss and the number of birds killed, and fishermen have become aware that it is simple to catch fewer or no birds. It is now time for ALL longline fishermen to make similar efforts to implement changes to their fishing gear and/or practice so that bird catch rates continue to decline.



- Q. HOW MANY SEABIRDS ARE CAUGHT ON LONGLINES IN THE SOUTHERN HEMISPHERE? 
- A. MORE THAN 40 000 ALBATROSSES ALONE ARE CAUGHT AND KILLED EACH YEAR.
- Q. WHAT BIRD CATCH RATES OCCUR IN THE CCAMLR CONVENTION AREA?
- A. ON AVERAGE, BETWEEN 0.15 AND 0.47 BIRDS FOR EACH 1 000 HOOKS SET.
- Q. DO ALL BIRDS CAUGHT ON HOOKS ACTUALLY GET HAULED ABOARD? 
- A. APART FROM THOSE CUT LOOSE BY CREW, ABOUT ONE THIRD DO NOT GET HAULED ABOARD.
- Q. HOW MANY SPECIES OF SEABIRDS ARE CAUGHT?
- A. AT LEAST 20 - SEE THE ILLUSTRATIONS AT THE END OF THE BOOK.
- Q. HOW DO BIRD DEATHS FROM LONGLINING AFFECT SEABIRD POPULATIONS?
- A. ALBATROSS POPULATIONS COUNTED ON BREEDING ISLANDS HAVE DECLINED, SOME BY NEARLY 90%. POPULATIONS OF  SOME SPECIES ARE LESS AFFECTED BECAUSE THEY ARE NOT YET EXPOSED TO INTENSIVE LONGLINE FISHING EFFORT. SOME SPECIES, THOUGH, MAY BECOME EXTINCT, PROBABLY WITHIN OUR LIFETIMES, UNLESS WE REDUCE THE CURRENT CATCH RATES.

O

F THE world's 14 species of albatrosses, 10 are confined to the Southern Ocean. At sea, they are most abundant south of latitude 30°S. Albatrosses spend most of their lifetime roaming the oceans and usually come ashore only to breed on remote

oceanic islands.

One such island is South Georgia, which is located in the CCAMLR Convention Area. Many species of seabirds including four species of albatross, breed on this island and feed in nearby waters. The waters around South Georgia also happen to be fishing grounds for the bottom longline fishery

for Patagonian toothfish. Most of our knowledge of the interactions between seabird and bottom longline fisheries has come from this particular area as well as from the areas immediately adjacent to the north.



Birds of various species fighting for food near the vessel

*Seabirds*  
around  
*your*  
vessel

Many of you have an interest in seabirds - how long they live, how many eggs they lay, how far they fly and where they come from. While this information is interesting in itself, knowing more about these birds may help you to understand and appreciate why there is so much concern about them dying on fish hooks.

Just think the next time you remove a hook from a dead bird that the bird could be as old as you. In fact, the oldest known albatross, a royal albatross from New Zealand, is in her 66th year. Even the smaller species such as shearwaters can live for more than 40 years.

Although you might be fishing many thousands of kilometres from the nearest albatross breeding colony, the dead bird you just threw over the side could have flown to these waters from its nesting place in only a day or two. Its chick, dependent on both its parents, will slowly die of starvation. What will become of the other parent of this chick? Albatrosses stay with the same partner for life and, having lost its mate, this bird will search for perhaps several years before a new partner is found.



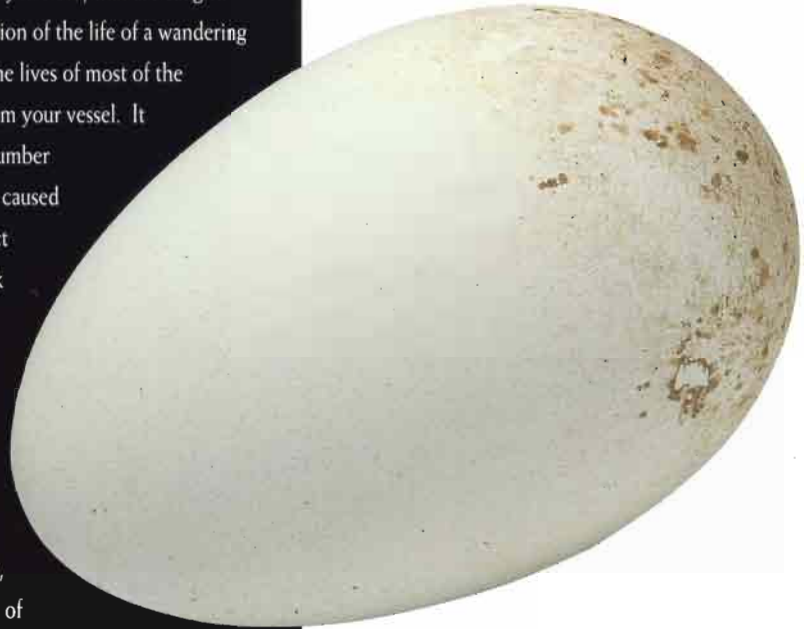
It's a long wait for the parents' return

A wandering albatross egg weighs about 500 g. From the moment the egg is laid, in December, it will take two to three months for the chick to hatch. The parents of this chick must be more than 10 years old, as these birds do not breed at a younger age. The task of egg incubation is shared by both parents, as is chick rearing. Between visits by either parent, bringing food such as squid and fish, the chick remains alone on the nest for long periods. At 9 months old it will weigh about 10 kg and be ready to fly. For the next 5 or even 10 years this bird will remain entirely at sea, roaming the southern oceans. Eventually it may die on a longline hook: it is mostly young birds, between 1 and 5 years old, that are caught.

To a certain extent, this description of the life of a wandering albatross could be used to describe the lives of most of the other seabirds which you observe from your vessel. It is little wonder, therefore, that the number caught on hooks is sufficient to have caused their populations to decline. The fact that seabirds can raise only one chick every one or two years, and that only half of these survive to start breeding at 5 or 10 years old, does not help them to withstand the increased death rate caused by fish hooks.

With a wing span of up to 3.5 m, the wandering albatross is the largest of all flying birds. Satellite transmitters attached to birds have shown that they can sustain flight speeds of 80 km per hour and cross oceans in only a few days. Even the shearwaters, after they have finished nesting in their burrows on islands around Australia and New Zealand at the end of summer, travel north past Japan to the Bering Sea in a matter of weeks.

It is a remarkable experience to visit an albatross colony on one of the remote islands where they nest, and to find that the birds show no fear of man. One is free to move among the nesting birds or to sit at a colony edge and be pecked gently or walked upon by a passing bird, curious and fearless. They have obviously not made the connection between us and our destructive capabilities. They really trust us, but should they?



Shy albatross egg (actual size)

## Banded birds



Chicken egg (actual size)

**Y**

OU WOULD have noticed the metal or plastic rings occasionally found around a seabird's leg. These are usually attached to a bird when it is a chick, and from the number engraved on the band we know how old it is and where it comes from.

Most bands were attached to birds as part of studies by various countries that have been going on for 10, 20 or even 30 years. Banded birds are very valuable to these studies, more so alive than dead but, it is also important to know when one dies on a hook.

By returning information about banded birds that are caught, you can be of great assistance in furthering our knowledge of how long seabirds live and where they fly. Please record and report the band number along with date and location of recovery. Please send these details to CCAMLR at the address given on the title page of the book. Don't forget to include your name and address (and a telephone or fax number). You will, in return, be sent all the information about the bird - species name, age, sex and place of origin.

Satellite transmitters which are taped to a bird's back are used to find out where the bird goes at sea.

These transmitters are highly valued for the information they provide and, if retrieved, should also be returned to the relevant authority. On each band and transmitter there is a return address. Please help the studies of seabirds by returning these items to this address.



Bird band

Q. HOW LONG DO SEABIRDS LIVE?

A. 60 YEARS AND MORE.



Q. HOW OLD IS AN ALBATROSS WHEN IT FIRST STARTS BREEDING?

A. BETWEEN 5 AND 10 YEARS OLD.

Q. HOW MANY EGGS DOES AN ALBATROSS, A PETREL OR A SHEARWATER LAY?

A. ONE EACH YEAR, AND FOR SOME SPECIES LIKE THE WANDERING ALBATROSS, ONLY ONE EVERY TWO YEARS.

Q. HOW LONG DOES AN ALBATROSS EGG TAKE TO HATCH?

A. ABOUT 70 DAYS.

Q. AT WHAT AGE DOES AN ALBATROSS CHICK FLY FOR THE FIRST TIME?






A. IT TAKES BETWEEN 4 AND 9 MONTHS FOR AN ALBATROSS CHICK TO FLEDGE.







- Q. HOW OLD ARE MOST OF THE ALBATROSSES WHICH DIE ON FISH HOOKS? 
- A. MOST OF THE BIRDS KILLED ARE YOUNG BIRDS, BETWEEN 1 AND 5 YEARS OLD. FOR SOME SPECIES THOUGH, LIKE THE SHY ALBATROSS, IT IS MAINLY THE ADULTS WHICH ARE KILLED. THE OLDEST BIRD CAUGHT ON A LONGLINE HOOK IN AUSTRALIAN WATERS WAS OVER 30 YEARS OLD.
- Q. HOW FAR AND FAST DO THESE BIRDS FLY?
- A. MOST OF THESE BIRDS BEHIND YOUR BOATS FLY AROUND  THE WORLD BETWEEN BREEDING SEASONS. THEY FLY HUNDREDS OF KILOMETRES EACH DAY, RIDING THE AIR CURRENTS.
- Q. HOW LONG CAN AN ALBATROSS STAY AT SEA WITHOUT ONCE VISITING LAND?
- A. AFTER LEAVING THE NEST 10 YEARS MAY GO BY BEFORE THE BIRD WILL RETURN TO LAND AGAIN.
- Q. HOW BIG ARE THE BREEDING POPULATIONS?
- A. SOME ARE HUGE, WITH OVER 100 000 PAIRS IN ONE COLONY. OTHERS, THOUGH, ARE TINY (LIKE THAT OF THE WANDERING ALBATROSSES ON MACQUARIE  ISLAND), WITH ONLY SEVEN PAIRS BREEDING EACH YEAR.



Some facts  
about  
the fish  
you catch

# Appendices

1

At present, the bottom longline fisheries in the Southern Ocean mainly target one species, the Patagonian toothfish. Chilean and Argentinian fishermen call this fish 'austro merluza negra', in French its name is 'légine australe', while Russian fishermen call it 'patagonsky klykach'. The scientific name of this fish is *Dissostichus eleginoides*.

This species belongs to a large group of carnivorous fish, commonly known as rockcods, which are found only in the Southern Hemisphere. The toothfish is one of the largest representatives of this group. Specimens over 2 m in length have been reported as having been caught in the Atlantic sector of the Southern Ocean.

The toothfish has a white oily flesh which is highly regarded by fish gourmets around the world. Catches of this fish are sought after at markets in many countries such as Argentina, Chile and Japan. For fishermen, the high market price paid for this fish is a fair reward for their hard and risky work.

The distribution of toothfish is generally well known on a broad scale. It is widespread in the sub-Antarctic zone, being found off the east and west coasts of South America, around South Georgia and Shag Rocks, South Sandwich Islands, on the Kerguelen Plateau, around Crozet Island and over Ob and Lena Banks and Macquarie Ridge. It is also found along the southern coasts of Argentina and Chile.

There are, however, some areas of uncertainty, including the southern limit of distribution around the South Orkney/Antarctic Peninsula and southern Kerguelen Plateau areas. Recent findings of toothfish on the South African shelf and the Campbell Plateau south of New Zealand, as well as the discovery of a population much larger than previously thought on the Macquarie Ridge, demonstrate that our knowledge of the distribution of this species is incomplete and the question of how many populations or stocks inhabit the Southern Ocean is also unresolved.

Evidence on the extent and timing of toothfish migrations is extremely scarce. Some information exists on possible short-term movements and there is weak evidence of seasonal movements. There is no information on the extent to which toothfish are capable of moving over long distances.

Information from the Chilean fishery demonstrates that catches of toothfish have been made to depths of 2 900 m off south Chile, which means that toothfish can apparently move in

depths to around 3 000 m. This indicates that a significant proportion of the population, at least in the Chilean area, could live between 1 500 m and 3 000 m. The presence of large fish in deeper waters seems to be well established.

Toothfish are slow-growing and relatively long-lived. Their average lifespan is probably about 20 to 30 years. Common length is about 90 to 100 cm and maximum length is over 2 m. Toothfish become mature and first spawn at about the age of 5 to 8 years. Spawning generally occurs during the austral winter, although there are some references to spent fish being taken in December. There is no precise information on spawning location or whether the fish aggregate during the spawning season. Spawning is presumed to take place during winter in mid-slope depths. Fecundity of this species is relatively low. Eggs, larvae and small juveniles of the species are pelagic.

Toothfish feed on other fish and molluscs. Sperm whales are known to feed on toothfish.



Hauling the longline with a good catch



Two-metre-long toothfish being hoisted aboard

## Bird line design

2

The bird line described below is effective because birds do not become used to it. The problems of line stress on the pole and lost efficiency in cross winds, as well as the potential for tangling with fishing gear, are also minimised if the following line material and construction design are used. Depending on local conditions, material used for streamers may vary from that which is recommended below. For example, in some field trials the best results were achieved with streamers made from flat fabric ribbon (30 to 80 mm wide).

The bird line is to be suspended at the stern from a pole at a point approximately 4.5 m above the water and such that the line is directly above the point where the baits hit the water during the setting of the longline.

The line is made of 3 mm diameter orange or red synthetic cord with a total length of 150 m and has at the end a large swivel or similar device which is necessary to provide sufficient resistance in the water to keep the line constantly tight even in cross winds. Three to five pairs of streamers are attached to the bird line by three-way swivels at regular intervals between the point just aft of where baited hooks enter the water and the point where the bird line enters the water. The streamers are made long enough to hang just clear of the water and are also made of synthetic cord. Each has a section of plastic tubing with an inside diameter of 5 mm slid over it. The tubing is elastic and causes the streamers to 'whip' and 'dance' in the wind or as they touch the water. Various colours of tubing have been tested, with red giving the best results.




While three streamer pairs are sufficient to protect baits at the line-setting speed of 10 knots usual in the pelagic longline fishery, adding one or two more streamer pairs will be necessary for optimal bait protection at the slower setting speeds used when fishing with bottom longline gear.

Some ships have mechanised bird line deployment and hauling, using hydraulic reels, to make this part of their fishing operation as efficient as possible.

# T

HESE are the most suitable materials, in terms of performance, from which a bird line should be constructed:

## Construction materials

1. 150 M OF SYNTHETIC CORD, 3 MM DIAMETER (PREFERABLY RED OR ORANGE) FOR THE BIRD LINE.
2. WEIGHTED SWIVEL (x1); THE  SIZE AND WEIGHT OF THE SWIVEL SHOULD BE ENOUGH TO CREATE SUFFICIENT DRAG IN THE WATER TO MAINTAIN THE BIRD LINE IN THE CORRECT POSITION WHEN TOWED.
3. 30 MM BARREL SWIVEL (x1). 
4. SNAP CLIP (x1).
5. 25 MM THREE-WAY SWIVELS (x3 TO 5, DEPENDING ON THE NUMBER OF STREAMER PAIRS ATTACHED).
6. 2 LENGTHS OF SYNTHETIC CORD (3 MM DIAMETER, PREFERABLY RED OR ORANGE) FOR EACH PAIR OF STREAMERS. 
7. LENGTHS OF ELASTIC CLEAR PLASTIC TUBING (INSIDE DIAMETER 5 MM) FOR EACH PAIR OF STREAMERS.
8. LENGTH OF 5-10 MM DIAMETER LINE (MOUNTING LINE) EQUIVALENT TO 3x THE LENGTH OF THE MOUNTING POLE.



## Construction



**C**RIMP the weighted swivel [2] to one end of 150 m bird line [1] - this prevents line end from wearing, provides enough weight to get the line clear of the ship when deploying it and to create sufficient tension so that the line trails directly behind the ship even in cross winds.

- Splice a snap clip [4] to the opposite end of the line [1]. This is used for quick attachment of the bird line to and its removal from the mounting pole.
- One metre away from the snap clip [4], splice in the 30 mm barrel swivel [3] - this swivel reduces line twisting.
- To attach the bird line [1] to the mounting pole, secure one end of the mounting line [8] to the top of the pole. Tie a non-slip loop in the line [8] at a distance equivalent to the length of the pole. This is the loop to which the snap clip [4] of the bird line [1] attaches. The remaining length of the mounting line [8] is secured at the pole base. This section of line [8], the lazy line, is used for setting and retrieval of the bird line.
- Attach the first three-way swivel [5] to the bird line [1] at a point such that streamers attached to it will hang just aft of the place where baited hooks enter the water. Attach two more swivels [5] to the line at intervals of 7 m. Vary the distance between swivels and add more streamers if appropriate for your setting speed and mounting height (a slow speed of 6 knots or less could require less distance between three-way swivels and the addition of extra streamers).
- Having attached the three-way swivels [5], calculate (based on pole height above the water) the distance between each swivel position and the water. This is the approximate length of the streamers. Attach pairs of 3 mm cord [6] of this length to the appropriate swivel.
- Slide plastic tubing [7] over each length of streamer cord [6] and crimp it at the lower end to secure.

3

Often hooks may be easily removed from wings, legs or bill tips. In this case, before removal the hook's barb should be flattened with a pair of pliers.

The following procedure is recommended when the bird has swallowed the hook and its position in the bird's gullet can be determined. The bird may not survive long unless the hook is removed.

Get the bird aboard as gently as possible and seize it by the bill [1] immediately. Albatrosses are powerful and have very sharp bill edges; to avoid injuring yourself ensure your hand does not come in contact with the tip of the bill.

Restrain the bird as in the illustration (use both hands for this). A second person can now determine the hook position externally by feeling along the neck or internally by following the line to the hook [2].

Reach down the bird's throat and grasp the hook [3]. Gently force the tip of the hook so that it bulges, and becomes visible, under the skin of the neck. Then make a small 1 cm long cut over the tip of the hook on the outside of the neck [4] to allow the hook to pass through and be withdrawn. The incision should run down the neck (not across the neck) beside the wind pipe to avoid severing major blood vessels and tendons. Always have a pair of pliers nearby which will cut hooks off with ease.

Never try to extract a hook backwards as considerably more damage will be caused.

By this time the bird will be stressed and may not be ready to be released. Leave it on deck for a short time to recover if necessary.

If you cannot locate the hook inside a bird, cut the hook line as short as possible and let the bird go - it may survive. Remember that for some species every individual saved can be significant and the chances of a bird recovering from even serious hook wounds are very good if the bird is treated properly.

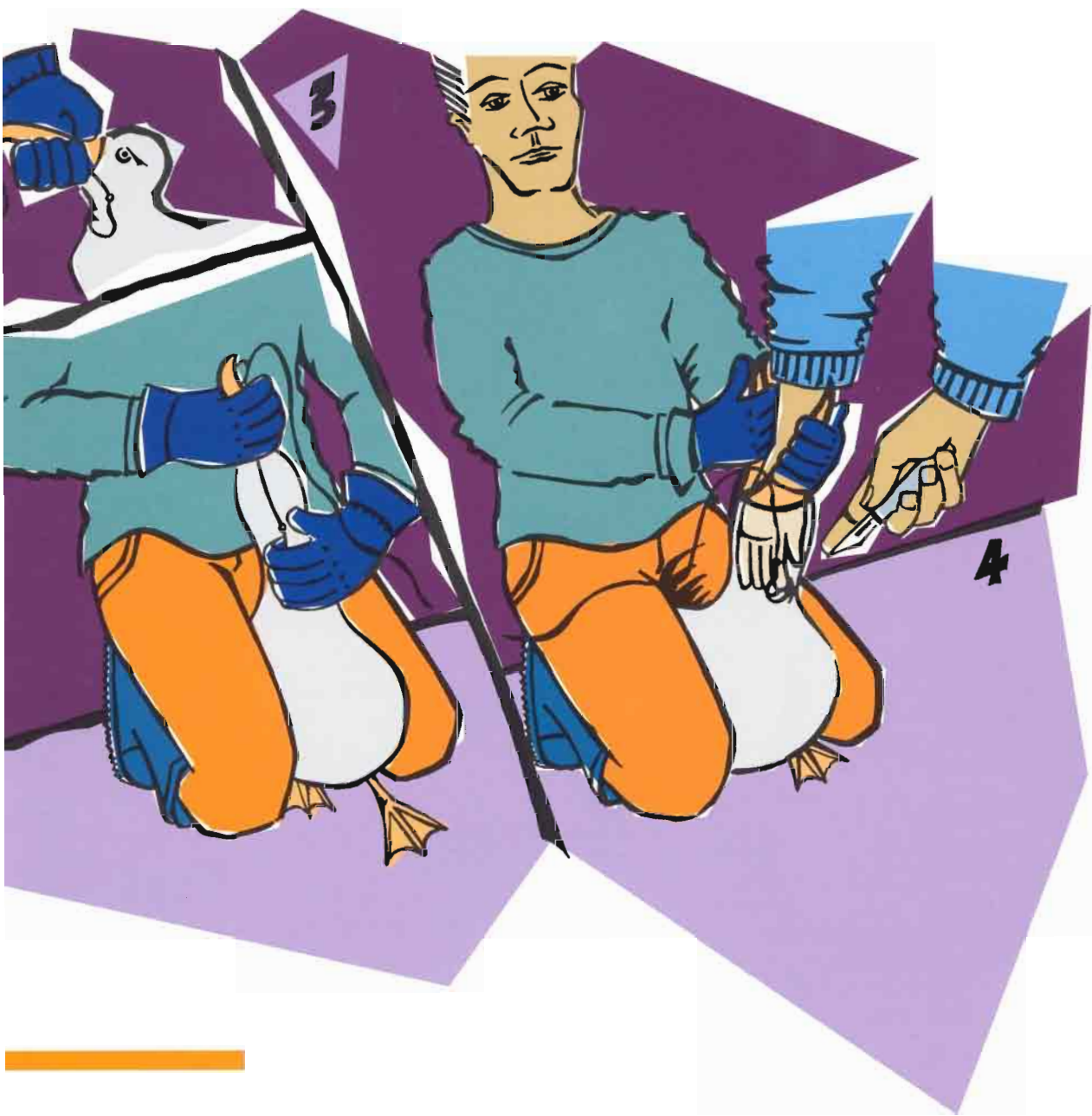
So, do your best!

# Removing hooks from birds



A lucky survivor?







Wandering Albatross



Royal Albatross



*ssp sanfordi*

*ssp epomophora*



Amsterdam Albatross



Juvenile Wandering Albatross



Immature Wandering Albatross



Juvenile Royal Albatross



Light-mantled Albatross



Black-browed Albatross



Buller's Albatross



Grey-headed Albatross



Sooty Albatross



Juvenile Black-browed Albatross



Yellow-nosed Albatross



*ssp cauta*



*ssp eremita*

*ssp bassi*



*ssp chlororhynchos*



Shy Albatross



*ssp salvini*



Southern Giant Petrel  
(dark morph)



Southern Giant Petrel  
(white morph)



Northern Giant Petrel



Cape Petrel



Antarctic Skua



Great-winged Petrel



Grey Petrel



Short-tailed Shearwater



Sooty Shearwater



Flesh-footed Shearwater



Australasian Gannet



*ssp. aequinoctialis*

White-chinned Petrel



*ssp. conspicillata*

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The book is based on an original draft prepared by Mr N. Brothers (Australia) who took into account his previous publication on tackling the problem of seabird by-catch in pelagic tuna fisheries and his observations on fishing with bottom longlines in the waters adjacent to the CCAMLR Convention Area. The draft was reviewed by members of the CCAMLR Working Group on Incidental Mortality Arising from Longline Fisheries (WG-IMALF). The final text was prepared with the assistance of Dr C. Robertson (Australia). It took into account the findings of CCAMLR scientists and scientific observers working on board longliners fishing in the Convention Area, decisions and recommendations of the CCAMLR Scientific Committee and its working groups.

Photographs are courtesy of Dr F. Quintero (Spain), Dr D. Capdeville (France), Dr K.-H. Kock (Germany), Dr S. Løkkeborg (Norway), Prof. C. Moreno (Chile), Dr G. Roberston (Australia) and O. Mustad & Son A.S. (Norway). The Australian Antarctic Division of the CSIRO (Australia) provided technical assistance in preparing the book for publication. Seabird species identification plates are reproduced with the kind permission of *Lynx Edicions* (Spain) and prepared for publication by Parks and Wildlife Service (Tasmania, Australia). The Queen Victoria Museum (Launceston, Tasmania, Australia) provided a sample of an albatross egg, a photograph of which is used in the book.

## GRAPHIC DESIGN & ILLUSTRATION

Georgie Fenton, Art Vark Design.

## CCAMLR PRODUCTION

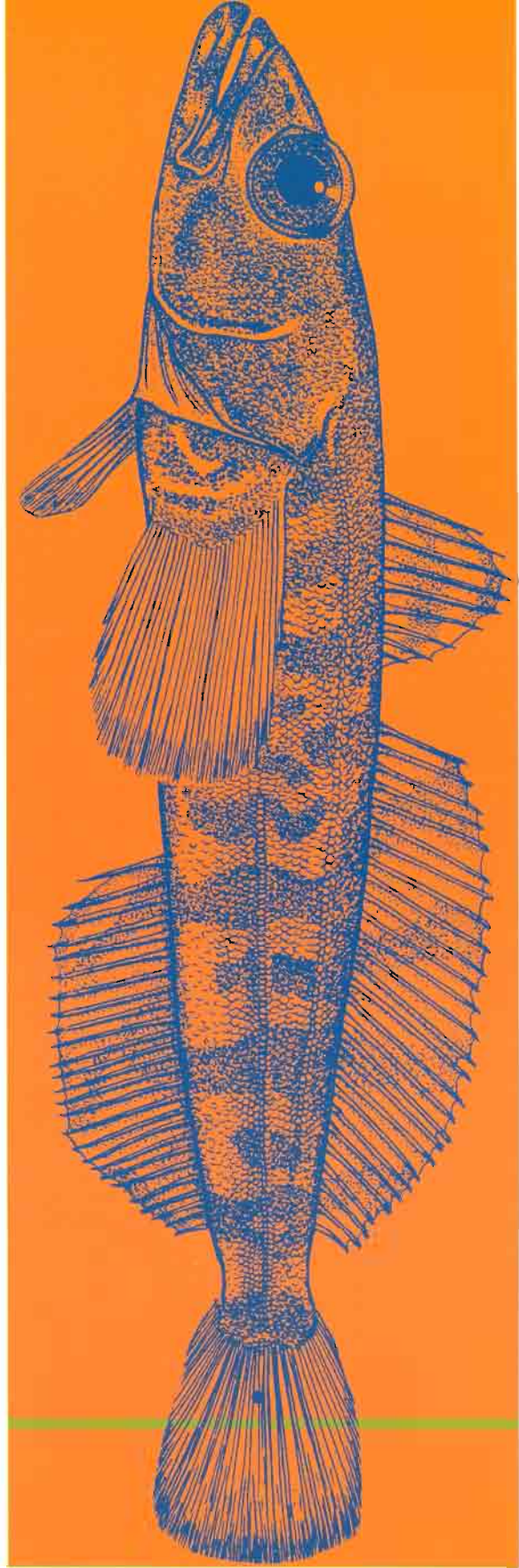
Eugene Sabourenkov (Editor)

Gillian von Bertouch

Blair Denholm

Rosalie Marazas

Published in 1996



# YES

Oui

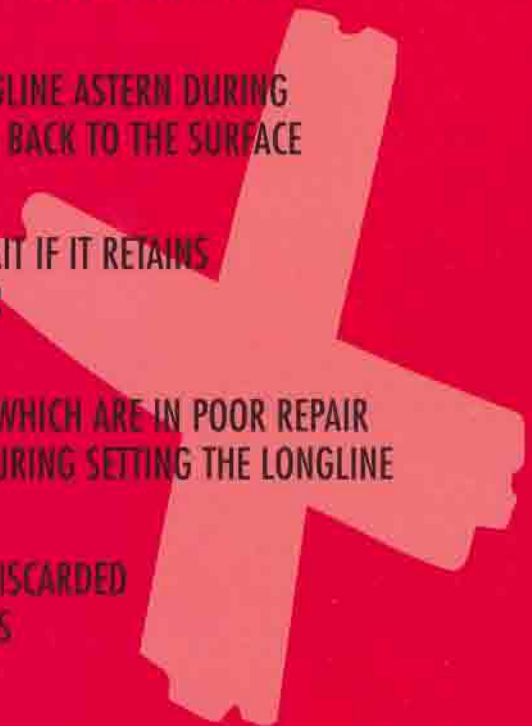
Si ДА

- USE A BIRD LINE EVEN WHEN SETTING LONGLINES AT NIGHT
  - USE A PROPERLY CONSTRUCTED BIRD LINE
  - USE APPROPRIATE WEIGHTS ON LONGLINES
  - THAW BAITS PROPERLY BEFORE SETTING LONGLINES
  - DISCHARGE OFFAL CORRECTLY
  - MINIMISE LIGHTING AT THE STERN OF THE SHIP WHEN SETTING LONGLINES
- 

# NO

Non

No Нет

- DON'T SET LONGLINES DURING DAYLIGHT HOURS
  - DON'T TENSION THE LONGLINE ASTERN DURING SETTING, IT BRINGS BAITS BACK TO THE SURFACE
  - DON'T USE A FISH FOR BAIT IF IT RETAINS AIR IN ITS SWIM BLADDER
  - DON'T USE HOOK BOXES WHICH ARE IN POOR REPAIR AND ENTANGLE HOOKS DURING SETTING THE LONGLINE
  - NEVER LEAVE HOOKS IN DISCARDED BY-CATCH AND FISH HEADS
- 

**CONSERVATION MEASURE 25-02 (2005)<sup>1,2</sup>**  
**Minimisation of the incidental mortality**  
**of seabirds in the course of longline fishing or**  
**longline fishing research in the Convention Area**

Species	seabirds
Area	all
Season	all
Gear	longline

The Commission,

Noting the need to reduce the incidental mortality of seabirds during longline fishing by minimising their attraction to fishing vessels and by preventing them from attempting to seize baited hooks, particularly during the period when the lines are set,

Recognising that in certain subareas and divisions of the Convention Area there is also a high risk that seabirds will be caught during line hauling,

Adopts the following measures to reduce the possibility of incidental mortality of seabirds during longline fishing.

1. Fishing operations shall be conducted in such a way that hooklines<sup>3</sup> sink beyond the reach of seabirds as soon as possible after they are put in the water.
2. Vessels using autoline systems should add weights to the hookline or use integrated weight hooklines while deploying longlines. Integrated weight (IW) longlines of a minimum of 50 g/m or attachment to non-IW longlines of 5 kg weights at 50 to 60 m intervals are recommended.
3. Vessels using the Spanish method of longline fishing should release weights before line tension occurs; weights of at least 8.5 kg mass shall be used, spaced at intervals of no more than 40 m, or weights of at least 6 kg mass shall be used, spaced at intervals of no more than 20 m.
4. Longlines shall be set at night only (i.e. during the hours of darkness between the times of nautical twilight<sup>4</sup><sup>5</sup>). During longline fishing at night, only the minimum ship's lights necessary for safety shall be used.
5. The dumping of offal is prohibited while longlines are being set. The dumping of offal during the haul shall be avoided. Any such discharge shall take place only on the opposite side of the vessel to that where longlines are hauled. For vessels or fisheries where there is not a requirement to retain offal on board the vessel, a system shall be implemented to remove fish hooks from offal and fish heads prior to discharge.
6. Vessels which are so configured that they lack on-board processing facilities or adequate capacity to retain offal on board, or the ability to discharge offal on the opposite side of the vessel to that where longlines are hauled, shall not be authorised to fish in the Convention Area.
7. A streamer line shall be deployed during longline setting to deter birds from approaching the hookline. Specifications of the streamer line and its method of deployment are given in the appendix to this measure.

8. A device designed to discourage birds from accessing baits during the haul of longlines shall be employed in those areas defined by CCAMLR as average-to-high or high (Level of Risk 4 or 5) in terms of risk of seabird by-catch. These areas are currently Statistical Subareas 48.3, 58.6 and 58.7 and Statistical Divisions 58.5.1 and 58.5.2.
9. Every effort should be made to ensure that birds captured alive during longlining are released alive and that wherever possible hooks are removed without jeopardising the life of the bird concerned.
10. Other variations in the design of mitigation measures may be tested on vessels carrying two observers, at least one appointed in accordance with the CCAMLR Scheme of International Scientific Observation, providing that all other elements of this conservation measure are complied with<sup>6</sup>. Full proposals for any such testing must be notified to the Working Group on Fish Stock Assessment (WG-FSA) in advance of the fishing season in which the trials are proposed to be conducted.

<sup>1</sup> Except for waters adjacent to the Kerguelen and Crozet Islands

<sup>2</sup> Except for waters adjacent to the Prince Edward Islands

<sup>3</sup> Hookline is defined as the groundline or mainline to which the baited hooks are attached by snoods.

<sup>4</sup> The exact times of nautical twilight are set forth in the Nautical Almanac tables for the relevant latitude, local time and date. A copy of the algorithm for calculating these times is available from the CCAMLR Secretariat. All times, whether for ship operations or observer reporting, shall be referenced to GMT.

<sup>5</sup> Wherever possible, setting of lines should be completed at least three hours before sunrise (to reduce loss of bait to/catches of white-chinned petrels).

<sup>6</sup> The mitigation measures under test should be constructed and operated taking full account of the principles set out in WG-FSA-03/22 (the published version of which is available from the CCAMLR Secretariat and website); testing should be carried out independently of actual commercial fishing and in a manner consistent with the spirit of Conservation Measure 21-02.

#### APPENDIX TO CONSERVATION MEASURE 25-02

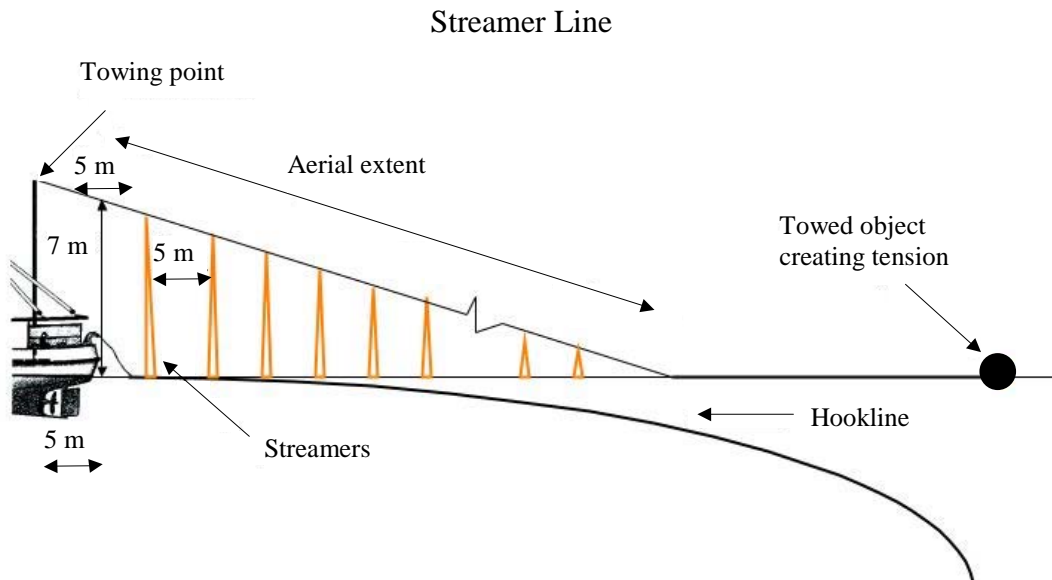
1. The aerial extent of the streamer line, which is the part of the line supporting the streamers, is the effective seabird deterrent component of a streamer line. Vessels are encouraged to optimise the aerial extent and ensure that it protects the hookline as far astern of the vessel as possible, even in crosswinds.
2. The streamer line shall be attached to the vessel such that it is suspended from a point a minimum of 7 m above the water at the stern on the windward side of the point where the hookline enters the water.
3. The streamer line shall be a minimum of 150 m in length and include an object towed at the seaward end to create tension to maximise aerial coverage. The object towed should be maintained directly behind the attachment point to the vessel such that in crosswinds the aerial extent of the streamer line is over the hookline.
4. Branched streamers, each comprising two strands of a minimum of 3 mm diameter brightly coloured plastic tubing<sup>7</sup> or cord, shall be attached no more than 5 m apart commencing 5 m from the point of attachment of the streamer line to the vessel and thereafter along the aerial extent of the line. Streamer length shall range between minimums of 6.5 m from the stern to 1 m for the seaward end. When a streamer line is fully deployed, the branched streamers should reach the sea surface in the absence of



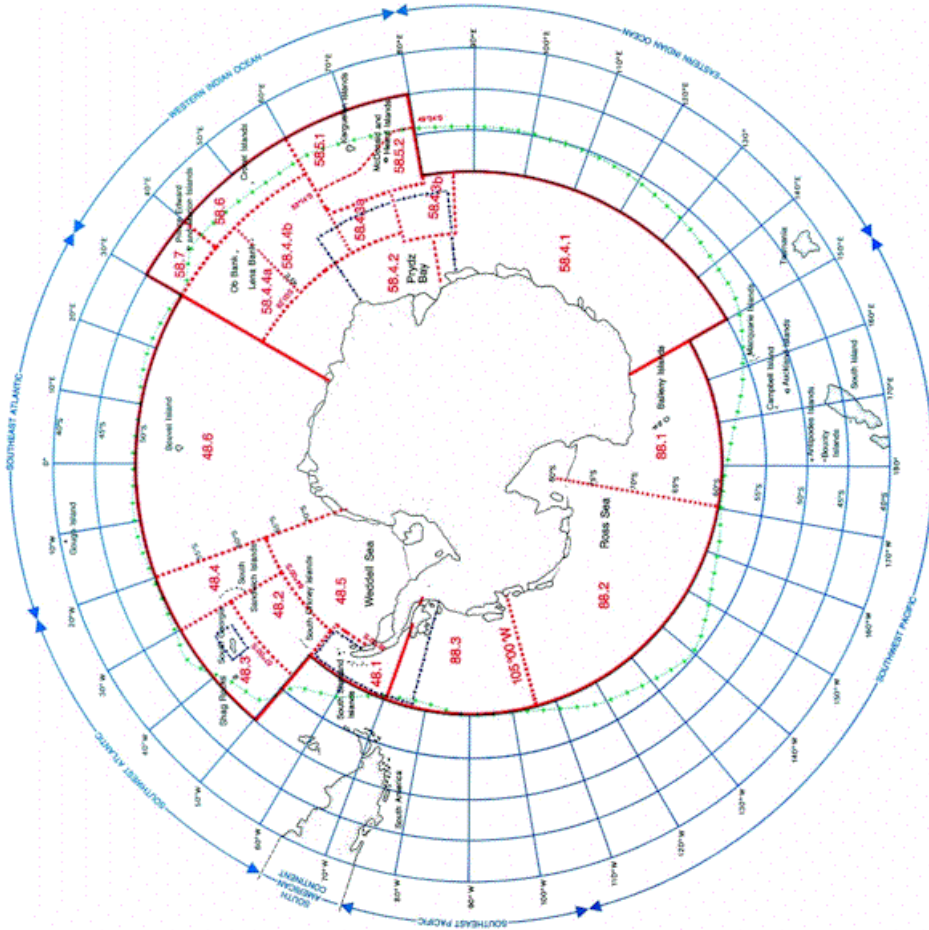
wind and swell. Swivels or a similar device should be placed in the streamer line in such a way as to prevent streamers being twisted around the streamer line. Each branched streamer may also have a swivel or other device at its attachment point to the streamer line to prevent fouling of individual streamers.

5. Vessels are encouraged to deploy a second streamer line such that streamer lines are towed from the point of attachment each side of the hookline. The leeward streamer line should be of similar specifications (in order to avoid entanglement the leeward streamer line may need to be shorter) and deployed from the leeward side of the hookline.

<sup>7</sup> Plastic tubing should be of a type that is manufactured to be protected from ultraviolet radiation.



# MAP OF THE CONVENTION AREA



CCAMLR

Boundaries of the  
Statistical Reporting  
Areas in the  
Southern Ocean

- LEGEND**
- STATISTICAL AREA  
ЗОНА СТАТИСТИКЕ  
СТАТИСТИЧКИХ ПАРОВА  
AREA ESTADISTICA
  - STATISTICAL SUBAREA  
СТАТИСТИЧЕСКИ ПОДПАРОВ  
SUBAREA ESTADISTICA
  - ANTARCTIC CONVERGENCE  
АНТАРКТИЧКА КОНВЕРГЕНЦИЈА  
CONVERGENCIA ANTARCTICA
  - CONTINENT, ISLAND  
CONTINENT, ILE  
CONTINENTE, ILLA
  - INTEGRATED STUDY REGION  
ИНТЕГРИРАНА ИСТРАЖИВАЧКА  
ПАРОВА КОМБИНИРАНА РЕГИОН  
REGION DE ESTUDIO INTEGRADO

