



For seabird bycatch mitigation



Food and Agriculture Organization
of the United Nations



COMMON
OCEANS
PROGRAM

Workshop objective and content

Objective:

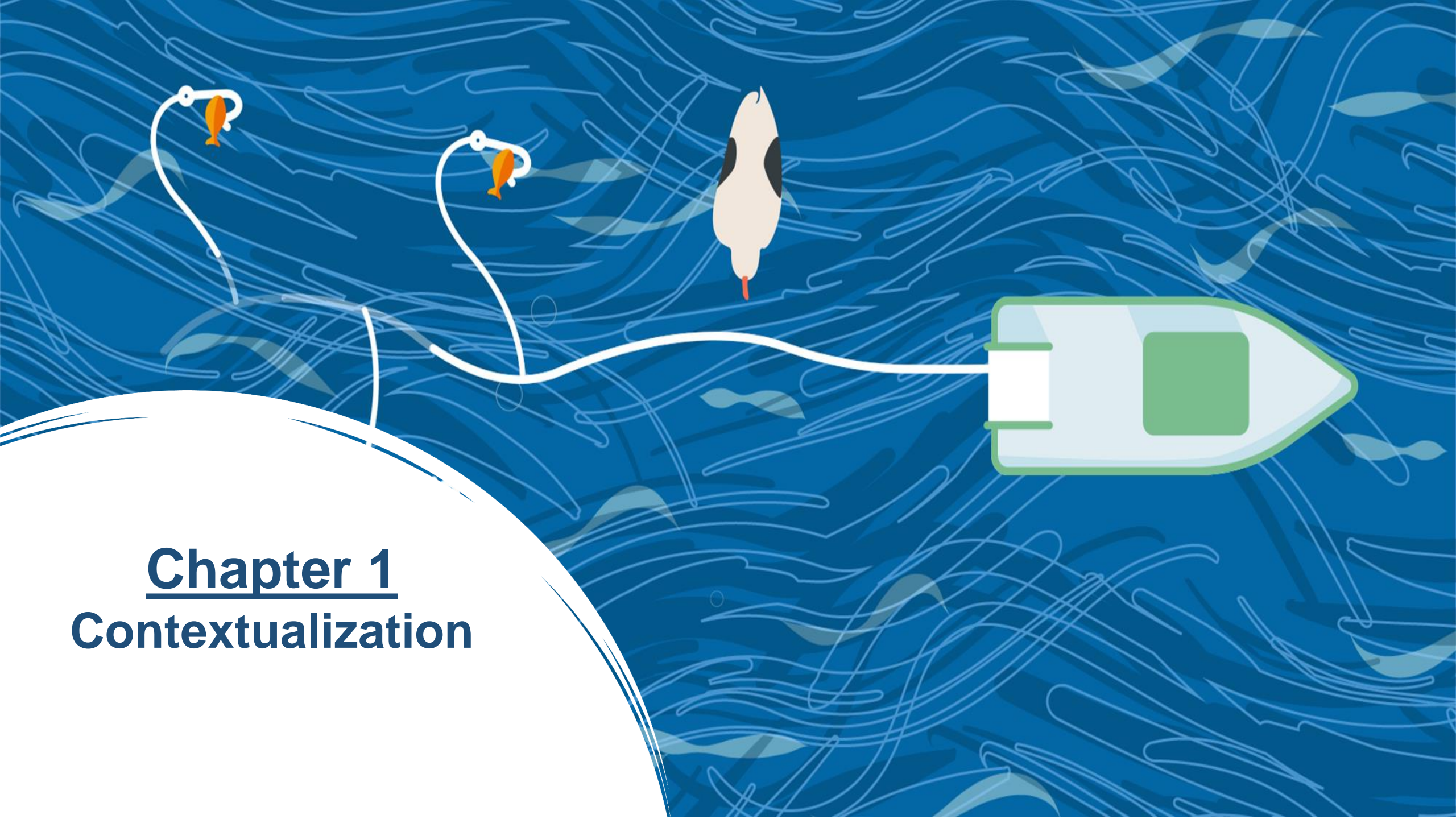
Increase awareness and promote uptake of seabird bycatch mitigation in CCSBT fisheries.

Workshop content

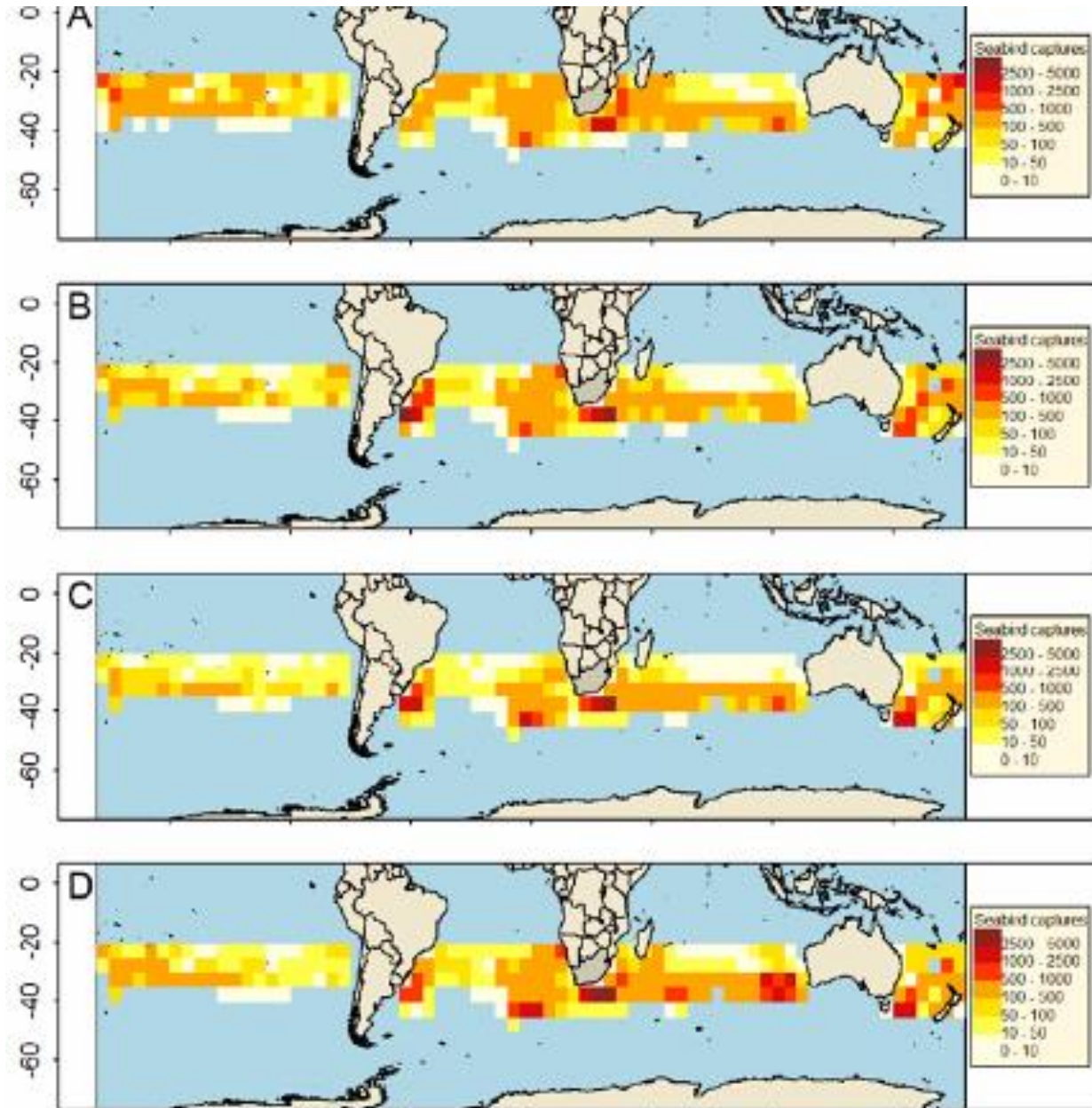
- Chapter 1. Contextualization
- Chapter 2. Introduction to at-risk seabirds - albatrosses and petrels
- Chapter 3. Seabird bycatch
- Chapter 4. RFMOs mitigation measures requirements
- Chapter 5. Seabird bycatch mitigation measures
- Chapter 6. Handling and release of hooked or entangled birds

Chapter 1

Contextualization



Seabird bycatch in tuna longline fisheries



30,000 to 40,000 seabirds estimated caught per annum in the Southern Hemisphere

Abraham et al. (2019), FAO Common Oceans Report

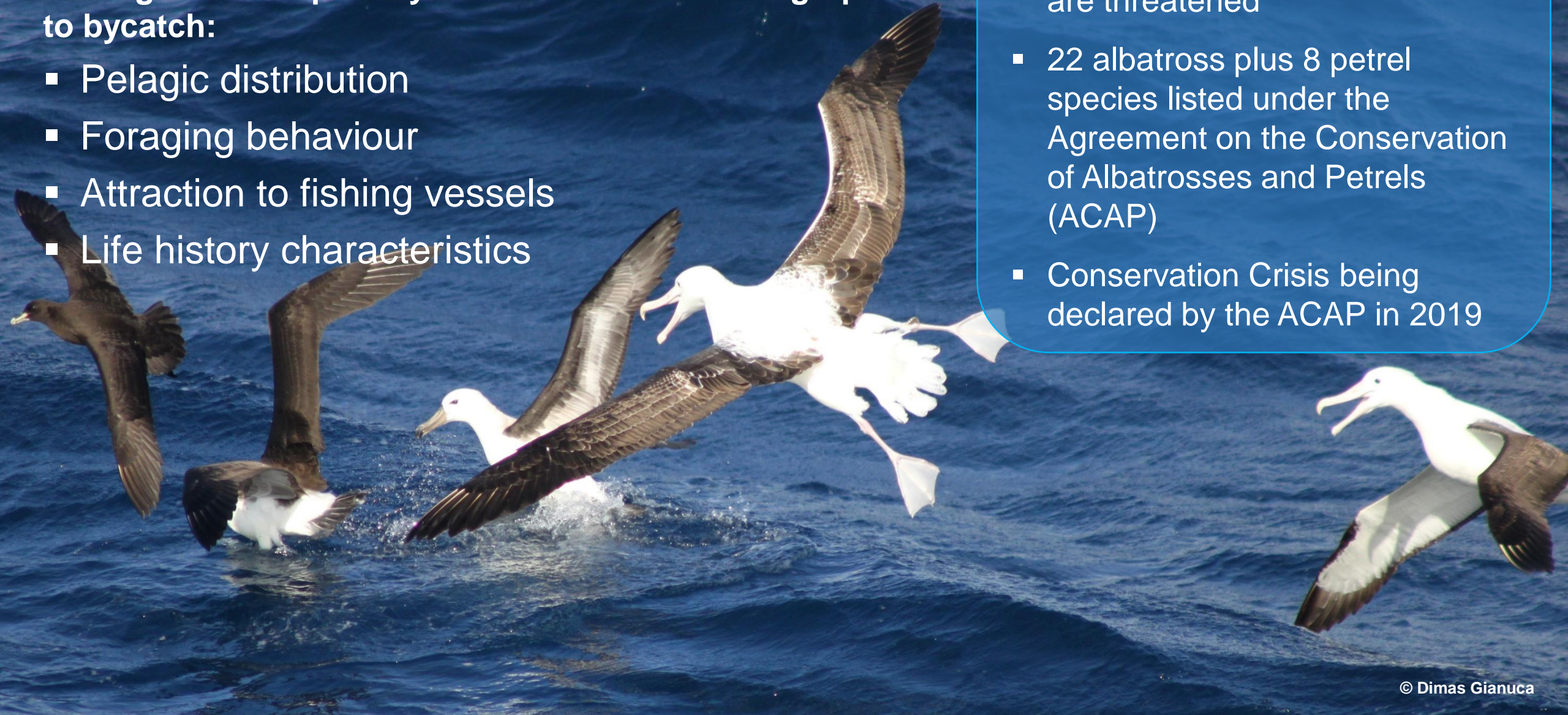



Albatrosses and large petrels are the most affected species

A combination of ecological and life history factors drives the higher susceptibility of albatrosses and large petrels to bycatch:

- Pelagic distribution
- Foraging behaviour
- Attraction to fishing vessels
- Life history characteristics

- 15 of 22 species of albatrosses are threatened
- 22 albatross plus 8 petrel species listed under the Agreement on the Conservation of Albatrosses and Petrels (ACAP)
- Conservation Crisis being declared by the ACAP in 2019





Chapter 2

Introduction to at-risk seabirds: albatrosses and petrels

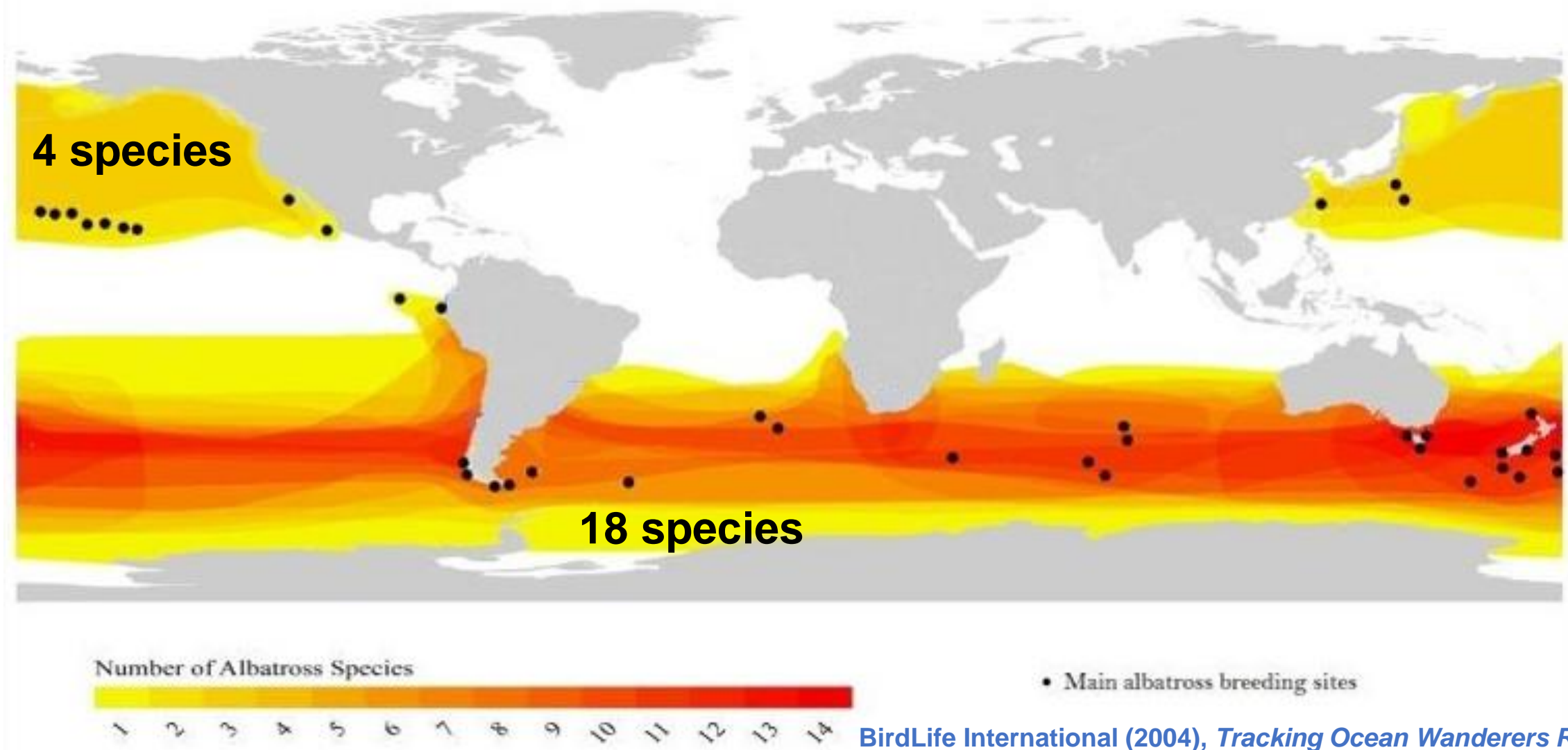
Introduction to albatrosses and medium/large petrels

- Highly oceanic birds, spend most of their lives at sea, visiting land only for breeding
- Albatrosses are huge (up to 3,5 m wingspan)
- Breed in remote islands and forage across the vast expanses of the oceans
- Travel long distances searching for (scarce) food on the sea's surface



Albatrosses and petrels distribution and breeding sites

22 albatross species

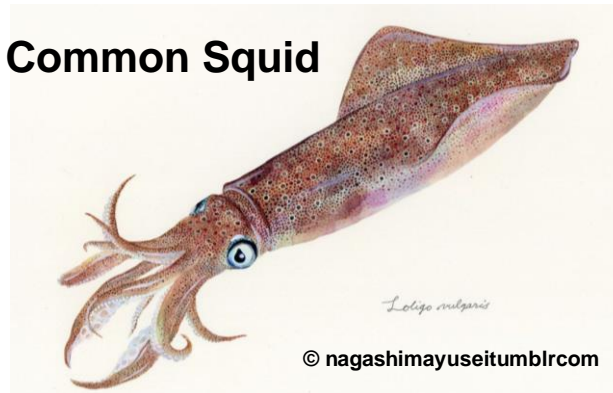


Foraging

Food

- Squid
- Small pelagic fish
- Krill
- Scavenge on the sea's surface (any carcass or remains)

Common Squid



Sardines



Antarctic krill



Lobster krill



Foraging

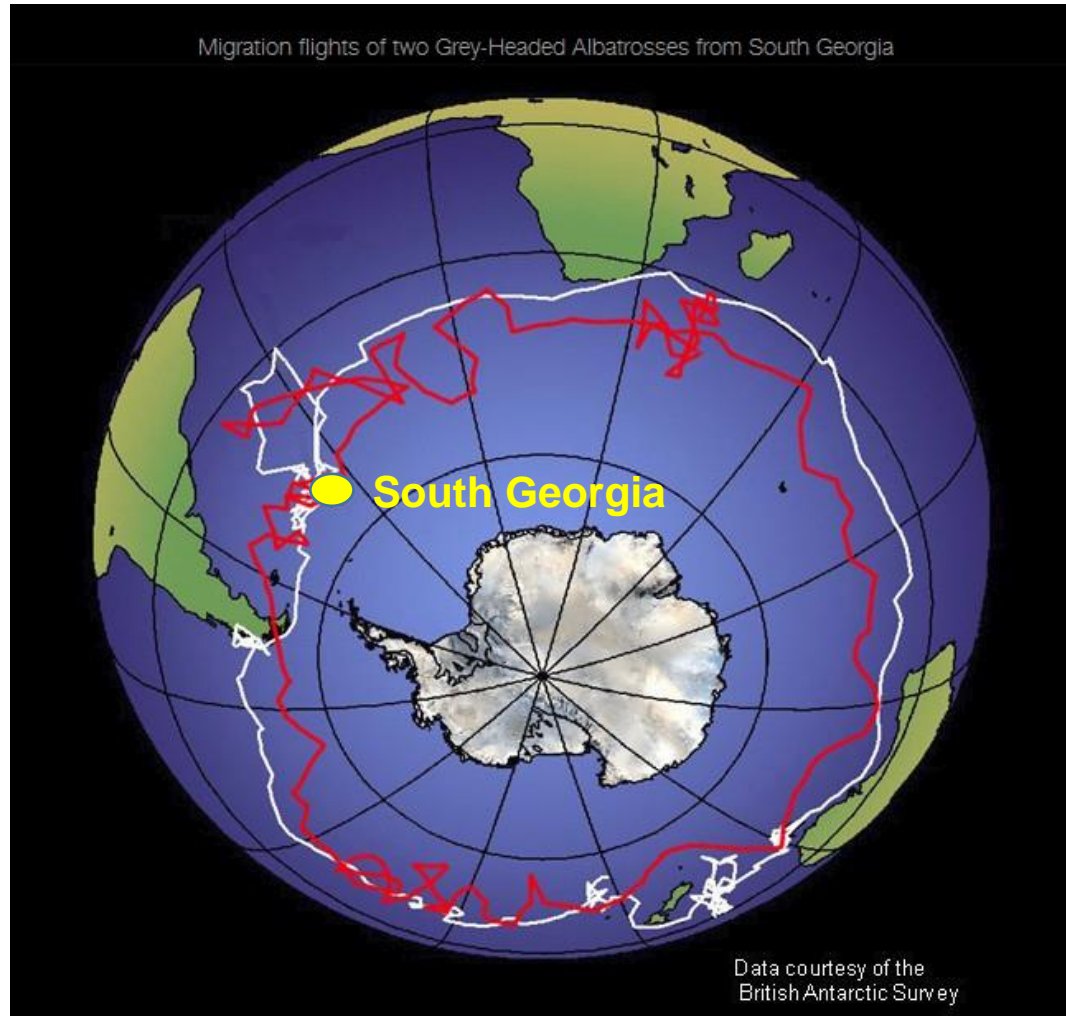
- Search for scarce food across the oceans surface
- Rely heavily on their sense of smell, **can detect fishing vessels 30 km away**
- Can reach the speed of 100 km/h
- Can fly over 1,000 km per day



Foraging



Foraging



Non-breeding grey-headed albatross flew **around the world in just 46 days.**

This is the current world record!

Croxall et al (2005), Science 307: 249-250

Tuna vs Albatross life history

ALBATROSS

- Form breeding pairs
- Extensive post-fertilisation parental care
- Late maturity (~10 years old in great albatrosses)
- Low birth rate (one egg every 2 years in great albatrosses)
- Long-lived (50 to 75+ years)
- Small population sizes (most albatross populations are in thousands, some <100 pairs)

Highly vulnerable to additional factor for mortality (including fisheries bycatch)

TUNA

- Broadcast spawn
- Zero parental care
- Several spp. breed at 3 years old
- Extremely high birth rate (many thousands of eggs each season)
- Short-lived – 20-40 years
- Abundant (population measured in millions of individuals/tons)

Can withstand high levels of mortality, if fishery well-managed

Chapter 3

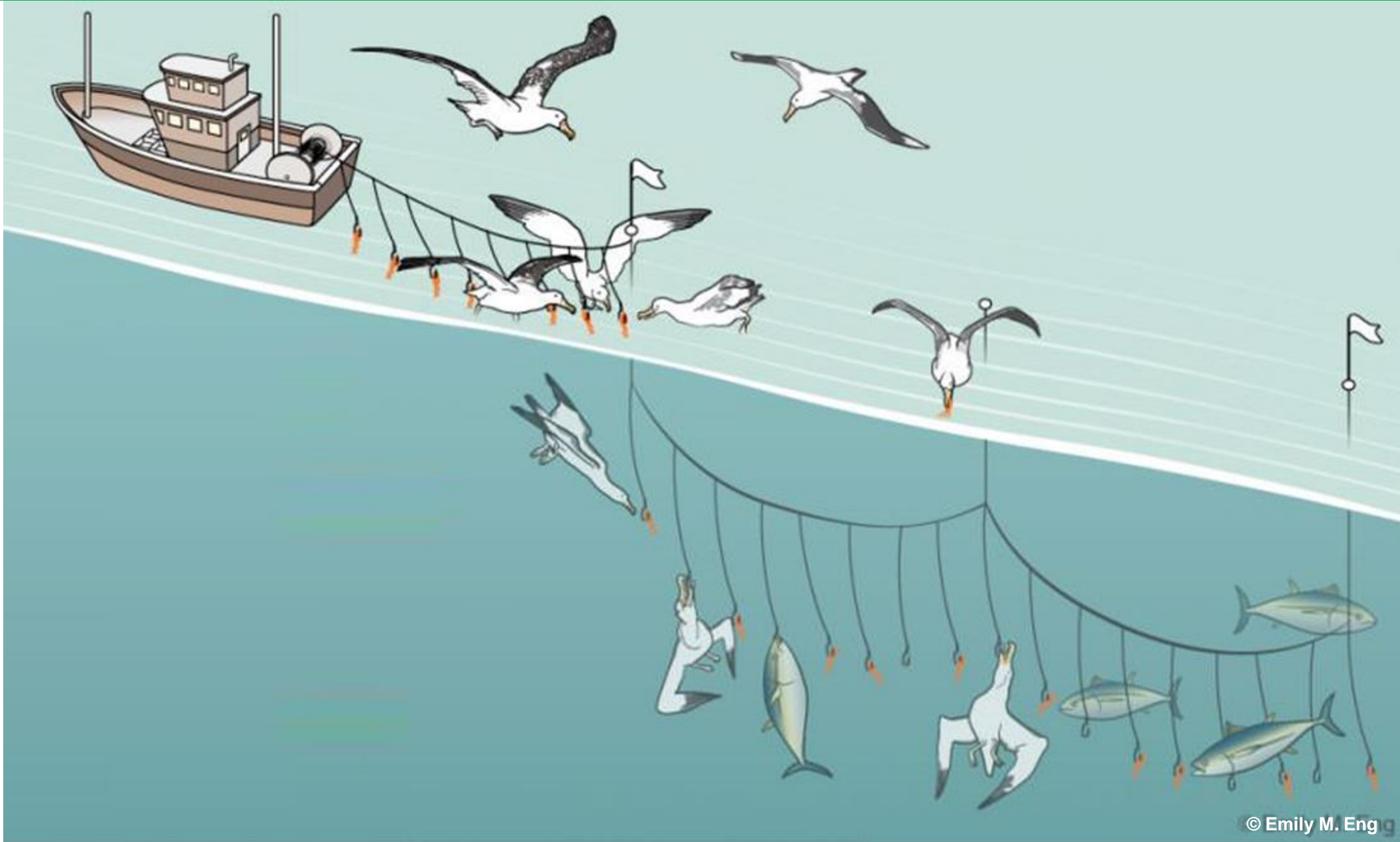
Seabird Bycatch



Attraction to fishing vessels

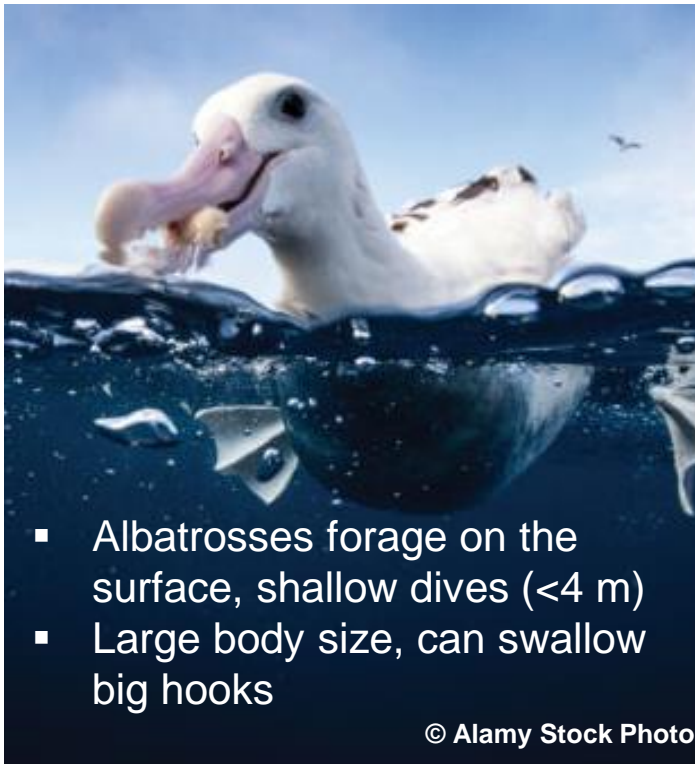
Seabirds are attracted to fishing vessels to feed on baits, offal and discards

How seabirds die in the longlines

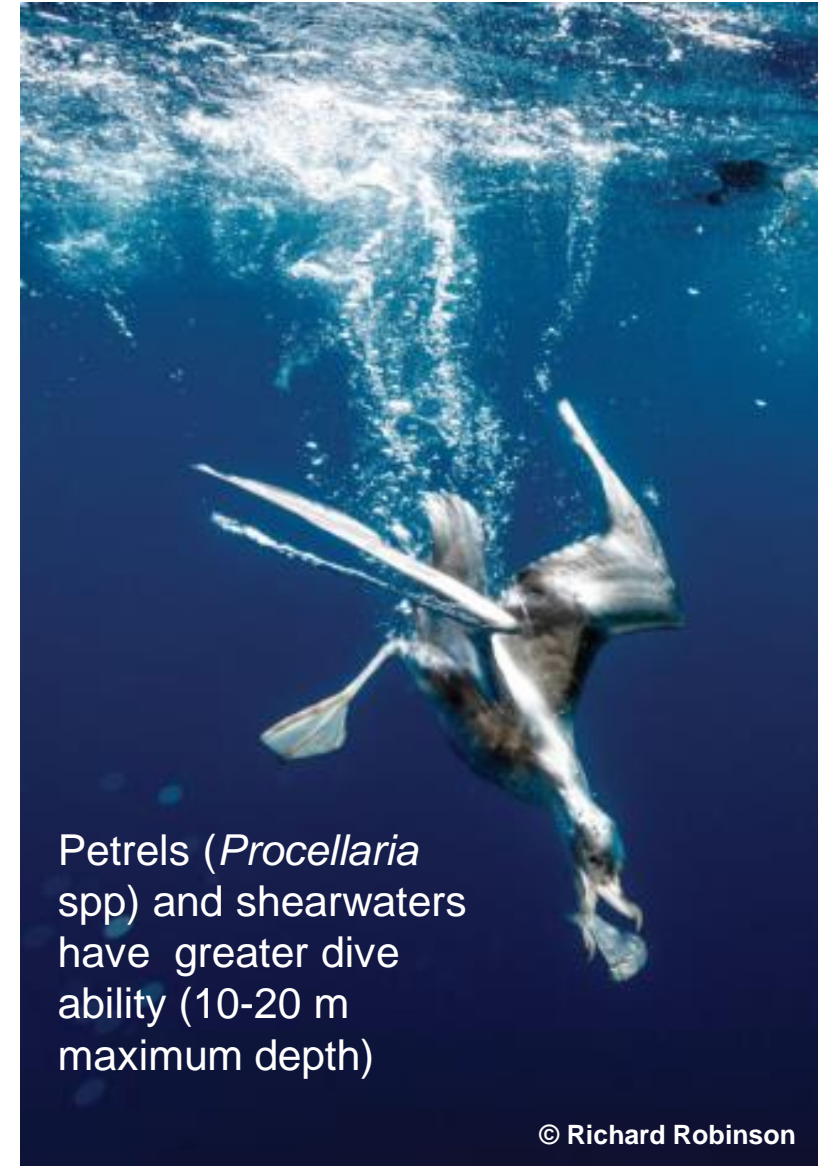


Bird size and dive ability influence bycatch risk

- Petrels and shearwaters with high diving ability facilitate the catch of albatrosses in tuna longline fisheries
- **Different areas has different species composition**
- Mitigating seabird bycatch is more challenging in areas with **high seabird density and the presence of diving petrels/shearwaters and albatrosses**
- **Southern Hemisphere**



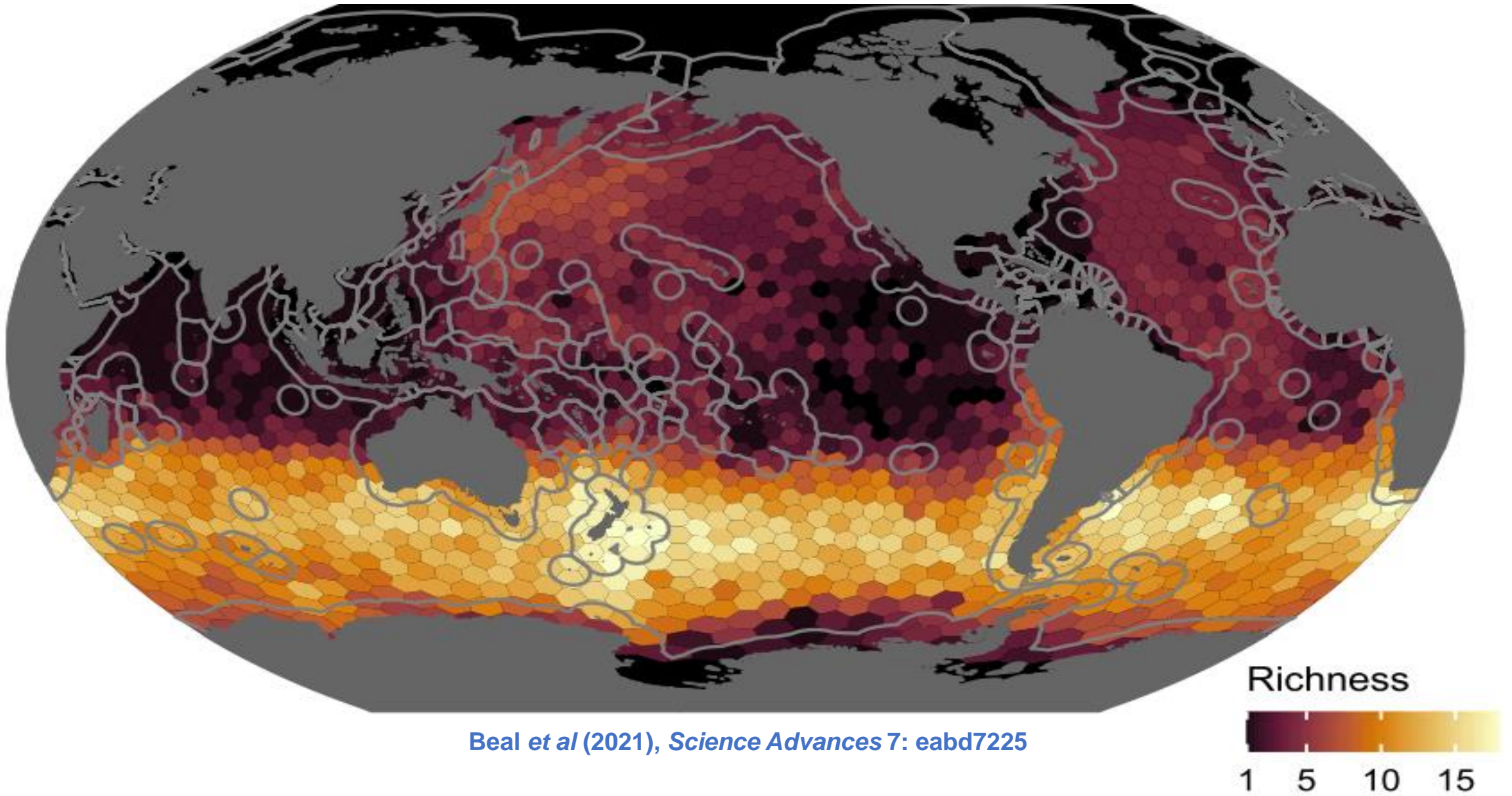
- Albatrosses forage on the surface, shallow dives (<4 m)
- Large body size, can swallow big hooks



Petrels (*Procellaria* spp) and shearwaters have greater dive ability (10-20 m maximum depth)

Bird size and dive ability influence bycatch risk

39 species: 22 albatrosses and 17 petrels



Beal et al (2021), *Science Advances* 7: eabd7225

Bird size and diving ability influence bycatch risk

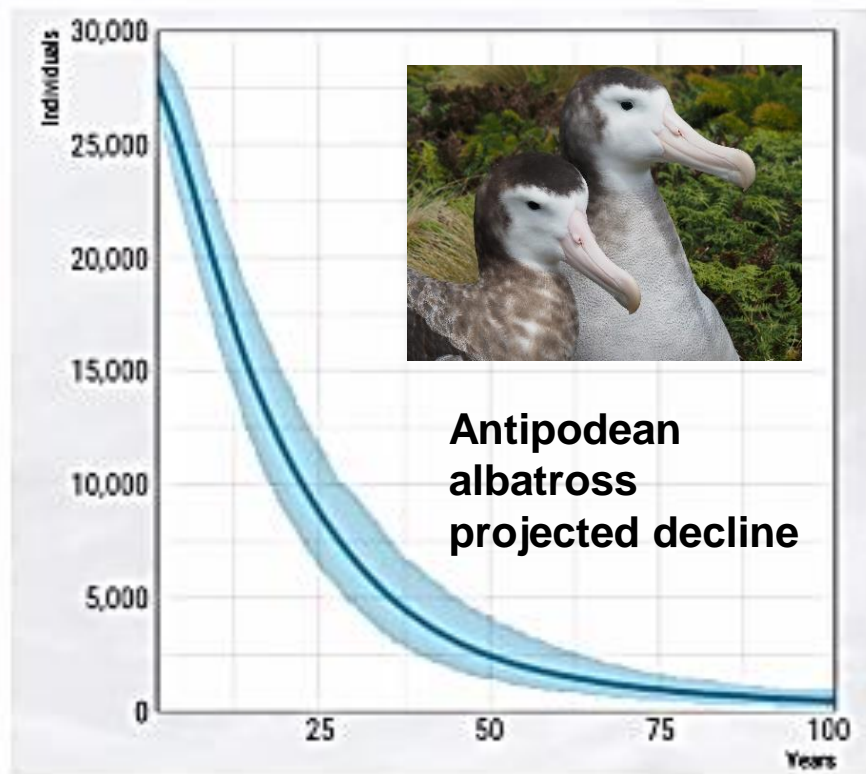
White-chinned petrel
(*Procellaria aequinoctialis*)

Black-browed-albatross
(*Thalassarche melanophris*)

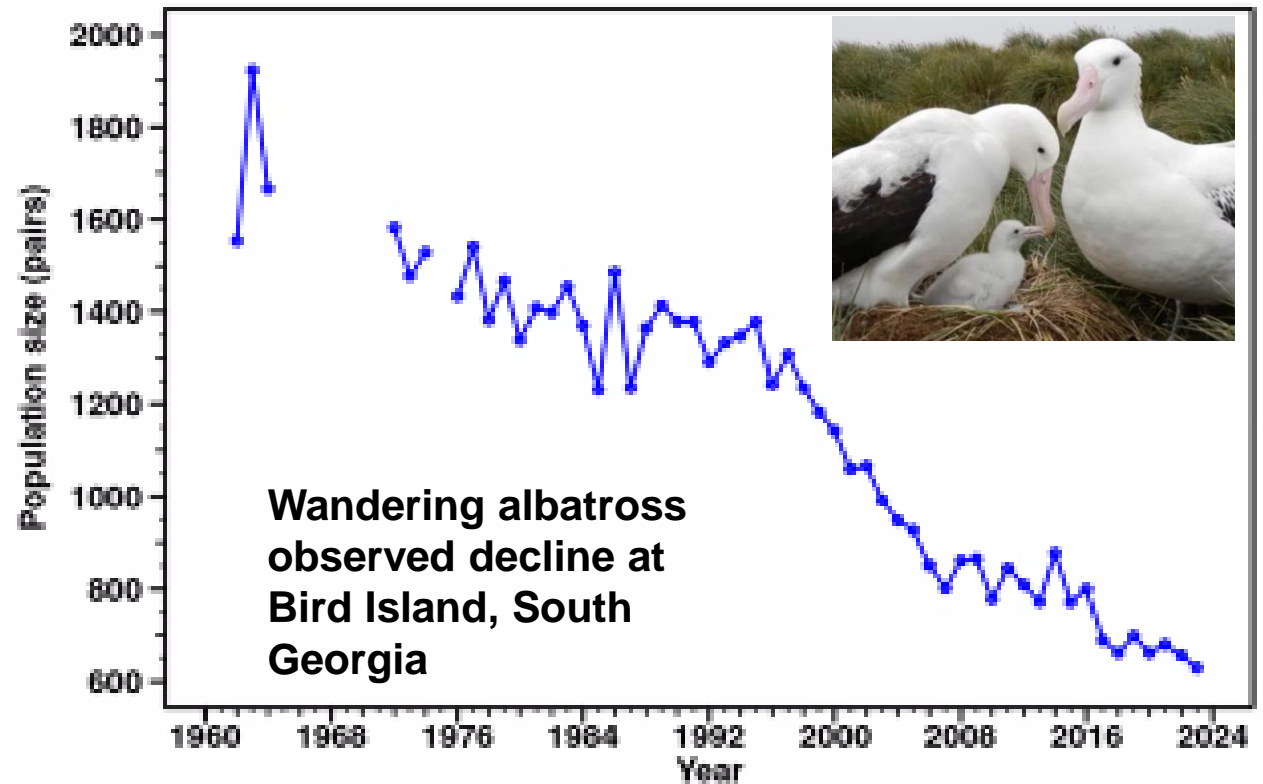
Spectacled petrel
(*Procellaria conspicilata*)

Unsustainable population declines

- Bycatch in tuna longline fisheries is one of major drivers of unsustainable population declines
- **15 of 22 species of albatrosses threatened with extinction**
- International Conservation Crisis in 2019*



Dragonfly (2023), *Unpublished data*



British Antarctic Survey (2023), *Unpublished data*

*ACAP – Agreement on the Conservation of Albatrosses and Petrels, an inter-governmental agreement

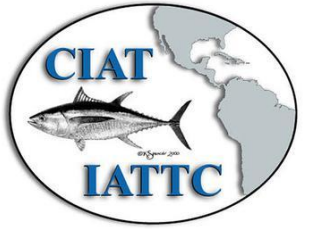
The role of seabirds in marine ecosystems and fisheries

- Albatrosses and petrels mostly scavenge – like vultures, they ‘clean’ the ocean
- Fertilize” oceans by spreading nutrients across vast areas
- **Marine systems and tuna food webs are healthier and more productive with seabirds**



Inter-governmental efforts to reduce seabird bycatch

Regional Fisheries Management Organizations (RFMOs)



FAO



Food and Agriculture Organization
of the United Nations

- Developed and promotes the IPOA-seabirds
- Executes the Common Ocean Program including the CCSBT Seabird Projects

**COMMON
OCEANS**
PROGRAM

Agreement on the Conservation of Albatrosses and Petrels (ACAP)

- Multilateral agreement which seeks to conserve listed albatrosses and petrels species
- 13 States are Party to ACAP
- Co-financing partner in Common Oceans Program

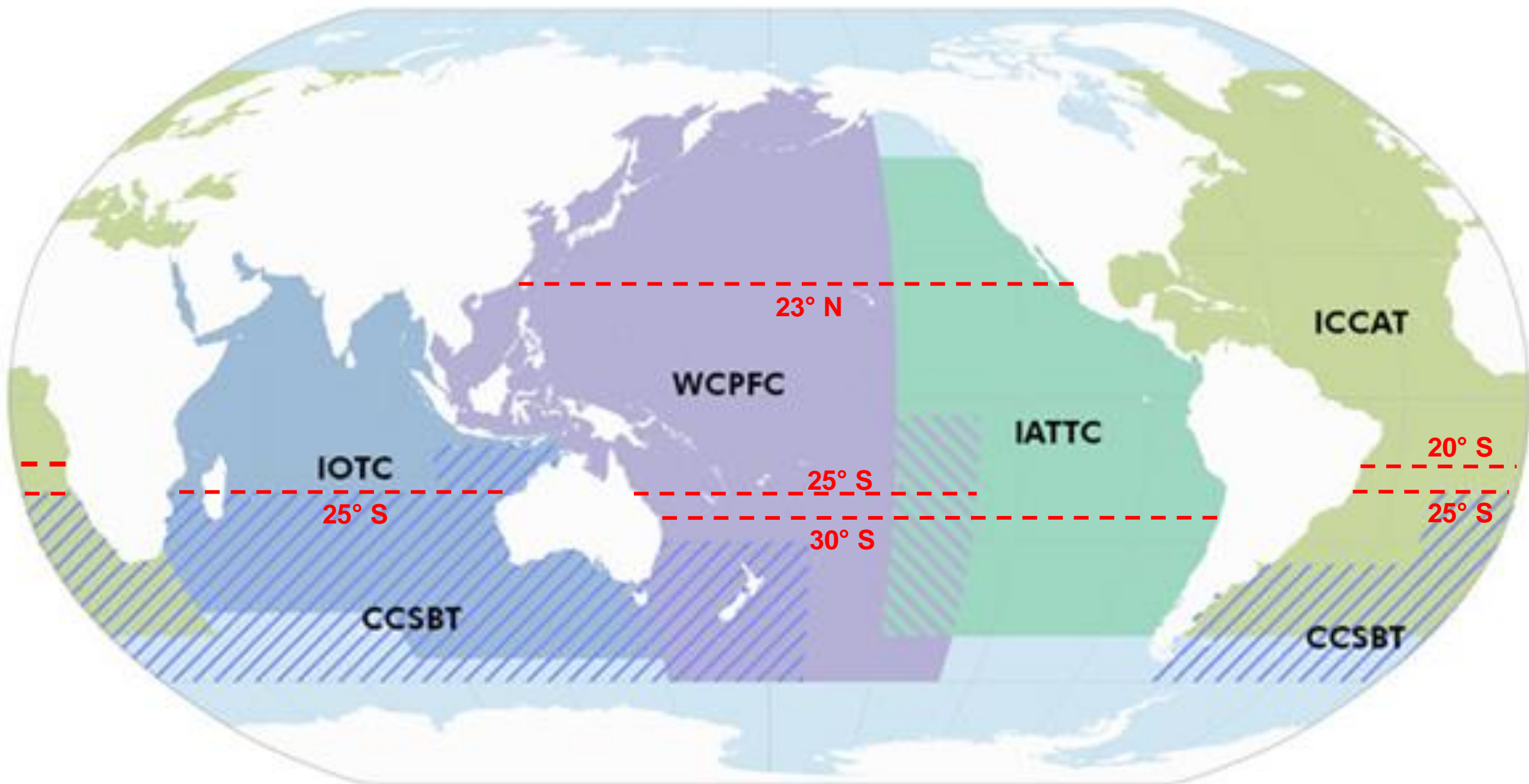


Chapter 4

RFMOs mitigation measures requirements



Tuna RFMOs



RFMOs mitigation measures requirements in CCSBT areas of operation



ICCAT

South of 25°S

- Two from:
 - Tori line
 - Line weighting
 - Night setting

Between 20°-25°S

- Tori line

IOTC

South of 25°S

- Two from:
 - Tori line
 - Line weighting
 - Night setting
- Or hook-shielding devices (**Hookpods**) alone

WCPFC

South of 30°S

- Two from
 - Tori line
 - Line weighting
 - Night setting
- Or hook-shielding devices (**Hookpods**) alone

Between 25°-30°S

- one of:
 - Tori line
 - Line weighting
 - Hookpods

IATTC

South of 30°S

- Two of eight, including at least one from Column A:

Column A

- Tori line
- Line weighting
- Night setting
- Side setting

Column B

- Tori line
- Line weighting
- Underwater bait setter
- Blue baits
- Deep setting line shooter
- Offal management

In areas south of 30°S
that are not covered by tuna RFMOs – Tori line

Chapter 5

Seabird bycatch mitigation measures



Solutions to bycatch problem

Minimizing access of seabirds to baited hooks is a win-win case, because this avoid bait losses to the seabirds and reduce the seabird mortality



Solutions to bycatch problem



The illustration shows a dark grey fishing vessel on the left, with a longline extending from its stern towards the right. The longline is a thin black line with several vertical lines (snoots) hanging from it, each ending in a hook. The background is divided into three horizontal bands: a light blue sky at the top with many black silhouettes of seabirds in flight; an orange band in the middle representing the 'DANGER DEPTH ZONE'; and a darker blue band at the bottom representing the water. The text 'DANGER DEPTH ZONE 10m' is written in white across the orange band. Below this, in the water band, is the text 'Hooks within 10 m of the surface represent the greatest danger for seabirds'.

DANGER DEPTH ZONE 10m

Hooks within 10 m of the surface
represent the greatest danger for
seabirds

Solutions to bycatch problem

Research, development and scientific/experimental testing of seabird bycatch mitigation measures since 1990s

Broadly speaking, mitigation measures in RFMOs' CMMs required in the southern hemisphere are:

- Based on comprehensive review of scientific literature and recent research
- Shown to be effective with scientific evidence
- Assessed regularly against several criteria
- Only mandatory in areas where fishing effort overlaps with seabirds vulnerable to bycatch

Solutions to bycatch problem

Mitigation measures broadly considered by RFMOs

Scientifically proven

- Tori line/Bird-scaring line
- Night setting
- Weighted branch lines

Requires 2 used
simultaneously

- Hookpod
- Underwater bait setter

Can be used
alone

Solutions to bycatch problem

The following slides describe important aspects for effective implementation of three commonly used mitigation measures:

- Tori line/bird-scaring line
- Night setting
- Line weighting

Bird-scaring line (BSL)

Bird-scaring line (BSL), also known as **Tori line**, is a line (often >100 m long) that is towed from a high point near the stern, with brightly colored streamers attached to it



© Dimas Gianuca



© New Zealand Department of Conservation

Bird-scaring line (BSL)



Birds displaced
further astern

Longline mainline

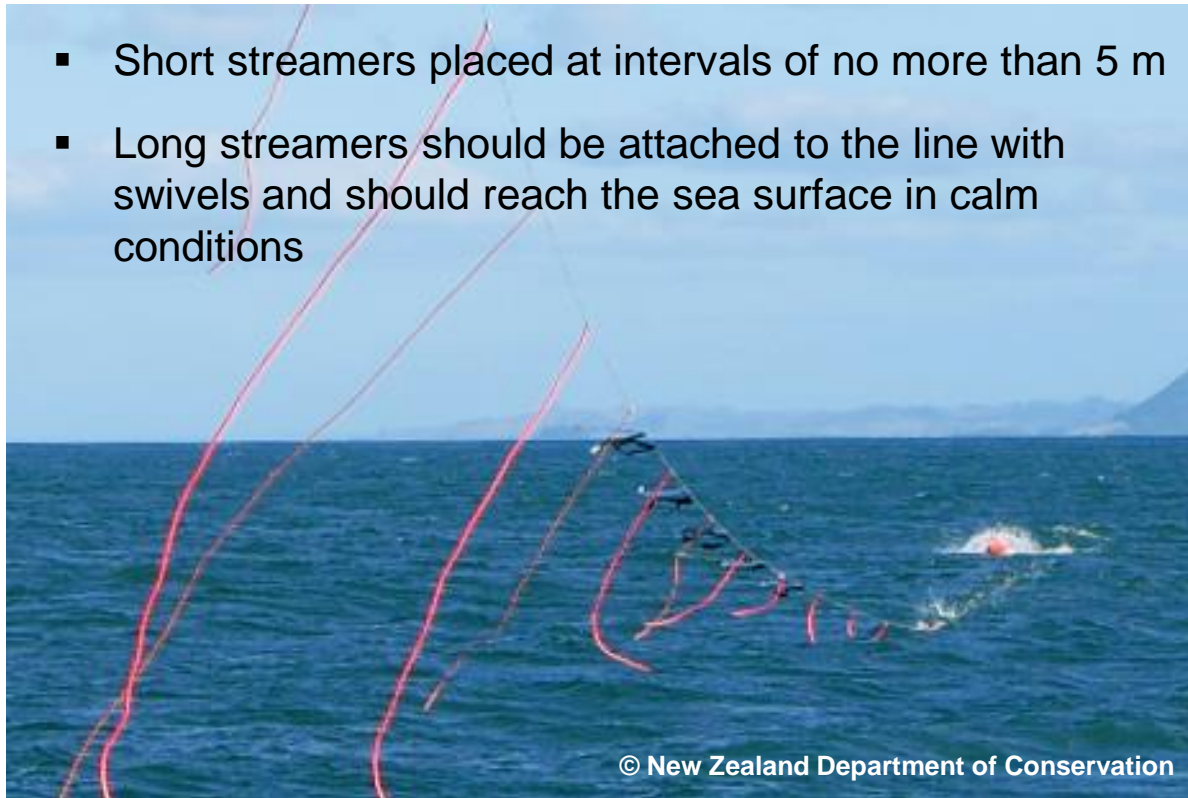


Bird-scaring line (BSL)

Vessels ≥ 35 m total length

- The use of at least one BSL
(used of two BSLs simultaneously, one on each side of the longline, can improve maximum protection)
- Should be attached to a point ≥ 7 m above the water
- A design with a mix of long and short streamers

- Short streamers placed at intervals of no more than 5 m
- Long streamers should be attached to the line with swivels and should reach the sea surface in calm conditions



Bird-scaring line (BSL)

Examples of towed object/section for drag

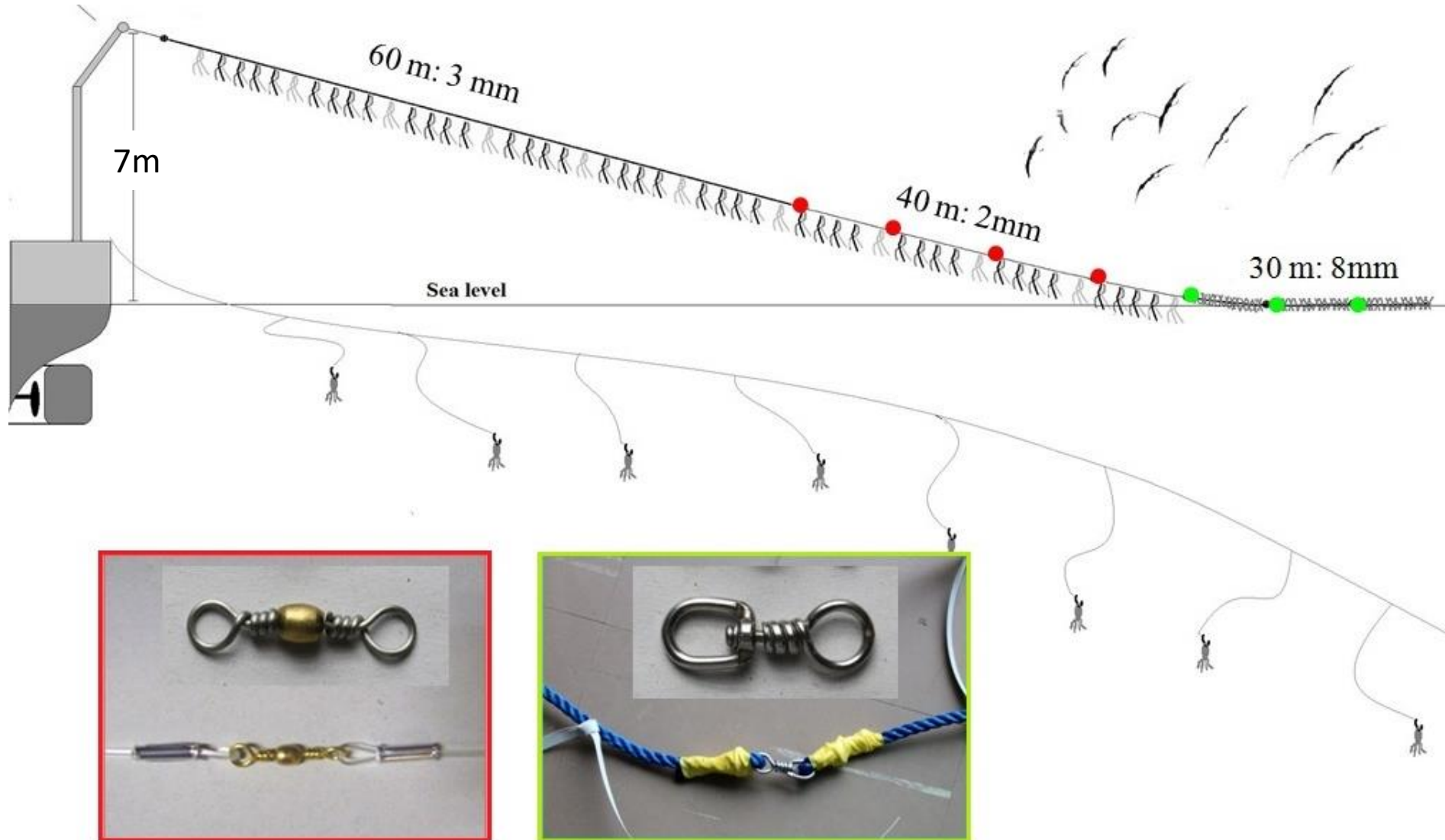
- Very important to **create tension and maximize aerial extent**
- Buoys
- Road cones
- Rope with packaging straps

After setting, stop the vessel to release the tension and haul the BSL effortless



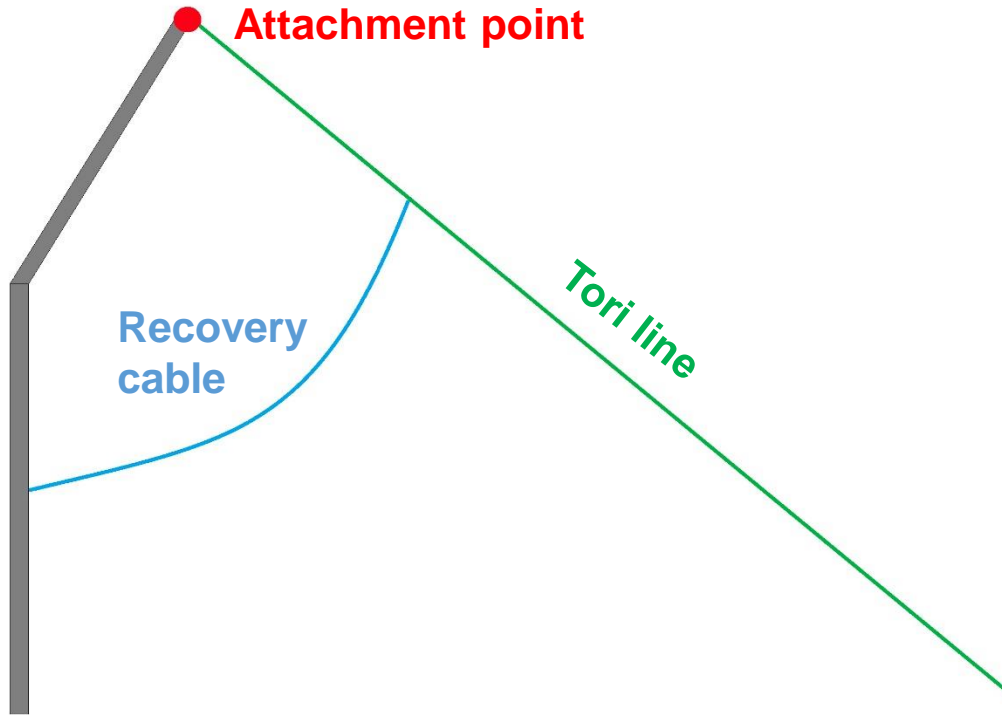
Bird-scaring line (BSL)

It is important to place barrel swivels through the BSL to reduce rotation of the line from torque (twisting) created as it is dragged behind the vessel



Bird-scaring line (BSL)

BSL attached to end of the pole, recovery cable needed to reach the BSL



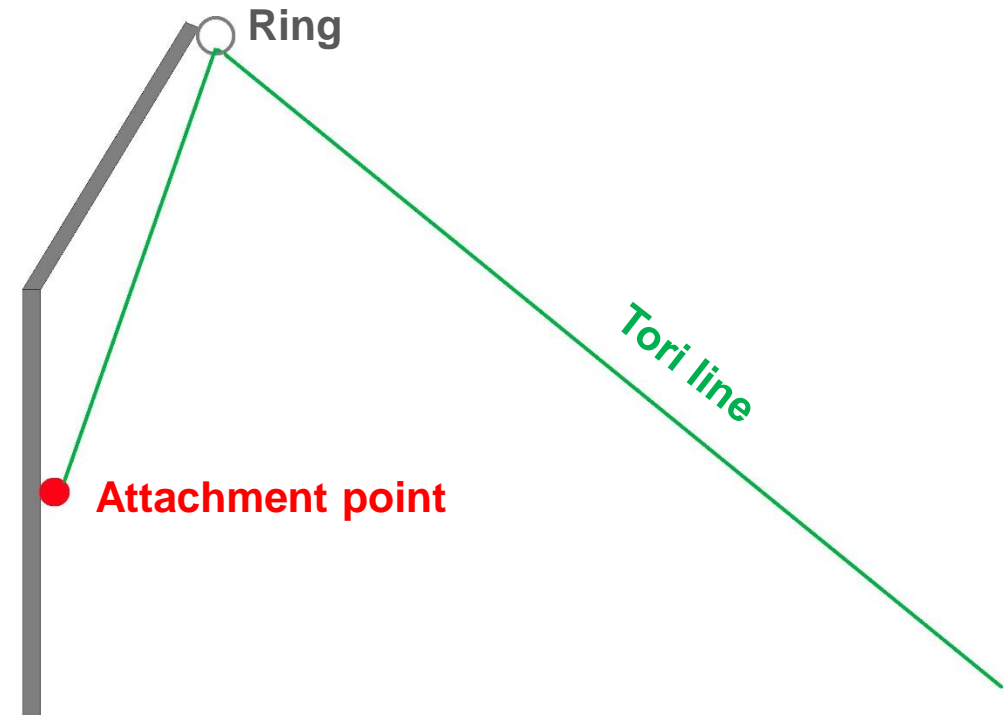
Pros

- Suitable for short and long streamers

Cons

- More difficult to operate and replace the BSL
- BSL lay on the water during deploying and hauling

BSL attached to the base of the pole, passing through a ring at the end



Pros

- Easier to replace the BSL (no need to climb the pole)
- BSL never lay on the water during deploying or hauling

Cons

- Potential challenges with long streamers

Night setting

- Night setting means **no setting between nautical dawn and before nautical dusk**
- This is defined as when the sun is below 12° BELOW the horizon – well after sunset
- Deck lighting should be kept to a minimum



Night setting is significantly less effective on clear nights with a full moon



Weighted branchlines

Weighted branchlines sink faster and reduce time for seabirds to access the bait

Three options for line weighting in IOTC and ICCAT:

- At least 45 g within 1 m of the hook
- At least 60 g within 3.5 m of the hook
- At least 98 g within 4 m of the hook

In addition, in WCPFC fishers can chose to use 40 g within 0.5 m of the hook

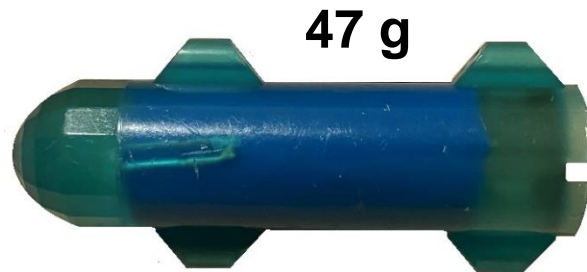


Weighted branchlines

Electronic fishing lights are not always the same as required weights

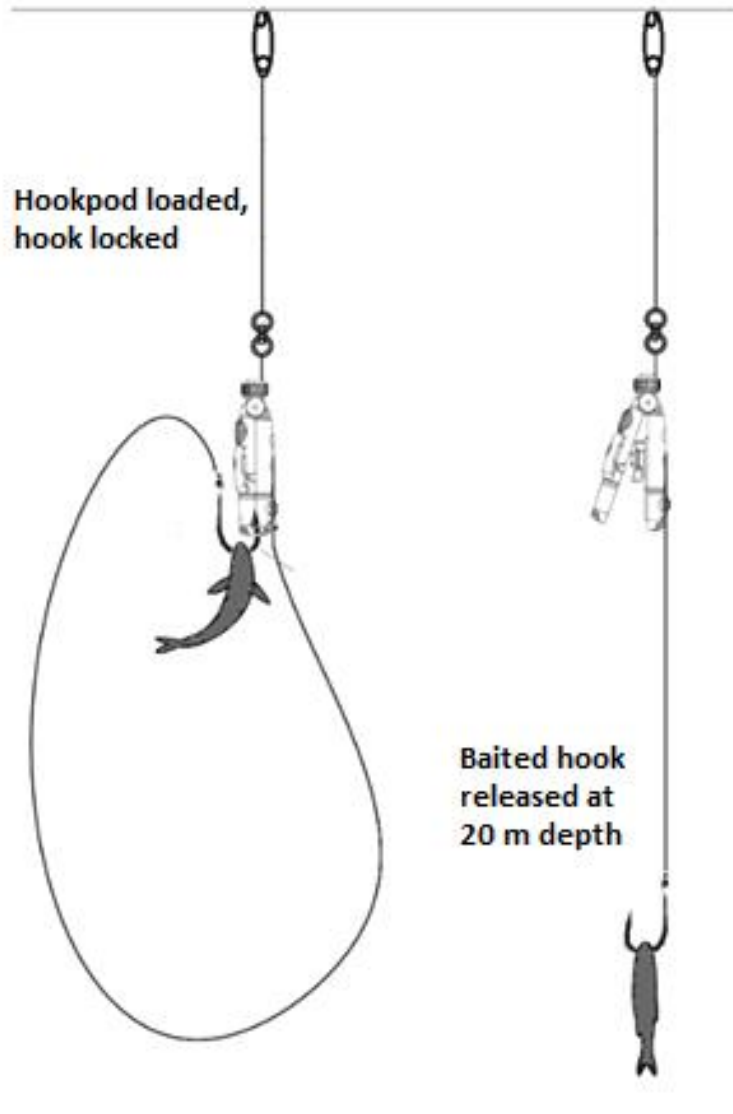
Fishers must take great care to confirm that

1. Weights added as required (if not, electric lights may float or cause hooks to sink slowly)
2. Weights are placed within the required distance from the hook



Hook-shielding devices – Hookpod (stand-alone measure)

The Hookpod is a capsule that encases the tip and barb of baited hooks (preventing anything from becoming hooked), releasing the hook at 10 or 20 m depth



Hookpod LED
(65 g)



Hookpod-mini
(48 g)



No impact on target species catch rates



ACAP Best Practice Advice

ACAP Best Practice Advice recommends the simultaneous use of the three commonly used mitigation measures: **Tori line + Night setting + Line weighting**

- All three recommended measures are demonstrated to be effective; however, each have limitations when used alone.
- There is a period of time when hooks are accessible to birds even when branch lines are weighted.
- Night setting used alone is less effective at reducing seabird bycatch for nocturnally active birds and during bright moon light conditions.
- Bird scaring lines used alone can rarely protect baited hooks beyond the aerial extent of the line.
- Consequently, the simultaneous use of the three ACAP recommended seabird bycatch mitigation measures compensate for these limitations.



ACAP Best Practice Advice

Hook-shielding devices

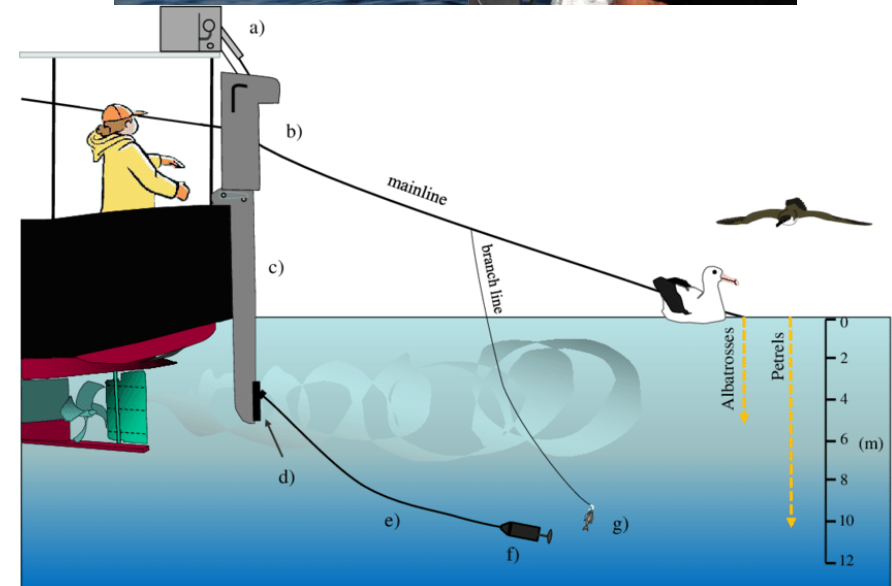
Hookpod LED
(65 g)



Hookpod-mini
(48 g)



Underwater bait setter ("The Capsula")



ACAP Best Practice Advice

Line weighting



ACAP

≥40 g within **0.5 m** of the hook

≥60 g within **1 m** of the hook

≥80 g within **2 m** of the hook

ICCAT, IOTC, WCPFC, IATTC

≥ 45 g within **1 m** of the hook

≥ 60 g within **3.5 m** of the hook

≥ 98 g within **4 m** of the hook

- The use of **lighting devices or other fishing accessories as weights is not recommended** unless they achieve the sink rate criterion (**0.5 m/s to 5 m depth**).



ACAP Best Practice Advice

- Measures that are **NOT RECOMMENDED** to mitigate seabird bycatch during logline setting operations are
 - Line shooters
 - Olfactory deterrents
 - Blue dyed bait
 - Bait thaw status
 - Laser technology
 - Offal management
- The use of **lighting devices or other fishing accessories as weights** is not recommended unless they achieve the sink rate criterion (**0.5 m/s to 5 m depth**).



Chapter 6

Handling and Release of Hooked and Entangled Birds



Handling and Release of Hooked and Entangled Birds

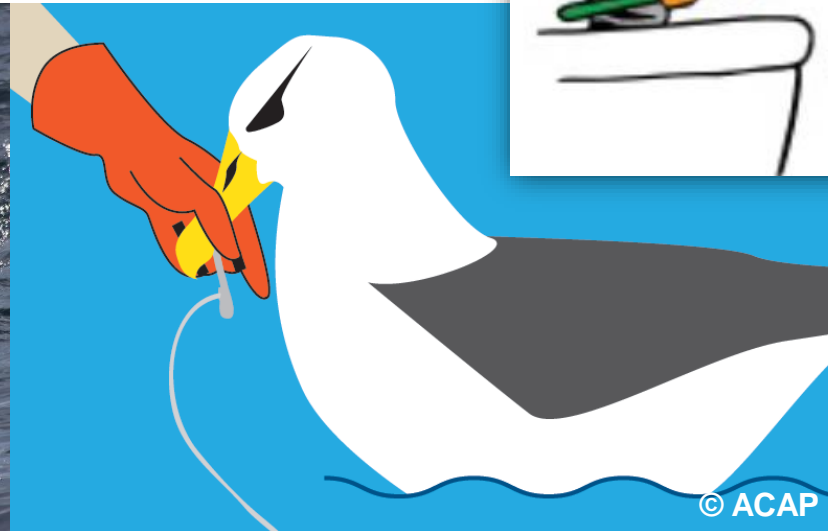
Current CCSBT Action: make every effort to release alive and remove hooks, noting

- Birds are terrified and confused when hauled aboard
- Crew should remain calm and not shout unnecessarily
- The bird thinks crew are trying to hurt it, so it may try to bite or run away or both!
- Seabirds are very weak compared to a man, so crew should be firm but gentle, even with the biggest albatross
- The sharp, hooked beak is the seabird's main defence; to avoid being hurt, crew should
 - quickly hold the bird
 - grab the back of the head, or the beak
 - fold and hold the wings carefully

Handling and Release of Hooked and Entangled Birds

Bring bird aboard

- Slow or **stop hauling** and slow or **stop vessel** to release line tension
- Retrieve the bird as safely and quickly as possible
- If practical, **use a landing net** to lift the bird
- Never grab by the wing

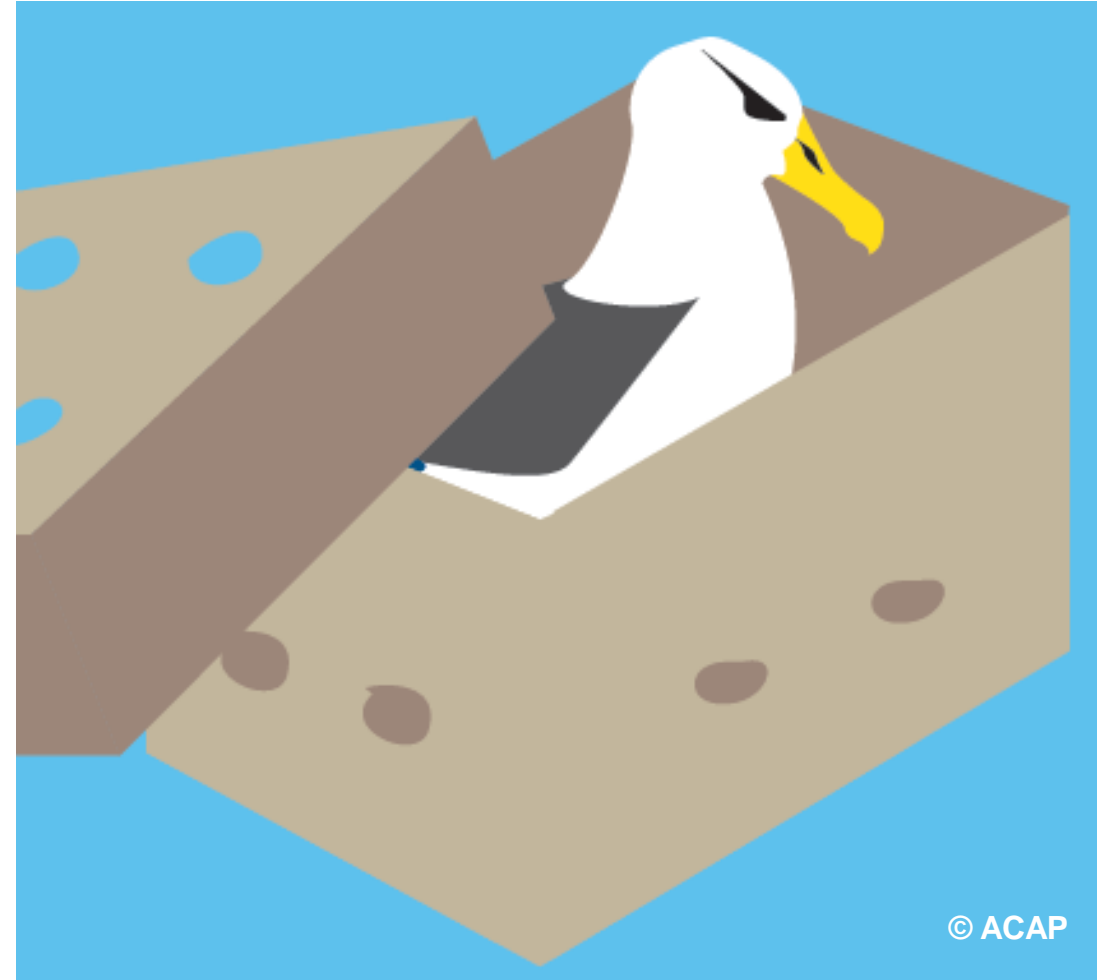


Handling and Release of Hooked and Entangled Birds

If the bird is strong and mostly dry, release it immediately after hook removal.

If the bird is exhausted or waterlogged

- Put the bird in a ventilated box to recover
- Otherwise, contain the bird in a quite dry area, **away from oil**
- The bird is ready for release when the feathers are dry, bird is alert and able to stand



Thank you



The logo for the Seabird Project. It features the text 'Seabird project' in a blue, sans-serif font. Above the word 'Seabird' are three stylized blue birds in flight.

Coordinator: Dr Ross Wanless
Email: rwanless@ccsbt.org



Partnership for
nature and people

Presenter: Dr Dimas Gianuca
Email: dgianuca@gmail.com



Food and Agriculture Organization
of the United Nations



COMMON
OCEANS
PROGRAM

Handling and Release of Hooked and Entangled Birds

Catch and hold securely

- Carefully fold the wings into the bird's body
- Wrap the bird in a towel/blanket (not too tightly)
- Make sure the seabird doesn't come into contact with oil on deck

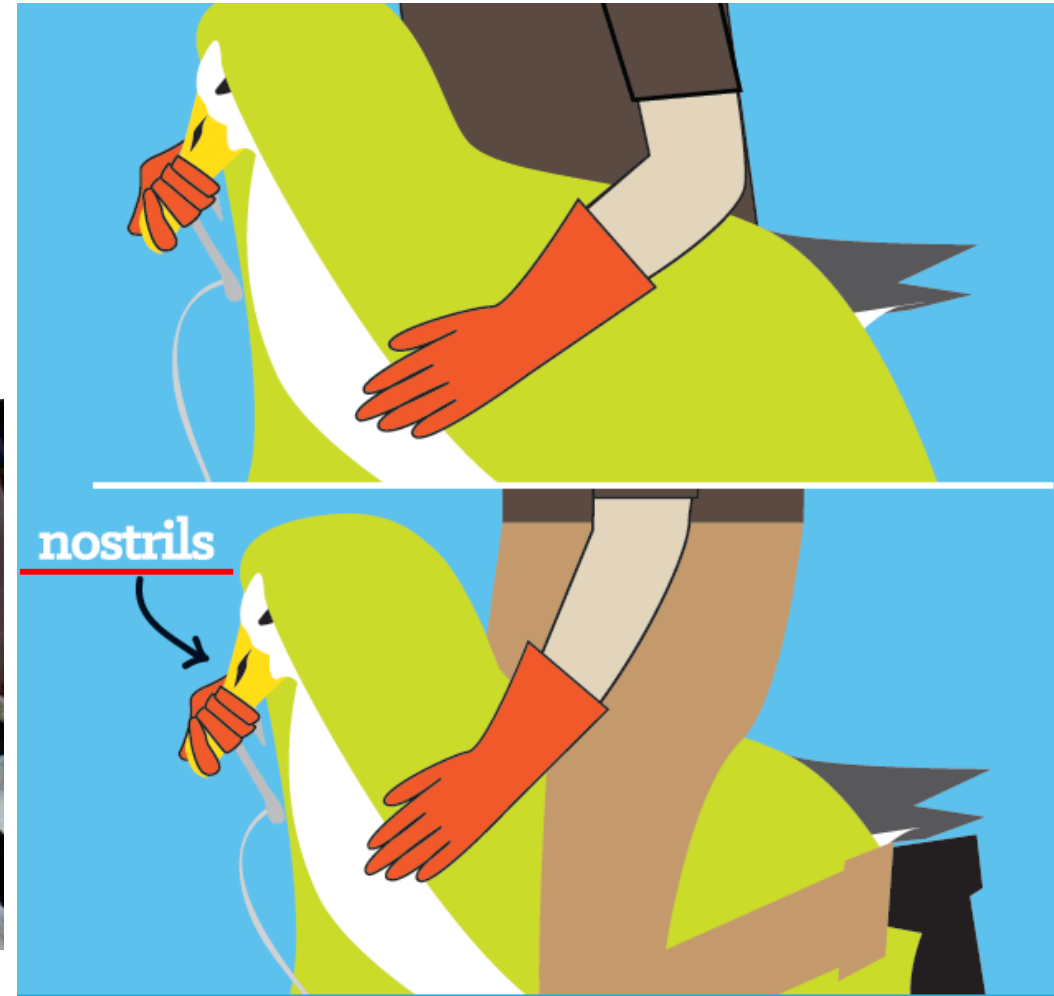
How **NOT** hold a bird



How to **COREECTLY** hold a bird



- For large birds that you cannot manage under your arm, hold it between your legs
- Do not cover the nostrils



Handling and Release of Hooked and Entangled Birds

Remove the hook

If hook is visible

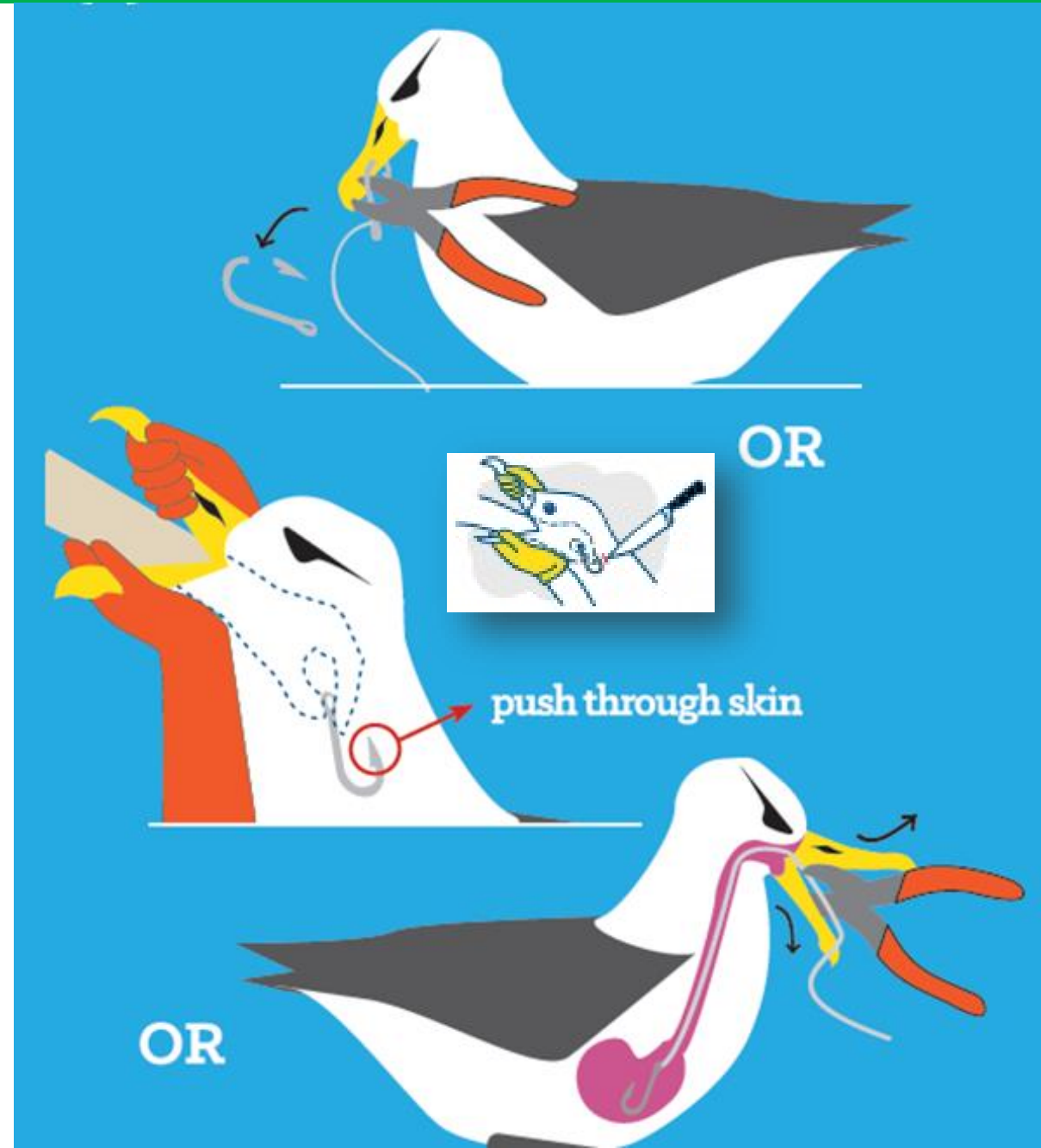
- Use pliers (or bolt cutters) to cut through the hook shaft (**or flatten the barb**)
- Pull the hook back out of the bird

If hook is swallowed or removal isn't possible

- A second person can find the hook position externally by feeling along the neck, or internally by following the line to the hook
- If safe and possible, push the tip of the hook through the skin and remove
- **Never try to extract the hook backwards**

If the hook removal is not possible

- Cut the line as close to the hook as possible and leave the hook in the bird



Handling and Release of Hooked and Entangled Birds

Release the bird

- Check that the bird seems healthy and is dry
- Grab the beak, lift the bird and slowly lower it to or towards the water, letting go of the beak last
- Where birds cannot be lowered directly onto the water, lift and release the bird from the side of the vessel into the wind letting go of the beak at the same time

