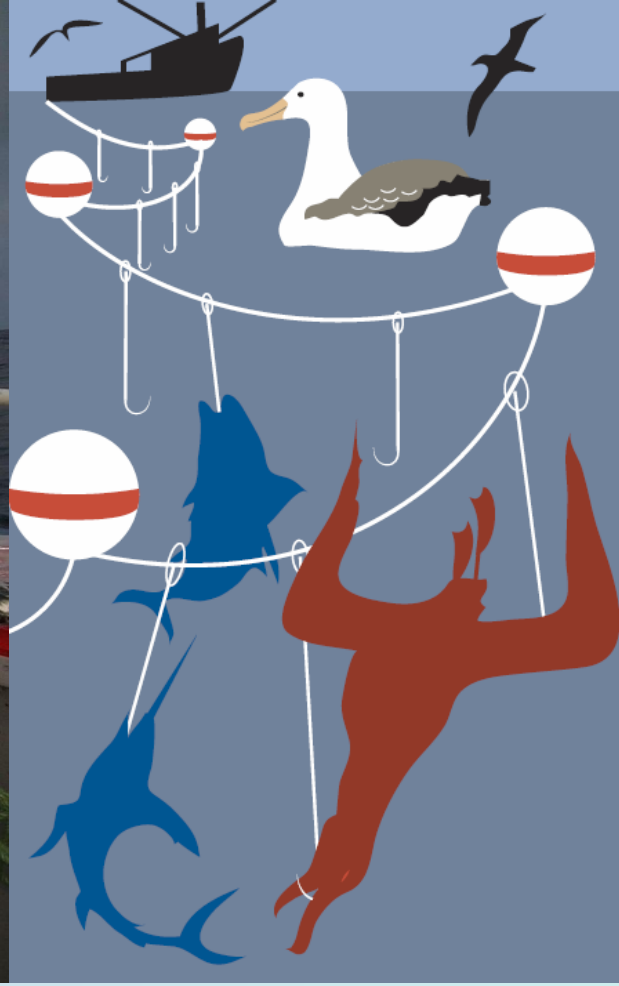

Seabird Mitigation – introduction to key research and ACAP best practice

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BirdLife INTERNATIONAL

Partnership for nature and people

What we'll cover

- Why preventing bycatch is so important
- What is seabird mitigation
- A subset of bycatch mitigation available for Pelagic LL fisheries, focusing on ACAP best practice
  - Streamers or Bird Scaring Lines (BSL)
  - Night setting
  - Weighted branch lines
  - Hook shielding devices

Who is ACAP?

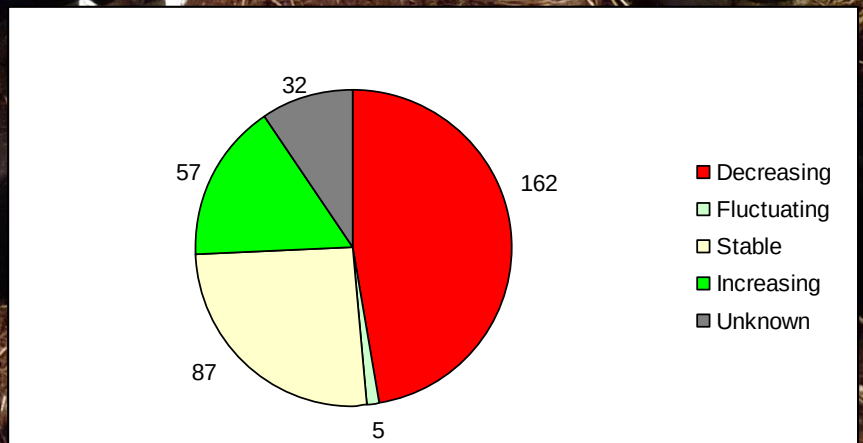
Agreement for the Conservation of Albatrosses and Petrels.

is a multilateral agreement which seeks to conserve albatrosses and petrels by coordinating international activity to mitigate known threats to their populations.

- ACAP regularly reviews the most up to date research available on seabird bycatch mitigation techniques and provides updated best practice advice to the Agreement.


How threatened?
Seabirds are the most threatened group of birds in the world
Photo: MPI NZ

Nearly half of all species (162) are declining: 15 of the 22 species of albatross in the world are threatened with extinction



Why is there a problem?

- Seabirds are attracted to baited hooks when lines are set.
- Highly developed sense of sight and smell to find food in a featureless ocean
- It's a "free lunch"

Why are seabirds so vulnerable and therefore so endangered?

- Albatrosses mate for life which could be up to 60 years or more
- It takes albatrosses several years to mature and then choose a mate; then several more if mate is lost
- Large albatrosses only produce 1 egg every 2 years, because it takes nearly a year to raise their single chick
- Requires both parents to feed their chick for it to survive
- Small increases in mortality can cause significant population declines

What is seabird bycatch mitigation?

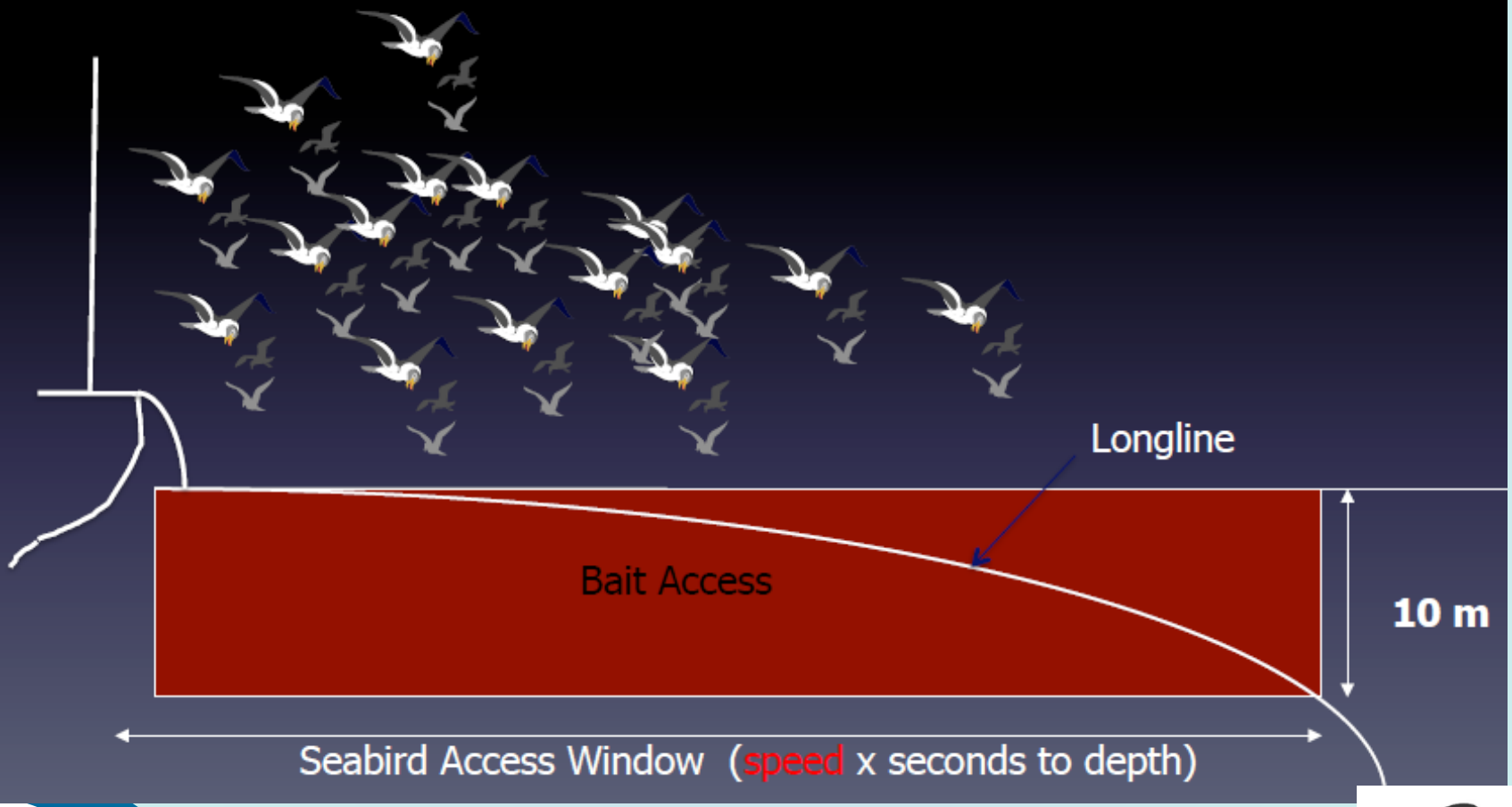
A measure which is a modification to **gear design** or a **fishing operation** that reduces the likelihood of catching seabirds (Lokkeborg 2011)

Four main categories

- Avoiding fishing in areas/times when seabird interactions are most likely (time/area closures/night setting
- Limiting seabird access to baited hooks (underwater setting devices, weighted lines, side-setting, hook shielding devices
- Deterring seabirds from taking baited hooks (streamer lines)
- Reducing attractiveness or visibility of baited hooks (retention of offal, artificial baits/blue-dyed bait)

Side View: The Seabird Access Window

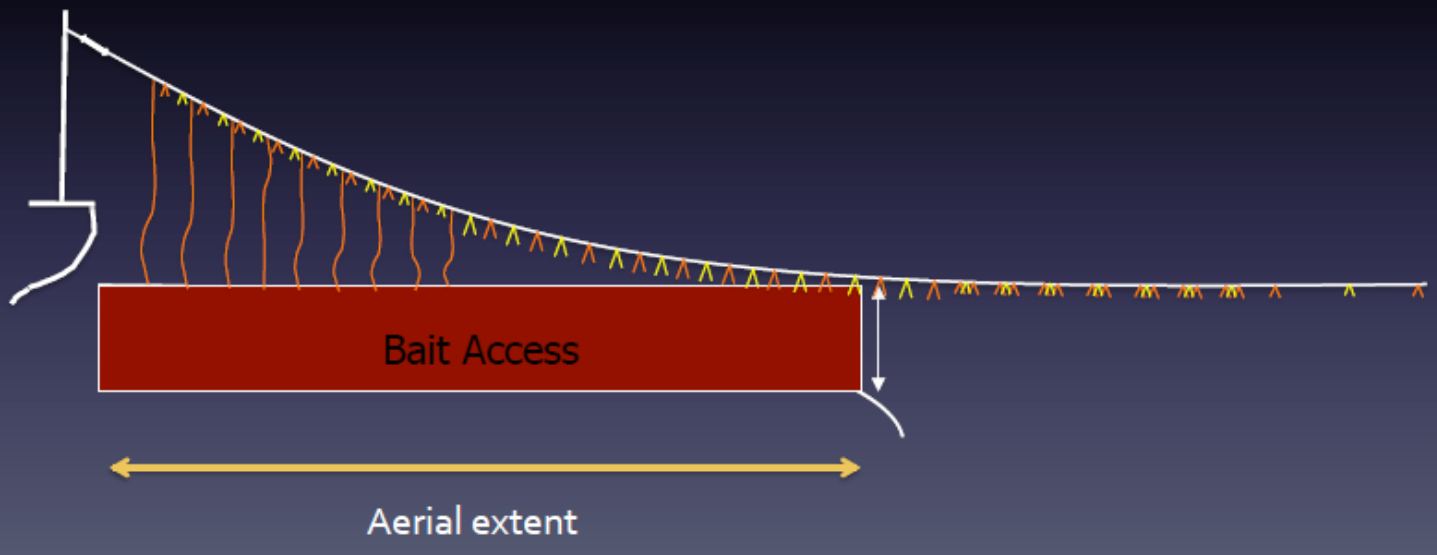
the area that birds can access baited hooks



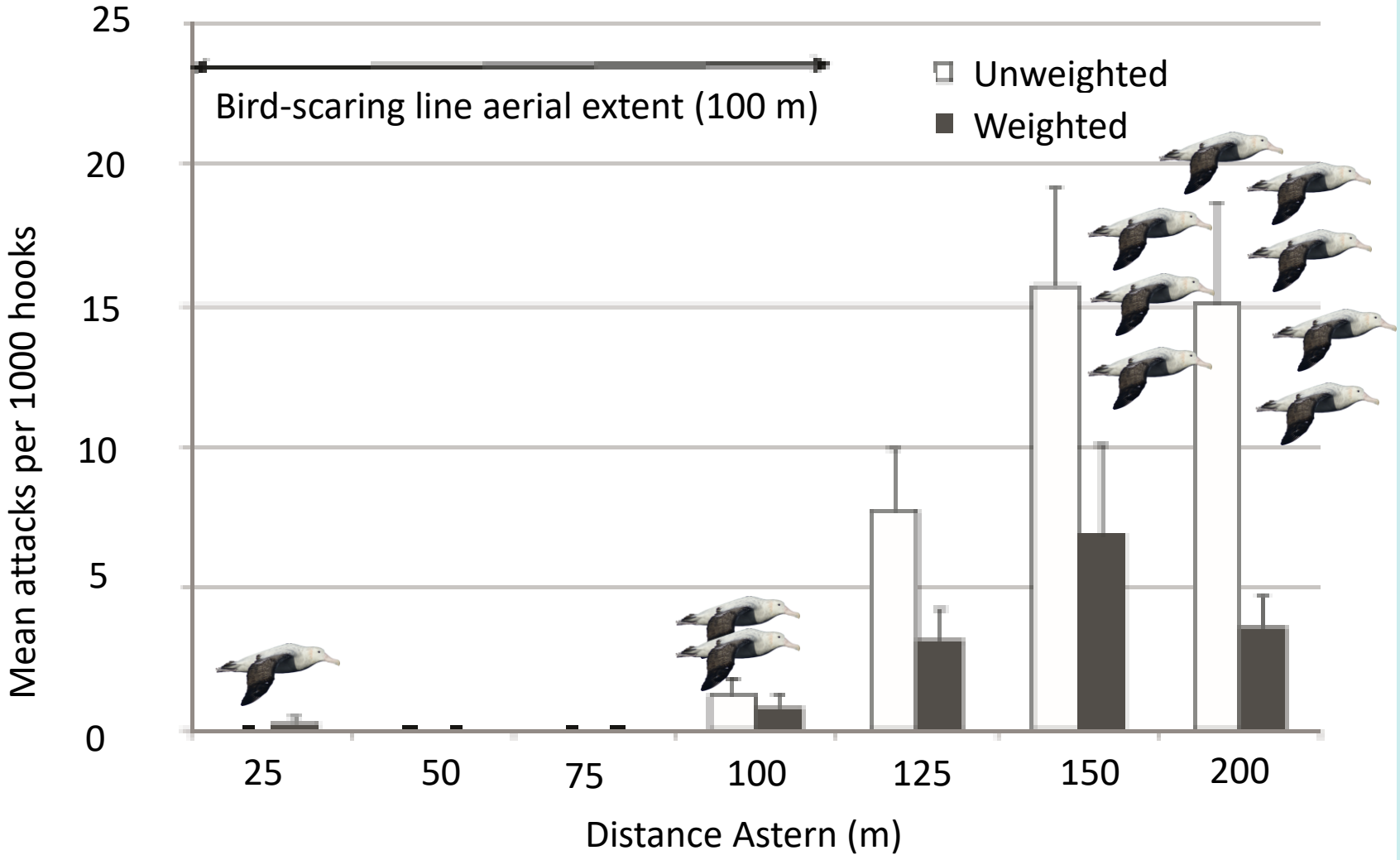
Melvin, E.F., Guy, T.J., Read, L.B. 2010

Streamer Lines: The Concept

Aerial extent defends the access area



ACAP 2017, Goad & Debski, 2017, Melvin *et al,* 2010, 2013)



(Melvin *et al.* 2014)

Paired Tori lines more effective in preventing bait attacks (Sato *et al* 2013)

BSL (Tori Lines) ACAP best practice

- Specifications are based around meeting performance standards. (>=35m;<35m)
- These include the requirement for brightly coloured streamers to scare the birds, both long and short
- Towed objects to maximise the aerial extent
- Weak links – breakaways with secondary attachments

Night Setting

- Works as most vulnerable seabirds don't forage at night.
- Seabird bycatch rates have been found to be 4.6X higher during daylight (Melvin *et al* 2013)

BUT-

- *Procellaria* petrels such as white-chinned, black and Westland forage at night and are excellent divers bringing baits to the surface.
- Catch rates near full moon doubled (Melvin *et al* 2013)
- mbinations needed

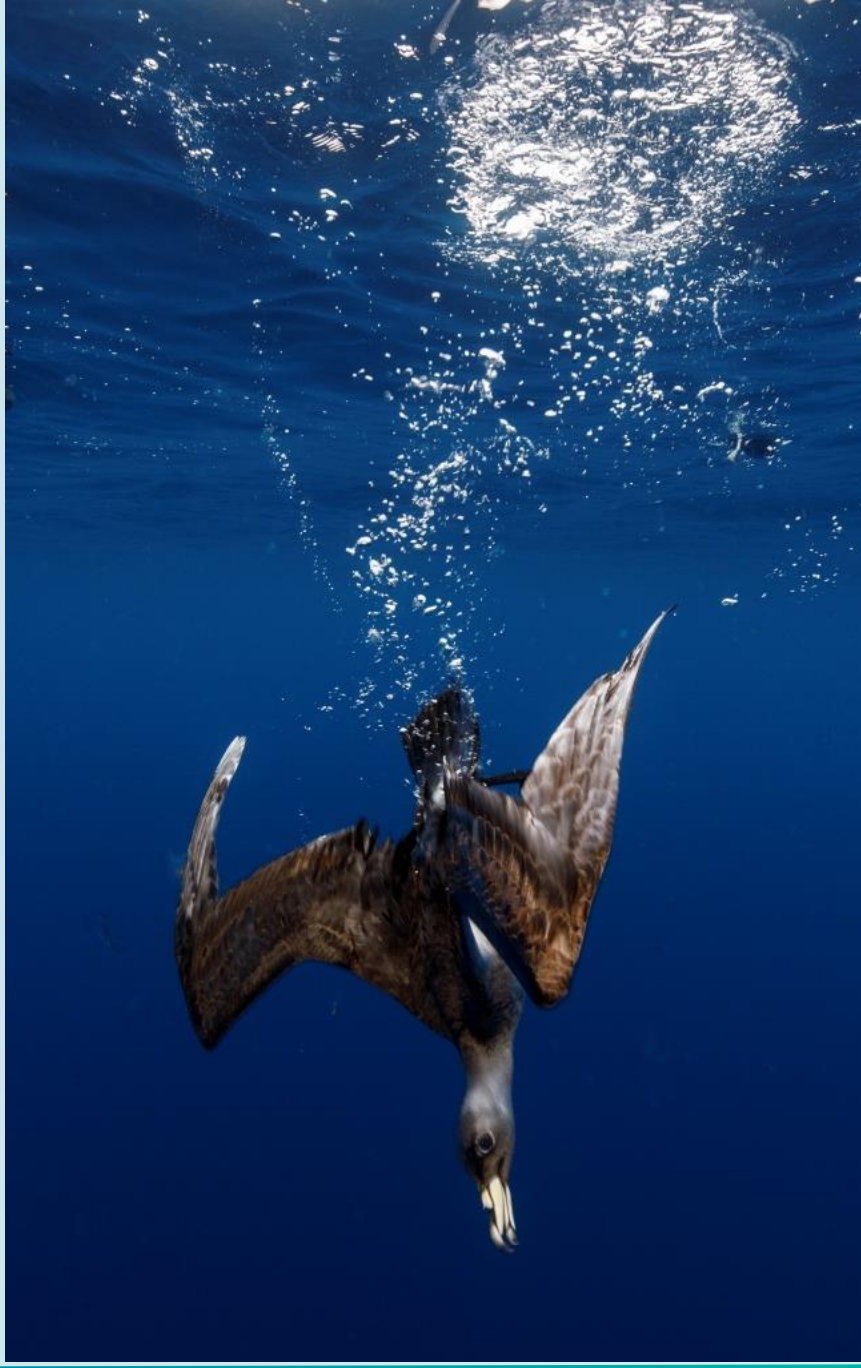


Photo by Richie Robinson

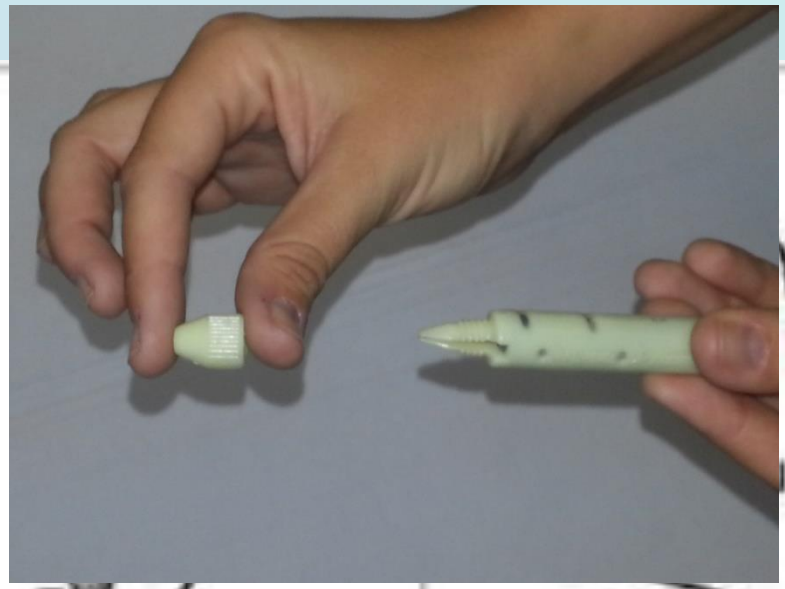
Line weighting & bait sink rate

- Improves the effectiveness of other methods “Shrink and defend”(Melvin *et al* 2010,13)
- Shorter leaders facilitate faster sink rates in the upper level of the water column where attack rates are greatest (Barrington *et a*l 2016)

Line Weighting

3 methods for adding weight to branchlines

- Weighted swivels
- Yamazaki-san (Melvin et al (2011)
  Double-weight System
- Safe-leads & Lumo Leads



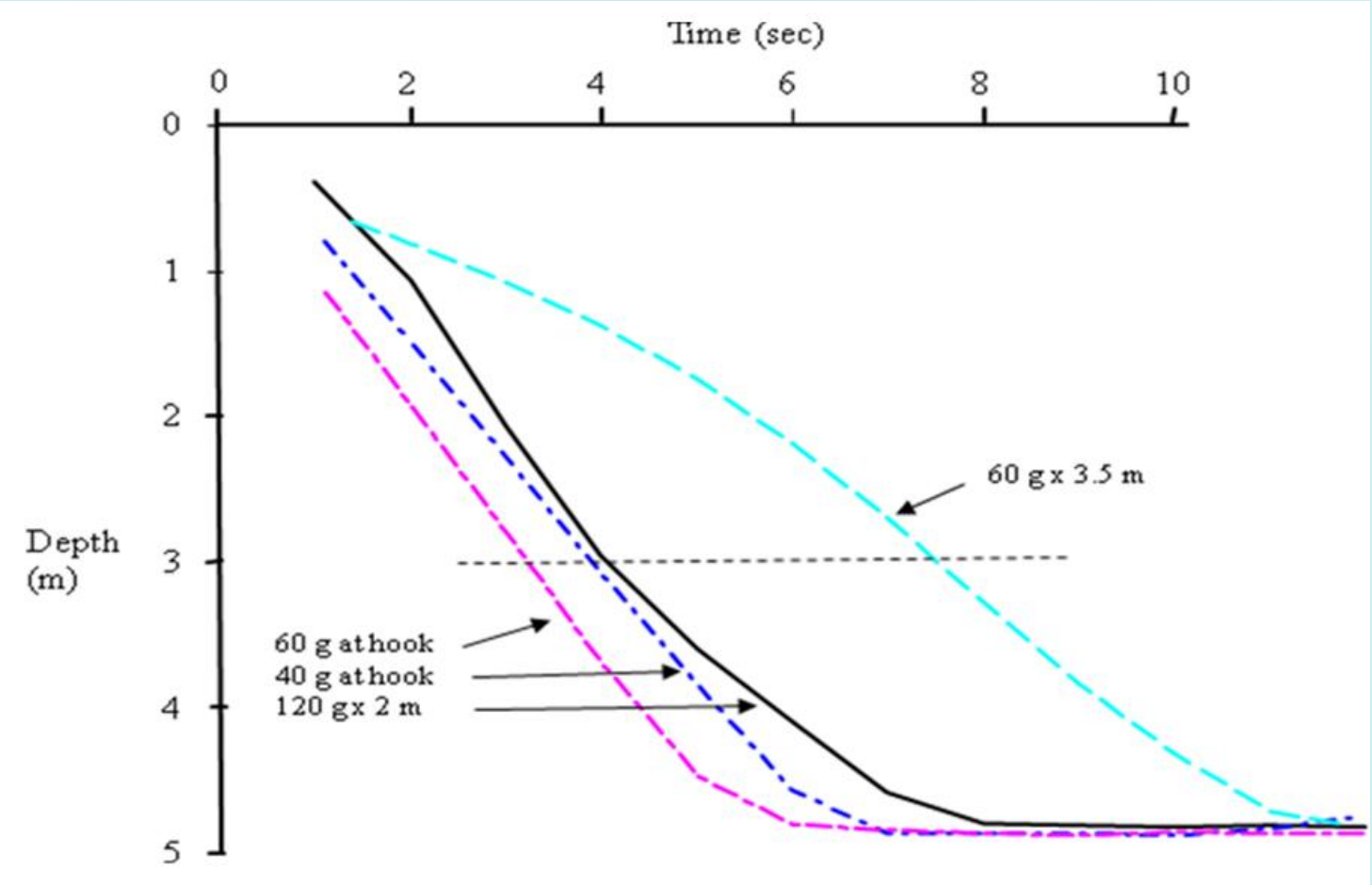
Lumo leads

- Threaded onto mono, not tied/crimped
- Designed to ‘clamp’ onto unstretched mono
- Bite-off: mono recoils, but slips through LL
- Safe leads were shown to reduce velocity by 80% on impact (Sullivan *et al* 2012)

Target catch rates and sink rates

- 40g and 60g at the hook had the fastest initial sink rates and were significantly faster than 60g at 3.5m
- No statistical differences in catch rates of target and non-target fish species(60g/3.5m leaders (industry standard) and 120g/<=2m or 40g at hook) summarised in Robertson *et al* (WCPFC-SC8-2012/EB-WP-10)
- Korean experiments (Rollinson *et al 2016*) no impact on bluefin tuna catch rates but black lumo leads close to hook affected yellowfin bigeye (45g at 60cm), and albacore(45g at 5cm)

Controlled pool experiment (Robertson *et al* WCPFC-SC8-2012/EB-WP-10)



Further tests on a stationary vessel of sink rate profiles concluded :

- the fastest initial sink rates were achieved by the 40 g and 60 g weights placed at thehook; when the **40 g and 60 g weights at the hook had reached 8 m**, the **60 g at 3.5 m is still only at a depth of around 5 m** (currently an option in WCPFC)
- 60 g at 1 m and 40 g at 1 m were also faster than 60 g at 3.5m by highlighting that lighter weights are proportionally more affected by increased leader length and that even a small leader makes a sizable difference to the sink rate of lighter weights;

Take home message: To achieve significant improvement in sink rates requires weights to be placed at or very close to the hook (<= 1m)

ACAP best practice

- deleting options of 60 to 98g within 3.5m of the hook and greater than 98g at 4m from the hook
- 40g or greater attached within 0.5mof the hook; or
- 60g or greater attached within 1mof the hook; or
- 80g or greater attached within 2mof the hook

Why three mitigation measures together recommended by ACAP

- Bird-scaring lines less effective in high winds
- Night setting less effective during full moon and for diving birds
- Branch line weighting
  - but hooks vulnerable until they sink beyond the diving range of birds.
  - Also facilitates compliance through port monitoring
- Simultaneous use of all three provides the greatest protection to seabirds and prevents bait loss to birds
- Alternatively use of one of the two assessed hook-shielding devices is recommended a “one-stop” mitigation solution recommended by ACAP

Hook Shielding Devices

WCPFC14 has tasked SC and TCC to review hook shielding devices at this years meetings.

Two types

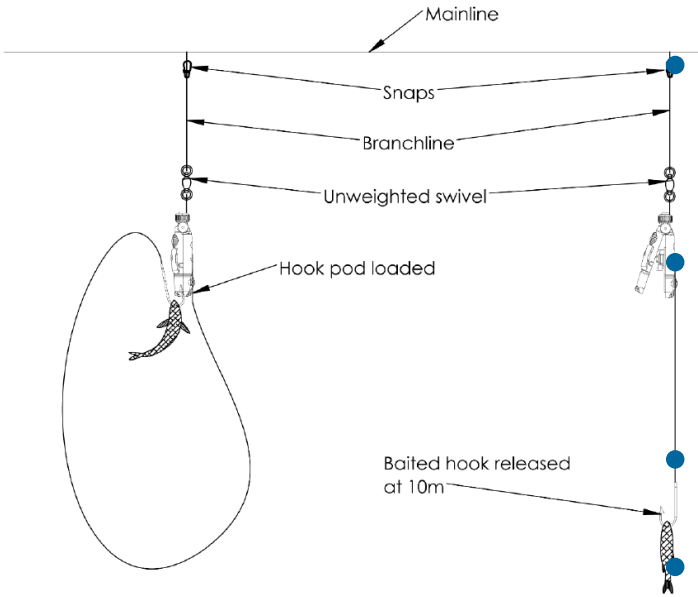
1. Hook Pod (HP)
2. Smart Tuna Hook (STH)

10 minutes/10 metres

Smart Tuna Hook

- Experiments in South Africa (Baker & Candy, 2014, Latitude 42), reduced bycatch by 81.8% - 91.4%
- No detectable difference in catch rates

Hook Pod



- 18 at sea trials (Sullivan *et al* 2018)
- 59,130 hooks were set in total, >129 sets
- Hookpods – 0.04 birds/1000 hooks (1 bird)
- Controls 0.8birds/1000 (24 birds)
- No difference in catch rate of target species.
- Also reduced turtle bycatch and trials are planned for setting release to 20m
- Breakages and failure 1.23%

Hookpod ‘mini’

- Key principles
- New Zealand experiments on a modified hook pod just 45gm (LED removed) cf 68gm and 30% smaller
- 24 of 25 bird deaths occurred on control branchlines. (Preliminary results)
- No statistical difference between catch rate and size of target fish
- Hookpod failure rate of 0.693
- Positive feedback from skipper.

ACAP performance criteria

a. The device shields the hook until a prescribed depth of 10m or immersion time of 10 minutes is reached

b. The device meets current recommended minimum standards for branchline weighting (current recommended best practice)

c. Experimental research has been undertaken to allow assessment of the effectiveness, efficiency and practicality of the technology against ACAP best practice seabird bycatch mitigation criteria developed for assessing and recommending best practice advice on seabird bycatch mitigation measures.

ACAP recommendations

- Two devices currently meet the performance criteria – the hook pod and Smart Tuna Hook.

photos

- Kath Walker and Graeme Elliot
- MPI
- Kyle Morrison
- BirdLife South Africa
- Paul Sagar
- Ed Melvin for schematics

BMIS

- Use latest ACAP advice to find references used to inform latest advice
- Use FAO Global Review paper by Clarke et al 2014
- Bycatch mitigation fact sheets (although need updating)