



Asia-Pacific  
Economic Cooperation



Reports

# SEABIRD-SAFE FISHING – CAPACITY GAP ANALYSIS

APEC Ocean and Fisheries Working Group

October 2026



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Economic Cooperation**

# **Seabird-Safe Fishing – Capacity Gap Analysis**

**APEC Ocean and Fisheries Working Group**

**October 2026**

APEC Project: OFWG 201 2024A

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APEC#226-OF-01.5

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# Executive Summary

## Project Overview and Objectives

The **Seabird-Safe Fishing – Capacity Gap Analysis** was developed to support tuna longline industries within **Asia Pacific Economic Cooperation (APEC)** economies in identifying pathways toward seabird-safe fishing. The project's primary objective is to create a “win-win” scenario where the industry successfully catches fish while avoiding seabird bycatch – producing both environmental and economic benefits.

The project has facilitated effective participation of and collaboration with many APEC economies on the topic of seabird-safe fishing. Through qualitative research and a workshop, the project engaged fishing captains, industry bodies, companies, administrations, and other organisations. Strong participation from these key stakeholders has enabled in depth understanding of the **practical challenges** to using seabird-safe fishing practices, **and how these can be addressed**.

## The Problem: Ecological and Economic Impacts

Seabird bycatch—the accidental killing of seabirds during fishing operations—is a critical threat to species like the **antipodean albatross**, which faces potential extinction within 20 years if bycatch in high-risk Pacific areas is not addressed. Seabird bycatch also threatens the **economic success** of fishing businesses through:

- **Bait loss**, which prevents the capture of target fish.
- **Wasted crew time** spent de-hooking and releasing birds.
- **Loss of gear** such as hooks and lines.
- **Market pressure**, as seafood retailers increasingly require environmental eco-labels like the **Marine Stewardship Council (MSC)**, which mandate the protection of endangered species.



## Key Findings: Drivers and Challenges

The project utilised in-depth interviews with vessel captains and support organisations, followed by a participatory workshop with over 100 participants from ten economies.

The key findings from the research were:

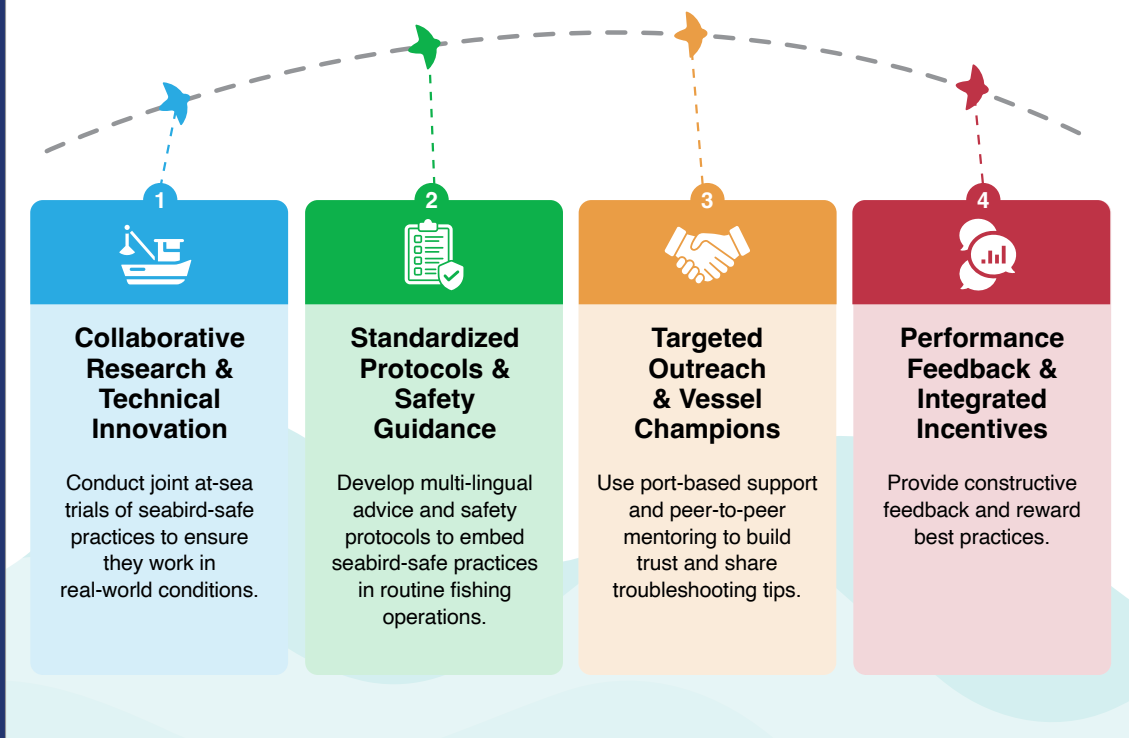
- **Drivers for seabird-safe fishing** include three main topics:
  - **Regulatory requirements:** These are the strongest motivators for adopting seabird-safe practices due to the risk of fines or loss of fishing opportunities.
  - **Operational efficiency:** Captains also recognise the operational efficiency of practices like tori lines, which reduce bait waste, however these vessel-level economic benefits have not yet been quantified.
  - **Environmental concern:** Some captains are driven by **environmental concern** or a desire to avoid international backlash against their company or image of their economy.
- **Challenges to adoption:** Three primary categories of barriers were identified:
  - **Equipment challenges:** These include difficulties achieving the required **aerial extent** for tori lines, as well as frequent tangles and breakages in rough weather. **Line weighting** is often the least preferred method due to **safety concerns** regarding “flybacks,” where weights shoot back toward the vessel if a line breaks.
  - **Operational challenges:** Captains expressed significant concern that **night setting** and line weighting might reduce **target catch rates** by missing peak feeding times or altering bait appearance. Furthermore, rigid night-setting schedules can lead to **crew fatigue** and scheduling conflicts caused by unpredictable weather or mechanical delays.
  - **Motivation and engagement gaps:** Many captains follow rules without understanding the **ecological rationale** (the “why”) behind specific technical requirements. There is also a lack of **performance feedback**; captains often only receive binary “pass/fail” compliance results rather than constructive data on how well their gear is performing to minimise seabird bycatch.

## Capacity Building Recommendations

To address these gaps, the report recommendations include **Capacity Building in four areas:**

- 1 Collaborative research and technical innovation:** Conducting joint at-sea trials and user-led design to refine equipment like tori poles and safer line-weighting options.
- 2 Operational and safety protocols:** Developing clear safety plans and multi-lingual guidance (such as the **Seabird-Safe Fishing Toolkit**) to ensure seabird-safe practices are easy and safe to implement.
- 3 Targeted outreach and training:** Implementing port-based outreach and “Vessel Champion” programs to foster peer-to-peer learning and explain the business and ecological benefits of using seabird-safe practices.
- 4 Integrated monitoring, feedback, and incentives:** Monitor seabird-safe practices using tools such as **electronic monitoring (EM)** and provide constructive performance feedback to fishers and reward excellence.

## Supporting the Journey to Seabird-Safe Fishing



### Next Steps – Scoping a Capacity Building Programme

The report highlights an opportunity to efficiently address multiple capacity building recommendations by developing a cohesive capacity building programme.

The next step would be a collaborative process for APEC economies working towards seabird-safe fishing to further explore and scope a capacity building programme.

### Conclusion

This project has shown there is a high level of interest in seabird-safe practices from APEC economies involved in longline fishing. The drive and momentum for seabird-safe fishing reflects that there are multiple benefits for both threatened seabirds, and fishing businesses.

The key conclusion is that common challenges for fishers can be overcome with targeted and coordinated capacity building. The collaboration between many APEC economies in this project shows that further work in this area could be fruitful.

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# Acknowledgements

The authors would like to acknowledge the support throughout the project provided by the Project Overseer, Mandy Leathers (New Zealand Department of Conservation). We hope that we have helped bring your vision to life.

This project has been made possible thanks to the expert advice, guidance and generous support of the Steering Committees in the People's Republic of China and Chinese Taipei. The members are from the key fishing agencies, academia, and industries in participating economies. Their passion, dedication and sincere interest in the wellbeing of fishing people, economies and ocean wildlife have been a source of optimism and energy throughout this project.

## **The Steering Committee members included:**

- Dr. Jiangfeng Zhu, Shanghai Ocean University, People's Republic of China
- Li Yan, Deputy Director of the High Seas Fisheries Department at China Overseas Fisheries Association, People's Republic of China
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- Wei-Yang Liu, Director, Overseas Fisheries Development Council, Chinese Taipei
- Ting-Chun Kuo, Associate Professor, National Taiwan Ocean University, Chinese Taipei

We would also like to acknowledge the experts who shared their knowledge and experiences on addressing challenges with uptake of seabird-safe practices at the project workshop: Dave Goad (Vita Maris), Richard Wells (Resourcewise Ltd), Prof Ed Melvin (University of Washington), James Nagan (BirdLife International), Scott Pursner (independent consultant) and Howard Tsai (FCF Co Ltd). The workshop was also supported by technical support, translators, break-out group leaders. We are grateful to Tamas Molnar, Lorraine Lee, Kumi Koike, James Lin, Heather Glass, Yasuko Suzuki, Daryl Wang and Julia Chang for their assistance.

The project benefitted throughout from the inputs and advice from project supporters Janice Molloy (Southern Seabirds Trust) and Igor Debski (New Zealand Department of Conservation), and team members in the New Zealand Department of Conservation, New Zealand Ministry for Primary Industries, and Ministry for Foreign Affairs and Trade. In addition to those named above and the Steering Committees, the report was improved by feedback from Ross Wanless (independent consultant), Oli Yates and Yasuko Suzuki (both BirdLife International).

# List of Acronyms

|             |                                                          |
|-------------|----------------------------------------------------------|
| <b>ACAP</b> | Agreement on the Conservation of Albatrosses and Petrels |
|-------------|----------------------------------------------------------|

|             |                                   |
|-------------|-----------------------------------|
| <b>APEC</b> | Asia Pacific Economic Cooperation |
|-------------|-----------------------------------|

|              |                                                          |
|--------------|----------------------------------------------------------|
| <b>CCSBT</b> | Commission for the Conservation of Southern Bluefin Tuna |
|--------------|----------------------------------------------------------|

|             |                           |
|-------------|---------------------------|
| <b>CCTV</b> | Closed Circuit Television |
|-------------|---------------------------|

|             |                                             |
|-------------|---------------------------------------------|
| <b>eNGO</b> | Environmental Non-Governmental Organisation |
|-------------|---------------------------------------------|

|            |                               |
|------------|-------------------------------|
| <b>FIP</b> | Fisheries Improvement Project |
|------------|-------------------------------|

|             |                                                 |
|-------------|-------------------------------------------------|
| <b>ISSF</b> | International Seafood Sustainability Foundation |
|-------------|-------------------------------------------------|

|            |                            |
|------------|----------------------------|
| <b>MSC</b> | Marine Stewardship Council |
|------------|----------------------------|

|            |                               |
|------------|-------------------------------|
| <b>NGO</b> | Non-Governmental Organisation |
|------------|-------------------------------|

|             |                                            |
|-------------|--------------------------------------------|
| <b>RFMO</b> | Regional Fisheries Management Organisation |
|-------------|--------------------------------------------|

|              |                                                  |
|--------------|--------------------------------------------------|
| <b>WCPFC</b> | Western and Central Pacific Fisheries Commission |
|--------------|--------------------------------------------------|

# 1 Introduction

The **business objective** of the Seabird-Safe Fishing Capacity Gap Analysis is to support tuna longline industries in Asia Pacific Economic Cooperation (APEC) economies with identifying pathways to seabird-safe fishing. This will help create a win-win for the industry and seabirds, as seabird-safe fishing benefits both.

The **research objective** of this project is to investigate the practical challenges to seabird-safe fishing and identify opportunities to address the challenges.

This report first provides context about the problem of seabird bycatch and the approach we took to achieve the research objectives. We then set out the results, addressing the research questions:

- Who is involved in working towards seabird-safe fishing and what are their main drivers, objectives, and preferred pathways to seabird-safe fishing?

- What are the key practical challenges longline businesses face in their work towards seabird-safe fishing?
- What are the potential solutions to the key practical challenges?
- What capacity support is currently available and/or needed to address the challenges?
- How can key gaps in capacity support best be addressed?

We make recommendations on priority actions which can be taken up by a range of actors involved in supporting fisheries improve their environmental sustainability. This includes fisheries managers, companies, and industry bodies, researchers and academia and non-government organisations.

We also set out a blueprint for a capacity building program to address challenges to seabird-safe fishing in APEC economies, and to foster collaboration and efficiency. The Annexes to the report contain more detailed information on the background and project approach.

*Photo: Marine Stewardship Council*



## 2 Background

### 2.1 Seabird bycatch: a problem for seabirds & fishing businesses

Seabird bycatch is when seabirds are accidentally killed in fishing operations. Longline fishing is particularly dangerous for seabirds, because the birds mistake the baited hooks for an easy meal. They dive for the bait and can get hooked and drowned.

Seabird bycatch in tuna longline fisheries across the Pacific is a top threat driving the population decline of threatened seabirds such as the Antipodean albatross. The Antipodean albatross may go extinct within as few as 20 years if fisheries bycatch in high-risk areas of the Pacific Ocean is not addressed. See Annex 1 for more information about longline fishing impacts on seabirds.

Seabird bycatch can also threaten the economic success of tuna longline businesses. Some potential costs associated with seabird bycatch include:

- bait loss from birds means fish are not caught on those hooks,
- crew time needed when birds are caught and need to be de-hooked, and
- actual costs of lost bait and gear (hooks, lines) if birds are caught (Pierre et al 2021).

Markets are also influential for fishing businesses. There is increasing awareness of seabird bycatch as an issue amongst seafood retailers and many preferentially source from fisheries with environmental eco-labels such as the Marine Stewardship Council (New Zealand Department of Conservation and Southern Seabirds Trust 2024).

To meet the MSC Fisheries Standard, fisheries need to demonstrate they are implementing measures to minimise mortality of Endangered, Threatened and Protected species. So, improving uptake of seabird-safe practices can support fisheries with achieving this Standard and accessing these markets.

Even fleets that are not seeking MSC certification are working towards more seabird-safe fishing to meet new seabird bycatch regulations of the Western Central Pacific Fisheries Commission (WCPFC) which will come into effect until 1 January 2028.<sup>1</sup>

### 2.2 Solving the problem with seabird-safe practices

Importantly, seabird bycatch is a problem that we can solve. There are ways to make longline fishing safer for seabirds. A recent review of scientific literature shows that seabird captures can be reduced to close to zero if fishers use the best practice mitigation measures (called 'seabird-safe practices' hereafter) that have been recommended by the Agreement for the Conservation of Albatross and Petrels (**ACAP**) (Pierre, 2023).

ACAP develops their best practice guidelines by assessing at-sea trials of seabird-safe practices on fishing vessels against a set of criteria that includes factors such as safety, practicality and characteristics of the fishery (ACAP 2024). Researchers, officials, industry experts and environmental non-governmental organisation (eNGO) representatives all contribute to the ACAP review process.

<sup>1</sup> The new WCPFC requirements mean that vessels fishing in the region West of 175° West between 25° S -30° S must use two best practice mitigation measures simultaneously or hookshielding devices (CMM 2025-05 - Conservation and Management Measure to Mitigate the Impact of Fishing on Seabirds I Monitoring and Evaluation).

## BEST SEABIRD-SAFE PRACTICES (ACAP 2024):

Combining, as illustrated in Figure 1:

- 1 **Tori lines:** lines with streamers that scare the birds away from the hooks as they are being set into the water
- 2 **Line weighting:** putting weights near the hooks so that they sink quickly out of reach of diving seabirds
- 3 **Night setting:** starting and finishing the line setting process during night when the birds are less active

Or using standalone measures:

- **Hook-shielding devices:** capsule that protects the hook from birds until it sinks out of reach
- **Underwater bait setter:** a device that sets the hooks at depth, so the birds never get a chance to go for the bait



Figure 1. Illustration of the use of three ACAP recommended seabird-safe practices: Tori lines, line weighting and night setting.



Photo: Francisco Blaha

### 2.3 Capacity gaps in the journey to seabird-safe fishing

While effective seabird-safe practices exist, uptake of them has been slow (Baker et al. 2024). This suggests there are some capacity gaps affecting progress towards seabird-safe fishing.

The **capacity** of longline businesses to achieve seabird-safe fishing may include:

- their knowledge of what the seabird-safe practices are and how to implement them
- their practical ability to implement them including whether they have the materials, tools, skills, experience and influence that they need
- their willingness and motivation to achieve seabird-safe fishing

The capacity of tuna longline businesses to achieve seabird-safe fishing is affected by range of practical challenges. New Zealand's seabird-safe fishing projects in the APEC Ocean and Fisheries Working Group are focused on understanding and addressing the capacity gaps that are common across longline fishing economies, particularly those that are fishing in the high-risk areas for threatened seabirds.

Over 2024-2025 New Zealand developed the Seabird-Safe Fishing Toolkit<sup>2</sup> to address a capacity gap in knowledge about seabird-safe fishing. The Toolkit makes the best available information accessible for those fishing businesses and organisations that are working towards seabird-safe fishing. It provides an interactive map showing the high-risk areas for seabirds and enables fishing businesses to explore how seabird-safe their fishing is and how to improve over time. This Toolkit has been endorsed by ACAP and traffic to the website has reached 5000 hits since it was publicly launched in November 2025.

The Seabird-Safe Fishing Capacity Gaps Analysis project builds on the previous work by New Zealand and further develops understanding about the key challenges affecting capacity for seabird-safe fishing in APEC economies, and how they can be addressed.

<sup>2</sup> <https://www.doc.govt.nz/about-us/international-agreements/species/seabird-safe-fishing-toolkit/>

# 3 Project Approach

The project comprised two key components: qualitative in-depth interviews, followed by a participatory workshop which shared expert perspectives and facilitated group discussions on the key challenges.

The qualitative in-depth interviews were conducted in two economies (the People's Republic of China and Chinese Taipei). The interviews were conducted with captains and support organisations associated with the longline fleets that fish in the high seas areas that overlap with seabird distributions. The workshop was open to representatives from all APEC economies.

The findings in this report summarise the experiences, knowledge and perceptions of a subset of captains, supporting organisations and experts, in regard to the use of three seabird-safe fishing measures in two economies.

The value of the findings lies in providing social science insights into the beliefs that may shape motivation and attitudes. This report is not intended to verify, validate, or evaluate the scientific accuracy of participants' statements nor the causal impact on the adoption or use of mitigation practices.

A summary of the approaches is provided below. Additional detail is provided in Annex 2.

## 3.1 In-depth interviews

In-depth interviews were undertaken as a form of qualitative research. Qualitative research is exploratory in nature and does not seek quantification or quantitative analysis—it instead focuses on exploring and understanding motivations, barriers, thoughts and feelings of those being interviewed.

The in-depth interviews were conducted between 17 September 2025 and 28 January 2026 with participants from two stakeholder groups:

- **Eleven captains** of albacore tuna longline vessels<sup>3</sup> that were flagged to the People's Republic of China (5 captains) and Chinese Taipei (6 captains) and operated in the South Pacific areas that are of higher risk for seabirds<sup>4</sup>.
- **Supporting organisations** in the People's Republic of China (4 organisations), Chinese Taipei (four organisations), and the wider Pacific (1 organisation) spanning academia, industry associations, fishing companies, supplier organisations, eNGOs, and gear manufacturers.

## 3.2 Participatory workshop

The project's second phase featured a workshop titled "Addressing Key Challenges and Capacity Gaps in Moving Towards Seabird-Safe Longline Fishing". The workshop was carried out on 15-16 April 2026 (two half days) and was conducted online to encourage a wide range of participants from all APEC economies to join.

The purpose of the workshop was to share the results of the interviews, foster stakeholder collaboration, and identify actionable pathways toward safer fishing practices. The workshop attracted 102 participants (which ranged from 70 to 102 participants over the course of the two days) from ten different economies.

<sup>3</sup> Vessels over 24 metres.

<sup>4</sup> These areas were identified using a mapping tool (<https://www.seasketch.org/ssft/app>) developed by the New Zealand Government that shows risk areas for seabird interactions in each ocean basin based on seabird density and vulnerability.

# 4 Key Findings

## 4.1 What are the drivers for vessel captains to implement seabird-safe fishing?

Captains see their primary responsibility as catching fish while meeting regulatory and company requirements. Seabird-safe practices sit in this balance: captains ensure that measures such as the deployment of tori lines, night-time setting, and—where applicable—line weighting are carried out and maintained throughout fishing trips.

**The key drivers** for captains to implement seabird-safe practices included regulatory requirements, economic, and operational benefits to fishing.



Photo: Fisheries Agency of Chinese Taipei, 2026

### 4.1.1 Regulatory requirements

**Regulatory requirements**<sup>5</sup> were consistently cited by both captains and support organisations as a key motivator for longline fishing vessels to adopt seabird-safe practices. The importance of monitoring and enforcement activities to support regulations was highlighted, with captains reporting that non-compliance carries significant financial and operational consequences. Captains reported that the combination of regulations from their economy and monitoring from joint inspection frameworks set a clear compliance baseline, reinforced by the fishing companies, and regular monitoring and port inspections.

Support organisations confirmed that complying with these regulations is important for fisheries as the failure to deploy the required seabird bycatch measures can lead to fines or loss of fishing opportunities. One support organisation noted that the influence of the driver is dependent on there being effective monitoring in place to support the regulations, since there is only a consequence if implementation issues are detected.

#### Examples of what captains said:

*“We have no choice now—it’s a must, especially with the regulations. From what I understand, it’s tied directly to the regulations.”*

*“Basically, if you’re near New Zealand waters and they see you, they’ll give you a hard time and board your ship to check things out. Economies like Australia and New Zealand are actively patrolling with their boats, and they even use planes or drones to take photos from above.”*

<sup>5</sup> The Conservation Measures in the Western and Central Pacific Fisheries Commission set the framework for the regulations adopted in individual economies.

### 4.1.2 Economic and operational benefits to of seabird-safe fishing

Beyond meeting regulatory requirements, captains consistently pointed to the practical value of implementing one or more seabird-safe fishing practices in relation to **economic and operational factors**.

Captains recognised several **economic costs** associated with seabird captures, including bait loss to birds, reduced fishing efficiency given hooks without bait would not attract fish, and disrupted operations when having to de-hook birds. They noted that reducing these costs by using seabird-safe practices would benefit them by improving operational efficiency and reducing waste. Captains indicated that using seabird-safe practices was also a way of maintaining operational rhythm, with fewer interruptions to de-hook and steadier catch performance.

Some captains reported that night setting improved **catch efficiency** because the setting time coincided with when the fish were hunting, although this was not a view held universally. Other captains reported that tori lines help reduce bait loss.

Although not asked to quantify costs associated with losses to seabirds, such as bait or hooks, some captains considered the losses would be negligible. For example, one captain thought losses would be typically under 1%. Conversely, another captain noted that without bird-scaring gear, total catch could be greatly affected. Another captain noted that although each hook is not expensive, the loss of dozens or hundreds is unnecessary waste and financially distressing.

#### Examples of what captains said:

*“If you don’t use [a bird-scaring line], seriously, those birds will just be out there eating up all your bait. On top of that, once they’re done with the bait, they’ll leave everything in a total mess... It’s impossible not to use bird-scaring lines. If you don’t put them out, you’re only hurting yourself, because once a bird takes the hook, you’re not catching any fish.”*

*“Look, you’ve got one hook for every mainline, and when we set them out there, we’re talking over 3,000 hooks—yeah, more than 3,000. If you actually put your bird-scaring gear to good use, your catch rate is going to be much better. But if you don’t do a single thing, your total catch might end up taking a huge hit.”*

*“Those hooks may cost only a few hundred yuan each set, but repeated losses of several hundred yuan can be financially distressing. More importantly, [seabirds] waste your time, and disrupt your daily schedule, and ultimately can lead to greater financial losses.”*

Support organisation interviews confirmed issues, such as bait loss and the costs of replacing hooks or other gear, are influential to fishers primarily as components of operational efficiency and economic calculation, rather than as standalone, major financial burdens. The importance of these costs varies between captains and vessel owners.

One support organisation noted that using seabird-safe practices may not create a large economic benefit as seabird bycatch is likely only a rare occurrence, which another noted that even small losses could add up.

Another support organisation representative observed that when the captains started using tori lines, they were more willing to continue doing so because of the practical benefits.



Photo: Fisheries Agency of Chinese Taipei, 2026

Linked to the discussion on economic benefits, it is useful to note that the **economic cost of implementing seabird-safe practices** was not seen as a major barrier by most interviewees based on which measures they currently use. Most interviewees indicated that the cost of the seabird-safe practices (e.g. tori lines, line weights) was not high or that they could create their own tori lines to keep costs down. One support organisation has set up a program to build tori lines and provide these for free to skippers when they are in port.

### 4.1.3 Environment and social concerns

One supporting organisation noted that **environmental concern** is influential among their fleet, and that fishers **did not want to harm** seabirds. Multiple captains noted that they are willing to protect birds and the environment if their own interests are not affected. Some said motivation had evolved to the point where they considered implementing seabird bycatch measures **the right thing to do**. Several captains also linked good compliance with company image, describing seabird-safe operations as a sign of professionalism rather than pressure.

Some captains explained that, from an emotional perspective they do not want to harm birds, especially during long-distance operations when their lives are lonely and monotonous, as birds provide them with emotional comfort.

#### Example of what a support organisation said:

*“We know that to New Zealand seabirds are like flying pandas.”*

#### Examples of what captains said:

*“Besides the endless ocean, water, and catching fish, we just repeat the exact same routine day after day. But sometimes, honestly, when the weather is nice and you see the seabirds flying all around the vessel, it just changes your whole mood, you know?”*

*“Truth is, we actually care quite a bit about the birds, and our boss back at the company pushes for it too, so we just follow their lead. Plus, doing this actually does us some good anyway.”*

*“I mean, nobody really wants to hurt the birds, right? It’s a matter of overall image. That’s why up here in these high-latitude areas, everyone’s pretty on top of their bird-scaring gear.”*

Other captains were conscious of **avoiding an international backlash** associated with wildlife bycatch, which would put pressure on the company and the economy’s image.

### 4.1.4 Market pressure

A few interviewees mentioned market pressure as another key driver for the adoption of seabird-safe practices. Some support organisations explained that this pressure seemed to be most important for vessel owners and trading companies. For example, those seeking or wanting to maintain Marine Stewardship Council (MSC) certification would find market pressure important and could influence vessel owners or captains through those means.

One captain also noted that company policies and expectations of trading partners further strengthened their drive to implement seabird-safe practices.

**Example of what a support organisation said:**

*“Big companies do care about [markets] because they are trying to get MSC. But for the [captains], they don’t understand the importance of the market...so it is not a main reason for them to use the measures.”*

**Example of what a captain said:**

*“Companies like [our trading company], they represent those buyers and they require us to do this.”*

Support organisations from the different participating economies had varying views on the importance of market drivers. Some interviewees considered market pressure as a less important driver, as the market where the albacore tuna is going, mainly the United States (USA), is perceived to have less interest in seabird bycatch than bycatch of other species like marine mammals. However, another support organisation viewed it differently, noting a growing awareness of seabird bycatch issues in the USA so market pressure may become more influential in the future.

## 4.2 What are the key challenges to implementing seabird-safe fishing?

The interviews with captains and support organisations found that although there are strong drivers for captains to adopt seabird-safe fishing, there are also barriers holding back effective and consistent adoption.

There were **three key sets of challenges** that were found to limit the implementation of seabird-safe practices:

- equipment challenges—including difficulties using tori lines and safety concerns with line weighting;
- operational challenges—including the potential for seabird-safe practices to affect target catch, and impact fishing schedules and crew fatigue; and
- motivation and engagement challenges—including lack of clear incentives to use seabird-safe practices.

A summary of each challenge and ideas generated on how to overcome them, based on the interviews and workshop outputs, is provided below.

### 4.2.1 Equipment Challenges

Captains reported various difficulties with using tori lines and line weighting. These challenges affected vessel’s ability to comply with legal requirements the efficiency of fishing, crew safety and tori line effectiveness in rough conditions.

#### Difficulties with using tori lines

Captains indicated that tori lines are the preferred seabird-safe practice because they keep birds away from the bait without affecting the fishing process. Most captains reported that they see use of this practice as a part of daily operations when fishing in high-risk areas for seabirds.

Tori lines are lines with streamers that scare the birds away from the hooks as they are being set into the water. The tori line has one section that is in the air and the other is in the water to create drag. To work well, the section of the tori line in the air needs to extend over the area where the fishing line and hooks are near the surface so that diving birds cannot get to the bait<sup>6</sup>.

The Western and Central Pacific Fisheries Commission (WCPFC) Conservation and Management Measure to Mitigate the Impact of Fishing on Seabirds (CMM 2025-05<sup>7</sup>) mandates specific requirements for vessels that are greater or equal to 35m in length when they are fishing in south of 25° South. Vessels are required to deploy the tori line to have a desired areal extent of at least 100m. To achieve this aerial extent, the CMM also requires that the tori line is attached to a ‘tori pole’ greater than 7m above the sea surface, and that the tori line length is at least 200m, or 120m if a towing object is used to create drag.

The difficulties with using tori lines identified by the captains related to different aspects of achieving this aerial extent, including use of the tori pole, dealing with tangles and breakages and operational issues with using the required length of tori line.

<sup>6</sup> <https://www.doc.govt.nz/about-us/international-agreements/species/seabird-safe-fishing-toolkit/finder/summary/seabird-safe-practices/bird-scaring-lines-tori/>

<sup>7</sup> <https://cmm.wcpfc.int/measure/cmm-2025-05>



Photo: Francisco Blaha

### Difficulties achieving the required tori line aerial extent

Captains commonly raised that achieving the required aerial extent can be difficult and can depend on vessel set up and how experienced the captains and crew are.

Captains recognised the importance of tori poles in achieving aerial extent. Some said that the height that they attach the tori line to the pole is determined by habit and their own visual judgement rather than measuring it exactly.

#### Examples of what captains said:

*“The pole’s got to be high enough—but not too high. Too low, and there isn’t enough distance between the line and the sea.”*

*“I don’t know who designed this rule, but it’s completely unreasonable. He probably hasn’t even tried it himself. Since I started sailing, I’ve never been able to pull a full 100 metres [for aerial extent]. Reaching 60 metres is already a good achievement.”*

Captains with slightly smaller vessels reported that it is difficult to meet the required extent because using a higher tori pole would endanger navigation safety.

A couple of support organisations noted that dedicated poles for the tori lines may not be used on all vessels, with other things like the back decking rail of the vessel or a flagpole being used as the tori line attachment. Support organisations also noted that even with a tori pole, maintaining the effective height can be difficult, especially when the vessel is fully loaded (sitting lower on the water) or when the wind is strong.

### Tori line tangles and breakages

Captains explained that during strong winds, crosscurrents or sudden course changes, tori lines can tangle around the mainline and break, requiring immediate replacement.

Although these incidents are quickly resolved, captains indicated that they interrupt the deck rhythm, add to crew workload and fatigue from manual retrieval, and degrade streamers more quickly. While captains generally manage tangles and breakages as part of the job, these problems can slow down the setting process and can push line setting into daylight hours. This could impact their ability to achieve night setting. Tangles and breakages also increase workload and contribute to crew fatigue.

To address these issues, some captains make their own tori lines from available material that they consider to be stronger, more cost effective and more practical than those supplied by vendors.

#### Examples of what captains said:

*“Company materials break too easily; we make our own [tori lines].”*

**One captain adjusts streamer length, spacing and colour depending on wind and bird behaviour, describing his approach as:**

*“Common sense mixed with practice.”*

### Difficulties with the required length of the tori line

At the time the interviews were conducted, captains were required to use tori lines that are 200m in length to create enough drag to maintain the aerial extent<sup>8</sup>.

Captains explained that the 200m tori lines create various difficulties. For example, it:

- increases line tangling
- causes sections of the tori line to contact the water (reducing bird-scaring effectiveness)
- affects vessel manoeuvrability as it creates drag in adverse conditions
- increases crew fatigue.

#### Examples of what captains said:

*“Pulling the tori line back is hard work.”*

*“I don’t know who designed this rule, but he certainly hasn’t tested it himself. My boat is only about forty to fifty meters long and dragging such a long bird-scaring rope while keeping it suspended over 100 meters high is simply impossible. Even pulling it for fifty or sixty meters would be challenging enough. Everything beyond that would be submerged underwater. Please ask them how they manage it.”*

### Line weighting safety concerns

Line weighting is the addition of a weight near the hook to make it sink quickly out of reach of diving seabirds. There are different specifications that are acceptable under best practice and the regulations of regional fisheries management regulations.

Captains commonly saw line weighting as the least preferred option of the seabird-safe practices.

<sup>8</sup> Since then, the Western Central Pacific Fisheries Commission has updated the tori line specifications so that the required length is 200 or a minimum of 120m with a towing object (CMM 2025-05)

Captains highlighted that they have concerns about the safety of line weighting for their crew. Due to the tension on the line created by the weight, if a hook or line breaks or is bitten off the hook and/or weight can shoot back towards the vessel at a high velocity (“flyback”), which could be dangerous if it strikes someone. Captains noted that this concern about flyback is a barrier to wider uptake of line weighting.

There are safer line weighting options such as sliding weights and weighted hooks, but captains were generally not aware of these innovations. Additionally, a couple of captains raised a concern that sliding weights could create environmental and economic waste.

Support organisations also noted the risk to crew of flybacks as a key reason that captains did not prefer line weighting. In addition to flyback concerns, they also noted that adding line weights makes the gear heavier, requiring more labour from crew to set the lines.

#### Examples of what captains said:

*“If [the line] breaks, [the hook] can hit someone.”*

*“We’re worried it might hit a crew member right in the eye; honestly, carrying lead weights like that makes people fear for the crew’s safety. Sometimes they get snagged by the hooks, which gets pretty dangerous, so that’s why some guys have a lot of doubts about it.”*

*“There have been frequent reports of heavy lead objects rebounding and striking individuals, with at least 4–5 incidents occurring annually. In recent years, safety measures such as mandatory helmet use have significantly improved; however, the impact on victims remains extremely severe, comparable to that of a bullet.”*

*“If you use weighted lines, they aren’t always easy to work with, and it gets pretty dangerous if the line snaps. If the weight is too close to the hook and the line breaks—since that nylon leader is quite thin—you’re terrified it’s going to fly back... When it snaps and flies back, people get hurt, and we are the ones responsible for that.”*

## 4.2.2 Operational challenges

Captains perceived that night setting and line weighting can affect target catch rates and other vessel operations. Their perception of the potential effect on catch was a top motivational barrier to using these seabird-safe practices.

### Night setting and target catch rates

The seabird-safe practice of night setting was the second most acceptable to captains (after use of tori lines). Night setting requires completing the setting process for all hooks at night, after twilight and before dawn, when birds are likely to be less active.

Support organisations noted that setting to target albacore in the South Pacific would normally take place starting in the middle of the night (between midnight and 5am). This means that depending on the start time, length of the line and the setting speed, setting could carry on into daylight hours.

A common view from captains is that setting exclusively at night may reduce catch of target species, as hooks may not be available during peak tuna feeding periods. This perception influenced willingness to fully implement night setting (rather than the current practice of starting setting at night with potential to carry over into daylight hours).

Some support organisations confirmed this. They understood that captains fear that shifting the setting time earlier (to allow completing of setting during night) would mean the soak time for the hooks occurs during a less productive period for the target species, leading to lower catch rates.

However, other captains had a different view and had experienced that night setting coincided with peak feeding times for albacore tuna and considered night setting a normal practice.

**Examples of what captains said:**

*“We always aim to finish up right as the sun is coming up in the morning. This is something we learned from the old-timer captains; setting lines at night is just a much better way to go. Over all these years, we’ve gathered this kind of firsthand experience about the feeding patterns of the fish.”*

*“We frequently set hooks at night. The advantages of nighttime fishing are quite evident...fish schools are more active during this period making them easier to attract with lighting or other cues. Additionally, there is minimal bird disturbance at night.”*

**Line weighting and target catch rates**

Some captains reported that using line weighting could alter the attractiveness of the bait to target species, reducing catch performance. They explained that the weight changes the shape of the bait moving in the water, making it look less like a real fish or making it look dead, and the target fish lose interest.

Captains also said that branch line weighting requires thicker and more visible fishing line (compared to when no weights are used), and that the tuna see the line easier and don’t bite the line as much, which in turn decreases the catch. They also noted that the heavier fishing line made the hook sink deeper, which deviates from the tuna school’s position and affects catch rates. Some captains reported that they were more concerned about the impact of branch line weighting on catch yields than safety concerns.

**Examples of what captains said:**

*“You really can’t add too much weight to the line. If it’s too heavy, the bait won’t move naturally at all. It becomes completely stiff, just sitting there looking like a dead fish... After all, our main goal out here is still to catch fish.”*

*“If you weigh down the hooks too much, they’ll sink fast, but you won’t catch any fish, and the owner will go bankrupt in two and a half days. When you add that weight, it just drags the bait down and makes it look like a dead fish in the water. That’s why the fish won’t bite.”*

*“In the past, fish hardly noticed the thin fishing line. Then to increase the weight, lead weights had to be added. As the load increased, the line had to be made thicker—otherwise it couldn’t support such heavy weights and would easily break. But using a thicker line presented another problem: these fish aren’t blind... seeing so many objects densely packed together, they’ll inevitably try to avoid them, resulting in fewer catches.”*

Support organisation interviews confirmed that captains are concerned about line weighting affecting target catch rates. One interviewee noted that some captains had experimented with using the weighted hook but found their target catch rate to be lower, so did not want to adopt this tool. Another interviewee noted that some captains already use a weighted swivel (15-20g) on the branch line to prevent tangling and believe this is sufficient, feeling that they do not need to add additional weight.

**Night setting impact on vessel operations**

Captains noted two main operational concerns about doing night setting – where all hooks are set after dusk and before dawn. One is that setting fully at night impacts on crew rest schedules. The other is that environmental and situational factors can push sets into daylight, which makes returning to night setting operationally difficult.

### Night setting and crew rest schedules

Both captains and support organisations said that rigid night-setting rules mean that crews must work extended hours during periods normally reserved for rest, potentially compromising fatigue management and crew endurance. Support organisations also noted that working at night may require reduced deck lighting, increasing the risk of injuries.

#### An example of what captains said:

*“Crew rest is definitely a big consideration when we’re setting lines and retrieving them back. If the weather is rough and things get delayed, we just have to set fewer hooks. Sometimes we have to push the schedule and start setting at 10 or 11pm, just to keep the same hook count, but we really try to let the crew sleep a bit more. If we start earlier, it’s all to give the crew a break and let them catch up on sleep. We are constantly balancing this, always thinking about the crew’s fatigue.”*

### Environmental and situational factors pushing night setting into daylight

Some captains said that unpredictable factors such as weather, currents, or mainline breakages can unavoidably push setting operations into daylight, as well as other factors such as long travel distances. Another captain noted that, depending on the season and latitude, a full night set was not possible due to the short duration of darkness.

One support organisation explained that even if captains start out by setting fully at night, they can only follow this for a few days before factors like mechanical issues, crew injuries or other operational factors lead to delays that change the start time. This results in vessels no longer fully setting at night, and the routine nature of the operations means that they find it difficult to get back on track with night setting.



Photo: Fisheries Agency of Chinese Taipei, 2026

**An example of what captains said:**

*“Sometimes the mainline snaps and you waste a ton of time searching for it, plus the crew still need to get their rest. Mainline breakages and bad weather are the biggest reasons. When that happens, it can drag on for several hours, which means we unavoidably end up setting our lines into the daylight.”*

### 4.2.3 Motivation and engagement challenges

The research identified challenges relating to limited explanation of the ecological rationale for practices, lack of understanding about why combinations of practices are needed, limited performance feedback, compliance framed in binary terms, and lack of structured knowledge exchange.

#### Limited explanation of ecological rationale

Captains indicated that they receive technical instructions (e.g. line length, when to set, pole height, what to use), but seldom the ecological reasoning behind them.

Many interviewees stated they do not fully understand the ecological reasoning or the “why” behind technical details such as ideal streamer spacing, the required height of tori line poles, or the amount of weight attached to branch lines. This lack of understanding leads to scepticism about the effectiveness of certain mitigation practices.

Captains also reported that they are not informed by fisheries managers or companies whether their mitigation practices have reduced seabird interactions or contributed to company or conservation outcomes in a systematic way.

**An example of what captains said:**

*“We just follow what’s written; no one explains why.”*

#### Lack of understanding about why combinations of practices are needed

Some captains indicated that combining seabird-safe practices, such as tori lines and night setting, is useful to reduce seabird bycatch. However, others perceived little conservation need to combine practices. For example, captains noted there are less seabirds active around the vessel at night. In this context, adding tori lines as a practice was seen as creating unnecessary cost and effort.

**An example of what captains said:**

*“When we set our lines at night, there are absolutely no birds bothering us—they don’t even show up until the sun rises. In the dark, you can’t see a single thing, maybe just one or two birds flying around if you’re lucky. It’s only when daylight hits that the flock comes out looking for food. So honestly, deploying all these extra mitigation measures in the middle of the night feels like a complete hassle and a waste of effort. The birds aren’t even active at night, but because of these strict regulations, we still have to put out two people just to haul this massive 250-meter bird-scaring line. It’s completely unnecessary weight and extra work for the crew, when there’s zero bird activity.”*

#### Limited performance feedback

Captains noted that observers or inspectors document compliance during trips, but they don’t regularly receive feedback on how effectively their mitigation gear performed or whether minor adjustments could improve results.

**An example of what captains said:**

*“The regulatory departments and scientists set all these rules, but they don’t actually spend real time out at sea; they just show up, take a look, and that’s about it. The whole world is doing research on how to avoid catching seabirds, but none of those official studies ever bring us a real, effective result. They tell us to follow the international standards, but once you deploy it, you realise it’s completely nonsense! Nobody actually gives us feedback on whether these regulated gears are truly helping out here; we are just left to figure out what works through our own trial and error on deck.”*

**Compliance framed in binary terms**

Inspection processes were described as focusing on whether requirements are met (yes/no), rather than evaluating effectiveness or suggesting technical improvements. As a result, captains tend to prioritise passing inspections over optimising technical performance.

**An example of what captains said:**

*“So our priority is just making sure the gear is out there so we don’t get caught. But the fisheries agency’s official guidelines are so disconnected from reality—the ready-made lines they sell are useless; the cheap plastic streamers blow apart in the wind. The inspectors only care if you have a line in the water or not, so we just show them a compliant line, but we have to custom-make our own gear later if we want it to actually work and survive the weather.”*

**Lack of structured knowledge exchange**

Captains say there are limited opportunities to formally discuss results, share innovations, or exchange experiences. Knowledge tends to circulate informally through crew turnover, dockside discussions, or occasional company briefings, rather than through structured, documented, or scientifically validated learning channels. As a result, practical innovations often remain confined to individual vessels rather than benefiting the wider fleet.

**Examples of what captains said:**

*“[I] learned from old crew and watched how they set the tori line.”*

*“Every vessel finds its own way that works.”*

**4.3 What support is currently available for seabird-safe fishing?**

The interviews and the workshop explored what support is currently available for captains to help them with using seabird-safe practices. Existing support activities to address challenges include training, port-based outreach, at-sea trials, and technical instructions and guidance.

**4.3.1 Current support to overcome equipment challenges**

Captains noted that for addressing issues with using tori lines, there is some support already available in both economies, including training for captains and bringing in international experts to help improve tori line designs. There are also some trials underway, for example looking at using shorter tori lines with a float to reduce line length whilst maintaining aerial extent.

Despite this, some captains noted that they have reported issues with maintaining aerial extent but have not had a response, and others said there was no specific technical support with using tori lines. They said there was some general guidance such as booklets provided by fisheries associations, but captains generally rely on problem solving based on their experience and practical knowledge.

Support organisations interviewed noted that there are some port-based outreach and training initiatives to help captains. For example, there have been programs to help captains make their own tori lines that meet specifications but use materials readily available on the vessel so they are more robust and easier to repair or replace. Other programs include supplying vessels with tori lines and providing port-based instruction on installation and use.



Photo: Francisco Blaha

For line weighting safety issues, some captains said that fishing companies require use of safety helmets when line weights are used. While other captains said that the main safety practices are general crew awareness and use of basic protective measures (e.g. helmets), rather than consideration of different weighting options. Across all interviews, there was little awareness on use of safer options such as sliding weights.

The interview and workshop outputs indicated that additional support focused on addressing equipment challenges would be beneficial.

#### 4.3.2 Current support for overcoming operational challenges

Captains did not identify any existing support to address concerns about using line weighting or night setting affecting catch rates. Some captains noted that there is guidance on following seabird bycatch measures, but not on ensuring catch performance.

Robust science to answer the questions about the potential impact of seabird-safe practices on target catch may be helpful to progress and overcome the associated motivational barriers. However, workshop speaker and mitigation expert Prof. Ed Melvin noted that often studies are not convincing to captains unless the study is undertaken in their fishing area.

One support organisation interviewed noted that there are some trials underway looking at catch performance with different line weighting regimes. The insights from Prof. Melvin suggest that these studies should consider the compatibility of the study with real life fishing, and to ensure that fishers are engaged in the research.

Captains and support organisations did not identify specific support available to address the challenges associated with the scheduling of night setting to reduce crew fatigue.

Both the interviews and workshops indicated that additional support on both topics would be beneficial.

### 4.3.3 Current support to overcome motivation and engagement challenges

Captains said companies or authorities provide some technical instructions but no feedback on mitigation practice performance following monitoring or inspection. Training is largely compliance-oriented, focusing on what must be done. There is no clear mechanism to gain the ecological and technical reasoning behind the mitigation practice requirements and specifications.

Some support organisations noted that training and port-based outreach is available that does include the reasons behind mitigation use but do not go into why the specifications themselves are designed the way they are. A couple of support organisations noted that there have been initiatives to provide more specific training on seabird-safe practices to captains of longline vessels targeting tuna, including training workshops for captains run under the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) Seabird Project and the International Seafood Sustainability Foundation (ISSF) Skipper Training initiatives.

Workshop experts Dave Goad and Richard Wells provided the example of the New Zealand Fisheries Liaison Programme as an effective model for delivering appropriate training and support for vessels. They explained that the programme liaison officers visit the vessels and help the captains and crew with any difficulties they are having with mitigation use. The liaison offices are support only, and do not carry out compliance checks. This way the fishers can feel free to talk about the challenges and to get help.

Workshop expert James Nagan described BirdLife International's port-based outreach program. They have a liaison officer based in Suva (Fiji) to engage captains and crew of high seas longline vessels on moving to seabird-safe practices. He explained that by building relationships with captains, the program provides both technical support and motivational encouragement.

Similarly, workshop experts Scott Pursner and Howard Tsai described outreach programs in Chinese Taipei to improve engaging fishers on use of seabird-safe practices through port-based outreach on topics such as making their own tori lines and explaining the business and ecological reasons for using mitigation.

Finally, workshop expert Richard Wells provided an example of a reward scheme in New Zealand that has been effective to encourage and incentivise seabird -safe fishing. The Seabird Smart Awards,<sup>9</sup> run by the Southern Seabirds Trust, are an initiative that acknowledge commercial and recreational fishers and seafood industry bodies who are showing leadership in their efforts to reduce seabird captures. The awards help build a culture of stewardship and demonstrate that fishing and seabird protection can go hand in hand.

The interviews and workshop outputs both noted that this is a key area for additional support.



Photo: Oscar Thomas

#### 4.4 What are the opportunities to support seabird-safe fishing?

The participatory workshop identified opportunities to address the equipment, operation and motivation and engagement challenges identified in the interviews with captains and support organisations.

For each challenge, one or two objectives were prioritised and actions associated with these were developed through the workshop. These challenges, objectives and proposed actions are provided in Table 1. The actions are relevant for a range of actors involved in supporting fleets with seabird-safe fishing: government or company fisheries managers, industry groups, research agencies, and NGOs.

**Table 1** Key challenges and objectives and capacity building actions to support implementation of seabird-safe practices

| KEY CHALLENGES                                                                                                                                    | OBJECTIVES<br><i>(how to address the challenges)</i>                                                                                                                                                                     | CAPACITY BUILDING ACTIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EQUIPMENT CHALLENGES                                                                                                                              |                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <ul style="list-style-type: none"> <li>Difficulties with using tori lines e.g. achieving the aerial extent, and tangles and breakages.</li> </ul> | <ul style="list-style-type: none"> <li>Improve the use and functionality of tori lines so that they meet requirements such as aerial extent and do not break, tangle or cause other operational difficulties.</li> </ul> | <b>RESEARCH AND INNOVATION</b> <ul style="list-style-type: none"> <li><b>Data collection:</b> Collect information from fishers and observers on specific issues, to inform targeted interventions.</li> <li><b>Design and technical improvements:</b> including engaging engineers and captains to improve tori line and tori pole designs and create more detailed design specifications for manufacturers.</li> <li><b>Practical trials:</b> Conduct trials where mitigation tools are provided for fishers to test in an educational context to see what works best for their vessels.</li> </ul>                                                                                                                                                                                                                                                                    |
|                                                                                                                                                   |                                                                                                                                                                                                                          | <b>ENGAGEMENT, TRAINING AND SUPPORT</b> <ul style="list-style-type: none"> <li><b>Fisher engagement:</b> facilitate peer learning and workshops, brainstorming to address issues like using tori lines in heavy weather or rough seas, and explaining why certain design specifications (like aerial extent) are important.</li> <li><b>Training and support:</b> Provide on-board training and practice sessions for using tori lines and poles to overcome operational issues, integrate work on this into existing Fisheries Improvement Programs or addressing conditions for MSC certification, and have tori line experts available at port to help provide support.</li> <li><b>Monitoring and feedback:</b> Social research, and electronic monitoring to review tori line use and inform research and innovation, engagement, training and support.</li> </ul> |

| KEY CHALLENGES                                                                                                            | OBJECTIVES<br><i>(how to address the challenges)</i>                                                                       | CAPACITY BUILDING ACTIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EQUIPMENT CHALLENGES                                                                                                      |                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>Safety concerns with line weighting.</li> </ul>                                    | <ul style="list-style-type: none"> <li>Increase use of line weighting through addressing concerns about safety.</li> </ul> | <p><b>RESEARCH AND INNOVATION</b></p> <ul style="list-style-type: none"> <li><b>Research to understand issues:</b> Conduct research to understand causes of flybacks and conduct surveys to determine if low adoption of sliding weights is due to lack of awareness or other issues.</li> <li><b>Technical improvements:</b> Conduct trials on non-elastic branch lines and investigate methods to improve sink rates to achieve the same effectiveness with less weight.</li> </ul> <p><b>ENGAGEMENT, TRAINING AND SUPPORT</b></p> <ul style="list-style-type: none"> <li><b>Safety protocols and hazard management:</b> With Captains and crews, develop safety plans to describe and mitigate risks, define operational rules to keep people safe (e.g. where crew should stand during hauling).</li> <li><b>Training and outreach:</b> Provide practical guidance, create videos demonstrating safe use of weighting under real-world conditions, provide targeted vessel outreach with troubleshooting before wider roll-out, provide 'freebies' of different sliding weights to get captains to test them, and seek funding or subsidies to provide weights and offset potential costs.</li> </ul> |
| OPERATIONAL CHALLENGES                                                                                                    |                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>Concern about potential effect of seabird-safe practices on catch rate.</li> </ul> | <ul style="list-style-type: none"> <li>Concern about potential effect of seabird-safe practices on catch rate.</li> </ul>  | <p><b>RESEARCH AND INNOVATION</b></p> <ul style="list-style-type: none"> <li><b>Data collection:</b> Adapt and standardise existing data collection protocols (including electronic monitoring (EM) to evaluate impact of mitigation on catch rates.</li> <li><b>Collaborative research and at-sea trials:</b> Conduct inclusive research on fishing vessels in realistic conditions to determine how catch rates vary with different set times and line weighting options. Ensure researchers spend some time on vessels and that incentives are provided for participation.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| KEY CHALLENGES                                                                                  | OBJECTIVES<br><i>(how to address the challenges)</i>                                                                                                                                                                       | CAPACITY BUILDING ACTIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| <ul style="list-style-type: none"> <li>Night setting impact on crew sleep schedules.</li> </ul> | <ul style="list-style-type: none"> <li>Fishing schedules and practices allow more flexibility to accommodate environmental/situational factors, effective crew rest protocols and scheduling for night setting.</li> </ul> | <p><b>ENGAGEMENT, TRAINING AND SUPPORT</b></p> <ul style="list-style-type: none"> <li><b>Building trust and communication:</b> Industry and agencies work together to agree on the problem and that it needs to be solved. Identify “fleet champions” such as captains who are already using measures, to disseminate information to their peers. Use port-based outreach, and peer exchanges to share experiences.</li> <li><b>Support and incentives:</b> Provide incentives for vessel participation in research, resource the creation of guidance documents, and publications to share existing information with industry.</li> <li><b>Explore alternatives:</b> Investigate other options for meeting regulation requirements which might be more acceptable to captains than line weighting.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <ul style="list-style-type: none"> <li>Night setting impact on crew sleep schedules.</li> </ul> | <ul style="list-style-type: none"> <li>Fishing schedules and practices allow more flexibility to accommodate environmental/situational factors, effective crew rest protocols and scheduling for night setting.</li> </ul> | <p><b>RESEARCH AND INNOVATION</b></p> <ul style="list-style-type: none"> <li><b>Understand the problem and options to solve it:</b> Conduct gap analysis of existing labour laws to identify areas that can be adjusted and explore ways to standardise fleet procedures, optimise crew rotation, improve record-keeping, and improve onboarding communications.</li> <li><b>Collaborative problem solving:</b> Engage vessel managers and captains in a process to understand the problem and options to solve it. This could include reviewing the events that disrupt their schedules and in developing specific actions for managing increased seabird risk in those cases. Proposed responses should be reviewed by fishery managers for safety, agreed upon across fleets, and then documented in plain, simple procedures translated into the appropriate languages for the crew.</li> <li><b>Monitoring and feedback:</b> Utilise electronic monitoring (EM) to monitor execution of night setting and provide feedback.</li> </ul> <p><b>ENGAGEMENT, TRAINING AND SUPPORT</b></p> <ul style="list-style-type: none"> <li><b>Supply chain and economic incentives:</b> Involve company commercial teams and tuna buyers explore ways to incentivise mitigation use.</li> <li><b>Feasibility and policy support:</b> Conduct feasibility assessments for changes, work with governments and companies to prioritise operational flexibility and crew welfare as key components of seabird conservation.</li> <li><b>Education and mentoring:</b> Provide ongoing education for crew and establish mentoring programs to support the transition to new scheduling practices.</li> </ul> |

| KEY CHALLENGES                                                                                                                                                                                                                                                                                       | OBJECTIVES<br><i>(how to address the challenges)</i>                                                                                                                                                                                                                      | CAPACITY BUILDING ACTIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MOTIVATIONAL AND ENGAGEMENT CHALLENGES                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>Limited understanding of ecological rationale, including about mitigation specification and why combinations of mitigations are needed.</li> <li>Limited feedback about how mitigation is working.</li> <li>Lack of structured knowledge exchange.</li> </ul> | <ul style="list-style-type: none"> <li>Captains and crew understand the reasons for required seabird mitigation practices and how the practices can help them achieve conservation and business objectives and are motivated (incentivised) to implement them.</li> </ul> | <p><b>ENGAGEMENT, TRAINING AND SUPPORT</b></p> <ul style="list-style-type: none"> <li>Provide practical guidance to captains, vessel owners, and fisheries managers on using seabird-safe practices, business reasons for using seabird-safe practices, and why seabirds are important.</li> <li><b>Port-based outreach:</b> provide the support in the right place and time and in relevant languages, and using affective approaches including peer learning and face-to-face training.</li> <li><b>Training delivery:</b> should be from fisheries managers and captains, with support from mitigation experts, supply chain companies, vessel owners, and fisheries associations.</li> <li><b>Develop and provide effective incentives:</b> This could include market access/sustainability certification, awards or recognition for good practice, and direct financial contributions.</li> </ul> |



Photo: Francisco Blaha

## 5 Recommendations for Capacity Building

### 5.1 Introduction

The capacity building actions identified in Table 1 could be taken up by a range of actors involved in supporting fleets with seabird-safe fishing: government or company fisheries managers, industry groups, research agencies, and NGOs. The actions could be worked into annual fisheries management plans of agencies, company sustainability work programmes, or outreach programmes of NGOs involved in supporting sustainable fishing.

The capacity building actions could be implemented singularly, in pieces, or developed into a more cohesive capacity building programme. The purpose of developing a cohesive capacity building program would be to find synergies and create efficiencies to deliver capacity support to fleets seeking it. A programme could be developed to foster collaboration across economies, pool and share expertise and set up the institutional structure to ensure effective delivery and sustainable funding over time.

For all proposed actions where some support already exists, it is recommended that those responsible for the current support programmes should be engaged in discussions to determine the most effective and efficient ways to address the objectives identified. This may include determining if existing programmes can simply be expanded or if some new or additional actions are needed.

### 5.2 Four pillars of a potential capacity building program

The capacity building actions can be organised into four main pillars: 1) collaborative research and technical innovation; 2) safety and operational protocols; 3) targeted outreach and training; and 4) integrated monitoring, feedback, and incentives.

An infographic outlining the program is provided as Figure 2.

## Pillar 1: Collaborative research and technical innovation

**Focus:** *Solving practical equipment and operational problems through direct partnership with fishers. Noting the extensive existing scientific evidence on seabird-safe practices reviewed by ACAP, trials should build from this rather than duplicate it and be focused to answer specific equipment and operational challenges.*

### Key activities:

- **Joint at-sea trials:** Conduct research on active fishing vessels to test the functionality of mitigation practices, evaluate the impact of measures on vessel operations and target catch rates.
- **User-led design:** Engage captains and engineers to refine equipment, such as developing more durable tori poles or safer line-weighting options, ensuring they are practical for real-world conditions.
- **Operational feasibility studies:** Analyse fishing schedules and labour laws to identify flexible ways to implement night setting without compromising crew rest or safety.
- **Quantify the economic costs and benefits:** Quantify the number extra hooks that are available for target catch due to seabird-safe practices reducing bait loss from birds, and other vessel-based economic costs and benefits associated with seabird-safe fishing.

### Who will lead:

- **Researchers and academic institutions:** To design studies and analyse data on gear effectiveness and catch rates.
- **Captains and engineers:** To co-design and lead practical at-sea trials for tori lines and line weighting.
- **Fisheries associations and managers:** To identify research priorities and coordinate between vessels.
- **Mitigation and data experts:** To standardise data collection protocols.

### Who would participate:

- **Crew and observers:** Providing hands-on feedback and recording data during trials.
- **Equipment suppliers and gear manufacturers:** Providing materials and incorporating fisher-led design improvements into products.
- **Fishery Improvement Project (FIP) providers, supply chain organisations:** Aligning trials with existing sustainability workplans.
- **Vessel owners:** Providing access to production vessels for research.

### Collaboration:

Share trial results across APEC economies to avoid duplicating research efforts and to standardise effective gear designs.

## Pillar 2: Safety and operational protocols/plans

**Focus:** *Establishing safety and other operational protocols that are easy to follow.*

### Key Activities:

- **Develop safety and hazard protocols/plans:** Develop clear, practical operational plans for vessels to ensure safety, crew welfare and ability to respond to at-sea situations that may disrupt seabird mitigation practices.
- **Improve and Update:** Test and improve protocols/plans with feedback loops and update them based on the latest research.

### Who will lead:

- **Vessel managers and captains:** To ensure protocols/plans are specific and appropriate for their vessels.
- **Government fisheries managers and those responsible for implementing labour and safety regulations:** To imbed safety protocols/plans in management processes.
- **Social and vessel operations experts, and crew welfare experts:** To help draft protocols and ensure they meet labour laws regarding crew rest.
- **Fisheries associations:** Creating the bridge between government regulations and industry reality.

### Who would participate:

- **Captains and crew:** Providing input on the feasibility of proposed safety and operational protocols.
- **Researchers:** Advising on methods for testing, monitoring and improving safety and operational protocols.
- **RFMO representatives and ACAP working groups:** To provide standardised guidance.

### Collaboration:

Work through international fora (e.g. APEC, RFMOs, ACAP) to advise on improving safety and operations.

## Pillar 3: Targeted outreach and training

**Focus:** *Building trust and professional ownership through direct, two-way engagement.*

### Key Activities:

- **Port-based outreach:** Deploy outreach officers (potentially based on those described in section 4.3.3) to provide face-to-face technical support and troubleshooting directly to captains and crew at the port.
- **Develop simplified guidance and communication materials:** Create multi-lingual infographics, videos, apps (e.g., the Seabird-Safe Fishing Toolkit) that explain the “how” and “why” of mitigation practices in plain language.
- **Vessel champion programs:** Support “early adopter” captains as mentors, sharing their practical successes and troubleshooting tips with other fishers.
- **Rationale-based training and peer learning opportunities:** Provide training to explain the ecological and business benefits of seabird-safe fishing to foster professional pride; and enable peer learning.

### Who will lead:

- **Port-based outreach officers and mitigation experts:** Providing face-to-face technical support and troubleshooting.
- **“Vessel champion” captains:** Serving as peer mentors to share practical success and build trust among other fishers.
- **Fisheries improvement plan (FIP) providers, eNGOs and fisheries associations:** Hosting workshops, providing training, and developing multi-lingual guidance materials for the training to be made accessible via the Seabird-Safe Fishing Toolkit.
- **Supply chain companies:** Use the Seabird-Safe Tool to engage their supplier vessels in communicating how seabird-safe their fishing is currently, and how they are planning to improve. Monitor progress over time, encourage improvement and communicate the business benefits of seabird-safe fishing.

### Who would participate:

- **Captains and crew:** The primary recipients of training and peer-learning exchanges.
- **Vessel owners:** Ensuring their staff are available for training.
- **Observers and electronic monitoring (EM) providers:** Ensuring they are also aware of specifications and reasons for them so they can support with monitoring and feedback.

### Collaboration:

Host cross-economy peer exchanges and workshops to rapidly socialise best practices across different fleets.

## Pillar 4: Integrated monitoring, feedback, and incentives

**Focus:** *Closing the loop between data collection and vessel performance while rewarding best practices.*

### Key Activities:

- **Constructive performance feedback:** Utilise Electronic Monitoring (EM) and observer data to provide vessels with specific feedback on how their gear is performing, rather than just pass/fail compliance.
- **Incentive schemes:** Implement rewards for excellence e.g. based on New Zealand's Seabird-Smart Awards (see section 4.3.3), public recognition, or direct financial contributions.
- **Review and improvement:** Periodically evaluate the effectiveness of the capacity building activities using monitoring data to identify and address new gaps.

### Who will lead:

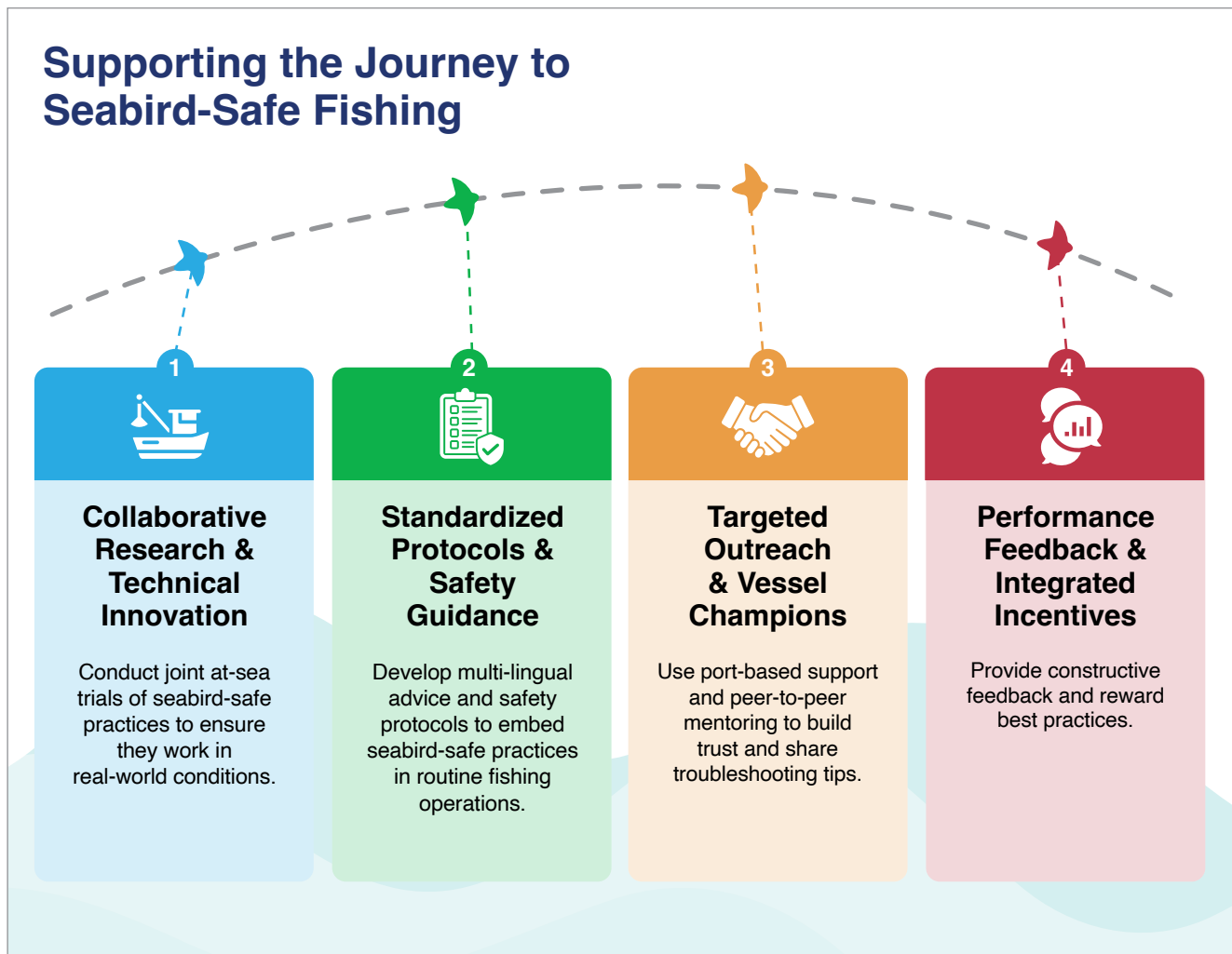
- **Fisheries managers and administrations:** committed to supporting capacity building activities for their fleets.
- **Fisheries associations:** helping to implement monitoring across their membership, encouraging they participate in training, communicating performance results back to the fleet and recognising excellence.
- **Researchers:** develop monitoring framework to assess effectiveness of capacity building activities and analyse and communicate results.
- **Supply chain companies:** Use the Seabird-Safe Tool and their verification processes to assess suppliers' seabird-safety and reward best practice and improvement.

### Who would participate:

- **Government fisheries managers and potentially observers and EM providers:** Collecting the data necessary for performance feedback.
- **Captains and crew:** Utilising the feedback to refine their on-board practices.
- **Tuna buyers and commercial teams:** Providing rewards e.g. price premiums for high-performing vessels.
- **Vessel owners:** To ensure they are engaged in relevant training, informed about how to effectively monitor seabird-safe practices, and receiving feedback to enable them to work with their vessel captains to improve seabird-safety over time.

### Collaboration:

Share regional monitoring insights through APEC or RFMOs to identify and solve common fleet-wide challenges.

**Figure 2** Four Pillars of Capacity Building for Seabird-Safe Fishing

# 6 Conclusion

Based on research with vessels captains, government, industry and other organisations this project has recommends a range of capacity building actions that would help to progress seabird-safe fishing across APEC economies.

Developing a coordinated capacity building programme may be an efficient way to address multiple recommendations and foster further productive cooperation and collaborative problem-solving by APEC economies. A coordinated capacity building programme could strengthen both technical implementation and captain engagement by combining greater practical support, knowledge exchange, and performance feedback.

A capacity building programme could aim to address the three issues:

- 1 **Mitigation equipment challenges:** by providing practical training and technical support to address the equipment challenges.
- 2 **Operational challenges:** by further exploring the challenges, undertake trials, and identify workable solutions.
- 3 **Motivational and engagement challenges:** by strengthening two-way knowledge exchange with captains on the current gaps (tori line measurement, self-made tori lines, crew knowledge, implementing line weighting requirements) and provide feedback on vessel and fleet-wide mitigation performance.



Photo: Tamzin Henderson

This project brought together a range of participants through interviews and a workshop, including captains, APEC economy agencies, fisheries managers, fisheries associations, vessel owners and operators, supply chain companies, academics and researchers, fisheries consultants and eNGOs. There were 70–100 participants over the two days of the workshop alone, indicating a high level of interest in this topic.

Survey results (see Annex 3) highlighted that the workshop was productive in helping APEC economies think about how to address the priority challenges and capacity gaps for seabird-safe fishing practices, and in increasing knowledge and skills on the topics presented. This included calls from participants for future events like this, publishing the results and further collaboration on this topic between APEC economies.

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*Photo: Oscar Thomas*



# Annex 1:

## Biological and economic considerations relating to seabird bycatch

### A1.1 Biological considerations

The world's albatrosses and petrels are facing an urgent and continuing conservation crisis (ACAP 2025). Nearly a third of the world's seabirds are threatened, and almost half have declining population trends (Dias et al. 2019).

The Advisory Committee of the international expert body on albatross and petrel conservation (ACAP) states the biggest threat to many threatened seabirds is fisheries bycatch – where the birds are accidentally entangled in fishing gear or caught on baited hooks (ACAP 2025).

Tuna longline fisheries across the high seas are having the greatest impact on a number of seabirds such as albatrosses and large petrels (Anderson et al 2011, Phillips et al. 2016). Global studies have estimated up to 300,000 seabirds are killed in longline fisheries annually (Anderson 2011). Bycatch is happening most on the high seas because this is where the most intensive fishing happens and where the seabirds spend the majority of their time (Beal et al 2021).

A recent review of scientific literature assessing the effectiveness of best practice seabird mitigation measures recommended by ACAP shows that seabird captures would be reduced to close to zero if these measures were implemented, even in the highest risk areas of the world's oceans (Pierre, 2023). Recent quantitative evaluations of the effectiveness of seabird mitigation measures in the Atlantic and Pacific Oceans (Bell et al., 2025; Fischer et al., 2024) also show there would be substantial reductions in bycatch by moving from mitigation measures currently required by tuna Regional Fisheries Management Organisation (RFMO) measures to best practice.

### A1.2 Economic considerations

The costs of seabird bycatch may fall on different parts of the tuna supply chain. For example, for trading companies, addressing bycatch of marine wildlife can improve their reputation, their ability to gain eco-certification, the value of their brand, their access to preferential finance (including lower insurance premiums), and their trade relationships with valuable retailers.

For vessels owners and even captains and crew, bycatch can affect the profit margins of every fishing trip. Some vessel-based economic benefits of using seabird-safe practices are outlined in Pierre, et al. 2021. These include:

- Potential catch increase associated with bait retention and bycatch reduction,
- Other cost savings related to bait retention
- Crew time saved by reducing the number of seabirds needing to be dehooked.
- Other cost savings related to reducing the number of bycaught birds i.e. from loss of gear if birds are cut off lines.

Benefits of using seabird-safe practices include (but are not limited to) bait retention and corresponding increase in target catch, crew time saved releasing captured seabirds and repairing gear, less gear loss, avoidance of new fishing restrictions, and reduced monitoring costs linked to bycatch risks. Meyer & Hickcox (2023) reviewed existing literature for methods to estimate bait loss caused by seabirds as well as whether data exists that could be further used to estimate bait loss and economic impacts. The potential economic benefits related to minimising seabird interactions have never been fully quantified.

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# Annex 2:

## Detailed project approach

### A2.1 Project team

The Project Overseer for this work was Mandy Leathers, representing the New Zealand Department of Conservation. Her role was to provide overall direction on the project and establish and liaise with two Steering Committees, one for each economy participating in the initial research, and to facilitate the execution of the project by the Contractors.

The Steering Committees in the People's Republic of China and Chinese Taipei consisted of members from Government, industry and research organisations in each economy. They were tasked with facilitating access to research and workshop participants and providing advice to the Contractor and Project Overseer on issues and risks that could arise.

The organisation contracted for project delivery was the Navigators, a New Zealand social science research consultancy. The Navigators team included Penny Turner (Project Director), Stephanie Good (Project Manager) and Hao Mai and Felix Yang (social science researchers with local knowledge of Chinese Taipei and the People's Republic of China respectively).

### A2.2 In-depth Interviews

As a qualitative data collection method, in-depth interviews are relatively unstructured interviews. The researcher is trained and experienced in the skill of probing for detailed answers. The direction of the interview is guided by the responses while ensuring the research objectives are covered. As the interview unfolds, the researcher explores the replies and uses them as a basis for further questioning. The interview allows time for the researcher to build rapport and trust with the research participant, and time for the participant to express their opinions, attitudes and experiences. Careful attention is paid to ensure questions are not leading and the researcher does not create any bias in the responses.

To enable fishers to speak freely in the interviews, the researchers prepared for the interviews by

becoming familiar with tuna longlining fishing, mitigation methods and key terminology — knowing enough but not too much, so participants were encouraged to share their expertise and explain their thoughts, experiences and scenarios in their own words.

#### A2.2.1 Interview participants

The initial qualitative research was conducted between 17 September 2025 and 28 January 2026. The researchers liaised with the Steering Committees in each economy and the Project Overseer to provide information on the proposed interview questions and to facilitate access to interviewees from two stakeholder groups:

- Captains of albacore tuna longline vessels that were flagged to the People's Republic of China and Chinese Taipei and operated in the South Pacific areas that are of higher risk for seabirds.
- Supporting organisations in the People's Republic of China and Chinese Taipei that engaged with albacore tuna longline vessels operating in the South Pacific.

The vessel captains were included in the research given they are directly responsible for day-to-day fishing practices and operational decision-making at sea, and therefore play a critical role in the adoption, implementation, and consistent use of seabird-safe fishing measures. Their perspectives provide important context on the reality of implementing seabird-safe practices at sea.

Supporting organisations were included as they influence the broader environment in which fishing practices occur, including training, policy development, industry standards, technology development, supply-chain requirements, and advocacy. Their perspectives provide important context on systemic enablers and barriers to the uptake of seabird-safe practices, as well as opportunities for coordinated action across the sector.

The final group of research participants from each

population included:

- 11 captains of longline vessels (six flagged to Chinese Taipei, representing four vessel companies; and five captains of longline vessels flagged to the People's Republic of China, representing two vessel companies)
- nine representatives from supporting organisations based in the People's Republic of China (four), Chinese Taipei (four) and the Pacific (one), spanning academia, industry associations, fishing companies, supplier organisations, environmental Non-Governmental Organisations (eNGOs), and gear manufacturers.

## A2.3 Participatory Workshop

The project's second phase featured a workshop titled "Addressing Key Challenges and Capacity Gaps in Moving Towards Seabird-Safe Longline Fishing."

The workshop was carried out on 15-16 April 2026 (two half days) and was conducted online to encourage a wide range of participants from all APEC economies to join.

### A2.3.1 Workshop purpose and participants

The purpose of the workshop was to share the results of the interviews, foster stakeholder collaboration and identify actionable pathways toward safer fishing practices.

The project Steering Committees, the Program Coordinator and project team helped to promote the workshop among key stakeholders, including:

- Fisheries agencies and managers
- Fisheries associations
- High-seas tuna longline businesses
- Private sector Fisheries Improvement Plan (FIP) providers, consultants and auditors working with environmental eco-labels
- eNGOs
- Multilateral for a working on sustainable management of longline fishing.

Simultaneous translation from English to Chinese and Japanese was provided to facilitate participation of key longline fishing economies.

The workshop attracted 102 participants (range 70-102 over the course of the two days) from ten different economies.

### A2.3.2 Developing the workshop agenda

Before the event, the project team worked with Steering Committees in the People's Republic of China and Chinese Taipei to look at the results of the interviews and decide the focus and agenda of the workshop.

We identified three sets of challenges arising from the interviews, and the key objectives that if met, would effectively address the challenges (Table A2.1). The challenges and objectives were chosen as a focus for the workshop because they are relevant across multiple APEC economies and addressing them would support vessels to use seabird-safe practices, and resolve specific concerns raised by captains. The agenda is provided in Table A2.2.

| KEY CHALLENGES                              | OBJECTIVES (how to address the challenges)                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Equipment challenges</b>                 | <ul style="list-style-type: none"> <li>• Improve the use and functionality of tori lines so that they meet requirements such as aerial extent and do not break, tangle or cause other operational difficulties.</li> <li>• Increase use of line weighting through addressing concerns about safety.</li> </ul>                                                       |
| <b>Operational challenges</b>               | <ul style="list-style-type: none"> <li>• Answer the question about whether use of night setting and line weighting affects catch rates, in a way that captains trust.</li> <li>• Fishing schedules and practices allow more flexibility to accommodate environmental/situational factors, effective crew rest protocols and scheduling for night setting.</li> </ul> |
| <b>Motivation and engagement challenges</b> | <ul style="list-style-type: none"> <li>• Captain and crew understand the reasons for required seabird mitigation practices and how they work to meet the conservation and business objectives and are motivated (incentivised) to implement them</li> </ul>                                                                                                          |

Photo: Graeme Elliot



**Table A2.2** Workshop Agenda

| Day 1: 15 April 2026 |                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TIME (NZST)          | TOPIC                                                                                                                                                                                                                                                                                                                                                                          |
| 15.00–15.30 (30 min) | <b>Introduction</b> <ul style="list-style-type: none"> <li>• Welcome (from New Zealand)</li> <li>• Introduction of research team and experts</li> <li>• Workshop objectives</li> <li>• Workshop “Ground rules”</li> </ul>                                                                                                                                                      |
| 15.30–16.00 (30 min) | <b>Presentation of research results and workshop focus areas</b>                                                                                                                                                                                                                                                                                                               |
| 16.00–16.45 (45 min) | <b>Focus area 1: Seabird bycatch mitigation equipment challenges</b> <ul style="list-style-type: none"> <li>• Describe issues, objectives, and what support is available already</li> <li>• Expert presentations</li> <li>• Explain exercise</li> </ul>                                                                                                                        |
| 16.45–17.00 (15 min) | <b>Short break</b>                                                                                                                                                                                                                                                                                                                                                             |
| 17.00–17.45 (45 min) | <b>Focus issue 1: Break out groups – Objectives and actions</b><br>Each group explores: <ul style="list-style-type: none"> <li>• What are key steps/actions to achieve the objectives?</li> <li>• Who needs to be involved (e.g. decision makers, implementers)?</li> <li>• What can be done with existing support?</li> <li>• What additional support is required?</li> </ul> |
| 17.45–18.45 (45 min) | <b>Focus area 1: Report back/discussion</b> <ul style="list-style-type: none"> <li>• Groups present proposed actions to plenary</li> <li>• Questions/discussion</li> </ul>                                                                                                                                                                                                     |
| 18.45–19.00 (15 min) | <b>Wrap up day 1</b> <ul style="list-style-type: none"> <li>• Summarise progress</li> <li>• Plan for the next day</li> </ul>                                                                                                                                                                                                                                                   |

**Table A2.2** Workshop Agenda

| Day 2: 16 April 2026 |                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TIME (NZST)          | TOPIC                                                                                                                                                                                                                                                                                                                                                                                                     |
| 15.00–15.10 (10 min) | <b>Welcome day 2</b> <ul style="list-style-type: none"> <li>Reminder objectives/ground rules</li> </ul>                                                                                                                                                                                                                                                                                                   |
| 15.10–15.40 (30 min) | <b>Focus area 2: Operational challenges with seabird-safe fishing</b> <ul style="list-style-type: none"> <li>Describe issues, objectives, and what support is available already</li> <li>Expert presentations</li> <li>Explain exercise</li> </ul>                                                                                                                                                        |
| 15.40–15.45 (5 min)  | <b>Short break</b>                                                                                                                                                                                                                                                                                                                                                                                        |
| 15.45–16.15 (30 min) | <b>Focus area 2: Break out groups – Objectives and actions</b><br>Each group explores: <ul style="list-style-type: none"> <li>What are key steps/actions to achieve the objectives?</li> <li>Who needs to be involved (e.g. decision makers, implementers)?</li> <li>What can be done with existing support?</li> <li>What additional support is required?</li> </ul>                                     |
| 16.15–16.55 (40 min) | <b>Focus area 2: Report back/Discussion</b> <ul style="list-style-type: none"> <li>Groups present proposed actions to plenary</li> <li>Questions/discussion</li> </ul>                                                                                                                                                                                                                                    |
| 16.55–17.00 (5 min)  | <b>Short break</b>                                                                                                                                                                                                                                                                                                                                                                                        |
| 17.00–18.00 (60 min) | <b>Focus area 3: Motivational barriers and engagement gaps</b> <ul style="list-style-type: none"> <li>Describe issues and objectives</li> <li>Panel presentations on potential key steps/actions to achieve the objectives, including who can be involved, what support already exists, where additional support is needed and how collaboration across economies can help implement solutions</li> </ul> |
| 18.00–18.40 (40 min) | <b>Focus area 3: Discussion</b> <ul style="list-style-type: none"> <li>Plenary discussion on prioritising and implementing potential actions presented by panellists</li> <li>How can collaboration across economies support all of the objectives</li> </ul>                                                                                                                                             |
| 18.40–19.00 (20 min) | <b>Workshop wrap-up</b> <ul style="list-style-type: none"> <li>Summarise progress/achievements</li> <li>Next steps</li> </ul>                                                                                                                                                                                                                                                                             |

### A2.3.3 Workshop experts

The workshop featured six expert speakers who shared practical technical solutions, scientific research, and engagement strategies to achieve seabird-safe fishing. The expert speakers included:

- **Mr. David Goad** (Vita Maris): Director of Vita Maris for 17 years, Goad has extensive experience as a fisheries observer and liaison officer. He currently serves as a fisheries manager specialising in sustainability and protected species interactions.
- **Prof. Ed Melvin** (University of Washington): An Emeritus Affiliate Professor with a career dedicated to collaborative research and outreach programs focused on seabird bycatch reduction in pelagic longline fisheries.
- **Mr. Richard Wells** (Resourcewise Ltd.): A fisheries consultant with over 30 years of experience in the commercial fishing industry, focused on developing risk mitigation tools for protected species.
- **Mr. James Nagan** (BirdLife International): A Port-Based Outreach Officer based in Fiji who engages with distant-water fishing fleets to provide advice and education on managing seabird interactions.
- **Mr. Scott Pursner** (Independent Consultant): A conservation professional with over 20 years of experience specialising in cross-sector collaboration and seabird bycatch mitigation.
- **Mr. Howard Tsai** (FCF Co. Ltd.): A senior Project Manager at FCF with over 11 years of experience in vessel operations and sustainability-related initiatives, including MSC certification and Fishery Improvement Projects (FIPs).

### A2.3.4 Methods and tools used in the workshop

**Key methods used in the workshops include:**

- Presentations by research team and expert speakers. The research team shared the results of the interviews, and the experts shared their knowledge and experience on the key challenges and how to best address them.
- Breakout groups. Participants were put into smaller groups with a facilitator to discuss the actions to address each objective.
- Mentimeter. An online participation tool was used to collect participant feedback on a set of questions.

### A2.4 Methodological Limitations

Captains' availability for interviews was limited because they are often out at sea for many months and only come into port several times per year. This meant a relatively small sample of captains fishing in high-risk areas for seabirds were interviewed. For example, out of about 30 vessels fishing in high-risk areas for seabirds in one economy, 6 captains were interviewed.

In addition, the focus of the interviews was on captains, so crew experiences of drivers and challenges to implementing seabird-safe practices are not captured here.

Due to the sensitivity of the topic and limitations of the time available to build rapport and trust with interview participants, the identification of barriers to mitigation use is limited to those that people felt comfortable talking about. For an example, we know from previous research (e.g. Gilman et al 2014, Phillips et al 2016, Jiménez et al 2020) that limited monitoring and enforcement of regulations is a key barrier to consistent use of mitigation, however participants did not raise this as a barrier in interviews.

Despite these limitations, the interviewee sample was sufficient to highlight key themes in drivers and challenges faced at sea when implementing seabird-safe practices. Answers from captains in both economies were also considered alongside the interviews from supporting organisations, many of whom work with a wide range of captains and vessel owners.

The main limitation of the workshop was that it was a relatively short time to get in-depth

perspectives on actions to address challenges. Also, despite the best efforts to encourage participation, not all participants chose to engage in the discussion sections. Despite this, we were able to provide the results of the initial research on drivers and challenges to implementing seabird-safe practices to a wide audience and to facilitate initial discussions on priority actions, key participants and collaboration to feed into the development of the recommended capacity building plan.

### References:

Gilman E., Passfield K., Nakamura K. 2014. Performance of regional fisheries management organizations: ecosystem-based governance of bycatch and discards. *Fish and Fisheries*, 15: 327–351.

Jiménez S., Domingo A., Winker H., Parker D., Gianuca D., Neves T., Coelho R et al. 2020. Towards mitigation of seabird bycatch: large-scale effectiveness of night setting and Tori lines across multiple pelagic longline fleets. *Biological Conservation*, 247: 108642.

Phillips R. A., Gales R., Baker G. B., Double M. C., Favero M., Quintana F., Tasker M. L et al. 2016. The conservation status and priorities for albatrosses and large petrels. *Biological Conservation*, 201: 169–183.

# Annex 3:

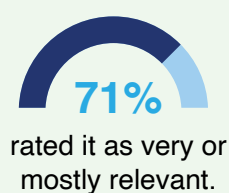
## Results from workshop survey

Following the workshop, an online survey was sent to 106 contacts who had registered for the workshop. The survey was provided in the choice of four languages. The number of survey invitations that were sent in each language were:

- 52 in English
- 39 in Simplified Chinese
- 10 in Traditional Chinese
- 5 in Japanese.

In total 44 responses were received, following the invitation email and two reminders, resulting in a response rate of 42%.

### Overall findings:



### Survey respondents reinforced these sentiments in their own words:

*"[The project's achievement was] getting like-minded people together to discuss seabird mitigation issues."*

“提供了一些新的思路，可以更好的改进现有操作。”

*[Translation: "It offered some new ideas that could help improve current practices."]*

*"Provided information on seabird mitigation devices that may not be well-known. Provided this information to a large audience that may not usually be aware of this information."*

“設定未來目標及方向，未來可以測試方案是否可行!!”

*[Translation: "It helped establish future goals and direction, and provided a basis for testing the feasibility of the approach."]*

*"Effectively engaged Asian economies on seabird bycatch mitigation challenges."*

*"Reached a wider/different audience."*

*"I learned a couple of things about Tori line operations that I did not know before."*

*"I had a broad understanding of the issues [before the workshop], but I think the results of that research that was presented was very compelling as it does shift a way of thinking."*

*"Useful for talking with long line clients in ways to mitigate seabird interactions."*

“与船队实际操作相结合，不足且可实操的地方进行改进。”

*[Translation: "I will apply the learnings within the fleet's actual operations, focusing on improving areas that are currently lacking but practical to implement."]*

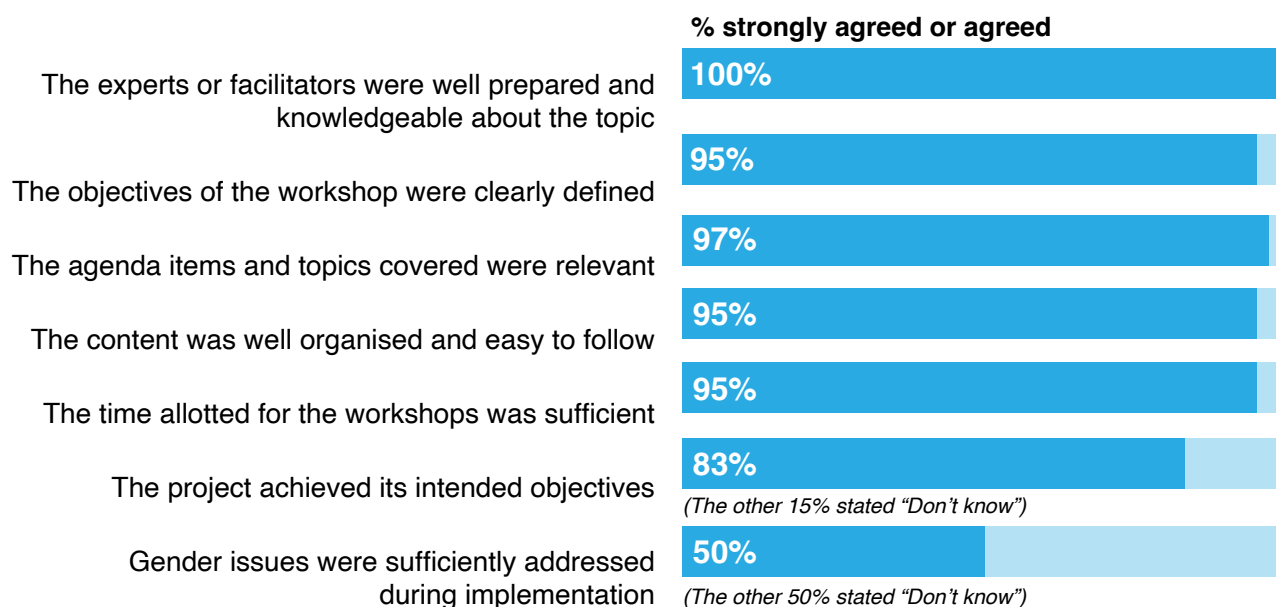
*"This will help us identify projects that need to be funded to improve use of mitigation measures."*

*"I will use the knowledge gained from this training and share it with relevant teams in my organisation, especially those working on fishing gear and those involved in monitoring fishing activities outside Thai waters."*

“倡議業者進行更積極的查核機制以及教育訓練”

*[Translation: "I will advocate for more proactive monitoring mechanisms and training among operators."]*

**Most respondents agreed with the following workshop evaluation measures:**



As a result of the workshop, respondents' level of knowledge and skills on the topic increased. Before the workshop 46% of respondents felt they had a high or very high level of knowledge and skills, and after the workshop 85% felt this level of knowledge and skills.

|                                | Very high | High | Medium | Low | Very low |
|--------------------------------|-----------|------|--------|-----|----------|
| Prior to participating (row %) | 11%       | 32%  | 41%    | 11% | 5%       |
| After participating (row %)    | 25%       | 61%  | 14%    | 0%  | 0%       |

In terms of the momentum generated for seabird-safe fishing discussions among APEC members:

**80%**

would like to **hear** about future projects related to the workshop discussions

**34%**

would like to **participate** in future projects on the topic.

**As the next steps for APEC, respondents provided the following comments and suggestions:**

*“APEC support would give further work a great platform. There is much more to do now there is a collective plan.”*

*“建议将理论落地，在船实际操作进行可行性验证。”*

*[Translation: “APEC should focus on putting the theory into practice and validating its feasibility through real onboard operations.”]*

*“Tori trials with keen skippers.”*

*“Break barriers to obvious gaps like engagement directly with fleet operators and crew. Options may be limited, but it only makes sense to approach all aspects of what adoption takes rather than the only pathways available to us.”*

*“The next line of enquiry to me is what will companies do if they cannot convince fishers of the merits - will they require it anyway. And then what will the market do if the companies won't come willingly? Who is prepared to take responsibility for not implementing measures to prevent extinction. It would be nice to be able to bring fishers along, but what do we do if we can't address that attitudinally?”*

*“[There be plans to link the project's outcomes to subsequent collective actions by APEC members, and individual actions by economies], and entities / firms within economies, pursue the early adopters.”*

*“做更多的資料搜集和各經濟體的工作串連”*

*[Translation: “APEC should undertake further data collection and strengthen collaboration across member economies.”]*

*“Identify mechanisms to promote improved RFMO management of seabird bycatch.”*

*“New Zealand should continue the seabird-safe fishing work and do another project in the OFWG to advance capacity building to support fleets with seabird-safe fishing.”*

*“There should be work to access economic implications related to seabird bycatch.”*

*“[Provide] another event like this.”*

*“Publish information.”*



**Asia-Pacific  
Economic Cooperation**

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