Protecting Ocean Wildlife in Tesco's Seafood Supply Chain

Fisheries and Bycatch

Bycatch, the catch of non-target species, is one of the most significant issues affecting the biological sustainability of marine fisheries. In particular, bycatch of endangered, threatened, and protected (ETP) species continues at a global and ecologically significant scale, despite an increase in the number of certified fisheries and improvement projects, and public attention to this issue.

Fisheries bycatch is a primary driver of population decline in many ETP species. These populations are at very low levels and are formally listed as endangered, threatened, or protected by international, national, and/or local jurisdictions.

Sharks and rays, seabirds, marine mammals, and sea turtles, all of which are ecologically important to ocean habitats, are at high risk of capture and harm in commercial fisheries. Many of these species are distributed across large geographic areas and overlap multiple fisheries. Many also have life-history characteristics that make them vulnerable to fishing-related mortality, such as slow growth, long reproductive cycles, and production of small numbers of offspring.

One-third of the world's sharks and rays are threatened with extinction according to International Union for Conservation of Nature (IUCN) Red List criteria.

15 of the 22 species of albatross are threatened with extinction.

Less than 350 North Atlantic right whales remain in the world.

Fisheries bycatch is recognized as the greatest threat to all seven species of sea turtles.

Retailers and the Seafood Supply Chain Have a Key Role in Reducing Bycatch

It is imperative that retailers take action to identify bycatch problems in their own supply chains and promote measures that will eliminate lethal impacts on ocean wildlife, especially endangered, threatened, and protected (ETP) species.

The bycatch of ETP species in fisheries is a major challenge to retailers that sell seafood and have commitments on sustainable sourcing or biodiversity protection. Participating in production that leads to the decline of vulnerable marine wildlife will breach these commitments and generate concern from seafood consumers who do not wish to be associated with these kinds of impacts.

Tesco and Seafood Sustainability

Tesco is an international retailer, with headquarters in the UK. It is the UK's biggest fishmonger, with seafood offerings across the chilled, frozen, canned, and food-to-go categories.

The health of our oceans and fish stocks is a key part of Tesco's sustainability agenda, and it is a leader across the industry, working toward the goal of achieving 100-percent sustainable seafood.

All of Tesco's seafood is responsibly sourced, with certification as part of a wider marine agenda. Tesco works with NGOs and other partners to assess risks and drive improvement in its source fisheries (https://www.tescoplc.com/sustainability/taking-action/environment/marine/).

Tesco is a member of the Global Tuna Alliance (GTA). The GTA was founded in 2019 with Tesco as a member and part of the steering committee. The GTA is an independent group of retailers and supply-chain companies working to ensure that tuna ultimately meets the highest standards of environmental performance and social responsibility.

In addition, Tesco was pivotal in the creation of the North Atlantic Pelagic Advocacy (NAPA) group, a coalition of buyers advocating for improvements in the herring, whiting, and mackerel fisheries in the Northeast Atlantic.

Tesco supports the Global Ghost Gear Initiative to help address ocean pollution from lost or abandoned fishing gear and Fishing for Litter in Scotland. It also partners with Sustainable Fisheries Partnership (SFP) and is a member of the Sustainable Seafood Coalition.

To reduce the environmental footprint of aquaculture and release pressure on marine ecosystems from production of fish feed used in aquaculture, Tesco is promoting alternative sustainable feed ingredients such as algal oil.

Key Findings and Recommendations

This audit identified the fisheries in the Tesco supply chain that present the highest bycatch risks to sharks and rays, seabirds, marine mammals, and sea turtles. As part of the review, SFP consulted with Tesco to identify overlaps with its top-selling seafood items, to determine areas where the most impacts could be made by advancing improvements to reduce ocean wildlife bycatch. The following are the top findings of this analysis.

- Tuna fisheries utilizing longlines and purse seine gears utilizing fish aggregating devices (FADs) pose a significant risk to sharks and rays, seabirds (longline), sea turtles (longline), and marine mammals (purse seine).

- Alaskan salmon set/drift gillnet fisheries pose a significant risk to seabirds.

- Argentine shrimp and Indonesian prawn fisheries could potentially pose a risk to sea turtles.

- Icelandic cod gillnet fisheries pose a significant risk to seabirds and marine mammals.

- Canadian lobster pot and trap fisheries pose a risk to marine mammals.

Tesco commits to working with its suppliers to improve fishery management and implement the recommendations to address the above issues. However, Tesco also understands that the issues identified in this report signal a need to fully address risks to ETP species across all of its sourcing.

In response to the audit's findings related to tuna fisheries, Tesco provided the following additional information:

> "While Tesco does not allow tuna caught using fish aggregating devices (FADs), there is an understanding of the need to improve the management and use of these devices. As a result, Tesco is working with its supply chain to spot areas of focus and track action in line with its new Seascape approach to sourcing following WWF's tuna checklist.
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> Similarly, through its Seascape approach to sourcing tuna, Tesco is aiming to roll out 100 percent observer coverage and bycatch mitigation measures across its supply chains."

In addition, a number of common and important themes emerged from this audit. These were presented to Tesco with recommendations that the company can pursue with its suppliers across various fisheries. These themes include:

- Levels of bycatch monitoring are generally poor. Higher levels of observer coverage are needed.

- There is an urgent need for a significant increase in the levels of bycatch incident reporting, which should be regular, detailed, and standardized. Data on bycatch should be in the public domain and available to all stakeholders.

- Currently, there is minimal effort to continuously improve bycatch reduction. Bycatch prevention and mitigation should aim to adopt, advance, and innovate new and best practices at all times.

- There is a clear need for a systematic examination of alternative gear options in fisheries where there are high bycatch risks, e.g., moving away from gillnet fisheries to cleaner fishing methods.

Methodology

Sustainable Fisheries Partnership (SFP), Birdlife International, and Whale and Dolphin Conservation collaborated to develop criteria to identify fisheries that could be considered high-risk for interactions with sharks and rays, seabirds, marine mammals, and sea turtles.

These criteria include:

- The conservation status of the relevant bycatch species, as determined by the International Union for Conservation of Nature (IUCN).

- Bycatch rate and evidence of impact at a population level, or high likelihood of bycatch, based on gear type and overlap with susceptible species.

- Scale of the specific bycatch problem, e.g., across the world versus limited to one fishery.

- If the fisheries impact species with a very small range.

- If the fisheries include cross-taxa bycatch.

- If Marine Stewardship Council (MSC) certification has been suspended due to non-compliance with elements of Principle 2 in the MSC Standard.

These organizations reviewed and assessed all of the fisheries disclosed by the company in the Ocean Disclosure Project (ODP) against these criteria. Based on this analysis, the top three fisheries in the company's portfolio that represent the greatest risk for each of the four types of wildlife (sharks, seabirds, marine mammals, sea turtles) were identified.

Detailed Findings of Bycatch Audit

The following briefing and sections include:

- Background on bycatch issues for each of the wildlife categories.
- The identified high-risk fisheries per taxa and recommended monitoring and mitigation methods.

Sharks

The loss of sharks has been shown to negatively impact ecosystems. This includes changes in the abundance of their prey species, which can lead to a cascade of other impacts throughout the ecosystem. For example, the abundance of predators can decrease, or prey behavior can be altered, releasing lower-level species from predation.

Sharks are primarily caught as bycatch in pelagic longline fisheries. Large quantities are also caught in purse seine fisheries, where they can become entangled in fish aggregating devices (FADs) and gillnets, particularly in regions such as the Indian Ocean.

High levels of shark bycatch have been reported in pelagic longline fisheries that target tuna and swordfish. This is considered a major source of mortality for many species worldwide. Up to one-quarter of the total catch in some pelagic longline tuna fisheries are shark species.

The most commonly caught shark species is typically the blue shark, which has a healthy population status in most of its range, though the situation is different for other commonly caught species such as shortfin mako. Many species, such as thresher and hammerhead species, are listed as Vulnerable and Endangered (respectively) by the IUCN or other national measures.

In purse seine fisheries, the predominant bycatch species of shark is the silky shark, followed by the oceanic whitetip shark. Bycatch of these two species in purse seine fisheries can be substantial in the Indian and Pacific oceans, and this mortality is negatively impacting their populations. The IUCN has listed the silky shark as Near Threatened and the oceanic whitetip as Vulnerable.

Information on bycatch of sharks in gillnet fisheries is often limited, due to poor data collection. Analysis from some fisheries has shown sharks to be a large component of gillnet bycatch. Many species of sharks can be captured in gillnet fisheries (i.e., shortfin mako, thresher), due to the indiscriminate way in which gillnets are used.

High-Risk Fisheries

Yellowfin tuna longline fisheries in the Indian Ocean (Republic of Korea)

South Korea has reported interactions with several species of sharks in its longline fishery in the Indian Ocean, including blue, mako, and porbeagle sharks. Information on shark catches in the

Indian Ocean is sparse, and stock assessments have only been conducted for a few species, meaning the status of most is unknown.

The Indian Ocean Tuna Commission (IOTC) has some shark-related management measures in place to prohibit the retention of some species and requires fishers to report interactions. However, there are no shark bycatch-mitigation measures in place, and observer coverage rates are so low they cannot provide an accurate representation of shark bycatch in the fishery.

Observer coverage of the longline fishery is very low. During 2018, only three observers were deployed on three Korean longline vessels, for a coverage rate of 4 percent. This is below the IOTC-mandated 5-percent coverage rate. Since 2014, observer coverage rates have ranged between 4 and 6 percent.

Priority recommendations for the fishery:

1) Increase observer coverage on vessels to at least the RFMO-required minimum of 5 percent now, increasing to 20-percent coverage within 3 years (mix of human and electronic observers, with human coverage of at least 5 percent) and 100-percent coverage within the next 5 to 10 years (at least 20-percent human observer coverage).

2) Adopt best practice bycatch-mitigation measures for vessels.

3) Require that all vessels collect and provide accurate data on shark captures to the IOTC, according to IOTC guidelines.

4) Require that vessel captains and crews attend shark identification workshops and workshops on best practices for safe handling and release.

Skipjack tuna purse seine (FAD) fisheries in the Eastern Pacific Ocean (Ecuador)

Several species of ETP sharks and rays are reportedly caught in this fishery, including: silky, oceanic whitetip, scalloped hammerhead, great hammerhead, and whale sharks, and giant manta and manta/mobulid rays. The most commonly reported bycatch species in this fishery are the silky and oceanic whitetip sharks.

The fishery uses fish aggregating devices (FAD) during purse seine fishing to capture the targeted species. The use of FADs has been documented in many fisheries to result in the incidental capture of sharks and other species. It is unclear what, if any, percentage of these fleets utilize non-entangling biodegradable FADs, which have been shown to greatly reduce interactions with bycatch species.

There are management measures in place through the Inter-American Tropical Tuna Commission (IATTC) for silky and whale sharks, along with sharks and manta and delta rays in general. Ecuador also prohibits shark finning and directed fishing of sharks, and has a monitoring program in place (Morison et al., 2020).

The IATTC has a requirement for 100-percent observer coverage on large-scale purse seine vessels, but not small-scale (class 6) vessels, which are included in this fishery. These smaller vessels are covered by a voluntary observer program through Ecuador.

This fishery entered the Marine Stewardship Council (MSC) full assessment process in 2020. The MSC assessment team noted that observer data for the smaller vessels was provided, but that the data was of poor quality and it was unclear how many vessels were observed (Morison et al., 2020).

The draft MSC full assessment notes a failing score (<80) for two principles related to ETP species, 2.3.1 outcome and 2.3.3 management. If the fishery were to obtain MSC certification, there would likely be conditions associated with these two outcomes (Morison et al., 2020).

Priority recommendations for the fishery:

1) Increase observer coverage on vessels to at least the RFMO-required minimum of 5 percent now, increasing to 20-percent coverage within 3 years (mix of human and electronic observers, with human coverage of at least 5 percent) and 100-percent coverage within the next 5 to 10 years (at least 20-percent human observer coverage).

2) Adopt best practice bycatch-mitigation measures for vessels, including the use of fully non-entangling biodegradable fish aggregating devices (NEFADs).

3) Require that all vessels comply with Ecuadorian and IATTC management measures for sharks and rays, including providing accurate data to the IATTC and the Ecuadorian fisheries authority.

4) Require that vessel captains and crews attend shark identification workshops and workshops on best practices for safe handling and release.

Yellowfin tuna purse seine (FAD) fisheries in the Western and Central Pacific Ocean (Philippines, Solomon Islands, and US)

Purse seine fisheries that utilize fish aggregating devices are known to capture sharks, including silky and oceanic whitetip sharks, both of which are at low population levels in the Western and Central Pacific Ocean, with a particular concern of capture in purse seine fisheries (WCPFC 2019 a, b).

Information from the Philippines is limited, but the Solomon Islands reports the incidental capture of rays and silky, oceanic whitetip, hammerhead, and thresher sharks in their purse seine fishery (Solomon Islands, 2021).

There are some regional and RFMO management measures aimed at sharks (Philippines, 2021; Solomon Islands, 2021; USA, 2021).

The Philippines provides 100-percent observer coverage in the high-seas pocket closure, but it is unclear what the coverage level is for the remainder of the fishery (Philippines, 2021). The Solomon Islands reported observer coverage rates between 75 and 93 percent from 2016 to 2020 on its purse seine vessels (Solomon Islands, 2021). It is unclear what, if any, percentage of these fleets utilizes fully non-entangling biodegradable FADs, which have been shown to greatly reduce interactions with bycatch species.

Priority recommendations for the fishery:

1) Increase observer coverage to 100 percent on all fleets.

2) Adopt best practice bycatch-mitigation measures for vessels, including the use of fully non-entangling biodegradable fish aggregating devices (NEFADs).

3) Require that all vessels comply with national and Western and Central Pacific Fisheries Commission (WCPFC) management measures for sharks and rays, including providing accurate data to the WCPFC and national fisheries authorities.

4) Require that vessel captains and crews attend shark identification workshops and workshops on best practices for safe handling and release.

Sea Turtles

All sea turtles are considered endangered, threatened, or protected (ETP) species.

Sea turtles are restricted to temperate and tropical seas, with loggerhead and leatherback turtles ranging into high latitudes such as Northern Europe and the Northern coastline of the US, and leatherbacks ranging into Canadian waters (Hamelin et al., 2017). As a result, fisheries in high latitudes that impact other taxa such as seabirds and marine mammals are less relevant for sea turtles.

All seven species of sea turtles have a similarly complex life cycle, at various stages of which they are subject to different threats. However, the most significant threat is fisheries bycatch.

Sea turtles can be caught and killed in most fisheries. The biggest contributors to sea turtle bycatch include bottom trawls, gillnets/trammel nets, and demersal and pelagic longlines, all with varying capture rates and mortality rates, depending on factors such as mesh size, bait type, and soak times.

Rates of sea turtle development vary between and within species. For many populations, the maturity age is unclear, but it is often estimated as being between 20 and 50 years (Casale, 2011; Scott et al., 2012). These uncertainties, along with low or nonexistent fisheries observer coverage, confound the ability to understand the population-level impact of fisheries mortality at the different life stages (e.g., pelagic juvenile, pelagic adult, neritic juvenile, neritic adult) of various populations (Wallace et al., 2008).

There is no robust estimate for sea turtle bycatch worldwide, because of a global paucity of data (observers), especially for small-scale fisheries.

However, more than 44,000 deaths annually are conservatively estimated in the Mediterranean Sea alone (Casale, 2011). In longline fisheries, global catches of 200,000 loggerhead turtles and 50,000 leatherback turtles have been estimated and are attributed to declines in nest counts (Lewison et al., 2004).

Bycatch reviews used available fisheries bycatch data (from onboard observer programs) to assess the relative importance of global fisheries bycatch on sea turtles (Lewison et al., 2004; Wallace et al., 2010, 2013). Wallace et al. (2013) also incorporated sea turtle Regional Management Units into their assessment. Regional Management Units are a system developed

for identifying discrete sub-populations of sea turtles that should be managed independently, all with varying population risk and threat scores (Wallace et al., 2011).

These reviews highlight the Eastern Pacific Ocean, Northwest and Southwest Atlantic Ocean, and Mediterranean regions as those with the most sea turtle captures, with the majority of captures (60 percent) on longlines.

Far more observer attention has been focused on high-seas and industrialized fisheries (Lewison et al., 2014), while observer data remains low for small-scale fisheries overall.

However, small-scale fisheries may have very high impacts on sea turtle populations, as they use gillnets close to shore, where larger turtles with high reproductive values are found (Casale, 2011). Conversely, although high-seas fisheries like pelagic longlines have high capture rates, their impacts (considering life stages and populations of turtles affected, fishing effort, and mortality rate) may be significantly lower than in set nets/gillnets and trawls (Wallace et al., 2013).

Specific fisheries implicated as being problematic for sea turtles are gillnets, longlines, and trawls in the Mediterranean Sea, and longlines in the West Atlantic Ocean and Eastern Pacific Ocean. Significant data gaps exist for Africa, the Indian Ocean, Southeast Asia, and the Eastern Mediterranean (Wallace et al., 2013; Lewison et al., 2014).

High-Risk Fisheries

The pacific longline fisheries in Tesco's supply chain need to be monitored carefully. In some demersal and coastal fisheries, there are some knowledge gaps where bycatch of sea turtles could be overlooked. Greater scrutiny of these fisheries could be a positive step that Tesco could take in further securing its low footprint on sea turtle populations.

Accordingly, advice is provided for three fisheries below where potential red flags for sea turtles bycatch occurred in the audit and assessment.

Yellowfin tuna longline fisheries in the Western and Central Pacific Ocean (Indonesia, Japan, South Korea, and Vietnam)

These pelagic longline fisheries are likely to be interacting with Western Pacific leatherback turtles and South Pacific loggerhead turtles, both of which are assessed by the IUCN Red List as Critically Endangered. As a result, associated mortality could be having significant impacts on these populations and should be mitigated.

Priority recommendations for the fishery:

1) Increase observer coverage on vessels to at least the RFMO-required minimum of 5 percent now, increasing to 20-percent coverage within 3 years (mix of human and electronic observers, with human coverage of at least 5 percent) and 100-percent coverage within the next 5 to 10 years (at least 20-percent human observer coverage).

2) Require the use of wide circle hooks to reduce the proportion of caught turtles that are deep-hooked, to improve their chances for post-release survival (Swimmer et al., 2017).

3) Require the use of fish rather than squid as bait (Swimmer et al., 2017).

4) Train crew and put procedures in place for safely bringing turtles onboard, handling them, and removing hooks. There are many guideline documents and training materials available that are generally transferable across fisheries. For example: the UN Food and Agriculture Organization's (FAO) Good practice guide for the handling of sea turtles caught incidentally in Mediterranean fisheries).

5) Maintain equipment (e.g., scoop net, steel cutters/de-hookers/line cutters; see guidelines below) ready to use.

Red shrimp bottom trawl fishery (Argentina)

This fishery uses bottom trawls that can trap and potentially drown or injure (e.g., through decompression sickness) any sea turtles. A 2011 study found that Argentinian trawl fisheries further north caught leatherback turtles, while other demersal fisheries caught green and loggerhead turtles (Carman et al., 2011). The amount of observer coverage was very low during this study. Most reports were from anthropological surveys, which typically underestimate true bycatch levels. A more recent study (López-Mendilaharsu et al., 2020), found that trawls were the greatest threat to juvenile and adult loggerhead turtles in shallower waters (neritic).

Both of these published studies were conducted in warmer, more productive areas north of the port of Rawson (from which this red shrimp fishery operates), where sea surface temperatures during January to March are within the range that sea turtles can tolerate. However, the fishing area is within the suggested boundary of the Southwest Atlantic loggerhead and leatherback turtle Regional Management Units (Wallace et al., 2011).

Under current climate change scenarios, this fishing area may become important for sea turtles as their ranges expand into higher latitudes, and it should be monitored.

Furthermore, there are generally insufficient systematic studies of sea turtle bycatch in Argentinian trawl fisheries (Prosdocimi et al., 2021). In 2016, as part of a fishery improvement project (FIP) scheme, 294 hauls were observed, and no sea turtle bycatch was reported.

Priority recommendations for the fishery:

1) Encourage vessels to collect and report data on sea turtle bycatch to their respective authorities.

2) Require observer coverage of 5 percent of all trawls, at least until enough data has been collected to rule out significant sea turtle bycatch.

Banana prawn trammel net fishery (Indonesia)

Information for this fishery is so scant that the relevant page on FishSource advises buyers to ask their supplier to confirm that the product is wild caught and whether it is from a legal fishery. FishSource also advises that suppliers should initiate discussions with Sustainable Fisheries

Partnership (SFP) on fisheries improvements, due to confirmed and consistent overfishing. Overall, the assessments for this fishery are weak and based on observations using research vessels, not onboard observations or harbor surveys.

If overfishing is a problem, then fishing effort in this fishery is probably high and escalating, as fishers will fish with more gear and with longer soak times to maintain catches in the face of falling fish stocks. There is much evidence for this in the literature. If that is the case, then even a low CPUE (Catch Per Unit Effort) of sea turtles could be having a significant effect on turtle populations, of which there are up to seven species overlapping in this priority sea turtle area (Wallace et al., 2011).

The fishery apparently uses trammel nets. However, given that traceability is inadequate for shrimp fishing in the region, shrimp could also potentially be coming from trawls that target the same species, for which there is sea turtle bycatch information but also management problems.

The trammel net/set net fisheries may be small-scale fisheries that are important in alleviating poverty in this area. However, trammel nets are high-bycatch and high-mortality gears for sea turtles. The lack of sea turtle bycatch studies for shrimp trammel nets in Indonesia is also concerning.

In addition to sustainability issues (across all wild shrimp fisheries in the region), bycatch problems reported in trawls, and lack of information overall, there is also the issue of large commercial trawlers versus small-scale captains, who are often marginalized yet socio-economically valuable and perhaps more sustainable (Pauly, 1987; Jacquet and Pauly, 2008).

Priority recommendations for the fishery:

1) Advocate for solid traceability for this fishery and confirm the gear types being used, i.e., trawl, trammel net, gillnet, or even farming.

2) For trammel net fisheries that are likely to be small-scale/artisanal, systematic port-based anthropological surveys (e.g., Moore et al., 2010) should be undertaken. Once better information is available, then onboard observations could be considered. If bycatch is an issue, further investment might be needed for research into reduction strategies that use time/area management, reduced soak times, LED lights, or other gear modifications for set net fisheries (Gilman et al., 2010; Wang et al., 2010; Lucchetti et al., 2019).

3) If trawl vessels are found in the supply chain, the vessels must support an observer program, which is likely to encounter bycatch interactions. If bycatch is found, it is recommended that Turtle Excluder Devices (TEDs) be deployed by all trawl vessels.

Seabirds

Seabirds are vulnerable to bycatch impacts in multiple fishing gears, and this is considered the number-one threat to seabirds at sea (Dias et al., 2019).

Among the best documented is bycatch in longline fisheries, which has been identified as a key driver in the decline of albatrosses since the late 1980s and early 1990s (Brothers, 1991; Weimerskirch et al., 1997). Longlines continue to drive albatross declines, and also catch smaller petrel and shearwater species (Dias et al., 2019; Anderson et al., 2011).

Longlines alone are estimated to kill at least 160,000 seabirds per year, and particular fisheries of concern are those that operate south of 20 degrees latitude (particularly Japanese and Taiwanese tuna vessels on the high seas, and the domestic Brazilian tuna fleet). Other fisheries of concern include North Atlantic demersal longline fisheries for whitefish (e.g., hake targeted by predominantly Spanish vessels operating to the west of the UK and Ireland; and cod/haddock targeted in Norwegian, Faroese, and Icelandic waters) (Anderson et al., 2011).

While longline bycatch is better documented, gillnet fisheries were among the first to be recognized as problematic for diving seabirds, most notably driftnets (Tull et al., 1972). The global scale of bycatch in all types of this gear is conservatively estimated to be 400,000 birds per year (Žydelis et al., 2013), with the Baltic Sea, North Atlantic (particularly Iceland), and Northwest Pacific identified as hotspots.

A global estimate of seabird bycatch in trawl fleets has not been published, but work in preparation indicates that bycatch from fisheries from which there are data suggest that this is likely to be of a similar order of magnitude to longline fisheries (Bartle, 1991; Birdlife International, 2013; Fox et al.). Trawl fisheries tend to affect longer-winged species more (i.e., albatrosses), through collisions with the warp and net-sonde cables or entanglements in the nets as birds forage for discards behind vessels (Sullivan et al., 2006). Again, fisheries operating south of 20 degrees latitude (i.e., overlapping with albatross) are of particular concern.

In recent years, seabird mortality in purse seine fisheries, particularly of shearwaters, has been recorded in Portugal (Oliveira et al., 2015) and Chile (Suazo, 2014) and is receiving increased attention, though it has not been quantified on a global scale (Suazo, 2014).

High-Risk Fisheries

Alaskan salmon set/drift gillnet fishery (US)

The Alaskan salmon fishery was first certified under the MSC standard in 2000, with a condition of certification requiring that marine mammal and seabird bycatch data be collected in test fisheries to identify if it was likely to be a significant conservation issue.

Nearly 20 years later, the fishery went through its third reassessment process, in which Birdlife International raised concerns over seabird bycatch. The certification process used data that is highly variable both in time and space and does not specifically address different fishing practices nor question the data accuracy of the test fisheries used to assess bycatch. Misuse of data in the assessment may have resulted in an underestimation of bycatch.

Alcids (auks) are the species group most susceptible to bycatch in this fishery, as Alaskan waters host particularly large numbers of this group of diving birds (Smith et al., 2017; Sullender and Smith, 2016; Smith, 2016). Of particular concern is the marbled murrelet, which is listed under the US Endangered Species Act and is assessed as Endangered on the IUCN Red List.

Priority recommendations for the fishery:

1) Implement an observer program covering a sufficient percentage of the fleet – starting with a minimum of 5 percent now and increasing to 20 percent (Babcock and Pikitch, 2003) (mix of dedicated human and electronic, human at least 5 percent) within 3 years. The emphasis should be on areas that reported significant seabird bycatch in the past and areas of particular importance where seabirds overlap with gillnet fishing effort.

2) Require that all vessels collect and provide accurate data on bird captures to their respective authorities.

3) Adopt best practice bycatch-mitigation measures for vessels where they exist, and/or conduct research trials for new bycatch mitigation solutions (e.g., gillnets).

4) Require that vessel captains and crews attend bird identification workshops and workshops on best practice for safe handling and release.

Cod gillnet fishery (Iceland)

The ISF Iceland Cod fishery was MSC-certified in 2012. Across all the available information combined, the gillnet component of this fishery is estimated to catch approximately 2,200 birds each year, including about 1,500 northern fulmars, 500 common guillemots, and 140 northern gannets, as well as lower numbers of species such as black guillemots, razorbills, Atlantic puffins, common loons, and eider ducks.

Bycatch in this fishery is particularly concerning for fulmars, which are endangered in Europe and/or Iceland, and common loons, which are identified as vulnerable on Icelandic/European Red Lists. Bycatch represents 3 percent and 40 percent of the yearly estimated decline in adult birds for these species, respectively. Black guillemots are also listed as endangered under the Icelandic Red List of Birds (IINH), while common guillemots and Northern gannets are both listed as vulnerable.

A series of “conditions of certification” related to seabird bycatch have been raised through the re-certification of this fishery. However, it is currently unclear if measures will be effectively implemented in the fishery and deliver expected conservation outcomes. For gillnets, there are currently no widely effective technical mitigation measures.

Priority recommendations for the fishery:

1) Consider changing gear types and avoiding gillnets if this delivers an overall reduction in bycatch incidents.

2) Implement fishing restrictions in bycatch hotspots and during peak bird-foraging times (e.g., dawn/dusk), based on testing to ensure suitability for Icelandic vessels.

3) Implement an observer program covering a sufficient percentage of the fleet – starting

with a minimum of 5 percent now and increasing to 20 percent (mix of human and electronic, human at least 5 percent) within 3 years, with a goal of achieving 100-percent coverage (Babcock and Pikitch, 2003) (human and/or electronic) within 5 to 10 years. The emphasis should be on areas that reported significant seabird bycatch in the past and areas of particular importance where seabirds overlap with longline/gillnet fishing effort.

4) Explore bycatch mitigation solutions and implement a long-term strategy for seabird bycatch in the fishery. Recent research on “scarecrow-like” devices, such as predator-shaped kites (Oliveira, 2020) or looming-eyes buoys (Rouxel et al., 2021), have shown promising outcomes and could be trialed in this fishery to assess effectiveness. However, care must be taken to ensure these types of measures do not negatively impact other ETP species caught in this fishery (i.e., marine mammals, see below).

Longline yellowfin tuna fisheries in the Western and Central Pacific Ocean

Yellowfin tuna in the Western and Central Pacific Ocean (WCPO) is managed at the international level by the Western and Central Pacific Fisheries Commission (WCPFC).

The WCPFC mandates a minimum observer coverage of 5 percent for longline fisheries (WCPFC, 2021a). However, it is estimated that the observer coverage on longline vessels was only about 3 percent in 2020 (WCPFC, 2021b).

Tuna longliners fishing in the WCPFC are required to use seabird bycatch mitigation measures to comply with the provisions of CMM 2018-03 (WCPFC, 2018), or are recommended to, if fishing between 25°S-23°N. Use of mitigation measures varies by year and country, but relevant countries for this audit (Japan, South Korea, Vietnam, Indonesia, and the Federated States of Micronesia) suggest low or unknown levels of compliance.

In 2020, observer information suggested that only approximately 2-to-5 percent of fishing effort from Japanese longliners north of 25°S (where most of yellowfin tuna is targeted by Japan) complied with the provisions of CMM 2018-03. South Korean, Vietnamese, Indonesian, and Micronesian longliners operate between 25°S-23°N and, as such, are not required to employ seabird bycatch mitigation measures. However, they are encouraged to do so under CMM 2018-03.

In 2019, observers onboard Japanese tuna longliners reported the catch of 1,665 seabirds, with many species of conservation concern, including the wandering albatross (*Diomedea exulans*) and the white-chinned petrel. Both are listed as Vulnerable by the IUCN. While not all of this bycatch can be attributed to vessels targeting yellowfin tuna, about a third of all seabird catch occurred north of 25°S (WCPFC, 2021c) and may have been caught on vessels targeting this species.

Yellowfin tuna fishing grounds for South Korean, Vietnamese, Indonesian, and Micronesian vessels are at lower risk of seabird bycatch (Filippi et al., 2010). However, the lack of observer coverage and information regarding use of bycatch mitigation measures in those fleets is of concern. Observer programs from Fiji, Hawaii, French Polynesia, and New Zealand reported 66 birds in 2020, including Near Threatened species caught on longliners operating between 23°N-30°S (WCPFC, 2021a), thus indicating the need for accurate monitoring in all areas of the WCPFC.

Priority recommendations for the fishery:

1) Increase observer coverage on vessels to at least the RFMO required minimum of 5 percent now, increasing to 20 percent (mix of human and electronic, human at least 5 percent) within 3 years and 100-percent coverage (at least 20-percent human) within the next 5 to 10 years, particularly for vessels operating north of 23°N and south of 25°S

2) All vessels should demonstrate full compliance and/or follow recommendations with bycatch mitigation measures as per CMM 2018-03 of the WCPFC.

3) Adopt best practice bycatch-mitigation measures for vessels and live release requirements for all bycatch (including species required to be released and ETP species), and ensure effective compliance for all fleets.

Marine Mammals

Marine mammal bycatch data are poor for most fisheries. The latest global scientific assessment (2006) calculated that hundreds of thousands of marine mammals are killed in fisheries each year (Read et al., 2006), although this contains caveats and is likely to be an underestimate. For example, a recent review of the Indian Ocean tuna gillnets determined that 4 million dolphins have been caught as bycatch since 1950 (Anderson, 2020).

Static net fisheries (gill nets, tangle nets, etc.) are widely reported to have the biggest global impact on marine mammals (Reeves et al., 2013). Static rope gear using pots and traps is a problem for a range of marine mammals, particularly for baleen whales and especially for the endangered North Atlantic right whale and humpback whale. Lethal entanglements of baleen whales are, arguably, one of the worst forms of human-caused mortality in any wild animal (Cassoff et al., 2011), often lasting for long periods of time and causing immense suffering.

Purse seine fisheries can also capture marine mammals. Population-level impacts have been associated with the deliberate setting of purse seine nets around dolphins in tuna fisheries in the Eastern Tropical Pacific since the 1960s (Wade et al., 2007). Despite reduced mortality rates of dolphins to fewer than 1,000 per year in recent decades, their populations are not showing signs of recovery (Gerrodette and Forcada, 2005; Wade et al., 2002), and the rate of calf production has been declining since the 1980s (Cramer et al, 2008). In US purse seine fisheries, the most commonly captured species include bottlenose dolphins and humpback whales (NOAA).

Marine mammals can become entangled by trawl gear when swimming to forage or migrate, with risks differing widely between species. Species that forage on or near the seafloor are at risk of being captured or entangled in netting or tow lines. Pilot whales and common dolphins in the Atlantic are particularly susceptible to being caught in bottom trawls (Rossman, 2010).

Longline fisheries have very poor data on marine mammal interactions, but have been noted as a concern by some studies (Werner et al., 2015).

High-Risk Fisheries

Cod gillnet fishery (Iceland)

Gillnets are used in Icelandic waters to catch cod in the winter and spring during their spawning migrations (Punt et al., 2020). Bycatch of several species of marine mammals have been reported in the cod gillnet fishery, mainly of harbor porpoises. However, there are also records of bycatch of harbor seals, grey seals, harp seals, and white-beaked dolphins [13].

The fishery onboard observer scheme is led by the Marine and Freshwater Research Institute (MFRI), but there is limited information on the scheme and coverage. Annual cod fishery surveys conducted each April by the MFRI cover about 2 percent of total cod gillnet effort. Bycatch reporting is mandatory in Iceland, but the return of electronic logbooks has been low, with no marine mammal bycatch reported from 2009 to 2017, when the fishery changed to electronic logbooks.

There are also some inconsistencies between observer-collected data and self-reported data (Medley et al., 2017). It is estimated that about 811 (95% CI: 575-1065) porpoises are caught in the cod gillnet fishery annually. The majority of porpoise bycatch occurred in March and April in nearshore waters (MFRI, 2020). In 2015, 46 harbor seals were caught in the cod gillnet fishery (Þorbjörnsson et al., 2017). In 2017, trials of Acoustic Deterrent Devices were conducted in the cod gillnet fishery; however, there was no reduction in harbor porpoise bycatch (Vikingsson et al., 2020).

The cod gillnet fishery is subject to the US Seafood Import Rule requiring bycatch monitoring and mitigation standards to be comparable to US fisheries (NOAA Fisheries a). The cod gillnet fishery has been MSC-certified since 2012.

This fishery is the largest source of anthropogenic mortality for harbor porpoises in Iceland. However, harbor porpoises are not considered an endangered, threatened, or protected (ETP) species under the MSC scheme, due to the lack of legislation covering the species in Iceland and the IUCN classification of Least Concern (Braulik et al., 2020).

The population of harbor and grey seals has declined since counts started in the early 1980s, and fisheries bycatch and targeted hunts are likely the main factors (Þorbjörnsson et al., 2017). Targeted hunts have been banned since 2019 to maintain the seal populations above a set level (Vikingsson et al., 2020). However, there is limited work on the impact of bycatch on seal populations to date, and bycatch rates are thought to be underestimated.

Priority recommendations for the fishery:

1) Consider changing gear types and avoiding gillnets, as this is likely to deliver a reduction in bycatch incidents.

2) Increase observer coverage on vessels to at least 5 percent now, increasing to 20 percent (mix of human and electronic, human at least 5 percent) within 3 years, with a goal of achieving 100-percent (human and electronic) coverage within the next 5 to 10 years, and annual presentation of bycatch data to calculate a bycatch rate from each fishery. Include photos/samples of animals for more accurate assessment of bycatch

species, especially for grey and harbor seals, over the next 3 years.

3) Require implementation of best practice mitigation measures and demonstrate continual reductions in the bycatch rate. Measures to immediately reduce bycatch include spatial and/or temporal area closures, e.g., no coastal gillnets from March to April and further testing on the use of acoustic deterrent devices ("pingers") on all gillnets to reduce harbor porpoise bycatch. Conduct an appropriate environmental assessment to ensure the pingers are not causing habitat displacement until other gear types can replace gillnets altogether (as in Recommendation 1).

American lobster pots and traps fishery (Newfoundland, Canada)

The North Atlantic right whale (NARW) is the only large whale species listed as critically endangered by the IUCN Red List, with an estimated population of 336 whales (New England Aquarium, 2021), with fewer than 100 breeding-age females.

The NARW is protected under Schedule 1 of Canada's Species At Risk Act (SARA) and, as such, no person can kill, harm, harass, capture or take, possess, collect, buy, sell, or trade NARW. The Recovery Potential Assessment (RPA) for the NARW states, "There is no scope for allowable human-induced mortality since population abundance is estimated as critically low and the population appears to be declining toward extinction." The national limit for the protection and rebuilding of the NARW is zero-mortality.

Entanglement in fishing gear is thought to be the primary anthropogenic threat to NARW. The NARW population has been in decline since 2010 due to vessel strikes and entanglements (Pettis et al., 2021). About 85 percent of North Atlantic right whales bear entanglement scars from interactions with fishing gear, especially pots and traps (Knowlton et al., 2018), and studies have shown that large whale entanglement rates are underestimated in species like NARW and the endangered fin whale (Pace et al., 2021; Ramp et al., 2021).

No interactions between the American lobster fishery and blue and fin whales have been reported in the last five years; however, they cannot be excluded. Entanglement in fishing gear may cause large baleen whales to suffer for months to years, not only from the injuries caused by the entanglement but also from reduced reproductive output (Van der Hoop et al., 2017) and delayed growth rates (Stewart et al., 2021).

The Maritime Canada inshore lobster trap fishery obtained MSC certification in 2021. The fishery was previously covered under two different assessments certified in 2014 and 2015. While this is a Canadian fishery, it should be noted that the US American lobster fishery is classified by NOAA as Category I, meaning that there are frequent interactions with marine mammals (NOAA Fisheries b).

There are no reports of entanglements in Newfoundland in recent years, but there is significant concern with pots and traps in the region, and entanglement cannot be ruled out. Observer coverage in the fishery is low. There are relatively strict conditions for the MSC certificate. However, the potential for NARW entanglement is a major conservation issue, and therefore, this fishery is considered to be high risk.

Priority recommendations for the fishery:

1) Support the expedited development of on-demand fishing gear technologies.

2) Expand the location and duration of areas restricted in the use of static vertical (buoy) lines when right whales are present, based on real-time observational data.

3) Require gear marking to identify the fishery, including country of origin, management area, target species, and permit number.

4) Improve enforcement and monitoring of fisheries in NARW habitats, including restricted areas.

Yellowfin tuna purse seine fishery (Western and Central Pacific Ocean)

This fishery does not have MSC or FIP status, but it is covered by the Western and Central Pacific Fisheries Commission (WCPFC) and has Conservation and Management Measure (CMM) 2011-03 to Address the Impact of Purse Seine Activity on Cetaceans (WCPFC, 2012). CMM 2011-03 states that the fishery is not allowed to target tuna by encircling dolphins and requires that all reasonable steps are taken for the safe release of dolphins.

Bycatch of spinner, pan tropical spotted, and rough toothed dolphins are listed in the NOAA List of Foreign Fisheries (LOFF) for the Solomon Islands and the Philippines. Furthermore, false killer whales, Risso's and bottlenose dolphins, pygmy sperm whales, and melon headed whales are reported to have been caught in the Western and Central Pacific Ocean tuna fishery. Therefore, it is unclear why these fisheries are exempt from the LOFF.

There is up to 100-percent observer coverage in some parts of the fishery (e.g., Philippines high seas). However, there is no information on observer coverage in other areas of the fishery. In the Hawaiian WCPFC fishery, it was estimated that 66 percent of false killer whales suffering mortality were not detected in the net early enough for release to be effective (SPC, 2010).

The data presented in the reports are for the entire region and all the countries in the WCPFC. However, there is limited data on the specific fisheries for bycatch rates.

Marine mammal bycatch shows strong variability, and bycatch was generally higher from 2003 to 2009 (averaging 1,200 individuals), and lower from 2010 to 2017 (averaging 500 individuals per year) (Peatman et al., 2018).

It was estimated that nearly 2,300 marine mammals were caught in 2020 in large-scale purse seine fisheries operating in the Western and Central Pacific Ocean (Peatman and Nicol, 2021). This is a minimum estimate, as the complete observer data were not available at the time, due to COVID-19. The results in Peatman and Nicol (2021) represent an increase of 150 percent relative to the estimates in Peatman et al. (2018). Furthermore, bycatch rates of marine mammals were lower in the vessel logbooks compared to observer data (Peatman and Nicol, 2021).

In the reports by Peatman, all bycatch is listed as "marine mammal," with no specificity to the species level, and there is no information on the status of the animals (e.g., alive and released, dead). Different species have different life histories, abundance, and distribution. Data at the species level is required to determine the potential impact of bycatch on a population, e.g., it is

probable that false killer whale populations throughout the Western and Central Pacific are declining as a result of bycatch and their low abundance, life history characteristics, and high trophic level (Smith et al., 2014. Therefore, more detailed information on marine mammal interactions is required from the observers and vessels operating in this fishery.

Priority recommendations for the fishery:

1) Increase observer coverage to 100 percent on all fleets.

2) Improve mitigation measures to prevent bycatch by strengthening WCPFC management measures for marine mammals. Bycatch rates should be continually reduced; if this is not possible with technical measures, it should be done with other measures, e.g., reduced effort.

3) Include the fishery in the US export LOFF as an export fishery, requiring evidence of reducing marine mammal bycatch through mitigation.

4) Improve reporting of fisheries interactions, especially to the species level for marine mammals, including providing accurate data to the RFMO and national fisheries authorities.

5) Increase transparency in the bycatch rates of each country's fleet individually.

6) Require that vessel captains, crew, and observers attend marine mammal species identification workshops and workshops on best practice for safe handling and release, following the guidelines produced by Hamer and Minton (2020).

7) Adopt best practice bycatch-mitigation measures for vessels, including the use of fully non-entangling biodegradable fish aggregating devices (NEFADs).

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