



Small Cetaceans – Even Bigger Problems

**An updated global review of directed hunts
on small whales, dolphins and porpoises**

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1. Executive Summary

In 2018, we published “Small Cetaceans – Big Problems”. Since then, new information has become available and a record sized hunt of Atlantic white-sided dolphins in the Faroe Islands in autumn 2021 caused world-wide headlines. This, together with recent discussions in relevant fora, prompted us to produce this update. Six years on from our comprehensive review, this update investigates what has changed, what the main drivers/reasons for the hunts are and what impact these hunts are having on populations and even entire species of small cetaceans. Importantly, this update addresses what needs to be done to guarantee the long-term survival of healthy populations of small cetaceans.

Small cetaceans (i.e., all toothed whales, except the sperm whale, including dolphins and porpoises) are hunted in all geographic regions. Their meat is used for human consumption (see Chapters 3, 7, 8) with significant health risks for consumers (see Chapter 12), and for traditional and religious purposes (see Chapters 3, 5 and 9). In recent decades, the use of dolphin meat and fat as bait in commercial fisheries has increased exponentially and, in some places, has even overtaken its use as food (see Chapters 4 and 5). Due to an increasing commercial value of dolphin meat, a gradual transition between targeted hunting and commercialised bycatch has been documented (see Chapters 3, 4 and 5). The most recent information indicates an increased use of dolphins as bait in distant water fleets (see Chapter 4). Worryingly, in regions where dolphin meat is rarely consumed, they are killed by fishers to decimate or eliminate supposed competitors for depleting fish stocks (see Chapter 6).

The conservation status of small cetaceans has significantly worsened over recent decades, especially for species with small geographic ranges and those inhabiting freshwater and coastal habitats. Whilst bycatch remains the main threat, intense hunting, especially over an extended period, is detrimental to small cetaceans with their late maturity, low number of offspring, long maternal care and long lifespan (see Chapter 10). Due to dwindling numbers of target species, others are increasingly targeted in hunts around the world (see Chapter 12). It is not only the sheer number of individuals taken that has a negative impact, but also the potential disruption of their social structures and loss of cultural knowledge (such as migration routes, hunting techniques

for different prey), which likely leads to lower survival and reproductive success, and the impeded recovery of remnant populations (see Chapter 8). Research shows that throughout the tropics and subtropics, hunting of small cetaceans is unsustainable and similar concerns are identified for the Arctic (see Chapter 7).

Small cetacean hunts are dynamic. Whilst in some countries hunts are decreasing, recent studies show that directed hunts and/or the subsequent use of by-caught small cetaceans as food or bait, is becoming increasingly prevalent in others (see Chapter 3). In Japan, although the total number of individuals taken each year has decreased, new species are being targeted and the driver for these hunts is the lucrative aquaria industry (see Chapter 10). Recent news from Venezuela indicates an increase of dolphin consumption due to the economic crisis and in the Tristao Islands, Guinea, fishers only recently began utilising dolphin meat. In at least two other countries, Ghana and Ecuador, dolphins are being used as bait in fish aggregating devices (see Chapters 3 and 4). Commercialisation of dolphins is fuelling regional and international trade, whether alive or dead (see Chapters 9 and 10).

National legislation is poor or inadequate. Even in those countries where the hunting of small cetaceans is prohibited by national law or regulated by quotas, hunting can continue almost unhindered due to weak enforcement or the lack of political will. In Peru, despite existing legislation, thousands of small cetaceans are killed for bait in longline fisheries (see Chapter 4). In Greenland, contrary to scientific advice, authorities continue to grant significant and unsustainable quotas for narwhal despite one local population being threatened with extinction (see Chapter 7), whilst low abundance of small cetaceans in Japan are likely a result of decades of intense hunting (see Chapter 10). However, cases from several continents show that legislation can have a key role if properly enforced (see Chapter 11). We call on coastal states to improve their legislation and enforcement regarding global hunting of small cetaceans and urge relevant international fora, such as the IWC, the CMS, CITES and the CBD to intensify their efforts in protecting marine megafauna. We also call upon the FAO and, where relevant, national governments, to introduce clear guidance on maximum safe levels of mercury and other toxins found in small cetacean meat (see Chapter 13).

2. An Overview on Global Hunts

This report provides an overview of the volume and recent developments in the global hunting of small cetaceans and the different reasons for those hunts. In Table 1, the 20 countries or territories with the largest hunts are listed, giving insights on the targeted species and the different types of hunts. Our previous report (Altherr & Hodgins, 2018) served as the basis for the table, with updates from recent studies that helped us identify recent trends in the extent of hunting – although hunts are increasingly covert with dolphins no longer landed openly, e.g., in Peru or Senegal (Ingram *et al.*, 2022; van Waerebeek *et al.*, 2019; Mintzer *et al.*, 2018). Motivations for the hunts vary, ranging from food and traditions to killing for fishing bait or deliberate culling because of unwanted competition for fish.

Table 1: Countries with the largest numbers for small cetacean hunts (based on Altherr & Hodgins 2018, with updates from recent papers and reports: Ambie *et al.*, 2023; Barreto *in litt.*, 2024; Dolphin Project, 2023a,b, 2018; Campbell *et al.*, 2022a, 2020; Cerchio *et al.*, 2022; COSEWIC, 2022; Dolman *et al.*, *in prep.*; Ingram *et al.*, 2022; Félix *et al.*, 2021; Fielding & Kiszka 2021; Frost *et al.*, 2021; Kumar *et al.*, 2021; NAMMCO, 2021b, 2018b; Szakal, 2021; Sun-ae, 2021; Anderson *et al.*, 2020; de la Puente *et al.*, 2020; E/F, 2020b; Harwood *et al.*, 2020; Miyeon *et al.*, 2020; Reeves & Lee, 2020; Andrianarivelo *et al.*, 2019; Lee *et al.*, 2019; Segniagbeto *et al.*, 2019; Temple *et al.*, 2019; van Waerebeek *et al.*, 2019; Obie-nu, 2018; Torres, 2018; Jaiteh *et al.*, 2017; Deslie *et al.*, 2016; Teh *et al.*, 2015). Figures are likely to be underestimated as reports of catches are often anecdotal, individuals that are ‘struck and lost’ are not included in official figures, neither are calves and juveniles, and data from illegal hunts is difficult to acquire with information from high seas fisheries scarce and patchy.

No.	Catch/yr & trend	Country / Territory	Targeted species	Type of hunt (methods)
1	10,000 – 15,000 ⇒	Peru	dusky dolphin, Burmeister’s porpoise, common dolphin, bottlenose dolphin, long-beaked common dolphin, short-finned pilot whale, long-finned pilot whale, Risso’s dolphin, false killer whale, pygmy killer whale, pantropical spotted dolphin, common pygmy beaked whale, Cuvier’s beaked whale, southern right whale dolphin, boto, tucuxi	transition from opportunistic to directed hunts (harpoons, nets)
2	Close to 10,000 ↑	Ghana	pantropical spotted dolphin, clymene dolphin, Fraser’s dolphin, rough-toothed dolphin, Risso’s dolphin, common bottlenose dolphin, Atlantic spotted dolphin, false killer whale, long-beaked common dolphin, melon-headed whale, short-finned pilot whale, dwarf sperm whale, spinner dolphin, pygmy killer whale, Cuvier’s beaked whale	transition from commercialised bycatch to directed hunts (harpoons, spears, nets)
3	Close to 10,000 ↑	Nigeria	common bottlenose dolphin, clymene dolphin, pantropical spotted dolphin, Atlantic humpback dolphin, short-beaked common dolphin, Risso’s dolphin; probably also Atlantic spotted dolphin	assisted bycatch (gillnets)
4	> 5,000 ↑	Venezuela	long-beaked common dolphin, common bottlenose dolphin, boto, tucuxi, Guiana dolphin, spinner dolphin, clymene dolphin, Atlantic spotted dolphin	directed hunts (harpoons, nets, rifles, machete)
4	> 5,000 ↑	Greenland	harbour porpoise, narwhal, beluga, long-finned pilot whale, orca, Atlantic white-sided dolphin, white-beaked dolphin	directed hunts (harpoons, rifles, nets)
6	several 1,000s ⇒	Brazil	boto, tucuxi, Guiana dolphin, franciscana, common dolphin, false killer whale, Atlantic spotted dolphin, pantropical spotted dolphin, spinner dolphin, clymene dolphin, striped dolphin, rough-toothed dolphin, common bottlenose dolphin, short-finned pilot whale, Fraser’s dolphin, dwarf sperm whale	directed hunts (harpoons, nets (including gillnets), knives, axe, machete)
6	several 1,000s ↑	Taiwan, PoC	short-finned pilot whale, common dolphin, Risso’s dolphin, Fraser’s dolphin, orca, false killer whale, pantropical spotted dolphin, spinner dolphin, striped dolphin, rough-toothed dolphin, common bottlenose dolphin, Indo-Pacific bottlenose dolphin, Indo-Pacific humpback dolphin, striped dolphin, Cuvier’s beaked whale, melon-headed whale, ginkgo-toothed beaked whale, Blainville’s beaked whale, pygmy killer whale	commercialised bycatch, directed hunts (harpoons, spear, electrocution)

No.	Catch/yr & trend	Country / Territory	Targeted species	Type of hunt (methods)
6	several 1,000s ↑	Indonesia	pygmy sperm whale, orca, spinner dolphin, short-finned pilot whale, Risso's dolphin, Fraser's dolphin, Irrawaddy dolphin, melon-headed whale, false killer whale, pantropical spotted dolphin, common bottlenose dolphin, Indo-Pacific bottlenose dolphin, Blainville's beaked whale, Cuvier's beaked whale	directed hunts (tiger nets, harpoons, homemade explosives)
6	several 1,000s ⇒ ?	South Korea (= Republic of Korea)	Indo-Pacific finless porpoise, common dolphin, short-finned pilot whale, Risso's dolphin, Pacific white-sided dolphin, common bottlenose dolphin, Baird's beaked whale, Cuvier's beaked whale, Stejneger's beaked whale, orca, false killer whale, Blainville's beaked whale, harbour porpoise, Dall's porpoise	commercialised bycatch, supported bycatch (nets)
6	several 1,000s ⇒ ?	India	Ganges River dolphin, Indo-Pacific finless porpoise, spinner dolphin, common dolphin, Indo-Pacific humpback dolphin, Indian Ocean humpback dolphin, Indo-Pacific bottlenose dolphin, common bottlenose dolphin, pantropical spotted dolphin, Risso's dolphin	directed hunts (gillnets)
11	> 2,500 ↑	Sri Lanka	spinner dolphin, common bottlenose dolphin, Indo-Pacific bottlenose dolphin, striped dolphin, pantropical spotted dolphin, Risso's dolphin, rough-toothed dolphin, Fraser's dolphin, common dolphin, melon-headed dolphin, pygmy killer whale, false killer whale, dwarf sperm whale, pygmy sperm whale, southern bottlenose whale	commercialised bycatch, directed hunts (hand-harpoons, nets, dynamite)
12	2,000-2,500 ↑	Canada	beluga, narwhal, harbour porpoise, white-beaked dolphin, Atlantic white-sided dolphin	directed hunt (harpoons, rifles), incidental bycatch
13	up to 2,100 ↑	Faroe Islands	long-finned pilot whale, Atlantic white-sided dolphin, white-beaked dolphins, common bottlenose dolphin (northern bottlenose whales are taken if stranded)	directed hunts (acoustic drive hunt, knives)
14	< 2,000 ↓	Japan	Dall's porpoise (dalli- and truei-types), short-finned pilot whale, Risso's dolphin, Pacific white-sided dolphin, false killer whale, pantropical spotted dolphin, striped dolphin, common bottlenose dolphin, Baird's beaked whale, rough-toothed dolphin, melon-headed whale, Hubbs' beaked whale, ginkgo-toothed beaked whale, Indo-Pacific bottlenose dolphin, pygmy sperm whale, dwarf sperm whale, Northern right whale dolphin, orca	directed hunts (acoustic drive hunts, harpoons, spears, knives)
15	100s to few 1,000s ↓	Malaysia	spinner dolphin, common bottlenose dolphin, pantropical spotted dolphin, Irrawaddy dolphin, Indo-Pacific finless porpoise	commercialised bycatch, opportunistic & regular directed hunts
15	100s to few 1,000s ↓	Madagascar	Indo-Pacific humpback dolphin, Indian Ocean humpback dolphin, spinner dolphin, Fraser's dolphin, orca, melon-headed whale, Indo-Pacific bottlenose dolphin	directed hunts (harpoons, drive hunts), "directed bycatch"
17	up to 1,350 ↑	St. Vincent & the Grenadines	Atlantic spotted dolphin, short-finned pilot whale, spinner dolphin, Fraser's dolphin, orca, false killer whale, Risso's dolphin, rough-toothed dolphin, melon-headed whale, dwarf sperm whale, pygmy killer whale, common bottlenose dolphin, Gervais' beaked whale, clymene dolphin, striped dolphin, pantropical spotted dolphin	directed hunts (harpoons)
18	100s to > 1,100 ↑	Solomon Islands	pantropical spotted dolphin, spinner dolphin, Risso's dolphin, Fraser's dolphin, Cuvier's beaked whale, Indo-Pacific bottlenose dolphin, common bottlenose dolphin, striped dolphin, melon-headed whale, false killer whale, rough-toothed dolphin	directed hunts (acoustic drive hunts)
19	< 1,000 ?	Guatemala	spinner dolphin, striped dolphin, common dolphin, common bottlenose dolphin	directed hunts (harpoons)
20	~ 320 ⇒	USA (Alaska)	beluga	directed hunts (harpoons, rifles, nets)

There are several other countries that continue to hunt small cetaceans at similar levels to the USA (few hundreds), such as Cameroon, Colombia, Gambia, Myanmar and the Philippines. However, lacking more recent information we have not included these countries in the table.



3. Small Cetaceans as Food

Aquatic wild meat is defined as products from aquatic megafauna, such as mammals, reptiles, seabirds, sharks and rays (CMS, 2017). At least 18 species of small cetaceans are exploited as “marine bushmeat” in West Africa, one of which is the Atlantic humpback dolphin. This dolphin is restricted to the coast of West Africa and, as a direct result of exploitation by both incidental and directed catches, is listed as Critically Endangered by the IUCN Red List (Minton *et al.*, 2022; Collins *et al.*, 2017). The use of small cetaceans has been reported for several West African countries, including **Benin, Cape Verde Islands, Cameroon, The Gambia, Ghana, Guinea-Bissau, Guinea, Mauritania, Nigeria, Senegal, Togo** (Segniagbeto *et al.*, 2019) and the **Democratic Republic of Congo** (Mbungu Ndamba *et al.*, 2023). Directed captures are common in both **Ghana** (see Case Study 1) and **Nigeria**, where the hunting of dolphins for both human food and for fishing bait (see Chapter 4) has been on the rise due to the country’s difficult economic situation (see Table 1). They are also known from **Senegal** where despite protection, the landing of and trade in dolphins is a secret yet considered common practice (Segniagbeto *et al.*, 2019). Landed dolphins are mainly used as food either locally or in areas further from the coast; however, they are also used in traditional medicine (Ingram *et al.*, 2022). Furthermore, Bamy *et al.* (2021) noted concerns over the beginning of utilisation of dolphin meat by fishers at

Tristao Islands, **Guinea**, where fish landings have severely depleted, and raised particular concern for the future of the Atlantic humpback dolphin.

An increase of small cetacean hunts has also been highlighted in other African countries, including the **Republic of Congo** (Collins *et al.*, 2019, see photo above) and **Kenya** (Mwango'mbe *et al.*, 2021; Temple *et al.*, 2019). Only recently, the use of dolphins as food was reported from **Sao Tomé and Príncipe** (Matos *et al.*, 2023; Nuno *et al.*, 2023) – a practice not documented from this country before (Segniagbeto *et al.*, 2019). Cerchio *et al.* (2015) and Andraninarivelo *et al.* (2019) reported that in **Madagascar**, Indian Ocean humpback dolphin and bottlenose dolphins are killed in directed hunts and that bycaught cetaceans are landed for consumption or sale. In **Mozambique**, the demand for aquatic wild meat leads to directed and opportunistic hunts, as well as harvesting of stranded individuals, alive or dead (Reeve-Arnold *et al.*, 2020).

The use of aquatic wild meat is not limited to the African region and is in fact on the rise in Asia due to an increasing human population (Ingram *et al.*, 2022), population reductions in species that have been traditionally targeted, diminishing returns from traditional fisheries (Bamy *et al.*, 2021), and an increase in market demand for marine mammal products (Porter & Lai, 2017). All the countries of Southeast Asia (**Viet-**

nam, Cambodia, Myanmar, Philippines, Indonesia, Malaysia and Thailand) report previous or ongoing directed hunts for marine mammals and the utilisation of opportunistically found individuals (Porter & Lai, 2017). In Sabah, Malaysia, although dolphin hunting has decreased since the 1980s, it still occurs, with dolphins from both deliberate hunts and bycatch still used as food, for trade and as shark bait. Spinner dolphins were reportedly the most hunted species, followed by bottlenose and spotted dolphins (Teh *et al.*, 2015). In reaction to declining fish stocks, the hunting and consumption of small cetaceans has become a relatively new practice in the villages Lamalera and Lamakera, Indonesia and is believed to be rapidly increasing (Dolphin Project, 2023b). In the Philippines, some local communities have recently developed a taste for small dolphins (Ingram *et al.*, 2022) whilst in **India**, dolphin hunting for human consumption remains at high levels, such as in Kerala, where dolphins are regularly hunted and marketed (Kumar *et al.*, 2021) and in Malpe, Karnataka, an estimated 2,000 cetaceans are caught for human consumption every year (Kumarran, 2012). In contrast, small cetacean hunts are decreasing in **Japan** (see Case Study 9), largely due to declining populations of targeted species.

Deliberate takes of small cetaceans are also thought to be prolific in Latin America. In the upper Orinoco basin of the Amazon River, at the border between **Colombia** and **Venezuela**, smoked meat of the Amazon River dolphin (or boto), is marketed as the meat of lowland tapir, a dish traditionally consumed by local communities. Furthermore, the dolphin's oil has been increasingly marketed to treat symptoms of SARS-CoV-2 derived respiratory ailments (Mosquera-Guerra *et al.*, 2022). Worryingly, since the 2000's the authors have documented a significant increase in the trading of boto, primarily for bait, but more recently for human consumption. Additionally, the Global Organized Crime Index (2023) noted increased poaching of dolphins and other aquatic wild meat in Venezuela for local consumption. In the **Caribbean**, small cetacean hunts have increased and expanded to new countries such as **Cuba** (Rodríguez-González *et al.*, 2019) whilst in **St Vincent and the Grenadines**, as a consequence of declining pilot whale populations, hunters are more frequently targeting other species of small cetacean (see Case Study 12).

Some species of dolphin have been hunted extensively in parts of the Pacific, both for traditional and subsistence purposes and more recently for commercial gain, with some remaining highly valued as food items, medicine and as currency, jewellery and ornaments. Oremus *et al.* (2015) estimated that more than 15,000 dolphins were killed in the vicinity of Fanalei village in the **Solomon Islands** between 1976 and 2013, with anecdotal reports suggesting that these hunts are ongoing and may have occurred in other communities over the past decade (see Fig. 1). Additionally, there are reports that incidental catches and drive hunts may have occurred on an opportunistic basis in other locations within the South Pacific region (Miller, 2023). Subsistence hunting of dolphins in the region is no longer considered sustainable because of cumulative impacts from other threats, such as increasing human populations, coastal development, pollution, underwater anthropogenic ocean noise and new harvesting/capture technologies (SPREP, 2022); however, the authors note that there is a growing awareness of the non-consumptive value and benefit of small cetaceans to local communities (e.g., boat or shore-based tourism activities, such as whale watching).

In several communities in **Russia**, belugas are still taken occasionally either as a result of bycatch in salmon nets or by shooting and there are major concerns over the future of some stocks as a result of interactions with increasing coastal fisheries (NAMMCO, 2017) (see Chapter 6 and 7). Furthermore, anecdotal consumption of dolphin meat in Europe has also recently been documented, e.g. in France (see Case Study 2).



Fig. 1: Solomon Island's dolphin hunt © Dolphin Project

Case Study 1: Ghana

The largest documented take of small cetaceans in western Africa occurs in waters off Ghana's Western Region (see Fig. 2). This has temporally coincided with steadily decreasing catches of finfish, especially small pelagics (sardinellas, anchovies, mackerel) over the past decade (Bamy *et al.*, 2021). Industrial, capital-intensive fishing, mostly conducted by distant water fleets and often illegally, has disrupted the economic and social organisation of local fishing communities and increased poverty (Ayilu *et al.*, 2023; Berkowitz, 2019). Dwindling fish catches have led to a shift in fishing techniques (Sekey *et al.*, 2022), resulting in higher shark landings but causing higher bycatch-associated mortality for dolphins. **Given the poverty levels within small-scale fisher communities, dolphin bycatch is seen as a marketable additional resource, both for human consumption and increasingly for bait – and the line between bycatch, “assisted bycatch” and targeted hunting is becoming increasingly blurred.**



Fig. 2: Heads *Tursiops* © COREWAM

In western Ghana, over 18 species of dolphin, including the phenotypically unique West African “spotted spinner” (Segni-agbeto *et al.*, 2019) are butchered and smoked for trade, but an increasing portion is now used for bait in shark fisheries due to an increased demand for shark fins and meat (Sekey *et al.*, 2022). During a survey in the fishing port of Dixcove in 2018, van Waerebeek *et al.* (2019) found significantly lower daily catch rates and a significant alteration in dolphin species composition compared to surveys five and 15 years previously. These findings are likely linked to a decline in dolphin abundance and the authors noted that as a result of ongoing removals,

the West African population of clymene dolphin is showing signs of a population collapse, similar to observations made in bottlenose dolphins. Stricter controls at ports and the increased butchering and use of dolphins at sea as bait also contributed to smaller landings at ports. In 2018, for the first time, the use of dolphin-baited longlines deployed close to the main float line of a gillnet was evidenced as a novel shark aggregating device. **The authors raised significant concerns that dolphin hunts may increase to compensate for lost income from diminishing fish catches.**

Case Study 2: France

Within the European Union (EU), although dolphins are strictly protected from deliberate killing, there have been several cases of dolphin carcasses showing evidence of butchery in north-western France. A recent video showing the hauling of a fishing net in the midst of a swimming dolphin pod by a French vessel indicates the intentional catch of dolphins (Sea Shepherd, 2022), raising questions over the enforcement of relevant legislative measures. It remains unclear whether the deliberate catches of dolphins by French vessels are to eliminate unwelcome competitors (see Chapter 6) or aimed for consumption – as indicated by recent incidents. The consumption of small dolphins and porpoises in the northwest of France has been known throughout history; however, with the prohibition of such killing through the introduction of the Habitats Directive in 1992, any such practices were driven underground and little evidence was apparent. Yet, in 2003, carcasses of stranded dolphins on the French Atlantic coast were found to have been filleted and muscle flesh removed (Society for Dolphin Conservation, 2003) and in 2012, a dolphin with parts of its back flesh removed was found beached in southwest England (Anon., 2012). The most recent case was reported in August 2020, when the remains of a butchered dolphin were found in Brittany, western France (France24, 2020).



4. Dolphins as Bait for Fisheries

Due to its durability in salt water, dolphin blubber (and meat) is a preferred fishing bait (Barbosa-Filho *et al.*, 2018). The practice of using small cetaceans as bait in different types of fisheries is known to be geographically widespread, especially in South America and Asia (Mintzer *et al.*, 2018) but recently also in West Africa, with longline fisheries for sharks the most dominant gear-type used (Mangel *et al.*, 2010).

Although the utilisation of dead bycaught individuals as bait was thought to be common, this practice has increasingly developed into a directed take (Campbell *et al.*, 2020; Altherr & Hodgins, 2018; Debrah *et al.*, 2010). At least 30 species of small cetaceans (marine and freshwater species – see also Chapter 5) are known to be used as bait, which often involves deliberate killing for that purpose (Kolipakam *et al.*, 2020; Mintzer *et al.*, 2018). While in some countries the practice is thought to have ceased, in others it has recently expanded and in some areas, the market value of dolphins as bait, strongly correlated with the value of sharks, now outweighs its value as food (Mintzer *et al.*, 2018; Campbell *et al.*, 2020). Most recently, new findings from Africa's Atlantic coast indicate an increase in directed hunts on small cetaceans (see also Chapter 3) for their use as bait in declining shark fisheries (Ingram *et al.*, 2022; Mintzer *et al.*, 2018). The increased use of cetaceans as bait (mainly for sharks) reported from **Ghana, Nigeria**

and **Senegal** (Segniagbeto *et al.*, 2019) as well as from distant water fleets (EJF, 2020a,b) is of particular concern (see Case Study 4).

Large-scale hunting of dolphins to be used as bait in shark fisheries has been known to occur in **Peru** for some time (see Case Study 3); however, recent evidence points to an increasing use in other South American countries and there is significant concern that they are increasingly being deliberately killed for this purpose. In **Ecuador** in the 1990's, individual fishers were reported to harpoon dolphins to be used as bait. More than twenty years on, Castro *et al.* (2020) reported on the prolific use of pantropical spotted dolphin, short-finned pilot whale, pygmy killer whale and an unidentified small delphinid as bait for improvised fish aggregation devices (FADs) and warned that this practice is likely to expand rapidly and lead to increased direct kills. Jiménez *et al.* (2018) described cases of dolphin carcasses with their fins removed. As a result of these takes, Ecuador may not meet the US Marine Mammal Protection Act (MMPA) imports rule by which it is illegal to kill marine mammals in any fishery that imports fish and fish products into the USA (CBD *et al.*, 2023; NOAA, 2023).

Barbosa-Filho *et al.* (2018) found that 81.5 % of interviewed fishers in southern Bahia, **Brazil**, knew about

the use of dolphin fat as bait and 56.9% knew someone who had caught cetaceans. There have been reports of human consumption of cetacean meat in northeastern Brazil and recent findings suggest that if unsuitable for human consumption, stranded individuals are most likely used as bait (Sacristan *et al.*, 2022). The use of Guiana dolphins by local communities in the Lake Maracaibo System in **Venezuela** has been recorded for decades and the illegal hunting for meat, bait and religious rituals continues today, with an increase in recent years (Siciliano *et al.*, 2023; Barrios-Garrido *et al.*, 2021; Briceño *et al.*, 2021), at least partially due to the economic crisis (Szakal, 2021).

The use of marine mammals as bait is also escalating in Asia, supported by the commercialization of trade (Porter & Lai, 2017). A recent observation of fishing ports in **Sri Lanka** indicates that there is a clandestine trade in dolphins for bait in shark longlining fisheries as well as for consumption by people living in non-coastal areas (Porter & Lai, 2017). In the world's largest shark fishing fleet, in **Indonesia**, hand-speared dolphin (probably of the genera *Tursiops* and *Stenella*) are used as bait for longlines (Jaiteh *et al.*, 2017). Recent information has put the spotlight on large-scale use of dolphins as bait for sharks at the **Taiwanese** and **South Korean** longline fishing fleets (see Case Study 4).

Case Study 3: Coastal Peru

Documented since the 1990s (and likely occurring for some time before), Peruvian fishers have been known to kill thousands of dolphins every year to be used as bait in shark fisheries (Van Waerebeek & Reyes, 1994; Altherr & Hodgins, 2018; van Waerebeek *et al.*, 2018 – see Fig. 3). **Recent interviews with fishers showed that this is a particular problem in the blue and mako shark longline fisheries, where the majority of bycaught dolphins are still alive but deliberately killed** (Campbell *et al.*, 2020). Longline fishers reported using 10–20 dolphins per fishing trip (1–2 trips/month) from either harpooning or the exchange of carcasses from gillnet vessels. Four species are mainly used as bait: dusky, bottlenose and common dolphins as well as Burmeister's porpoise (Campbell *et al.*, 2020).



Fig. 3: Harpooning © Stefan Austerermühle, Mundo Azul

In Pucusana, 60 % of fishers working in purse seine fisheries indicated the use of dolphins for consumption or as bait (Peña-Cutimbo *et al.*, 2024), and a conservative estimate of takes by Campbell *et al.* (2020) is around **5,000 dolphins per year in just the two ports of Pucusana and Salaverry – plus a lower, unknown number of dolphins harpooned for bait in gillnet fisheries**. It can be assumed that usage rate and practice are similar for other ports along Peru's extensive coast. According to interviews with fishers, harpooning dolphins has decreased over the last two decades; however, it is unknown whether this is attributable to smaller dolphin populations or an increased awareness in fishing communities (Campbell *et al.*, 2020). Despite this, it warrants concern that the longline shark fishing industry is further expanding (de la Puente *et al.*, 2020, Doherty *et al.*, 2014) ensuring the hunting of dolphins as bait will also expand.

Case Study 4: Distant water fleets

Several governments provide subsidies to their fishing sectors allowing them to fish beyond their territorial waters, to travel farther, stay at sea longer and catch more fish than they could normally afford to (Millage *et al.*, 2023). These distant water fleets (DWF) target high value fish in locations where governance and enforcement are limited, primarily in the Pacific, East Africa, and West Africa. The clandestine nature of the industry has led to illicit activities and increased illegal, unreported, and unregulated (IUU) fishing (Stimson, 2019).



Fig. 4: Taiwan - Distant Water Fleet © EJF

Between 2015 and 2017, China and Taiwan represented nearly 60 % of all global DWF effort in other countries' waters, with Japan, South Korea, and Spain each representing about 10 % of effort. Next to nothing is known about the practices on board vessels from China, Japan, and Spain, and there is limited information on those from Taiwan and South Korea (see below) as despite its importance to international trade and economics, the DWF industry largely remains a mystery, shrouded in an opaque operating system that limits information (Stimson, 2019).

Although the hunting and killing of dolphins is prohibited by Taiwanese law, investigations into the activities of several vessels from the **Taiwanese DWF** (predominantly long-line fisheries targeting sharks) showed that dolphins are deliberately hunted for use as bait and/or for other purposes such as food, medicine and trinkets (see Fig. 4), including seven vessels (11 %) that practised the decapitation of false killer whales after which their teeth were removed to make jewellery. Using a harpoon with a rope attached, the crew reported that they were made to catch dolphins as they surfed the bow waves of the vessel, "*hunting them until they were all caught*". Individuals were then left attached to the side of the boat while they waited for the dolphin to tire. If they were still alive when hauled on board, they would use a car battery to electrocute and stun the dolphin. Crew estimated that they would catch six to nine dolphins at a time and estimated that on their most recent trip (3 months in duration) they caught approximately 300 dolphins. Sometimes they would give dolphin meat and juvenile sharks to other vessels to use as bait (EJF, 2020b).

Despite similar legal protections in place for cetaceans, investigations into the activities of the **DWF of South Korea** revealed multiple incidents of directed hunting of cetaceans. Even when caught by accident, regulations require that cetaceans are released, where possible alive. However, of the 54 former crew members from 40 different vessels, 30 % of those interviewed detailed illegal fishing, including fishing in prohibited zones without permission and being ordered by captains and other Korean crew to catch dolphins, to extract their teeth, livers, and genitals before discarding their bodies at sea (EJF, 2020a). With around 220 vessels making up the South Korean DWF, the number of dolphins being killed is thought to be significant.



5. Freshwater Dolphins as Target Species

River dolphins are particularly vulnerable to anthropogenic impacts due to their limited range in intensively used freshwater systems. The impact from direct harvesting is estimated to be particularly high due to the combination of other threats like bycatch, dams and pollution (Ingram *et al.*, 2022; Kolipakam *et al.*, 2020). Killing for use as bait is the main threat affecting both the Ganges River dolphin in South Asia (Kolipakam *et al.*, 2020) and the Amazon River dolphin, in South America (Mintzer *et al.*, 2018).

In the Makaham River, Borneo, **Indonesia**, the Irrawaddy dolphin is primarily threatened by bycatch in fisheries; however, deliberate hunting further contributes to the species' decline (Brownell *et al.*, 2019). In **India**, the harpooning of dolphins was prohibited in 1972, but this law has proven to be largely ineffective as fishers use nets to catch dolphins instead, coined "assisted incidental capture" (Mintzer *et al.*, 2018) and although the use of dolphin oil is illegal, it is marketed under the guise of fish or livestock fat (Kolipakam *et al.*, 2020). Recently, populations of the endangered Ganges River dolphin in the Brahmaputra River system in both **India** and **Bangladesh** have decreased at an alarming rate and poaching to produce dolphin

oil is a major reason. Dolphin oil is used as medicine against rheumatism, nervous and respiratory disorders, whilst both oil and meat are used as bait for large fish and crustaceans (Kibria *et al.*, 2023; Bordoloi & Saharia, 2021; Kolipakam *et al.*, 2020). Within the Brahmaputra River system, almost 100 boats are estimated to use dolphin oil as bait, representing an estimated 35–45 dolphins per year, where currently only ~900 dolphins are thought to remain (Kolipakam *et al.*, 2020 and literature therein). Alam *et al.* (2020) found indications of an increasing use and demand of dolphin products in Bangladesh, which may trigger more directed hunts.

In South America, river dolphins are regularly exploited as bait (van Damme *et al.*, 2023; Mintzer *et al.*, 2018; Herrera-Trujillo & Trujillo, 2016). Although Brazil is at the centre of criticism (see Case Study 5), Mosquera-Guerra *et al.* (2022) also found evidence of widespread use of Amazon River dolphin as bait in the piracatinga fishery in **Bolivia**, **Colombia**, **Venezuela** and **Peru**. In Peru and Bolivia, dolphin oil is sold to cure chest ailments and Amazonian city dwellers are known to perceive the value of boto body parts as love charms (Gravena *et al.*, 2008).

Case Study 5: Brazil



Fig. 5: Boto used as bait, Brazil © Veronica Iriarte

Populations of the Amazon River dolphin (“boto”) and the tucuxi are in steep decline and both species are listed as Endangered by the IUCN Red List (Braulik *et al.*, 2023; da Silva *et al.*, 2022). Martin & da Silva, (2022) warn that the probability of losing the boto within the next 50 years is 95 %. According to Siciliano *et al.* (2023) amulets and trinkets made of tucuxi teeth are sold in many Brazilian cities.

Since 2000, the Amazon River dolphin and the tucuxi populations in the Mamirauá Reserve in Amazonas state, Brazil, fell by 94 % and 97 % respectively (da Silva *et al.*, 2018a,b) with this decline consistent with the start of using river dolphins as bait (Campbell *et al.*, 2022b). In Brazil, the use of dolphins as bait in fisheries is comprehensively documented, whether in marine waters (Barbosa-Filho *et al.*, 2018) or in the Amazon River basin to catch Piracatinga, a catfish species (e.g., Iriarte & Marmontel 2013 a,b). **The use of botos (see Fig. 5) has further increased throughout the Amazon basin during the last decade and has become the species’ major threat** (Mosquerra-Guerra *et al.*, 2022; Mintzer *et al.*, 2018). According to several sources bait derived from a single boto can yield a range of 200-1500 kg of piracatinga (Fernando Trujillo, *pers. comm.* 2023; Pimenta *et al.*, 2018), and within the Mamirauá Reserve alone, an annual loss of 1,650 dolphins by Piracatinga fishing is estimated (da Silva *et al.*, 2011). In addition to the hunting of dolphins in Mamirauá, the recent high mortality of dolphins due to the severe drought may be relevant to the population trend in this region (Fernando Trujillo, *pers. comm.* 2023).

The Brazilian government imposed a moratorium on Piracatinga fisheries from 2015-2020, but fishing continued unabated with poaching of both boto and tucuxi (da Silva *et al.*, 2018b). **Despite pressure from fisheries and attempts to establish the use of alternative baits, the moratorium was extended in 2020 and again in 2023, this time for an unlimited duration** (Ministry of Fisheries, 2023; da Silva *et al.*, 2022; Beltrão *et al.*, 2017). Pimenta *et al.* (2018) warn that this may only “*sweep the dirt under the carpet*”, and the practice will continue but in a manner invisible to the authorities.

Since 2000, the use of dolphins as bait in the Tocantins and Guamá Rivers in the Tocantins basin have been documented, raising concerns over the fate of what has been proposed to be a new species *Inia araguaiaensis* (Hrbek *et al.*, 2014), as the Tocantins basin is isolated from the remaining Amazon basin (Mosquerra-Guerra *et al.*, 2022).



6. Aggression as a Result of Competition

Despite longstanding claims that cetaceans compete with humans for fishery resources, growing evidence suggests that the contrary is true. Cetaceans play a critical role in primary productivity in the ocean (see Chapter 12), thus the recovery of dolphin populations to pre-exploitation levels could, along with better fisheries management, support the recovery of depleted fish stocks. However, the killing of dolphins to eliminate an alleged competitor has been documented around the world and in light of dwindling fish stocks, is expected to further increase.

The attitude of fishers towards dolphins (marine and riverine) are often hostile (e.g., Campbell *et al.*, 2022a, b), as they are blamed for dwindling fish stocks or simplistically portrayed as “pests”, a reputation that is set to increase with commercial fisheries increasingly “fishing down the food web”, targeting low-trophic level species that were economically less relevant in the past (Ainley & Pauly, 2013; Essington *et al.*, 2006). Furthermore, dolphins are evidenced to predate fish from nets or hooks, resulting in potential damage of fishing gear and in loss of capture and resulting revenue (e.g., FAO, 2022; Pardalis *et al.*, 2021; Snape *et al.*, 2018). However, Cruz *et al.* (2014) studied interactions between Risso’s dolphins in the Azorean artisanal fishery for veined squid, and showed that there was no difference in the mean weight of squid landed in trips

with and without dolphin depredation and that damage to fishing gear was infrequent.

The culling of small cetaceans by fishers with the aim of decimating alleged competitors has been conducted in the past, e.g., in the Adriatic Sea and in Norway (Meliadò *et al.*, 2020; Bowen & Lidgard, 2012), and is still common practice in several countries, such as **India**, **Madagascar**, **Japan** and **Brazil** (Jog *et al.*, 2018; Cerchio *et al.*, 2014; Nishi, 2010; Loch *et al.*, 2009). WWF (2023) lists deliberate killing to reduce competition in fishing (together with killing for bait, meat and oil) as an ongoing threat to Asian river dolphins whilst in Brazil, Iriarte & Marmontel (2013b) noted a negative attitude towards Amazon River dolphins by fishers and assumed “*a catalyst effect for the transition from incidental to intentional capture and competitor removal*”. In **Nigeria**, dolphins are seen as “enemies” of fishers and, accordingly, bycaught small cetaceans are not released but intentionally killed (Babalolsa & Onatunji, 2018), whilst in **Bangladesh**, fishers admitted to intentionally killing bycaught dolphins as punishment for damaging nets (Dewhurst-Richman *et al.*, 2020). In **Myanmar**, conflicts between dolphins and fisheries are frequent. Fishers often report dolphins predated their catch and it is unclear as to whether or not this behaviour is due to a lack of food or out of convenience (WWF, 2022). Crews in **Taiwanese** and **South Korean** longline fisheries may

be ordered to kill bycaught dolphins to minimise future losses (EJF, 2020a,b) and recent incidents in France (see Case Study 2) indicate that some of the killings may be in retaliation for suspected competition.

In November 2021, four orcas had taken up temporary residency in Nuuk Fiord, **Greenland**, providing local whale-watching operators with a thriving business. However, hunters blamed the orcas for eating all the seals and proceeded to shoot and harpoon them. Three of them sank whilst the meat from the fourth was put up for sale despite the advice from health authorities advising people not to consume orca meat because of the extremely high levels of pollutants (KNR News, 2021).

The Panhandle region of the Gulf of Mexico, **United States of America**, is an area where an alarmingly high number of dolphins are fatally wounded by gunshot, hunting arrows or sharp tools. However, of the documented strandings of dolphins with evidence of

intentional harm, since 2003, only 30 % have involved the identification or legal conviction of the perpetrators of these crimes (Vail, 2016). The author also noted an apparent increase over time, with 65 % of the incidents taking place since 2011. Fishers in **Jamaica** have been complaining about dolphins turning over their fish traps and taking their fish and whilst some have threatened to retaliate against the dolphins there is no concrete evidence that this has occurred, yet there is the potential for harm. Researchers are currently working to assess depredation events and hope to develop mitigation strategies that will either prevent or minimise the effects of the depredation events (Christine O'Sullivan, *pers. comm.* 2023).

As the intentional killing of dolphins is illegal in many countries, accurate figures are unknown, but anecdotal data indicates that many thousands of dolphins may be intentionally killed by fishers around the world, every year.



In contrast, in some regions, fishers have positive attitudes towards cetaceans. They are worshipped, treated as sacred beings and increasingly around the world, are appreciated for their tourism value. This is reflected in the high rate of release (58 %) of live bycaught dolphins in Sarawak, **Malaysia** (Ambie *et al.*, 2023). For over a century, in the city of Laguna on **Brazil's** southern coast, fishers have worked cooperatively with dolphins to find fish (Cantor *et al.*, 2023). In some parts of **India**, fishers revere marine mammals and believe that the presence of dolphins enhances fishing catches and that some dolphins even chase fish into fisher's nets (Porter & Lai, 2017).

Much of the negative attitude towards dolphins could be addressed with increased education as to their invaluable role in marine and riverine ecosystem health. Knowledge of dolphin biology and life history could further contribute to conflict mitigation. For instance, Pardalis *et al.* (2021) showed in the Mediterranean Sea, in **Greece**, that both the depth of net setting and timing of net soaking were important factors in reducing depredation or net damage, noting that environmental education would help to reduce cetacean-fisheries interactions.



7. Quota-based Hunting

In a few countries around the world, the hunting of small cetaceans is legal. Some hunts are managed under self-imposed quota whilst others are not regulated and hunters can take as many individuals as they like.

Only since 1993 **Japan's** Fisheries Agency has been setting quotas by species. Until 2006, a quota of 940 bottlenose dolphins, 450 striped dolphins, 420 spotted dolphins, 350 Risso's dolphins, 300 short-finned pilot whales, and 40 false killer whales was given for the coastal town Taiji. Since then, these quotas began to decrease annually but were accompanied by the addition of new target species (Kasuya & Brownell, 2022). The same authors noted that a total catch decline in Taiji from 2,188 in peak years (1980-1984) down to 241 more recently (2015-2019) indicates a decline in availability of target species and called for all quotas to be greatly reduced to stop what appears to be substantial population declines. Importantly, they also pointed out that the quota does not function to limit the catch. Only individuals reported as killed or taken live for the entertainment industry are counted and there are no estimates of cryptic mortality, all leading to a gross underestimate of the damage the hunt is causing to dolphin populations.

In 2022, after international outcry at the slaughter of 1,423 Atlantic white-sided dolphins in a single hunt,

the Government of the **Faroe Islands** limited the hunt by introducing a provisional quota of 500 dolphins a year. This arbitrary number is not based on robust population data and has more of a symbolic than a regulative role, as prior to the hunt in 2021, for the period 2000-2020, the annual catch of white-sided dolphins was an average of 211 individuals/year (Føroya landsstýri, 2023; Heimabeiti, 2023). There are no quotas for pilot whales or bottlenose dolphins (see Case Study 7).

Greenland (an autonomous territory of Denmark, see Case Study 6), **Canada, the USA and Russia** are the remaining countries, where quotas are officially set for specific species and hunters are required to report back on their catches. In **Canada** and the USA, species with no quota can be taken at will but are meant to be recorded. In Canada, a quota is set for narwhals only (Reeves & Lee, 2020) but not for other small cetaceans (Watt, 2021). For belugas, the Inuit communities and the Canadian Government have jointly developed regional management plans and on average, 790 belugas are hunted annually (Breton-Honeyman *et al.*, 2021). Over the period 2017-2020, Canada reported catches of between 699-919 belugas and 662-782 narwhals per year (NAMMCO, 2021b, 2018b) however, these numbers do not include struck

and lost animals and catch reports by communities for both species are incomplete (Watt, 2021). Official catch figures for harbour porpoises, white-beaked and white-sided dolphins do not exist, but harbour porpoises are hunted “fairly regularly” in Labrador (COSEWIC, 2022).

There are indications that small cetacean hunts in Canada are on the rise. Since 2000, the community of Ulikhaktok has started opportunistic beluga hunts (Collings *et al.*, 2017) and Inuit in the province Quebec are presently lobbying to lift a local beluga hunting ban in place since 1986 (Wenger, 2023). In Alaska, **USA**, in addition to the officially hunted ~ 320 belugas per year (Frost *et al.*, 2021), bycaught harbour porpoises are also used for human consumption (Kunze, 2020). In **Russia**, the Federal Agency for Fisheries issues ‘total allowable catches’ or TACs for beluga whales and orcas. These TACs are then shared out into quotas for specific communities/areas. Beluga are hunted in the waters of Chukotka and the county government

purposefully subsidises communities providing them with hunting equipment. In 2021, the TAC for beluga was 35, although in recent years quotas have not been met. Additionally, TACs for four orcas and ten belugas were issued for scientific research and to enhance fishing in the Sea of Okhotsk (see Chapter 6).

To receive a quota for the purpose of Aboriginal Subsistence Whaling from the IWC, countries must provide proof of their ‘need’ for whale products. Yet, their needs calculation often does not include meat and blubber that is retrieved from the many small cetaceans that are hunted locally (e.g., Ministry of Fisheries, 2018), a practice which has been repeatedly criticised by NGOs (e.g., AWI, 2014; Altherr & Lonsdale, 2012). As with other dolphin hunts, neither numbers of struck and lost animals are included – despite the rate of loss assumed to be high, e.g., a loss rate of 28-33 % is assumed for narwhals in Canada (Reeves & Lee, 2020) – nor are individuals who become entrapped in the ice and are then killed and used (see Chapter 8).

Case Study 6: Greenland

Seven species of small cetacean are hunted in Greenland. Only two – beluga and narwhal – are hunted under quota although hunters are required to report their catch of all species. Records show that a total of 103,899 small cetaceans have been hunted in Greenland since 1993, including 9,589 belugas and 14,072 narwhals. However, in addition to a lack of accounting for struck and lost cetaceans, it is understood that a significant number of landed individuals go unreported (Dolman & Hodgins, 2023).

The Government of Greenland sets quotas for different stocks of narwhal and beluga, based on scientific advice from NAMMCO, yet in recent years that advice has been increasingly ignored. NAMMCO (2017-2022a) has repeatedly recommended a zero quota for distinct stocks due to serious concerns regarding their conservation status. Nevertheless in 2022, despite scientific advice of zero quota, the Government issued hunters in Ittoqqortoormiit, South of Kangerlussuaq and north of Tasiilaq narwhal quotas of 20, 15 and 15 animals respectively. **In recent years, beluga quotas have been substantially higher than previous years with NAMMCO SC repeatedly raising concern over the sustainability of the beluga hunts in East Greenland (NAMMCO, 2022a), yet despite this, a quota for 30 belugas was issued in 2023.**



Five species of small cetacean are permitted to be hunted without quota. Recorded data does not distinguish between Atlantic white-sided and white-beaked dolphins and all hunts have occurred without a full assessment of the status of either at species or population level. Nonetheless, there has been an increasing trend in catch numbers since data records began (Dolman *et al.*, in prep.). Between 1996-2021, a total of 416 orcas were recorded as hunted in Greenland (Dolman *et al.*, in prep.) and in 2022, NAMMCO's Scientific Committee noted that the continued harvest may jeopardise the species presence in some areas (NAMMCO, 2022a). No assessment has been undertaken of the impact of Greenland's long-finned pilot whale hunt (NAMMCO, 2022a), yet, as with other species permitted to be hunted, there has been an increasing trend in catch numbers since data records began (Dolman *et al.*, in prep.). Concerns have also been raised surrounding the number of harbour porpoise hunted each year as management advice from NAMMCO has not yet been implemented (NAMMCO, 2022b). Despite a lack of population data, more than 2,000 harbour porpoises are recorded as being killed every year, although interviews with hunters indicate that much larger numbers are taken. This is particularly concerning as it is assumed that this population may be genetically distinct from other populations and should be classified as a new subspecies (Carlén *et al.*, 2021; NAMMCO, 2019c).

A recent review of small cetacean hunts in Greenland recommended a robust and comprehensive small cetacean monitoring and assessment programme to understand the status and trends of local populations as well as encompass urgent implementation of (precautionary) measures for all small cetacean hunts consistent with international conservation management recommendations (Dolman *et al.*, in prep.). In 2023, the IWC Scientific Committee expressed concern regarding the sustainability of small cetacean hunts in Greenland and recommended that Greenland follows the scientific recommendations from NAMMCO and the JCNB (the Canada Greenland Joint Commission on Narwhal and Beluga) on sustainable removals and instigated an intersessional review of the progress of previous recommendations made by the Committee (IWC, 2023).



Fig. 6: Beluga mattak, Greenland © RobLott WDC



Fig. 7: Nuuk braette, Greenland © RobLott WDC



Fig. 8: Orca tooth necklace, Greenland © RobLott WDC



Fig. 9: Narwhal blubber, Green Arctic Food © WSPA



8. Animal Welfare and Conservation

“Unfortunately, the decline in the numbers of small cetaceans hunted off Taiji is following the same pattern as has been seen in commercial whaling with the most valuable species depleted first, followed by less desirable species.”

Kasuya & Brownell, 2023

Small cetaceans are hunted with nets, spears, hand harpoons, rifles, machetes or in drive hunts. Drive hunts are used to herd, capture and kill groups of small cetaceans, a practice used in the **Faroe Islands** (see Case Study 7) and common in **Japan** (see Fig. 10). During the Japanese hunts, dolphins are subjected to loud noises created by the fishers banging hammers on metal poles. This confuses the dolphins and they are subsequently herded into the bay either for slaughter, live capture or sometimes, release. Vail *et al.* (2019) highlighted that the prolonged and strenuous chase, as well as the use of sound barriers to enable their herding, capture, and restraint, causes dolphins acute stress and injuries that render these hunts inherently inhumane. They also allude to ‘capture myopathy’, whereupon even dolphins that are released are likely to suffer life-threatening trauma.

Shortly after the Oscar-winning documentary “The Cove” shone a global spotlight on the Japanese town of Taiji, a new killing method was developed to prevent blood loss in the water. In place since 2010, this method involves cutting the spinal cord by repeated insertion of a sharp metal rod into the dolphin’s blow-

hole and subsequent ‘plugging’ of the wound. It is alleged that this reduces time to death (Gilhooly, 2013) however, veterinarian and behavioural analysis of available video documentation indicates that death is not immediate and instead paraplegia (paralysis of the body) is induced with death only occurring as a result of trauma and gradual blood loss (Butterworth *et al.*, 2017, 2013). The authors state that this killing method would not be tolerated or permitted in regulated slaughterhouses in the developed world as it does not result in “immediate insensibility”.

Concerns on hunting methods, the number and fate of ‘struck and lost’ individuals and lack of time to death data have repeatedly been raised when it comes to small cetacean hunts in **Greenland**. The number of individuals struck and lost during hunts in Greenland varies depending on region, hunting method and hunter experience, as well as species behaviour, time of year and weather conditions (Dolman *et al.*, in prep.). The average annual struck and lost rate for narwhal is an additional 15-20 % of the number of landed animals (Garde *et al.*, 2019) whilst for orcas it has been reported to be as high as 50 % (Ugarte *et al.*, 2020).

Atlantic white-sided and white-beaked dolphins are shot by rifle and the struck-and-lost rate may be extremely high (NAMMCO, 2022a). The number of individuals 'struck and lost' in hunts around the world are not accounted for and therefore the total number of deaths from hunting is likely to be significantly higher.

Despite a cessation in hunting of beluga in Cook Inlet, **Canada**, the cumulative impact of past hunting pressure and present anthropogenic activities means the population is not recovering and continues to decline. The southwestern Greenland stock of beluga was extirpated as a direct result of hunting and several other narwhal populations in **Southeast Greenland** are quite likely to be next (Ugarte *et al.*, 2020).

Unfortunately, elsewhere in the world, several targeted populations of dolphins and small whales have already been decimated. The disappearance of melon-headed whales around the islands of Malaita in the **Solomon Islands** is suspected to be the result of drive-hunting (Reeves *et al.*, 1999), with a similar impact on short-finned pilot whales and orcas in **St Vincent & the Grenadines** (Fielding & Kiszka, 2021). Atlantic humpback dolphins have faced persecution along the coast of West Africa and are now listed as Critically Endange-

red (Minton *et al.*, 2022; Collins *et al.*, 2017) and clymene dolphins in the region are on the brink of population collapse (Van Waerebeek *et al.*, 2019) (see Chapter 3).

Compounding the threat, hunters are selective in the individuals they target (Kasuya & Brownell, 2023), with the largest and hence oldest preferred. Hunters in Greenland for example, are known to favour male narwhal over females, given their valuable tusks and in Canada, hunters are required to select for males and to avoid killing females and young whales (NAMMCO, 2017). Since several narwhal populations in Greenland are small and declining in number, unsustainable hunting is putting the species at risk of local extirpation (Heide-Jørgensen *et al.*, 2020). Besides the potentially disruptive effects on reproduction, takes of older individuals may have wider implications (Dolman & Hodgins, 2023), including a loss of cultural knowledge (Wade *et al.*, 2012) which may have long-term implications.

Given the enormity of welfare and conservation implications related to hunts which are considered legal and in places, managed, the amount of suffering endured by individual whales and dolphins in illegal hunts around the world is of grave concern.



Fig. 10: Dolphin drive hunt in Taiji, Japan © Dolphin Project

Case Study 7: Faroe Islands

Over the last decade, Faroese whalers have killed an average of 685 pilot whales and 114 dolphins a year (see Fig. 11 & 12). When a pod of whales or dolphins is spotted, a 'grind' is called. By corralling and confusing them with their boats, hunters drive the pod, sometimes over long distances, into designated 'killing' bays. Once in shallow water, a round hook is driven into the blowhole and the animals are pulled ashore one by one (Mamzer, 2021). Animals are then either killed with a knife or a spinal lance thrust in behind the blowhole, with multiple stabbings not uncommon. Despite the intent, the animals do not lose consciousness, nor do they die because of cutting the spinal cord, but as a result of gradual blood loss (AWI *et al.*, 2023a; Mamzer 2021). It was only as recently as 2015, that hunters needed to be certified – which is granted after watching a training video before taking part in a hunt (Ministry of Fisheries 2022).

The cruelty of Faroese whale and dolphin hunts have been criticised by veterinarians and NGOs for many years (e.g. Butterworth, 2023; Simmonds *et al.*, 2021; EIA, 1986); however, the September 2021 hunt of more than 1400 Atlantic white-sided dolphins caused an international outcry. The European Union and its Member States that are Parties to the International Convention for the Regulation of Whaling (ICRW), except Denmark, publicly condemned the cruelty of the hunt and “called upon the Faroese Government to immediately stop the outdated practice of whale and dolphin hunting” (IWC/CCG/1488, 2021). Concerns were also raised by the following IWC SC68D meeting, noting the lack of a full assessment of the species’ status (IWC SC, 2022), and at the IWC 68 meeting (IWC, 2022). The response of the Faroese Government (2022) was not to ban dolphin hunts (as it was favoured by the Faroese people, with 69 % opposing those hunts (Gallup Poll, 2022)) but to set an annual catch limit (2022-2025) of 500 Atlantic white-sided dolphins (see Chapter 7).

While the grinds have been conducted for centuries, Faroese society has changed significantly, and whale meat is no longer a vital part of the Faroese diet (Mamzer, 2021). Recent polls showed that 71 % of Faroese people never or rarely participate in hunts or have not done so for over 10 years (AWI *et al.*, 2023a). The Faroese health authority regularly issues warnings to no longer use pilot whale meat for human consumption due to its high levels of contaminants (see Chapter 12). Nevertheless, the hunting of small cetaceans continues unabated.

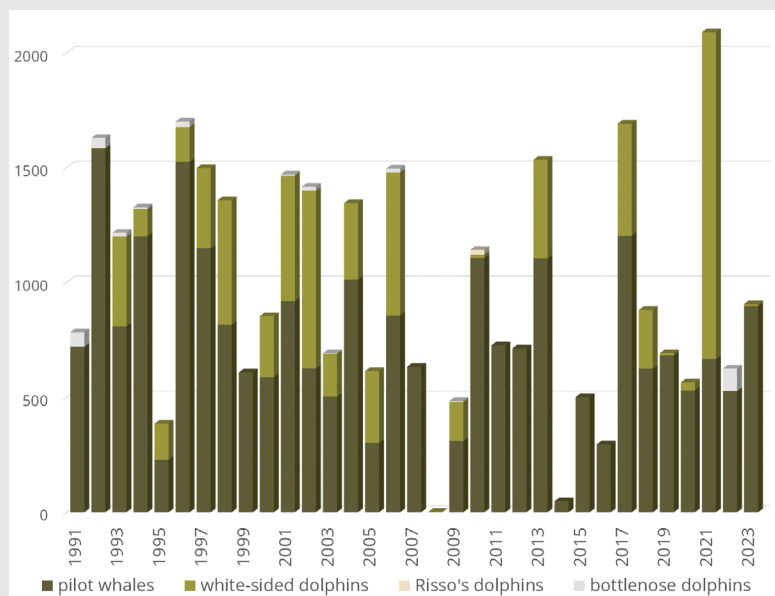


Fig. 11: Small cetaceans killed in the Faroe Islands



Fig. 12: Faroe Islands © Erik Christensen, CC 3.0



9. Trade in Small Cetacean Products

With all small cetaceans listed at least in CITES Appendix II, their international trade is managed and limited to a small number of species, and in the case of meat/blubber, to a specific number of countries. For example, small cetacean meat is traded between the **Faroe Islands, Greenland, Denmark, Norway and Iceland**. Whilst narwhals are traditionally hunted in Canada and Greenland as food, the commercial value of ivory remains an incentive for targeting large, tusk-bearing males (Reeves & Lee, 2020) (see Case Study 8). Small cetacean derivatives such as narwhal tusks are meant to be strictly controlled, with exporting countries ensuring the take is not detrimental to the population (by the provision of a Non-Detriment Finding, NDF). The 2023 CITES NDF evaluation for marine mammals in Greenland concluded that the catch of four stocks of narwhal (Inglefield Bredning, Melville Bay, Ittoqqortoormiit and Tasiilaq), beluga whale in East Greenland and harbour porpoise, exceeded sustainable levels. Hence, and in the absence of scientific assessments for most other species regarding the sustainability of the catch, “an NDF declaration cannot be made” for any small cetacean species (GINR, 2023) (see Case Study 8). The EU has treated all cetaceans as Appendix I species since 1984, meaning that all commercial trade is prohibited; yet products can be imported under the ‘household and personal effects’ exemption, which is used to great effect with the importation of over 200 narwhal

tusks, 61 teeth, eight skulls and four carvings within the period 2012-2021 (UNEP-WCMC, 2023a). Elsewhere, Hoerner (2021) noted that dolphin meat is imported to **St. Lucia** from **St. Vincent and the Grenadines** (SVG) (see also Chapter 12) where products from small cetaceans are widely for sale (McCormack *et al.*, 2020).

Yet trade can also be on local or national scale, for example when traded as bait, food, or as medicine or jewellery. A flourishing national trade exists in several countries, e.g. Ghana, Peru and Sri Lanka (see Chapters 3, 4 and 11) and is not covered by CITES obligations, although may be regulated or prohibited by national legislation. In Greenland, the main commercial product from narwhal hunting is the mattak or the skin of the whales, which is primarily sold to consumers in Southwest Greenland with the retail price per kilo having increased exponentially from 50 Dkr/kg in 1982 to 499 Dkr/kg in 2019 (Heide-Jørgensen, 2021). Wholesale prices for dolphin meat in **Ghana** are 55-545 Euros, depending on the dolphins’ size, with prices in the secondary markets considerably higher (van Waerebeek *et al.*, 2019), whilst in **Martinique**, where hunting of dolphins is taking place in the north of the country, their meat is sold for approximately 30 Euros per kg. (Jeffrey Bernus, *pers. comm.* 2023). In Asia, there is growing commercial trade in marine mammal products (Porter and Lai, 2017), despite it being illegal in most countries.

Case Study 8: Narwhal

One of the main concerns for narwhal populations is overharvesting in some parts of their range (NAMMCO, 2017); however, there is currently a flourishing international trade in narwhal products, risking the potential extirpation of local populations. Although no one disputes that obtaining an important local food source and maintaining cultural traditions are the major drivers of narwhal hunting, the commercial value of narwhal products is a major contributing factor (Reeves & Lee, 2020). This utilisation is part of an extinction spiral where the increasing economic incentives drives the hunting, and the increasing demand for the hunting product leads to increasing prices. The costs may increase simultaneously but they are partly compensated by government subsidies, and therefore the harvest is still increasing which leads to reduced abundance and range contractions (Heide-Jørgensen, 2021).

The international trade in wild-sourced narwhal tusks from Canada has increased substantially over the last decades, from 94 tusks in 2002 to 551 tusks in 2021, with over half of all narwhal products exported to **China**, including almost three-quarters of all tusks between 2012-2021 (UNEP-WCMC, 2023a). This growth in trade indicates an increasing demand, possibly linked to the closure of China's domestic elephant ivory market in 2017 and/or to traditional medicine (AWI *et al.*, 2023b). A significant conservation concern is that this increasing trade is fulfilled via the harvest of populations that may have declined or are also subject to hunting in Greenland. International trade originating in Greenland saw a significant increase in 2021, with 69 teeth and two tusks exported in 2021 (compared to just two teeth in 2019) (AWI *et al.*, 2023b).

In 2022, a study found that the combined impact of overharvesting, a declining proportion of females, an overrepresentation of large males and a lack of calves and juveniles was having detrimental implications for the small narwhal population found off the south-east of Greenland (Garde *et al.*, 2022). The long-term impact of bias-based hunting on narwhal populations has not yet been examined, but other examples of sex-biased hunting indicate significant changes in terms of social structure, reproduction, gene pools and/or survival rates of offspring (Frank *et al.*, 2017; Rodríguez-Munoz *et al.*, 2015; Freeman *et al.*, 2014; Milner *et al.*, 2007). Such aspects, especially in combination with other threats such as the climate crisis and marine pollution in the Arctic region, are largely ignored.

In 2022, the NAMMCO SC strongly reiterated its management advice to reduce the hunt of narwhals to zero in all three management areas in Southeast Greenland and stressed the urgency for immediate management action to ensure the future presence of narwhal in the area (NAMMCO, 2022a). This advice was ignored and a quota of 50 individuals was granted (see also Chapter 7). At the 32nd CITES Animals Committee meeting in June 2023, concerns were raised over the level of international trade in wild-sourced narwhal products from Canada and Greenland due to the declining conservation status of the species, the increase of narwhal derivatives exported from Canada and the resumption of trade from Greenland (AWI *et al.*, 2023b).

Close monitoring of tusk exports to countries such as China should be urgently implemented and exporting countries required to provide an NDF for the population from where the individual was sourced. If not, as a result of cumulative impacts including climate change and other anthropogenic activities, narwhal populations will continue to decline with some populations in East Greenland facing imminent local extirpation.





10. Trade in Live Animals

Around 3,600 small cetaceans are held in captivity around the world (WDC, 2023; WAP, 2019; Lott & Williamson, 2017). In view of the extremely low number of surviving offspring and the risk of inbreeding, the demand by dolphinariums is still mostly satisfied with wild-caught animals. Between 2000-2021, countries around the world reported the importation of 4,029 live cetaceans – of which at least 53 % were caught from the wild (UNEP-WCMC, 2023b). **Japan** is by far the world's largest supplier (see Case Study 9), followed by **Russia**. For decades, was the only supplier of wild-caught beluga (390 exported between 2000-2021) and orca; however, exports ceased in 2021 after a Russian export company was forced to close down after it made international headlines in 2019 as a “whale jail”, due to its exceptionally poor husbandry conditions for 97 young beluga and orca (Daly, 2019; AFP, 2021). Due to campaigning efforts by local activists and recent legislative changes (see Chapter 11), it is hoped that these hunts will not be allowed to resume. Other source countries have also stopped their exports of live dolphins in recent years, such as **Honduras** and **Indonesia**. Others, however, still supply the international dolphinarium industry, e.g. Cuba (UNEP WCMC, 2023b). The impact of these hunts is of serious concern, for example in the **Solomon Islands**, around the islands of Malaita, the resident populations of Indo-Pacific bottlenose dolphins have been heavily depleted because of the

trade (Oremus *et al.*, 2013) (see Chapter 8). Furthermore, according to the CITES trade database, in 2019, **Ghana** exported 50 live bottlenose dolphins to **China** (UNEP-WCMC, 2023b); however, there is conflicting information as to whether the permits were fulfilled, and dolphins ever caught.

Despite a Resolution at CMS (UNEP/CMS/Resolution 11.22) requesting countries that have not already done so to develop and implement national legislation prohibiting the live capture of cetaceans from the wild for commercial purposes, and to adopt stricter measures in line with CITES Article XIV with regard to the import and international transit of live cetaceans for commercial purposes, the majority of member countries either have not changed their legislation and/or continue to allow the importation of dolphins captured in the wild.

The IWC repeatedly advises that populations of small cetaceans should not be subject to removals where such removals have not been shown to be sustainable and the IUCN recognizes that live capture can be a serious threat to local cetacean populations, because the removal of live cetaceans from the wild, for captive display and/or research, is equivalent to incidental or deliberate killing, since the animals brought into captivity or killed during capture operations are no longer available to help maintain their natural populations.

Case Study 9: Japan

Within the period 2000-2021, Japan caught a staggering 182,850 small cetaceans (including 150,657 Dall's porpoise), with the vast majority of them having been killed. Yet according to official statistics of the Japanese Ministry of Agriculture, Forestry and Fisheries (MAFF, 2001-2022) the hunting of small cetaceans in Japan fell from 18,748 individuals in 2000, to 1,172 individuals in 2021, a decrease of almost 94 % (see Fig. 13a). **Recent findings suggest that several populations of dolphin in Japanese coastal waters, including the pan-tropical spotted, striped and bottlenose dolphins have been depleted as a direct result of decades of intense hunting** (Jefferson & Richlen, 2019), and recent declines in catch levels of Risso's dolphins in Taiji is signalling the start of a population decline in this species (Kasuya & Brownell 2023). **Over the same period, however, the export of live dolphins to meet the demand of the international dolphinarium industry has sharply increased**, with a temporary, obviously Corona-pandemic related drop in 2020 (UNEP-WCMC, 2023b; see Fig. 13b).

The increasing role of dolphinariums as the driving force of dolphin hunts in Japan was evidenced over two decades ago (Vail & Risch, 2006; Duits, 2005), yet with global market prices of USD 40,000-200,000 for a live dolphin, depending on its training status (McCurry, 2017; Zimmermann, 2014), the industry has expanded significantly. **Since 2000, Japan has reported the export of over 1,550 small cetaceans, 77% of which are common bottlenose dolphins** (UNEP WCMC, 2023b). **China** imported the vast majority (991 animals), followed by **Russia** (73), **Ukraine** (56), **Thailand** (51) and **South Korea** (43). As domestic demand for dolphin meat has fallen sharply, this international trade in live dolphins is keeping the drive hunts economically alive.

Concerns have been raised regarding the cryptic mortality related to the drive hunts for capturing live dolphins, due to stress, injuries and abortions (Kasuya & Brownell, 2023). In recognition of the cruelty of the drive hunts, the World Association of Zoos and Aquariums (WAZA) banned the sale and transfer of dolphins from Taiji in May 2015. Shortly afterwards, the Japanese Association of Zoos and Aquariums (JAZA) followed suit (McCurry, 2015). As a result of public pressure, South Korea stopped imports of live dolphins from Taiji in 2018 (IMMP, 2018) and several other countries have also introduced legislation to prohibit the import of wild-caught dolphins. However, mainly due to the booming aqua parks in China exports of live dolphins from Japan are still flourishing.

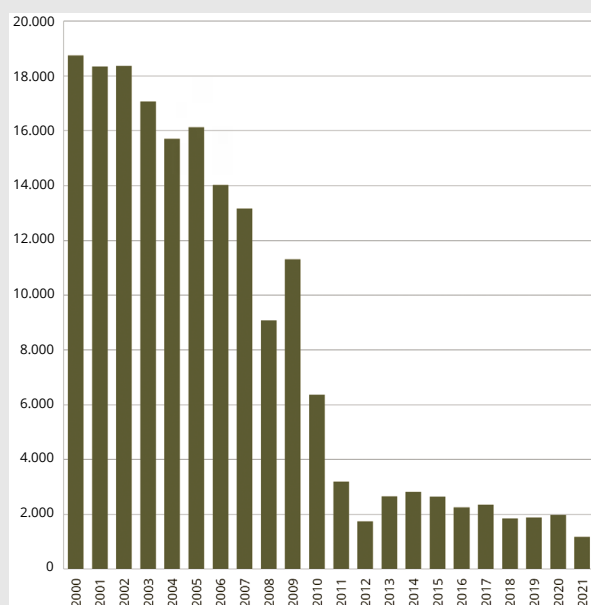


Fig. 13a: Hunting of small cetaceans in Japan 2000-2021 (according to MAFF 2002-2022)

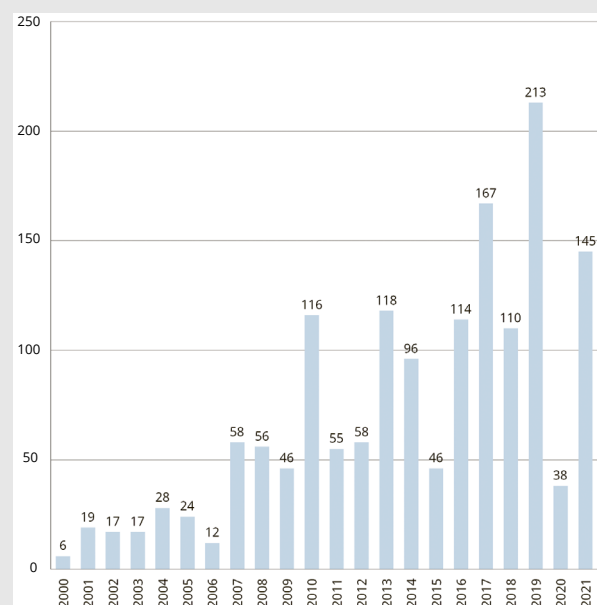


Fig. 13b: Japan's export of live dolphins 2000-2021 (according to UNEP WCMC CITES Trade Database 2023)



11. Key Role of Legislation & Enforcement

The hunting of small cetaceans is illegal in most countries around the world. Yet, even in countries where hunting is permitted (and sometimes where quotas are in place), illegal hunts have been documented. In **Greenland** in 2023, there was an illegal kill of 20 narwhals resulting in the arrest of the hunters (Bertelsen, 2023), whilst in **Russia**, there is likely to be illegal killing of belugas for human consumption or dog food by hunters without a licence (NAMMCO, 2017). In the **Faroe Islands** only five species of small cetacean are permitted to be hunted; however, in 2009 and 2010, three and 21 Risso's dolphins respectively, were taken in illegal drive hunts, according to whaling.fo (2023).

In countries where legislation already exists, for conservation efforts to be effective, legislation must be 'fit for purpose' and enforcement increased, rapid and effective. There are, however, frequent concerns regarding potential 'loopholes' or the effectiveness of deterrents. In several countries, for example **Togo**, national legislation is inconsistent with active hunting prohibited but the use of stranded or bycaught dolphins legal (Segniagbeto *et al.*, 2019) whilst in **Myanmar**, fines for violations are comparatively small (USD 10) and enforcement varies depending on location. Bordoloi & Saharia (2021) note that the high market value of dolphin oil is fuelling the hunting of dolphins

and that the killing areas are so remote that legitimate action against such crime becomes impossible.

Small cetaceans, falsely advertised as whale meat, are sometimes sold for human consumption. In **South Korea**, narrow-ridged finless porpoises and common dolphins comprised a significant proportion of 'whale' meat sales (see Case Study 10). Market surveys and forensic genetics, however, have been shown to improve documentation of the exploitation of small cetaceans (Baker, 2008), as well as highlighting concerns for species conservation (Oremus *et al.*, 2015) and human health (Endo *et al.*, 2005, 2003). In **Taiwan**, recent advances in forensic surveillance have curtailed the illegal marketing of small cetaceans (Ingram *et al.*, 2022 and literature therein).

Local community awareness of relevant legislation is of utmost importance. In **Pakistan**, the adoption of modified fishing gear, soft releases and increased awareness amongst fishers has led to fewer dolphins killed and used at sea (Kiszka *et al.*, 2021; Moazzam & Nawaz, 2017). Nevertheless, in rivers, the capture of dolphins remains high due to gaps between fishery laws and wildlife conservation laws (Kelkar & Dey, 2020). Kolipakam *et al.* (2020) noted that the laws in India provide adequate legal mechanisms to prosecute offenders, but their implementation, especially in riverine systems, remains challenging. In **India**, ten fishers were arrested

in March 2023 for poaching 22 dolphins in Porbandar, Gujarat, to be used as shark bait (Khakhariya, 2023). Four more were arrested in July 2023, in Yumuna, Uttar Pradesh, after evidence was circulated on social media showing them illegally catching, cooking and eating a river dolphin (Press Trust of India, 2023). In 2016, **Sri Lanka's** Minister of Fisheries directed the country's Navy and Coast Guard to take legal action against any fishers who are caught hunting and killing cetaceans and to immediately arrest those selling the product around the markets, with their fishing permit being revoked (Marine Connection, 2016). In the **Philippines**, two fishers were arrested and charged in January 2019, after killing and filleting a spinner dolphin in Bohol province (Udthohan, 2019). Cetaceans are protected under the Fisheries Code of 1998, Fisheries Administrative Order 208, therefore if proven guilty, the suspects would face imprisonment of 12 to 20 years or a fine of P120,000 (~USD 1,450). Cases like these, which make headlines and sometimes even go viral, thanks to social media, create awareness and have a deterrent effect.

Efforts in **Madagascar** to reduce hunting of dolphins by creating local laws, education, and the development of alternative livelihoods through local ecotourism were very successful in the Anakao community but failed in the community of Befandefa (Andrianarivelo *et al.*, 2019). Although wildlife hunting has been banned in **Brazil** since 1967, there is a clear contradiction between legislation and practice, since hunting continues to be a resource widely exploited by rural populations in Amazonia (Pimenta *et al.*, 2018). The implementation of actions proposed to regulate or prohibit the trade in piracatinga and thereby reduce direct takes of Amazon river dolphins (see Chapter 5), has not been effective due to factors such as a lack of transboundary unified management of the fishery resource, a reduced institutional capacity to control extensive areas in transboundary zones, high levels of economic vulnerability and low levels of education within the local communities facilitating their involvement in the illegal trade of wild species (Mosquerra-Guerra *et al.*, 2022).

National legislation is paramount for the protection and conservation of small cetaceans and governments must act in accordance with international conservation management recommendations. Sadly, in some countries, political will is lacking. For example, in 2017 after fishers killed two orca in the presence of a whale-watching group, the government of **St. Vincent and the Grenadines** promised to pass legislation outlawing their killing. Yet, this legislation never materialised and orcas are still taken today in direct contraven-

tion with the Cartagena Convention and the related Specially Protected Areas and Wildlife (SPA) Protocol, signed by St. Vincent and the Grenadines in 1990 and 1991, respectively (Borobia *et al.*, 2023; UNEP, 2023). In **Indonesia**, protection gaps still exist, rendering conservation efforts less effective and Sahri *et al.* (2020) argue that an adequate and appropriate legal framework and institutional arrangements will ameliorate and help strengthen marine mammal governance in Indonesia. They suggest some urgent-yet-lacking policies that should be added to the current regulations, including on traditional whale hunting.

One example of where appropriate legislation will be critical in the protection and conservation of small cetaceans is in **Russia**. After many years of campaigning to end the live capture of orca and beluga for commercial purposes, and the negative publicity of the 'whale jail' incident in 2019 when 97 young belugas and orcas were kept in exceptionally poor conditions (see Fig. 14), changes were made to the Fisheries Law in 2023 and will come into force on the 1st September 2024. Amended legislation bans the 'industrial and coastal fishing of cetaceans and the capture for educational and cultural purposes of marine mammals', although some loopholes remain. After 'whale jail', orcas were added to the Federal Endangered Species Red book and should technically receive additional protection. Changes to legislation will not impact Indigenous hunting (Oxana Fedorova, *pers. comm.* 2023). Another example is in **Gabon**, where on November 2nd, 2023, the government issued a Decree whereby all cetaceans have been added to the list of totally protected species, meaning they cannot be captured or hunted.



Fig. 14: Whale jail, Russia © Masha Netrebenko

Case Study 10: South Korea



Fig. 15: Finless porpoise © SEAMAR

In South Korea, the direct killing of cetaceans is prohibited; however, individuals shown to have died by stranding or in bycatch are allowed to be traded. Concerningly, molecular species identification revealed that narrow-ridged finless porpoises and common dolphins comprised a significant proportion of 'whale' meat sales; however, as finless porpoise meat is considered low quality and not at all delicious (Sun-ae, 2021), it is thought that this exploitation and trade persists because of the species potential economic value as disguised minke whale meat (Lee *et al.*, 2019).

Consumer demand therefore is clearly a factor that drives illegal whaling (Miyeon *et al.*, 2020; Tatar & Jung 2018) and the impact is thought to be having devastating consequences on small cetaceans, **for example, the population of finless porpoises dropped from an estimated 36,000 to 13,000 individuals between 2004 and 2011, with an additional 7,869 individuals killed between 2011 and 2016 (Miyeon *et al.*, 2020).** Subsequently, Lee *et al.* (2019) went on to estimate the number taken in 2018 and **with numbers found to be between 5,000 and 7,000 individuals, it is suggested that the local population of finless porpoises may have been irreversibly depleted.** In addition to this, between 2015 and 2018, more than 1,000 common dolphins were traded through designated cooperative markets (Lim, 2018). In view of this threat Miyeon *et al.* (2020) recommend banning the sale of all cetacean meat to eliminate any sales of disguised illegal bycatch of species that cannot be legally hunted.

The country has seen a recent tightening of regulations on the sale of whales and other cetaceans illegally hunted and captured in their waters. Furthermore, the public's growing awareness of conservation concerns and animal rights has seen positive developments regarding the future for local small cetacean populations. For example, monitoring of Indo-Pacific bottlenose dolphins off Jeju Island began in 2007 but it was not long before it was noticed that the population was in sharp decline, mainly because of poaching and incidental catch. However, **with increased awareness and enforcement (resulting in several suspects facing legal punishment), not only has the atmosphere shifted in Jeju's fishing communities – with fishers actively freeing dolphins incidentally captured in their nets – but the number of dolphins has also increased (Korea Bizwire, 2016).** Unfortunately, these positive developments in South Korea are tainted with the emerging news that dolphins are taken in significant numbers by around 220 vessels operating within their Distant Water Fleet (see Case Study 4).

12. Food Security and Health Concerns

It is well documented that small cetaceans, especially those in coastal areas, can accumulate high levels of heavy metals, chlorinated organic compounds, and other toxic substances in their bodies (e.g. Altherr & Lüber, 2012). The negative impact to human health from consuming cetacean meat high in toxins has been repeatedly voiced. At the NAMMCO Conference “Marine Mammals – a Sustainable Food Resource” in the Faroes Islands in October 2022 Dr Pál Weihe, Chief Medical Officer for Faroese Public Health, summarised the consequences of mercury contamination including neurotoxic effects in children impacting their development, suggesting that such negative effects are permanent. He also stood by his recommendation from 2008 that pilot whales should no longer be used for human consumption. It is further accepted by consensus within IWC (Resolution 2012-1), that as a result of having cetacean products in their diet, some communities may face chronic and long-term health problems.

In its guidelines, **Japan's** health ministry advises that fish and seafood with levels above 0.4 ppm for total mercury and 0.3 ppm for methylmercury are unsafe for human consumption. Despite this, over the years, a number of studies and investigations have found potentially toxic levels of both mercury and methylmercury in dolphin meat for sale (Endo *et al.*, 2005, 2003; EIA, 2015, 2013). Tests conducted by Action For Dolphins in 2020 and 2021 revealed mercury levels in dolphin meat between 12 and 25 times the regulatory limit whilst in 2023, one sample bought in the country – a portion of Risso's dolphin offal – exceeded the government-set regulatory limit of mercury by up to 265 times (AFD, 2023). Sonne *et al.* (2019) recommended the consumption of no more than a few grammes of dolphin meat a week, noting that the poisonous cocktail of contaminants pose a significant potential threat to Japanese public health. These findings should be a wake-up call to what is happening elsewhere in the world, but is as yet, mostly undocumented. Raising awareness on high levels of heavy metal in meat of cetaceans would help to reduce demand and could benefit both local communities and marine conservation (Rothamel *et al.*, 2021).

However, toxins are not the only concern. Infectious diseases, such as brucellosis, toxoplasmosis and herpesvirus, may pose a transmission threat to humans via

contact or ingestion (Waltzek *et al.*, 2012; Van Bresse *et al.*, 2009; IWC SC/69A/E/WP/05) with these zoonoses ranging in severity from localised skin infections to life-threatening diseases (Reeve-Arnold *et al.*, 2020). In the **USA**, an outbreak of botulism type E affected eight of 14 Alaska natives who ate muktuk (pieces of whale skin with blubber) taken from a dead whale found in the remote Alaska Bering Sea (McLaughlin *et al.*, 2004). In **Madagascar**, Vezo fishers report eating dolphin meat without hesitation, despite the common after effect of inducing gastrointestinal discomfort or diarrhoea (Cerchio *et al.*, 2015). Three novel coronaviruses have recently been isolated in marine mammals causing further concern regarding the transmission of potential zoonoses to those who come into contact with them (Reeve-Arnold *et al.*, 2020). Due to the zoonotic potential of certain bacteria/diseases, the finding of *Erysipelothrix* species in stranded bottlenose dolphins in **Brazil** that had evidence of being used for bait, Sacristan *et al.* (2022) advocated for active public health policies to inform the public about the health threats associated with marine mammal manipulation and consumption.

Whether deliberately hunted, bycaught or scavenged from the shore, meat of small cetaceans can present a significant risk to human health, particularly as sick or compromised individuals may be easier to hunt or become stranded. The handling and consumption of such meat may transmit parasites, bacteria or viruses and may cause serious diseases.



Fig. 16: Butchery of a dolphin, Solomon Islands

Many coastal communities are turning to the marine environment for their protein needs. Although the IWC has already adopted resolutions highlighting the negative human health impacts caused by the consumption of cetacean products, several countries in the Caribbean and West Africa were behind the tabling of a Resolution (IWC/66/12) on food security, in which they called for the consumption of marine mammals to be deemed a 'protein priority'. However, the Resolution was not passed.

Governments have a duty of care towards their citizens and should do everything in their national and regional power to address the primary causes of threats to food security in their marine environment, including IUU (illegal, unreported and unregulated) fishing, destructive fishing practices and bycatch, lack of adequate laws and deficiencies in enforcement.

Case Study 11: Role in Ecosystem Functioning

The importance of whales in maintaining healthy oceans – including healthy fish stocks – has received a lot of attention in recent years and whilst the 'whale pump', 'whale fall' and 'great whale conveyor belt' concepts were originally conceived for large whales (see Pearson *et al.*, 2022 and literature within; Pershing *et al.*, 2010), small cetaceans are also known to contribute to nutrient cycling with dolphins having long been considered 'nutrient vectors' (Kiszka *et al.*, 2022). Unfortunately, there has been minimal research (and quantification) into this to date; however, **spinner dolphins for example, were found to play a significant role in making pelagic energy and nutrients available to coral reefs with their contributions sustaining oceanic atoll productivity** (Letessier *et al.*, 2022). Gilbert *et al.* (2023) provided a quantitative estimation of nutrients released by cetaceans at the community level and found that the released nutrient cocktails vary geographically, driven by the composition of cetacean communities. Small cetaceans are also found to contribute to nutrient movements and recycling in the oceanic Gulf of Mexico and may provide one of the few allochthonous sources of nutrients for primary producers in oligotrophic ecosystems (Woodstock *et al.*, 2023).

The contributions of small cetaceans were found to exceed those of large whales in some areas and the authors concluded that for an equivalent total biomass, a population of small cetaceans would release more nutrients than a population of whales (Gilbert *et al.*, 2023). Due to low produc-



Fig. 17: Ecosystem coral reef © Andrea Izzotti

tivity in many tropical and subtropical waters small cetaceans are the only cetacean species involved in nutrient biological cycling. It is considered that a range of species could significantly affect nutrient dynamics, particularly when small cetaceans mediate the translocation of nutrients from productive foraging to nutrient-poor habitats, and therefore link spatially distinct ecosystems (Kiszka *et al.*, 2022). **The continued removal of small cetaceans from ecosystems in which they play a significant role will have deleterious effects for other marine flora and fauna, upon which the very health of our ocean relies.**

Case Study 12: Caribbean Region

The unregulated small cetacean hunt out of Barrouallie, **St. Vincent and the Grenadines** (SVG), is thought to be the largest hunt of cetaceans in the wider Caribbean. As it is unregulated, there are no official records of small cetacean catches; however, estimates have been attempted by several researchers including Fielding & Kiszka (2021), who estimate that at least 13,856 small cetaceans were killed between 1949 and 2017, including 5,896 short-finned pilot whales, 109 orcas, and 7,851 other small cetaceans (mainly pantropical spotted, spinner and Fraser's dolphins). The authors however, emphasised that records are largely incomplete. For example, between 2007-2017, a number of hunters were active, but records were only provided by a single whaler (3,058 small cetaceans; 766 short-finned pilot whales, 29 orca and 2,263 other species), meaning that total catches are undoubtedly significantly higher. Accordingly, while older figures may be even more inaccurate, these recent figures may indicate an increase in hunts. All whalers interviewed by Fielding & Kiszka (2021) noted a decline in the presence of pilot whales and therefore an increasing need to catch other species of small cetacean. Iñíguez-Bessegua *et al.* (2021) monitored landing sites in Barrouallie over 2,406 days between 2014 and 2020 and determined that 603 small cetaceans from six species were landed. Again, the dataset was incomplete, and numbers are considered to be a low estimate.



Fig. 18: Spinner dolphins © Serge Vero

Products from small cetaceans are widely for sale throughout SVG, although a study by McCormack *et al.* (2020) found all liver samples and the majority of kidney, muscle, and blubber samples from dolphins hunted in SVG, exceeded the FAO/WHO human consumption advisory level for mercury in fish of $> 1,2 \mu\text{g/g}$ (FAO, 2018). Based on their estimations, consuming only a small amount of muscle a week would exceed the provisional tolerable weekly intake. The mean kidney and muscle concentrations reported in orcas in this study were 41 times higher than in Japan. Given the high levels of contamination and the frequency at which these tissues are consumed, the authors recommended further investigation to avert a human health crisis; however, it was a decade ago that Fielding & Evans (2014) raised similar concerns regarding mercury levels and nothing has changed. Even worse, this contaminated meat is exported to neighbouring islands (Hoerner, 2021).

In **St. Lucia**, hunts for pilot whales and other small cetaceans are known to occur in the south of the country (Hoerner, 2021). Hunts were thought to be sporadic and opportunistic as the citizens of St. Lucia reported that they relied predominantly on the hunting activity within SVG to obtain their cetacean meat (see Chapter 9), but since 2019, hunts are thought to have increased again with hunts in local waters now taking place (Hoerner, 2021). Recent evidence points to some hunting taking place within a national marine reserve, which itself is in a Marine Protected Area (MPA), within the Agoa Whale Sanctuary (Anon., *pers. comm.* 2023). Although a signatory of the Cartagena Convention and the related Specially Protected Areas and Wildlife (SPAW) Protocol (UNEP, 2023), as with SVG, St. Lucia has failed to implement national legislation on marine mammal conservation and national action plans for marine mammals or fisheries interactions (Borobia *et al.*, 2023).

Dominica recently made the headlines by creating the first MPA for sperm whales (AP, 2023); however, a dolphin head was found for sale on a market in 2022 and as hunting is legal, it is likely that the hunting of small cetaceans is on-going, but the country is working on regulations to stop this.



13. Conclusions

Compared to the original 2018 report, we found that both the drivers for these hunts and the key players are changing. We have documented the widespread decline in traditionally targeted species with a transition to new species, as well as some hunters having to travel longer distances to find their quarry. We also note the consumption of dolphin meat in regions where this has not been a traditional food.

Unlike the hunting of great whales, the exploitation of small cetaceans is not regulated by any international convention or intergovernmental agency (Baker & Steel, 2018). For this reason, the species identity and magnitude of exploitation are often poorly documented and often, only anecdotal in nature, especially in developing countries (Leeney *et al.*, 2015; Gravena *et al.*, 2008). Even in countries with a history of eating cetaceans, the documentation of species sold for human consumption is often incomplete (Baker *et al.*, 2008); hence our findings, including numbers in Table 1, are likely to be underestimated. Nevertheless, **these findings are based on the most recently available information, showing both orders of magnitude and trends, and they are cause for concern that global dolphin hunting has increased significantly in recent years.**

Food safety, nutrition and food security are inextricably linked. However, small cetaceans are apex predators and due to their long life span and trop-

hic position, bioaccumulate high concentrations of contaminants including mercury, making them an important sentinel species for ecosystem and public health (Reif *et al.*, 2015). Given the dangerous levels of toxins known to accumulate in some cetaceans and growing concerns over zoonoses in wildlife, cetacean meat would be an irresponsible food choice that could represent a threat to human health and well-being (Altherr & Lüber, 2012). **Whilst acknowledging that food security is of global concern, cetaceans will not resolve this problem; it is better addressed by systemic solutions that focus on the wide range of unsustainable practices in marine fisheries that cause food insecurity, including overfishing, IUU fishing, destructive fishing techniques, lack of adequate laws, failures of enforcement and corruption.**

Human consumption of marine mammals and their use as bait in commercial fisheries is on the rise around the world, including many regions that have little or no history of directed hunting of cetaceans (Campbell *et al.*, 2020; Baker & Steel, 2018; Mintzer *et al.*, 2018). Commercial whaling was significantly reduced by the IWC's Moratorium, which came into force in 1986, yet in contrast, ongoing or even expanding large-scale exploitation of small cetaceans over decades remains largely overlooked and unregulated at an international level. These hunts give reason for serious

concerns, especially in combination with increasing commercialisation of small cetacean products, a high uncertainty due to non- and under-reporting, a lack of population data and the documented decline of several species, such as the Atlantic humpback dolphin or the Amazon river dolphin, which are on the brink of extinction as a direct result of their exploitation. For instance, decreases in dolphin hunts in Malaysia and Kiribati were not due to stricter regulations but to significantly declining dolphin populations (Deslie *et al.*, 2016; Jaaman *et al.*, 2008).

On a national level, several countries have banned or at least regulated the direct hunting of small cetaceans (e.g., through quotas); however, laws are often outdated, not fit for purpose and enforcement is poor. **Opportunistic and illegal catches are by their nature mostly under- or unreported and are further undermining conservation efforts.** In other coastal states no legislation or regulations are in place, and hunting is technically legal, although catches are not documented, and hunters are free to take as many animals as they like. To make matters worse, tens of thousands of dolphins and porpoises are killed every year for the sole purpose of being used as bait in commercial fisheries, e.g., in fisheries of declining shark populations, which is doubly problematic for conservation. The use of dolphins as bait has significantly increased over the last decades and in many places has largely replaced its use as food.

Both bycatch and targeted hunting coincide with changes in fishing practices, for instance, the replacement of traditional fishing gear by industrial fishing; intensified long-line fisheries for sharks driven by increase of prices for shark fins. **With fish stocks depleted worldwide and fishing activities continuing to intensify, there is a clear risk that hunting of small cetaceans will further increase in the future unless it is urgently regulated around the world.**

In many regions, bycatch reduction strategies will only achieve the desired goal if it is ensured that by-caught dolphins are neither marketed nor used as bait. Economic incentives for fishers to increase safe handling and release of bycaught dolphins from their nets, to use environmentally compatible alternatives to dolphins as bait and to gain alternative incomes are urgently needed to change current practices. The U.S. Marine Mammal Protection Act (MMPA), due to be implemented in January 2024, will ban *“the importation of commercial fish or fish product from fish which have been caught with commercial fishing technology which results in the incidental kill or serious injury of ocean mammals in excess of United States standards”* may prove a useful measure in that regard (Félix *et al.*, 2021).

One major threat to cetaceans that is generally overlooked is the impact of climate change. Not only is the consumption of products from dolphin hunts detrimental to human health, but it will also adversely impact future food availability by impairing the ecosystem functions provided by cetaceans and marine biodiversity (Altherr & Hodgins, 2018). Models predict migratory shifts and crashes across several small cetacean populations in mid and later decades of the 21st century due to changing oceanic conditions if anthropogenic greenhouse gas emissions are not rapidly brought under control (Kebke *et al.*, 2022; van Weelden *et al.*, 2021; Lambert *et al.*, 2014). The rapid pace of the climate crisis and the large number of potential cumulative and synergistic stressors, including pollution and overfishing, further worsen the situation for small cetaceans (Acharyya *et al.*, 2023; Haria *et al.*, 2023; Nelms *et al.*, 2023). Any additional loss in the short-term owing to their exploitation as a human food source or bait will decrease the resilience of populations and increase the likelihood of functional and actual extinction by the end of the century.





14. Recommendations

To All Range States

- At a minimum, coastal states need to make catch data for small cetaceans publicly available and provide this data to the IWC. They must also work to ensure that under-, mis- and non-reporting of catches (such as lacking or incomplete hunters' data, struck and lost animals, calves separated from their mothers, and fetuses) is minimised.
- Coastal states are urged to ban the use of small cetaceans as bait for fishing, including FADs, and promote alternative baits that can be derived sustainably, are easily accessible and inexpensive. Vessel-based monitoring (including mandatory use of cameras and high onboard observer coverage) is needed to prevent the use of dolphins as bait.
- Enforcement of national legislation and site inspections (vessels, ports and markets) need to be intensified. Market surveys and forensic studies to identify species for sale are urgently recommended.
- Where there is an evidenced indigenous subsistence need for small cetaceans as a human food source, coastal states need to undertake full assessments of all species and population abundance and trends, set hunting quotas for all targeted species following scientific advice and the precautionary principle, as well as increasing awareness as to the potential health implications from consuming dolphin products.
- Awareness campaigns in fishing communities are required, including existing legislation and cetacean ecology, providing e.g., information that depletion of fish stocks has not been caused by small cetaceans, and raising awareness for the ecosystem services they provide instead. Training on handling and soft release of bycaught dolphins is recommended.
- Engage in the promotion of a low-impact dolphin-based tourism as an alternative income for coastal and rural communities.
- Countries with distant water fleets and fisheries partnership agreements, as well as fish importing countries, have an obligation to ensure that their consumer markets do not jeopardise food security in the country in whose national waters the fish were caught.

To Consumer Countries

- Countries where small cetaceans are consumed must introduce mandatory testing of small cetacean products to address human health concerns. Further, they must introduce mandatory labelling of small cetacean products.
- Countries must introduce national health and safety guidelines, including maximum safe levels for mercury e.g., to ensure the well-being of their citizens.
- The USA should review its seafood imports from fishing nations, which use dolphins as bait (including within their DWFs), for potential violations of the MMPA.

To International Conventions

- While the **International Whaling Commission (IWC)** does not regulate the hunting of small cetaceans, it initiates research and conservation programmes related to small cetacean species and populations (IWC, 2023). The IWC Scientific Committee has a long-standing recommendation that no small cetacean removals, live capture or directed harvest, should be authorised until a full assessment of status has been made (IWC, 2022). However, this is not implemented by several IWC Member States. The IWC should therefore pass a Resolution, calling on coastal states to strengthen national legislation and enforcement to better protect small cetaceans.
- **The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)** should examine the cross-border and regional trade in small cetaceans more closely, e.g., in West Africa, and adopt a resolution and/or hold a workshop to collect data and to identify measures to reduce unsustainable and illegal trade in small cetaceans. Related NDFs for any such cross-border trade should be publicly available.
- CITES should also request status assessments from the IWC SC for all cetaceans in trade.
- CITES should closely collaborate with CMS to collect data on cross-border and regional trade in small cetaceans.
- CITES should ensure that valid and watertight NDFs are in place wherever small cetaceans are traded.
- In assessing the impacts of trade in shark products, CITES Parties are urged to consider the broader ecological harms of shark fisheries when small cetaceans are used as bait, which has a double negative impact on marine ecosystems. The fate of the vaquita, which is threatened with extinction as collateral damage of the totoaba fishery (a CITES Appendix I species), is a good example of how CITES can also act on interspecific contexts and request stricter enforcement with pressure (see Taylor *et al.*, 2023; CITES, 2022).
- The Aquatic Wild Meat Working Group of the **Convention on Migratory Species (CMS)**, which has so far focused on mammals and reptiles, only recently agreed to expand its scope to all sharks and ray species listed on CMS Appendix I (CMS, 2020). This step was urgently needed, regarding the close correlation of industrial shark fisheries and its impact on small cetaceans and their exploitation as bait.
- As per Resolution 11.22, Parties to CMS are urged to develop and implement national legislation prohibiting the live capture of cetaceans from the wild for commercial purposes, and to adopt stricter measures in line with CITES Article XIV.
- As per Resolution 12.15, CMS has now explicitly recognized that the increased demand for aquatic wild meat is a threat to aquatic wildlife in many regions around the world, and therefore it is urgent to develop methods to evaluate the impact on wildlife populations of trade in aquatic wild meat.
- The **Food and Agriculture Organization of the United Nations (FAO)** are urged to introduce maximum safe levels for both mercury and methyl mercury found in small cetacean products, as is done for fish and shellfish (FAO, 2018).

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Glossary

CBD	Convention on Biological Diversity
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CCG	Commissioners & Contracting Governments
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DWF	distant water fleets
FAD	fish aggregating device
FAO	Food and Agriculture Organization of the United Nations
IWC	International Whaling Commission
NAMMCO	North Atlantic Marine Mammal Commission
NDF	non-detriment finding
SC	Scientific Committee of the IWC
SVG	Saint Vincent and the Grenadines
UNEP-WCMC	United Nations Environment Programme World Conservation Monitoring Centre

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