NAMMCO

MARINE MAMMAL WELFARE WORKSHOP

24 March 2025

Fram Centre (hybrid), Tromsø, Norway

REPORT

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1 OPENING REMARKS

The Chair of NAMMCO, Hallveig Ólafsdóttir (Iceland), welcomed the participants to the Marine Mammal Welfare Workshop (MMWWS) and thanked Japan for co-organising the event, as well as everyone who had travelled from afar to attend.

Ólafsdóttir observed that marine mammals have been hunted for millennia, as a logical and accessible resource. They have played, and still play, a key role in the livelihood, food security, and cultural well-being of many coastal communities, particularly in the Northern areas, but also in many other coastal areas around the world (Figure 1). She highlighted the core principles of NAMMCO, whose member countries recognise the right to utilise marine mammals as any other living natural resource, but embedded in this right is the responsibility to ensure their sustainable use and to consider animal welfare. In this context, she posed the question: How can we reduce suffering in marine mammal hunts?

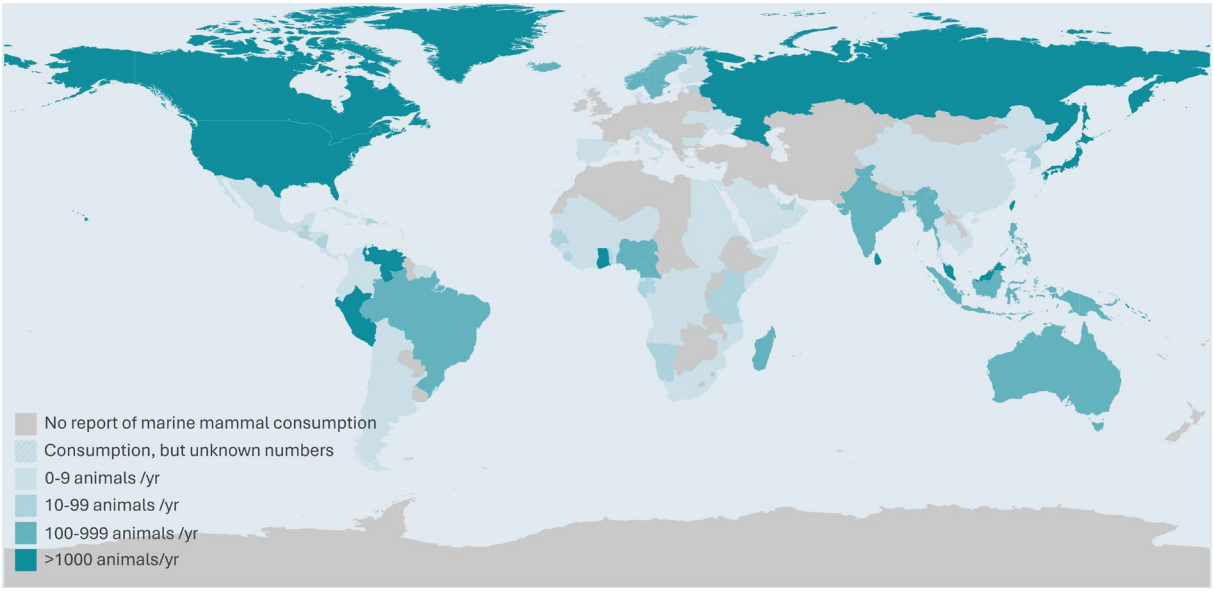

Figure 1. Global marine mammal consumption between 1990 and 2017, adapted from Robards & Reeves (2011) with updated information from the NAMMCO and IWC catch databases, as well as for South America and West-Africa from Cosentino & Fisher (2016), for Asia from Porter & Lai (2017), for Australia from Heinsohn et al. (2004), and for Japan with information from the Japanese Fisheries Agency[1].

Ólafsdóttir noted that NAMMCO has, over the years, examined a range of issues, including safety, time to death, struck and lost rates, and hunter training. She emphasised that the time had now come to assess the current state of progress, evaluate achievements to date, and consider the steps that can be taken moving forward. Coordinated and well-prioritised efforts would ensure the effectiveness and efficiency of future initiatives aimed at optimising welfare outcomes in marine mammal hunts. Greater visibility to the attention given to animal welfare by marine mammal hunting countries would also foster a better understanding of hunters and their livelihoods, as well as marine mammals as a responsible resource when managed sustainably. Considering the diverse circumstances of different

[1] Cosentino, A. M., & Fisher, S. (2016). The Utilization of Aquatic Bushmeat from Small Cetaceans and Manatees in South America and West Africa. *Frontiers in Marine Science*, 3.
Heinsohn, R., et al. (2004). Unsustainable harvest of dugongs in Torres Strait and Cape York (Australia) waters: two case studies using population viability analysis. *Animal Conservation forum* 7, No. 4.
Porter, Lindsay, and Hong Yu Lai. (2017) Marine mammals in Asian societies; trends in consumption, bait, and traditional use. *Frontiers in Marine Science 4,* 47.
Robards, M. D., & Reeves, R. R. (2011). The global extent and character of marine mammal consumption by humans: 1970–2009. *Biological Conservation*, *144*(12), 2770-2786.

hunts, regions and countries, ensuring an effective and efficient improvement in welfare outcomes requires assembling a broad spectrum of experiences and expertise from various cultural, ethical, and technical perspectives.

The purpose of the MMWWS 2025 was to:

- Evaluate the current status of welfare outcomes in marine mammal hunts in NAMMCO countries, Japan, and participant hunting entities, with a focus on lesser-known hunting methods, including for the different hunts the level of knowledge on animal welfare outcomes;
- Prioritise efforts in welfare improvements in relation to the global gain versus effort cost;
- Identify the most efficient methods, next steps, and avenues for collaboration to further enhance welfare outcomes in marine mammal hunts.

The objective of the workshop was to foster an inclusive environment that welcomed diverse backgrounds and areas of expertise in marine mammal hunting, while also aiming to enhance public understanding of hunters and sustainable hunting practices. She underlined that all participants had been invited on the basis of their personal expertise (not as national delegates) and encouraged everyone to actively share their knowledge. She transferred the word to the Chair of the Workshop.

The Chair of the Marine Mammal Welfare Workshop, Ichiro Nomura (Japan), introduced himself as a retired official of the Japanese government and a former head of the FAO Fisheries Department. He stated that he currently serves as an advisor to the Fisheries Agency representing Japan at various regional fisheries management organisations. He then called for a brief round of introductions. The 60 participants included hunters, veterinarians, scientists, and managers from the Faroe Islands, Finland, Greenland, Japan, Iceland, Norway, Nunavik, Nunavut, St Vincent and the Grenadines (SVG), Sweden, and Åland, as well as the NAMMCO Secretariat.

2 STATUS OVERVIEW

2.1 OVERVIEW OF RECOMMENDATIONS PROVIDED BY NAMMCO

Geneviève Desportes gave an overview of the recommendations provided by NAMMCO expert groups and workshops, highlighting the inclusive process followed for these meetings, always including hunters, veterinarians, and managers from NAMMCO and numerous other hunting entities, and the need for balance between hunter safety and animal welfare.

Summary

The NAMMCO founding principles were underlined, i.e., the people's right to hunt and utilise marine mammal resources with, embedded in this right, the obligation to ensure that the hunt is sustainable and conducted responsibly with respect to killing efficiency, hunter safety, and animal welfare. NAMMCO sees good welfare outcomes in hunting as minimising pain, distress, and suffering during the hunting process and minimising killing time, balanced by consideration of hunter safety and the risk of losing the animal. The factors defined by NAMMCO as important when considering good welfare outcomes are:

- Time to death (TTD), incl. instantaneous death rate (IDR)
- Animal awareness (of human-induced stress or suffering)
- Struck and lost rate (S&L rate, proportion of animals that have been hit by a projectile but not retrieved; these can be either dead or wounded)
- Hunter skills and training
- Weapon adequacy and maintenance

The recommendations provided by NAMMCO over the years to hunters and managers of NAMMCO and non-NAMMCO countries have addressed how best to monitor hunt efficiency and welfare

outcomes and which data are required, how welfare outcomes could be improved in specific hunts, weapons adequacy and maintenance, the importance of training and education of hunters, and not least the importance of their involvement in all processes from monitoring and improving welfare outcomes to regulating hunting practices.

Discussion

Gabriel Nirlungayuk (Nunavut) stated that culture and traditional knowledge are highly valued in Nunavut, where it is believed that the animal presents itself to the hunters. The hunters wish for their traditional knowledge to be respected. He further emphasised that securing the animal is of the utmost importance, as is ensuring that the entire animal is utilised following the hunt.

Mikael Petersen (Greenland) thanked Nirlungayuk for raising the point about respecting hunters' knowledge, emphasising that hunting has taken place in Greenland for thousands of years, and that hunters there as well seek to be treated with respect. While laws and regulations are in place, hunters also have their own traditional practices to follow. Petersen noted that, during the presentation, it was suggested that more thorough monitoring approaches should be developed, but that this has not yet been observed in practice; he enquired whether this was currently in development. In response, Desportes explained that she wasn't referring to a specific monitoring process per se, but that the CHM is continually working to improve monitoring practices. She added that this workshop could also contribute to the enhancement of those practices.

2.2 OVERVIEW OF CURRENT KNOWLEDGE STATUS ON WELFARE OUTCOMES

Prior to the workshop, all participant countries and communities were asked to fill in a database with information on their hunts regarding the period 2019–2023. Noor Elias presented an overview of the information collated (see also Figures 2 and 3).

Summary

The most hunted species in the period 2019–2023 among cetaceans were harbour porpoises, long-finned pilot whales, belugas, and minke whales (3,133, 847, 644, and 642 animals reported respectively), and among pinnipeds, harp, ringed, and grey seals (41,281, 32,353, and 1,375 animals reported respectively). The main hunting method was the deck-mounted grenade harpoon gun for large whales, while for smaller cetaceans and seals it was the rifle.

Regarding reporting standards of welfare criteria in hunts, catches of cetaceans are reported, while struck and lost animals are only systematically recorded for large whales, narwhal, beluga, and small cetaceans hunted in drives in the Faroe Islands and Japan. For all other species and welfare criteria, reporting requirements vary considerably by country and hunt type. As a result, there is limited information on TTD, IDR, S&L rate, and chase time (for hunts where that is applicable).

Licensing and training of hunters also varies by country. Certain large whale hunts have minimum vessel requirements (e.g., minimum number of boats per hunt, non-motorised, etc.). All but the hand harpoon hunt in St Vincent and the Grenadines require a hunter's licence. Iceland, Norway, and Greenland require additional formal training for the hunters after the original licence is issued for hunters operating deck mounted harpoon guns. For small cetacean hunts, no additional training is required besides what is necessary to obtain the license to use the killing tool (e.g., rifle, spinal lance).

The reporting of catches of seals and walrus is mandatory in all countries except Nunavik and Nunavut. Additional training to use a rifle for killing seals is only required in Sweden for all species and in Norway for harp seals.

In many areas, hunting knowledge and skills are shared within local communities and passed down from generation to generation—this is particularly seen in places with subsistence hunts (Greenland, Nunavut, Nunavik, St Vincent and the Grenadines).

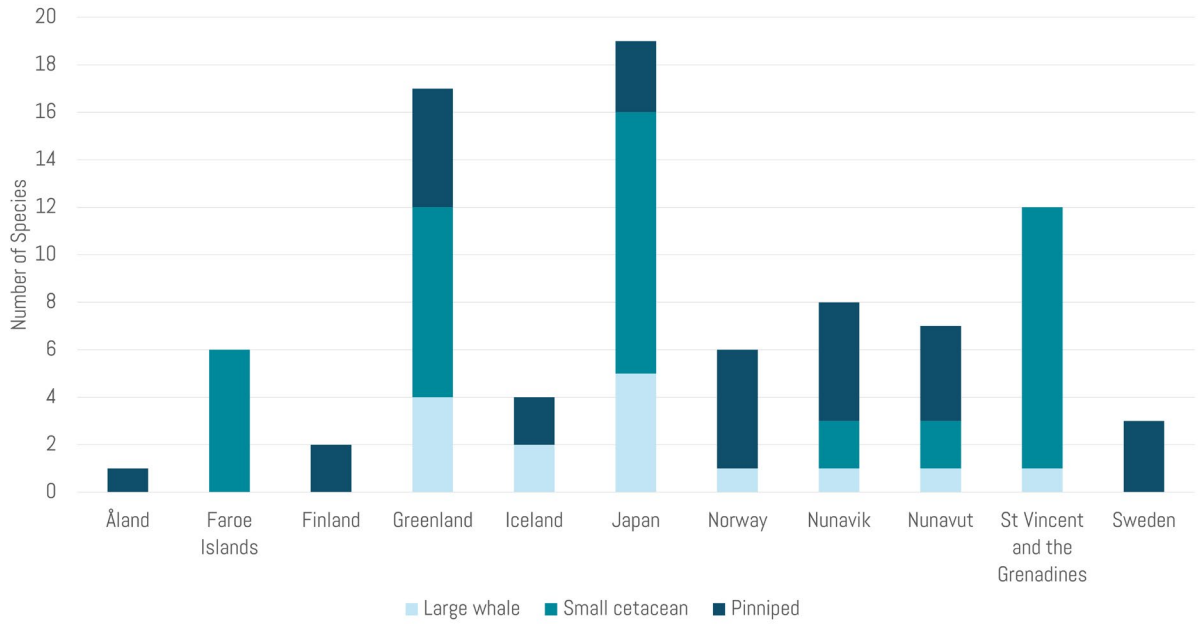

Figure 2. Number of marine mammal species hunted in each of the participating communities.

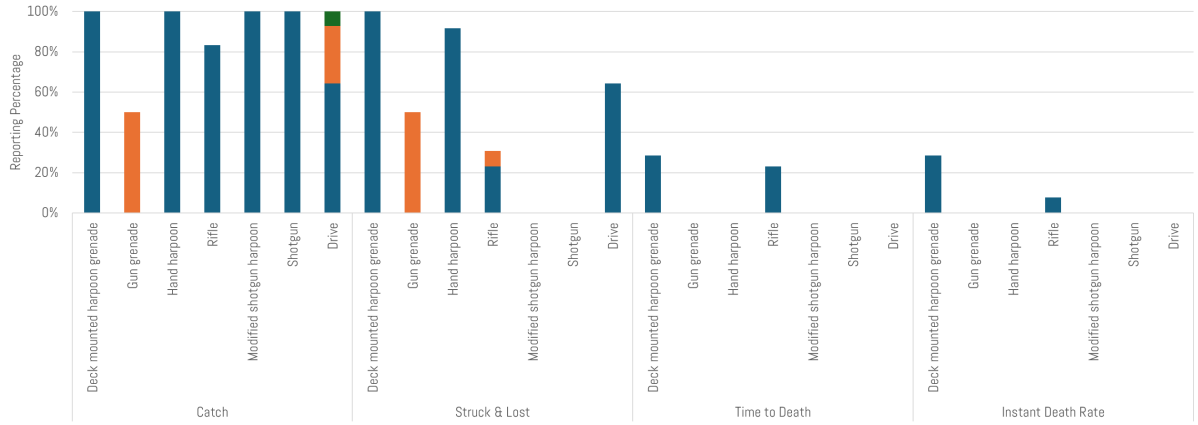

Figure 3. Percentage of cetacean hunts for which different welfare criteria are reported to or by authorities, by law or voluntarily. Blue: mandatory self-reporting by hunters; orange: mandatory reporting for by the authorities supervising the hunt; green: voluntary self-reporting by the hunters.

Discussion

The Chair thanked the participants for submitting their data, noting that it was through this exchange of information that the overview had been made possible.

Egil Ole Øen (Norway) observed that no specific definition of "chasing" had been provided during the presentation. He noted that, over the years, he had encountered various definitions of the term across different workshops and emphasised that a clear definition would be valuable for reporting purposes. As an example, he pointed out that following a whale does not necessarily mean that the animal is experiencing distress. Kathrine Ryeng (Norway) agreed that not all forms of pursuit are equivalent and suggested that the definition of 'chasing' should include the stipulation that the animal is aware that it is being followed and responds behaviourally.

Amalie Jessen (Greenland) expanded on the point about generational transfer of knowledge and its importance in Greenland and other areas of the Arctic, highlighting that the same is true for all hunted species (marine and terrestrial).

Johnny Mike (Nunavut) spoke of instances in Nunavut where hunters' knowledge surrounding their target species is not acknowledged by management procedures (see also section 3.5), adding that reporting schemes should make room for the inclusion of local knowledge somehow.

3 HUNTER INSIGHTS ON LESSER-KNOWN HUNTING METHODS

Hunting methods from six different areas were presented, with a focus on lesser-known methods and those where harpoon and killing weapon are not combined, e.g., hand harpoon hunts, rifle hunts for small cetaceans, minke whales, and seals. The focus was also on hunting methods for which there is less knowledge and data on the outcome (welfare and losses).

3.1 JAPAN

Genta Yasunaga and Hikari Maeda presented an overview of the killing methods and TTD statistics for cetaceans in Japanese commercial whaling.

Summary

Currently, four large cetaceans (sei, Bryde's, common minke, and fin whales) are caught under factory ship–type whaling and coastal base–type whaling, while 11 small cetaceans (Baird's beaked, false killer, short-finned pilot, melon-headed whales, common bottlenose, Risso's, rough-toothed, striped, pantropical spotted, Pacific white-sided dolphin, and Dall's porpoise) are caught under coastal base–type whaling, drive fishery and hand harpoon fishery in Japanese commercial whaling. The information needed for assessing whaling welfare (species hunted; weapons and killing methods; hunter training etc.) was presented. Regarding large cetaceans, Japan left the IWC in 2019 and began to catch large cetaceans commercially the same year. Since then, consistent efforts have been also continuously made to further improve on welfare criteria. Indeed, there are no differences in TTD and IDR when compared before and after the start of commercial whaling. Additionally, since the resumption of commercial whaling, Japan has begun developing a data collection system similar to Norway's Blue Box. Although information on small cetaceans is limited, certain improvements have been made in the killing methods used in drive fisheries that were studied in the past.

Discussion

Jessen (Greenland) asked the presenters to describe the type of lance used in commercial whaling and to confirm for which species the modified slaughtering knife is employed. The presenters responded that the lance was a standard, non-electric type, shaped like a knife. A rifle and the lance, can be used as secondary weapon in factory ship whaling, while only the lance is allowed to be used as secondary type weapon in coastal whaling. The modified knife, inspired by the Faroese spinal lance, is used for all species in drive hunts.

Kristján Loftsson (Iceland) also raised a question regarding the use of the lance. He noted that in the Expert Group in 2015, the recommendation to Japan was to acknowledge that a rifle results in a quicker kill than a lance, and to assess the efficiency of the lance method accordingly. He asked whether any progress had been made on this matter over the past ten years. The presenters responded that the introduction of rifles into the Japanese hunts had been considered challenging, and that the issue remained under investigation. However, they mentioned that they had not closely followed recent developments on the matter. Yoshifumi Kai (Japan) added that the use of rifles is permitted in factory ship whaling, as these hunts are conducted over an extended period. However, in the case of coastal whaling, hunters are not granted the same permission, as such hunts typically take place within a single day.

Ragnar Jacobsen (Faroe Islands) enquired about the drive hunts and asked whether the animals were first beached before being killed. The presenters responded that a rope is placed around the tail to bring the animals onto the beach, where they are then killed.

Rune Frøvik (Norway) asked whether any data were available on TTD and IDR for minke whales, and, if so, what the data indicated. The presenters referred to a report published in 2015, noting that since then, there had been a transition from research whaling to commercial whaling, resulting in significant changes to the hunting operations. Consequently, there is currently no dedicated personnel or systematic data collection in place. They acknowledged the importance of collecting such data and indicated that discussions are needed to determine the most effective way to proceed.

Páll Nolsøe (Faroe Islands) asked how harpoon fisheries are conducted. The response was that the operations are largely opportunistic and employ various types of harpoons; for example, one is operated by hand, while another employs a mechanism similar to a bow and arrow.

3.2 GREENLAND

Anthon Egede, Mika Kruse, and Jens Danielsen presented an overview of marine mammal hunting in Greenland, describing the hunts for large whales, small cetaceans, and walrus, and highlighting their limitations, advantages, and potential improvements that could be made.

Summary

Egede explained that he uses a deck mounted harpoon cannon equipped with a grenade for hunting humpback whales and, predominantly, minke whales. However, in recent years, municipal regulatory limitations have resulted in fewer humpbacks being taken. He noted that in order to engage in large whale hunting, it is necessary to purchase a harpoon cannon that can be mounted on the deck. Regarding safety, all equipment must be inspected prior to use, and hunts are conducted only under suitable weather conditions. Egede emphasised the importance of extensive practice and repeated firing in order to gain proficiency with the harpoon cannon. With respect to fin whales, Egede noted that they cannot be flensed at sea and must be transported back to land, as they cannot be brought aboard the vessel. He also offered suggestions for improving large whale hunting operations. These included the need for better infrastructure, such as appropriate harbour facilities or floating platforms for flensing. He described flensing large whales as physically demanding but highly rewarding. Multiple parts of the animal are fully utilised, including the meat, blubber, heart, and tongue, as well as the bones and baleen for handicrafts. In recent years, weather conditions have changed in Greenland because of climate change. It is therefore necessary to continuously monitor the weather throughout the day. As a result, the hunting season may not begin until April and, in some cases, must end before November, despite there being a continued demand for whale meat.

Kruse provided an overview of the collective minke whale hunting, which is conducted by multiple boats (five boats is the required minimum number) operating in groups, each led by a designated group leader. The leader is responsible for assessing weather conditions and ensuring that all participants have the necessary equipment. For example, given the unreliability of mobile phone coverage at sea, it is essential that all hunters are equipped with satellite communication devices. The group leader also determines when to target an animal, and the hunters aim to secure the minke whale as quickly as possible, as weather conditions can change rapidly. To prevent the whale from sinking, it is secured using a floating stick. This is a new steel harpoon that has proven more effective in retaining the animal and is intended to improve S&L rates. Once the whale is secured, the meat is divided among the hunters. He also highlighted the importance of higher-quality non-explosive ammunition, noting that the increasing scarcity of ammunition was identified as a growing concern.

Danielsen and Kruse spoke about the small cetacean hunts in West Greenland. Traditional methods are still in use, including harpoons with throwing sticks. Danielsen added that hunting skills are passed down from a young age, with children learning from the extensive knowledge of experienced hunters. Regarding harbour porpoise hunting, Kruse noted that there are relatively few legal requirements, though specific weapon regulations do apply. He further noted that harbour porpoises are fast, but a skilled hunter knows precisely where to aim. Capturing them requires considerable expertise. The

equipment is relatively inexpensive, mainly rifles, but it is essential to always have a hook on hand to prevent the animal from sinking after it has been struck.

Danielsen further spoke about walrus hunting in Northwest Greenland, which traditionally begins in November. However, due to the effects of climate change, the animals are now arriving later in the season, resulting in a lack of meat supply in the winter for local communities, including for sled dogs. While hunting was previously conducted using dog sleds, boats are now used, along with rifles and hand harpoons, as this method is easier. He noted that specific groups of walruses and designated hunting areas have been targeted for many years. However, in recent times, walruses are no longer observed in locations where they were once commonly found.

Discussion

Bjørne Kvernmo (Norway) noted that the cost of ammunition has been rising. He enquired whether harpoon grenades have also become more expensive in Greenland. The presenters confirmed that prices were significantly lower five years ago and have since nearly doubled. They stated that each shot now costs approximately 10,000 DKK, making the use of explosives considerably more expensive. They emphasised the need for increased government support to ensure such equipment remains affordable for hunters.

3.3 SWEDEN

Sven Gunnar Lunneryd presented the ethical issues of the Swedish seal hunt, highlighting wounded seals and losses.

Summary

The severe conflict between seals and small-scale fishing and even now with fish stocks, has been going on for decades in Sweden both in the Baltic and the west coast after decades of a strong increase in seal population size (Suuronen et al. 2024[2]). This has meant that both protective hunting and licensed hunting have started. If hunting from a boat, and on the state's islands, seal hunter training is required. Over the past 10 years, there has been an average quota of 2,000 animals, but only half have been used. Similar figures are found in Finland and Åland. Only Estonia has another limited hunt.

In Sweden, there is a debate about shooting at a small target like a seal's head and the fact that the loss of dead seals is so great. An observational study has been carried out on a total of 755 shot seals, mainly harbour seals, 90 grey seals and a few ringed seals, by 104 hunters. The overwhelming majority of the shots have taken place from land, in 10% of seals that are on shore. 74% of the seals were retrieved. 94.8% of the seals died immediately, while 3.3% died within a few minutes from further shots. 1.6% were judged to be hit and not with certainty dead.

Official data of 8,664 reported seals to the Swedish Environmental Protection Agency between 2001 and 2022 shows that the proportion of seals lost was 39% for grey seals and ringed seals and 29% for harbour seals. The proportion of lost grey seals in different counties varies between 11 and 80%.

The proportion of unconfirmed dead seals was low, in accordance with other studies (Ryeng & Larsen 2021[3]). The difference in the proportion of lost seals between counties cannot be explained solely by different physical or biological parameters. The individual difference in the level of care for the seal is an important factor, as they are mainly shot to reduce a problem. It means that the losses are caused

[2] Suuronen, P., Lunneryd, S.G., Königson, S., Coelho, N.F., Waldo, Å., Eriksson, V., Svels, K., Lehtonen, E., Psuty, I., Vetemaa, M. 2023. Reassessing the management criteria of growing seal populations: The case of Baltic grey seal and coastal fishery. *Marine Policy*. 155. https://doi.org/10.1016/j.marpol.2023.105684.

[3] Ryeng, K.A & Larsen, S.E (2021). The relative effectiveness of two expanding bullet designs in young harp seals (*Pagophilus groenlandicus*): A randomised controlled field study in the Norwegian harp seal hunt. *Animal Welfare*. 30 (2), 155–167. DOI: 10 7120/09627286.30.2 155

by political decisions, as the EU's seal product trade ban hinders the seal from becoming a positive resource. Another important factor is also the protection of the seals in certain areas, e.g., their haul out sites, where it is shallow, while these are the places where it would be easier to retrieve shot animals.

Discussion

It was noted that Sweden, in the information reported and as also underlined in the presentation, had stressed the conflict that may sometimes arises between attention to animal welfare, with protection during the moulting period, and hunt efficiency, when the moulting period also offers a more effective hunting opportunity with safer shots as the seals are on land.

3.4 ST VINCENT AND THE GRENADINES

Vincent Reid gave a presentation titled "A day in the life of a Barrouallie whaler" and focused on the critical and important aspects of the hunting activity of whalers who conduct a shore-based hunt for small cetaceans from the small town of Barrouallie on the western coastline of St Vincent and the Grenadines.

Summary

Whaling in Saint Vincent and the Grenadines is restricted to two places: Bequia Island, from which humpback whales have been hunted since the 1870s and with an IWC aboriginal subsistence whaling quota of four whales per year since 2013, and Barrouallie, from which smaller delphinids where hunted at first, with short-finned pilot whales joining the list since about 1910. Approximately 250 animals are caught per year from Barrouallie, and no species is subject to quotas. Focussing primarily on pilot whales, Reid outlined in detail the tools used during a hunt, namely, gun (a modified 12-gauge shotgun with the ability to fire a five-pound, four-foot-long harpoon at least 75 m away), harpoon, rope, buoy, knives, and compass, as well as the type of boat (outboard) used in the hunt, which takes place in an area approximately 25 miles off the west coast of St Vincent. The effectiveness of this particular hunting method (using the modified shotgun), coupled with targeting a particular spot below and slightly anterior to the dorsal fin has proven to be the ideal combination for putting to death a cetacean in the shortest possible time—the estimated average TTD at present (not yet scientifically verified) is 90 seconds, which speaks well for marine mammal welfare, compared to the estimated nine minutes prior to 2010, when the target spot was located further back on the animal. A study led by Florida International University aims to officially quantify TTD. At the time of this WS, five whaling captains hold a licence for the modified shotgun. The presentation concluded by highlighting the use of almost every part of the animal caught for food and local health supplements.

Discussion

Jessen (Greenland) inquired whether the gun stand which is attached to the prow of the boat is homemade. Reid responded that everything required for this hunt is generally fabricated by the whalers themselves, with local blacksmiths providing their services to modify the harpoons. Jessen noted that Greenland has been trying to develop more appropriate hunting methods for small cetaceans (compared to the existing rifle hunts), but that there was considerable uncertainty regarding the direction they should follow. Reid offered to share schematics of the gun stand and harpoons, and of the different modifications necessary for their use, highlighting that the use of a rope attached to a buoy dramatically reduces S&L rates, and that the accuracy of the shots in animals caught so far is astounding (which speaks to the accuracy of the shooting method).

3.5 NUNAVUT

Gabriel Nirlungayuk, Raymond Mercer, and Johnny Mike presented an overview of marine mammal hunting methods used in Nunavut, Canada.

Summary

Marine mammals hunted in Nunavut waters include three species of seal, as well as walrus, narwhal, beluga, and bowhead whales. These have always been hunted for subsistence and with great respect to the animals and their significance for the continuation of Inuit life. The Nunavut Land Claims Agreement was signed in 1993, enshrining both the right to harvest wildlife and the equal representation of Inuit when it comes to environmental and wildlife management. The Department of Fisheries and Oceans Canada is responsible for the collection of scientific data to inform harvest limits, and the Hunters and Trappers Organisation of each community allocates a Total Allowable Harvest to its members. While there are differences between the hunting seasons and methods used for each species, the rifle is the primary weapon used for all but the bowhead whale, although harpoons and hooks are also used in various combinations. The pelts of seals are not generally used, except for bearded seal pelts from animals hunted in late summer—these are used to make clothing and ropes. In Cumberland Sound, belugas are hunted under a strict quota, although it is widely suspected that the depletion of the resident stock is due to other human activities (e.g., oil prospecting) and the recently increased presence of killer whales in the area. Additionally, the locals recognise two distinct (in size and behaviour) beluga stocks, one resident and one migratory, and argue that the migratory stock would not be endangered if the quota is lifted. As technology improves, a new method of detecting belugas trapped in ice has emerged, namely, the use of drones to explore areas where access has historically been limited. Bowhead whales are primarily hunted with a penthrite gun and secondarily with a lance (anguvigak). Animals are not hunted indiscriminately, but selected by size, with a preference for intermediate sizes, which can be more easily brought to shore.

Discussion

A point of interest was raised by Kvermo as to whether animals hunted in Hudson Bay are found to have much (or any) plastic in their stomachs; at present, no information was available to discuss, but Nirlungayuk was keen to look into the matter further.

Nolsøe (Faroe Islands) inquired whether there are any limitations on commercial distribution of the meat caught by hunters, and whether there is much local demand for the meat. Nirlungayuk specified that within Nunavut, there are no restrictions on the sale of any part of the animal. Bowhead whales, due to their size, are able to feed many of the locals, while the demand for mattak is quite high. Meat and mattak can be sold to southern Canada with special permits, while China is the biggest market for narwhal ivory. The trade in ivory offsets the cost of hunting and is therefore important for the hunters.

As considerable training and specific ammunition and equipment are required to hunt bowhead whales in particular, Rune Frøvik asked who covers the costs thereof. Nirlungayuk informed that Nunavut Inc. pays for both training and supplies, noting that the costs for ammunition range from five to seven thousand dollars.

3.6 FAROE ISLANDS

Ragnar Jacobsen and Bjarni Mikkelsen presented an overview of the recent development in the traditional community-based hunt of pilot whales and smaller dolphins in the Faroe Islands.

Summary

Since the 1980s, there has been a concerted effort on upgrading the legislation, organisation, and equipment around the pilot whale drive, with animal welfare in focus. Hunts can only happen in 23 authorised whaling bays, where the topography makes it suitable to herd and beach whale groups. These beaches are constantly under revision. The district administrators of the six whaling districts, together with four grind foremen for every single bay, organise and oversee the drive and cull, and have legal mandate during the hunt. The district administrators, together with the community council, distribute the shares of meat and blubber freely among participants and in some cases the rest of the community, e.g., if the catch is large. The division of the meat and blubber is regulated by law and

follows traditional and local customs depending on the number of whales and participants (different reward level for the finder, district administrator, foremen, boat owners, hunt participants, community members).

The traditional whaling equipment was the hook and the knife, together with the whale spear, which was later forbidden. The hook was gaffed in the head of the whale, for pulling it into shallow water. The knife was thereafter used to kill and bleed the animal by cutting down on the spinal cord one hand's breadth behind the blowhole. Motivated by reducing impact and killing time, improving animal welfare and hunters' safety, a rounded blunt hook and a spinal lance were developed. These are today the legal whaling equipment in the grind hunt and were available and demonstrated for the participants of the workshop by the Pilot Whalers Association. The hook is inserted in the blowhole, after which the spinal lance is positioned in the midline, and with a single thrust, at an angle of approximately 10 degrees backward, followed by sideways movements, the spinal cord and the surrounding blood vessels are severed. Thereafter, the jugulars and the carotids are severed with a whaling knife, so that the whale can be bled properly. The development of this new hunting equipment has been a great improvement to the pilot whale practice and has reduced handling and killing time significantly.

Discussion

Diogo Marques (Norway) inquired how often a second attempt per animal needed to be made with the spinal lance, to which Mikkelsen responded that, (although not counted) such cases are very rare, given how easy the lance is to use—so much so, that some people can even use it with one hand.

To a question on the amount of interference from NGOs and protesters who do not agree with the drive hunt, the presenters informed that there are occasional interventions, and that Sea Shepherd in particular has led an aggressive campaign within the Faroese community. However, the hunters themselves are very transparent about the methods they use and are content to uphold their traditional way of life.

Given that the drive is a community-based hunt, Sigurborg Daðadóttir (Iceland) asked who pays for each component. Mikkelsen responded that the municipality supervises the hunting process covering the cost of any municipal authorities involved and ensures the fair distribution of meat. It is voluntary to participate. A few whales can be sold by the district administrators to local supermarkets, to compensate for extra costs, for example reparation of boat damage.

Øen stated that the NAMMCO Committee on Hunting Methods is proud to have started the discussion on the spinal lance, as an efficient method to cut the blood supply and to the brain at the same time as severing the central nerve so that the animal feels nothing.

4 GENERAL DISCUSSION

4.1 ANIMAL WELFARE TERMINOLOGY

Kathrine Ryeng opened the general discussion session with a presentation exploring the term animal welfare.

Summary

As outlined by the World Organisation of Animal Health, animal welfare is a complex and multi-faceted subject with scientific, ethical, economic, cultural, social, religious and political dimensions. Animal welfare comprises the physical and mental state of an animal in relation to the conditions in which it lives and dies. As with the slaughter of farmed animals, protecting animal welfare in hunting is about minimising the pain, distress or suffering of the animal at the time of killing as well as reducing stress prior to killing. Marine mammal hunting takes place in many different regions of the world with a variety of weapons and methods depending on factors such as species and size of animal, hunting habitat and environmental conditions, cultural traditions, commercial availability of gear, legislation,

economy, personal experiences and preferences, and animal welfare consideration. NAMMCO's focus is on ensuring that hunters make every effort to reduce unnecessary suffering in hunted animals, by minimising killing times to the extent feasible. However, this goal must be balanced by considerations for the safety of the hunter, and the risk of losing the animal. Achieving the best welfare outcomes of a hunt implies avoiding or minimising the duration of suffering such that the time to bring about unconsciousness is as short as possible. An unconscious animal is unable to experience pain and fear. Unconsciousness is a mental state characterised by lack of response to stimuli due to disturbances in the cerebral cortex and brainstem. Death occurs when the respiratory and circulatory centres in the brainstem are irreversibly inactive. From an animal welfare point of view, the time to loss of consciousness is more important than the time to death. The ideal weapon should render the animal instantly and irreversibly unconscious and insensible to pain, until death. Time to death (TTD) and the instantaneous death rate (IDR) are terms used to measure and quantify killing efficiency and the state of art of killing methods and practices. TTD quantifies the time it takes for an animal to die from the moment it is first struck by an implement or projectile intended to secure or kill it, to the death of the animal. IDR is the proportion of animals killed instantaneously. Standardised collection and analysis of TTD and IDR data with "explanatory variables" that may influence these, make it possible to compare how rapidly marine mammals are killed using different techniques and gears. It also makes it possible to calculate effects of new developments, modifications or changes in hunting practices and of systematic training of hunters. TTD data collection will benefit hunters in helping to make improvements to the hunt and to make the hunt more efficient. The duration of stress prior to the killing attempt should also be included in the welfare outcome assessment along with TTD. Hence, the total duration of stress imposed by certain hunts, beginning at the onset of escape behaviour and ending with insensibility would be equal to the chase time + TTD. Also, the unquantifiable duration of suffering caused by the escape of a wounded animal is perhaps the worst of all possible outcomes. An assessment of the rate of S&L, in addition to TTD, also allows quantitative assessment of shooter skill, optimal ambient conditions, and projectile choice. In several NAMMCO hunts, significant advances have been made in achieving the goals of increasing IDR and reducing TTD and S&L rates. Today, we have learned about marine mammal hunting methods from different areas of the world. The upcoming discussions should be on sharing knowledge. By open dialogue and exchange of information, we may learn from each other to get new insights and ideas on methodology in a manner that maximises hunter safety and reduces TTD and S&L rates, while achieving the intended goal.

Discussion

Reid (SVG) inquired how and why TTD is the standard welfare criterion, given that time to unconsciousness is the more obvious descriptor for an animal's suffering. Ryeng conceded that, indeed, it can be a confusing distinction. She also pointed out that the original measurement in the field was time to total stillness, e.g., when the jaw has slackened and the animal has stopped moving. However, immobility could be a result of paralysis, not necessarily of unconsciousness. Referring to the Barrouallie pilot whale hunting method, Reid further inquired how quickly an animal may become unconscious when shot in the heart and lungs. This is relatively fast but depends on the rapidity of blood loss; as Ryeng highlighted, the only blow capable of killing instantly is if a projectile strikes the upper portion of the central nervous system (CNS), comprising the brain and/or upper cervical spinal cord.

4.2 WELFARE LEGISLATION OF PARTICIPATING BODIES

Nikolas Sellheim summarised a report he had been commissioned to prepare for the WWS, providing a comparative analysis of animal welfare legislation across multiple jurisdictions, highlighting key legal frameworks, enforcement mechanisms, and the integration of ethical considerations into regulatory structures in the participating regions, as well as the EU.

Summary

This study identifies the commonalities and divergences in how different legal systems approach animal welfare. A central finding of this analysis is the variation in legal recognition of animal sentience. While the European Union explicitly acknowledges animals as sentient beings, other jurisdictions, such as Japan and Greenland, regulate animal treatment through practical welfare measures rather than formal recognition of sentience. In many regions, including Norway and Finland, welfare laws emphasise the prevention of unnecessary suffering, although the scope and enforcement of such provisions differ. Criminalisation of animal cruelty is widespread but inconsistent in its application. Countries such as Sweden and Finland have comprehensive legal frameworks that explicitly prohibit cruel treatment of animals. In contrast, jurisdictions such as Greenland prioritise ethical hunting and sustainable use over broader cruelty prevention laws. In Nunavut, animal welfare laws are integrated into traditional Inuit ethical hunting practices, reinforcing cultural responsibility rather than applying strict anti-cruelty provisions. The enforcement of animal welfare regulations varies significantly. The European Union maintains an extensive oversight mechanism, with member states required to uphold strict welfare standards in farming, transport, and slaughter. Norway and Iceland regulate hunting and whaling with detailed procedural laws to ensure compliance, yet enforcement mechanisms remain industry-driven in some cases. Greenland, Nunavut, and the Faroe Islands emphasise community-based enforcement, particularly in hunting contexts, rather than centralised government oversight. Marine mammal hunting regulations reflect some of the most stringent animal welfare provisions in the jurisdictions studied. Norway, Iceland, and Japan maintain legal frameworks that focus on efficiency in hunting techniques rather than explicit welfare considerations. In Greenland and the Faroe Islands, marine mammal hunting remains a culturally embedded practice, regulated primarily to ensure sustainability and the prevention of unnecessary suffering. While these laws enforce specific killing methods aimed at minimising distress, they do not equate to broader welfare protections granted to domestic or farmed animals. From a comparative perspective, the European Union stands out for its integrated approach, embedding welfare protections across multiple policy areas, including agriculture, trade, transport, and research. Nordic countries balance economic interests with welfare considerations, ensuring ethical standards in hunting and farming practices. Meanwhile, Japan and St. Vincent & the Grenadines adopt a more utilitarian approach, where sustainability takes precedence over comprehensive welfare protections. This report underscores the absence of a universal approach to animal welfare, as laws are shaped by national values, cultural traditions, and economic priorities. While some jurisdictions prioritise comprehensive welfare protections, others focus on sustainable use and ethical hunting practices. The trend toward recognising animal sentience and strengthening enforcement mechanisms suggests that legal frameworks will continue evolving to accommodate both ethical concerns and practical regulatory needs.

Discussion

Mike (Nunavut) highlighted the value of traditional knowledge, citing the establishment of a moratorium on caribou hunting in Nunavut as the first case where traditional knowledge was used as a basis for a total allowable catch restriction. Sellheim agreed and noted that there was no value judgement in his study as to national versus traditional management. All participants agreed that local and traditional knowledge should be broadly recognised alongside scientific knowledge.

Malik Hansen (Greenland) requested clarification on the use of the term sentience. Sellheim informed that EU law stipulates that “animals are considered sentient beings” but provides no further elaboration on any underlying specifications for that term.

Loftsson (Iceland) brought forward an objection to using the term welfare in the context of hunting, as its original use was in the context of animal husbandry. He argued that hunting aims, by definition, to end the life of an animal, and therefore welfare is a potentially misleading word. He further suggested the use of a term such as hunting success or similar, which cannot be misconstrued as having any long-term impacts on the animal (again, unlike animal husbandry, where the term welfare is applied to the entire life of the care for animals). Sellheim agreed that there is merit in this argument,

but that it should be the topic of a separate discussion. Ryeng (Norway) specified that currently, the term welfare outcomes is broadly preferred over welfare when talking about hunting.

4.3 PLENARY DISCUSSION

The Chair opened the floor for a general discussion on the topics presented, issues that were not discussed previously, and ways forward, encouraging participants to keep an open mind. The discussion that ensued is reported in thematic sections for easier readability, rather than following the order in which different points were brought up.

Hunting methods and hunters' perspectives on welfare

Jessen (Greenland) observed that some of the equipment presented, including the Faroese spinal lance and the Vincentian model of fixing the weapon onto the boat, could be very interesting for hunters in Greenland who are seeking to improve their methods. In a similar vein, Nirlungayuk (Nunavut) commented that the type of bullet used in rifle hunts affects TTD (e.g., round-nosed bullets perform better than military bullets), and suggested that hunters of small cetaceans may wish to investigate the bullets used for walruses and seals. It was agreed that knowledge sharing across different regions is key to improving welfare outcomes. NAMMCO would be in a position to facilitate technical information exchange if a more dedicated Expert Group or WS is needed.

Øen (Norway) noted that, as Ryeng's presentation had underlined, unconsciousness and a very fast kill are very important for reducing suffering. He reminded people that any wound inflicted by a weapon will hurt the animal and opined that weapons or practices that routinely require more than one hit should be regarded as substandard in terms of welfare outcomes. He also suggested that a core principle should be that the best available weapon should be the default for a given hunt. Reid (SVG) agreed that this may be ideal in theory, but in practice, the circumstantial approach to welfare outcomes depends heavily on what is being hunted and where—that is, the hunt itself determines what level of care you are able or willing to provide for the animal. For example, the spinal lance is a remarkable piece of equipment that reduces TTD but could never be used in hunts that occur out on the water. In those cases, the best welfare consideration they can offer is shooting accurately so the animal dies from the first hit.

Nirlungayuk (Nunavut) described the Nunavut Inuit perspective that, as part of their culture, they are taught from a very young age never to make an animal suffer and only to hunt those they intend to eat, not harming others. As such, it was on the hunters' own initiative that the penthrite grenade is now the norm used for hunting bowhead whales: they heard about it being used in Alaska, researched how it works and how much faster it is as a killing method, and then reached out to Norway for advice and supplies to implement it. A recurring sentiment throughout the workshop was that the hunters are very concerned with reducing animal suffering, both as its own end goal and because it often results in increasing their own safety.

Supply issues

Jessen and Danielsen (Greenland) brought up an issue that must be addressed when considering welfare improvements in Greenland (and beyond), namely, supply routes and costs that are impacted by global trade and geopolitics. Greenlandic hunters are dependent on supplies from outside the country, meaning that the suppliers determine what the hunters can use. Specifically, at the time of this workshop, the bulk of the ammunition brought into the country is not as effective as that supplied previously, and this has resulted in longer average TTDs for a number of hunts. In other words, the use of the "best available method" is not possible in this case, because the best equipment is essentially being withheld from the hunters by foreign trade. Sharing knowledge on its own is therefore not sufficient to implement meaningful and long-term improvements—ensuring the availability of appropriate materials and training is also fundamental. To that end, as spare parts for harpoon cannons are currently unavailable for Greenland to purchase, Norway has promised to share the necessary schematics so that some spare parts can be produced in the country.

Terminology, definitions, and best practice

When it comes to comparing the current status of welfare outcomes across different hunts and regions, one immediately obvious issue is the variation in definitions for certain welfare criteria. For instance, in the few hunts where they are documented, chase time or drive time do not have the same start and end point. TTD is also measured differently in the field, depending on the species and region. Total motionlessness may be easy for hunters to observe and record, but it is not scientific proof of death. Conversely, an animal may continue to move after it is unconscious. To directly compare current conditions and pinpoint areas for improvement, a first step would be to create a standardised lexicon and approach to identifying different states, e.g., animal is aware it is being chased, animal is unconscious, animal is dead. For TTD and IDR in particular, the purpose would be to assess the effectiveness of different hunting methods, which the hunters themselves are eager to improve.

Multiple participants highlighted that it will never be feasible to practice the same hunting methods across the globe, or even necessarily across the same country. Greenland, for example, is a vast territory where weather and time of year often determine the hunting techniques employed. The laws governing hunting are also tailored to the local prevalent conditions. In Nunavut, the treaties with Canada cannot be superseded by other laws, therefore it would be difficult to introduce management legislation that might clash with anything already established by treaty. As such, a one-size-fits-all approach to best practice is inappropriate. Reid (SVG) mentioned that best practice for, e.g., TTD, should be based on species and hunt type, where x seconds might be considered the target for pilot whales in an open water hunt, but y for pilot whales in a drive hunt, and z for harp seals hunted with rifles. This would give whalers and sealers a realistic goal to aim for per species. Loftsson (Iceland) agreed and expanded on the idea of species-specific norms, perhaps using thresholds to declare a TTD value unacceptable, acceptable, or ideal. Laurie Beaupré (Nunavik) cautioned that establishing best practice in places like Nunavik requires even more than making the necessary tools and equipment steadily accessible. Where knowledge and skills are passed down within local communities, as is the case in hunting societies, generational knowledge does not encompass innovative hunting methods and new weapons. Consequently, training must also be offered alongside any invitation/encouragement to use a different technique.

Following on from standardising the terminology used, Jóhann Ásmundsson (Iceland) suggested that the types of data collected, how data are to be recorded, and how they will be presented and parsed should also be generally agreed upon. Jessen (Greenland) observed that the validation of S&L rates, as well as their reduction, is one of the most frequent recommendations from the NAMMCO Scientific Committee and others. She noted, however, that there are many hurdles to data collection in Greenland and this poses management issues. Investigating the use of different gear types and techniques that are known to have low S&L rates in other regions might be a more direct management approach. In any case, participants agreed that any recommendations regarding methods and data collection should be accompanied by practical support wherever possible.

5 CONCLUSIONS, RECOMMENDATIONS, AND NEXT STEPS

Based on the questions and discussions that arose throughout the WWS, a drafting group outlined a series of recommendations that will enable the improvement of welfare outcomes at an international scale. These were further refined and agreed upon by all participants and are listed below.

- **Develop a common framework** for terminology, data collection, and analysis, taking into account the specificities of each hunt.
- **Define best welfare outcomes by species and hunt type**. This includes finding realistic best practices for the lowest possible TTD, highest IDR, and minimum Struck and Lost. Improving global welfare outcomes does not require standardisation of regulations across countries and regions.

- **Promote the fast killing of the animal to reduce suffering and improve welfare outcomes**, which has been recognised as being in the hunters' best interest. It should be a principle that the best available equipment should be used for the hunt.
- **Make available the necessary hunting equipment** to improve welfare outcomes and have a more efficient hunt. For this purpose, the aim should be to have stable access to the best available equipment.
- **Develop new methods and find the best available equipment for an efficient hunt.** This should be supported by accessible and adequate training, as well as with the appropriate practical support.
- **Share knowledge about hunting tools/equipment and know-how among hunting communities.** NAMMCO could organise a dedicated initiative to go further into exchanging knowledge. The specific hunts to be discussed in this setting could be prioritised in consultation between hunters and managers.

The importance of sharing knowledge and experience among hunting communities to progress in terms of welfare outcome and hunters' safety, regarding equipment but also all the processes around the hunt, including training, maintenance, monitoring and legislation, was underlined and agreed upon several times during the WWS.

At the conclusion of the workshop, the Chair thanked all participants for their attendance and their contributions. He expressed appreciation for the valuable insights demonstrated throughout the presentations as well as for the expertise shared, which advanced the collective understanding of marine mammal welfare. The Chair also expressed his appreciation to the co-organisers, NAMMCO and Japan, and the staff of the NAMMCO Secretariat for their efforts in facilitating the event. In turn, the participants applauded the Chair and commended the work of the Secretariat. The workshop was then formally closed.

APPENDIX 1: List of participants in alphabetical order, grouped by province or country of residence

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APPENDIX 2: Workshop agenda and list of documents

1. **Opening remarks**
2. **Status overview: Where do marine mammal hunts stand today in terms of welfare outcomes**
   a. Previous NAMMCO recommendations and responses given
   b. Current knowledge provided by participants
3. **Lesser-known or described hunting methods presented by hunters**
   a. Japan
   b. Greenland
   c. Sweden
   d. St Vincent and the Grenadines
   e. Nunavut
   f. Faroe Islands
4. **General discussion**
   a. Terminology
   b. Legislation
   c. Plenary
5. **Conclusions, recommendations, and next steps**

Reference no.	Title
MMWWS 2025/01	Programme and list of documents
MMWWS 2025/02	List of participants
MMWWS 2025/03	Information on hunts, as provided by participants
MMWWS 2025/04	National authorities involved in MM hunting, as provided by participants
MMWWS 2025/05	Global and national welfare issues, as identified by participants
MMWWS 2025/06	Summary of Welfare-related data provided by the participant countries for the MMWWS 2025
MMWWS 2025/07	A comparative analysis of animal welfare legislation in selected countries
MMWWS 2025/08	Overview of Workshops, Expert Groups and Seminars dealing with hunting methods and welfare issues and organised by the NAMMCO Committee on Hunting Methods – Review of Terms of Reference, Results and Recommendations, as reporting to the Council of NAMMCO
MMWWS 2025/09ab	NAMMCO Recommendations pertaining to hunting methods and addressed to parties, **Doc 09a**, and non-member countries, **Doc 09b** – and responses
MMWWS 2025/FI01	Robards & Reeves (2011) - The global extent and character of marine mammal consumption by humans: 1970–2009
MMWWS 2025/FI02	Øen (2021) - **A**nimal Welfare in the Conduct of Whaling: A Review of the Research and Developments to Improve Animal Welfare in the Minke Whale Hunt in Norway 1981–2005.

APPENDIX 3: Press release

INCREASED ATTENTION TO WELFARE IN MARINE MAMMAL HUNTING

Marine mammals are hunted for food and other resources across various regions of the world, from west to east and north to south, in very different environmental and cultural contexts. A shared feature of these hunts is the attention to welfare outcomes. This focus is driven by two key factors: A quick and humane kill benefits the hunted animal, and it is also in the hunter's best interest, improving both safety and efficiency.

On March 24, 2025, hunters from 11 communities gathered in Tromsø to discuss the state of welfare outcomes in marine mammal hunting and explore ways to improve these practices. The participants, including hunters, veterinarians, scientists, and managers from Nunavut, Nunavik, Saint Vincent and the Grenadines, Greenland, Iceland, the Faroe Islands, Norway, Sweden, Finland, Åland, and Japan, shared their experiences and expertise in efforts to minimise hunting durations and reduce the loss of animals.

The workshop, organised by NAMMCO and co-hosted with the Fisheries Agencies of Japan, provided an inclusive forum for participants to exchange knowledge on successful practices, challenges, and areas for improvement. Significant progress has been made in reducing the time it takes to kill marine mammals and in decreasing struck and lost rates for some hunts. However, there is still room for improvement in certain hunting methods.

The participants emphasised the importance of learning from one another and highlighted the need for a common framework for terminology, data collection, and analysis to track welfare outcomes. They also highlighted that target goals for reducing the duration of the hunting process and minimising animal loss for specific species and hunt types, would be beneficial. Additionally, the use of the best available equipment was underscored, as was the need for stable access to this equipment. Accessible and adequate training for the hunters was a prerequisite to good welfare outcomes, as well as their involvement in the development of new hunting methods and monitoring program.

NAMMCO is an organisation uniquely placed to support the improvement of hunting methods in a practical way and will continue to support the wider sharing of knowledge among hunting communities to improve welfare outcomes in marine mammal hunting, including hunting tools and equipment.

About NAMMCO

NAMMCO is an international organisation for regional consultation and cooperation on the conservation, rational management, and study of marine mammals in the North Atlantic, dealing with small and large whales as well as seals and walruses. The NAMMCO agreement was signed in Nuuk in April 1992.

NAMMCO provides conservation and management advice based on science, local knowledge, and technological developments. The work of the committees is assisted by international experts. The organisation follows best practices and a precautionary approach, striving to base its work on an ecosystem approach to management.

More information on NAMMCO and its activities can be found at www.nammco.org