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VKM Report 2022: 01

Compilation of knowledge on the global population of common minke whale (*Balaenoptera acutorostrata*)

Scientific Opinion of the Panel on Alien Organisms and Trade in Endangered Species of the Norwegian Scientific Committee for Food and Environment

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Norwegian Scientific Committee for Food and Environment (VKM)
Postboks 222 Skøyen
0213 Oslo
Norway

Phone: +47 21 62 28 00
Email: vkm@vkm.no

vkm.no

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Compilation of knowledge on the global population of common minke whale (*Balaenoptera acutorostrata*)

Preparation of the opinion

The Norwegian Scientific Committee for Food and Environment (Vitenskapskomiteen for mat og miljø, VKM) appointed a project group to draft the opinion. The project group consisted of two VKM members and one VKM staff. One referee commented on and reviewed the draft opinion. The VKM Panel on Alien Organisms and Trade in Endangered Species (CITES), assessed and approved the final opinion.

Authors of the opinion

The authors have contributed to the opinion in a way that fulfils the authorship principles of VKM (VKM, 2019). The principles reflect the collaborative nature of the work, and the authors have contributed as members of the project group and/or the VKM Panel on Alien organisms and Trade in Endangered Species (CITES) that assessed and approved the work.

Members of the project group (in alphabetical order after chair of the project group):

Eli K. Rueness – Chair of the project group and member of the Panel on alien organisms and trade in endangered species (CITES). Affiliation: 1) VKM; 2) Centre for Ecological and Evolutionary Synthesis (CEES), Department of Biosciences, University of Oslo.

Erlend B. Nilsen – Member of the Panel on Alien Organisms and Trade in Endangered Species (CITES) in VKM. Affiliation: 1) VKM; 2) Norwegian Institute for Nature Research (NINA), Trondheim.

Kjersti S. Kvie – Project leader, VKM staff. Affiliation: VKM.

Members of the Panel on Alien Organisms and Trade in Endangered Species (CITES) (in alphabetical order before chair of the Panel/Scientific Steering Committee):

In addition to Erlend B. Nilsen and Eli Rueness these were (in alphabetical order before chair/vice chair of the Panel):

Hugo de Boer - Member of the Panel on Alien Organisms and Trade in Endangered Species (CITES) in VKM. Affiliation: 1) VKM; 2) Natural History Museum, Oslo.

Katrine Eldegard - Member of the Panel on Alien Organisms and Trade in Endangered Species (CITES) in VKM. Affiliation: 1) VKM; 2) Norwegian University of Life Sciences (NMBU), Ås.

Kjetil Hindar – Member of the Panel on Alien Organisms and Trade in Endangered Species (CITES) in VKM. Affiliation: 1) VKM; 2) Norwegian Institute for Nature Research (NINA), Trondheim.

Lars Robert Hole - Member of the Panel on Alien Organisms and Trade in Endangered Species (CITES) in VKM. Affiliation: 1) VKM; 2) The Norwegian Meteorological Institute, Bergen.

Johanna Järnegren – Member of the Panel on Alien Organisms and Trade in Endangered Species (CITES) in VKM. Affiliation: 1) VKM; 2) Norwegian Institute for Nature Research (NINA), Trondheim.

Kyrre Kausrud – Member of the project group and member of the Panel on alien organisms and trade in endangered species (CITES) in VKM. Affiliation: 1) VKM; 2) Norwegian Veterinary Institute (NVI)

Inger Elisabeth Måren – Member of the Panel on Alien Organisms and Trade in Endangered Species (CITES) in VKM. Affiliation: 1) VKM; 2) Department of Biological Sciences, University of Bergen.

Anders Nielsen – Vice chair of the Panel on Alien Organisms and Trade in Endangered Species (CITES) in VKM. Affiliation: 1) VKM; 2) Norwegian Institute of Bioeconomy Research (NIBIO); 3) Centre for Ecological and Evolutionary Synthesis (CEES), Department of Biosciences, University of Oslo.

Eva B. Thorstad – Member of the Panel on Alien Organisms and Trade in Endangered Species (CITES) in VKM. Affiliation: 1) VKM; 2) Norwegian Institute for Nature Research (NINA), Trondheim.

Gaute Velle – Chair of the Panel on Alien Organisms and Trade in Endangered Species (CITES) in VKM. Affiliation: 1) VKM; 2) Norwegian Research Centre AS (NORCE); 3) Department of Biological Sciences, University of Bergen.

Acknowledgement

VKM would like to thank Denise Risch (Scottish Association for Marine Science) for her valuable comments through critical review of the draft opinion. VKM emphasises that referees are not responsible for the content of the final opinion. In accordance with VKM's routines for approval of a risk assessment (VKM, 2018), VKM received the comments before evaluation and approval by VKM Panel on Alien Species and Trade in Endangered Species (CITES), and before the opinion was finalised for publication.

Competence of VKM experts

Persons working for VKM, either as appointed members of the Committee or as external experts, do this by virtue of their scientific expertise, not as representatives for their employers or third-party interests. The Civil Services Act instructions on legal competence apply for all work prepared by VKM.

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Summary

Key words: *Balaenoptera acutorostrata*, common minke whale, CITES, Norwegian Scientific Committee for Food and Environment, VKM, Norwegian Environment Agency, compilation of knowledge

The Norwegian Environment Agency has requested the Norwegian scientific committee for food and environment (VKM), as Norwegian CITES Scientific Authority, to provide a science-based compilation of information pertaining to the global population of common minke whale. This is in accordance with the Convention's resolution 10.3 'Designation and role of Scientific Authorities'.

The common minke whale (*Balaenoptera acutorostrata*) is distributed in the Atlantic and Pacific oceans on the Northern- and Southern Hemisphere. Three subspecies are acknowledged: the North Atlantic common minke whale, the North Pacific common minke whale and the dwarf common minke whale.

The common minke whale is highly migratory and can be found in polar, temperate, and tropical waters in both coastal and offshore areas. Particularly mature females gather on higher latitude summer feeding grounds. This is where most whaling occurs, and females are overrepresented in the catch. Little information exists on the migration patterns and breeding ecology of common minke whales.

The North Atlantic- and North Pacific distribution areas have been divided into a hierarchy of management units by the International Whaling Commission (IWC). Abundance estimates for the common minke whale are made more or less regularly for the management units as well as for other regions of the distribution range. The latest population size assessment (from 2018) of the global common minke whale population by the International Union for Conservation of Nature (IUCN) was 200,000 mature individuals. The population trend is unknown. The degree of population structure within each subspecies is a topic of discussion.

In the North Atlantic, a northward distributional shift in summer and winter has been observed and is expected to continue as a consequence of global warming.

The common minke whale is subject to direct negative impact from ship strikes, entanglement in fishing gear and debris, noise and pollution, but the consequences on population level are unknown. Historically, whaling caused a severe population decline, and it is still a major cause of unnatural mortality. The long-term effects from climate change and pollution are unknown.

Since the 1980s a moratorium on whaling introduced by the International Whaling Commission has been adopted by most countries. The common minke whale is listed on the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix I and international commercial trade is banned. Norway, however, has a

reservation to the listing and manages the species as if listed on Appendix II. Norway has resumed commercial whaling and is the largest exporter of common minke whale meat. Japan is the main importer of whale meat from Norway.

Much of the knowledge about the common minke whale is based on relatively few observations within geographical regions representing a limited part of the distribution range. Both population size, -structure and -trends are therefore difficult to assess with certainty. There are gaps in the knowledge about basic biological features such as migration, reproduction and demography.

Sammendrag på norsk

Nøkkelord: *Balaenoptera acutorostrata*, Vågehval, CITES, Miljødirektoratet, VKM, kunnskapssammenstilling

Miljødirektoratet har bedt Vitenskapskomiteen for mat og miljø (VKM), som er vitenskapelig myndighet for CITES, om å utarbeide et sammendrag over vitenskapelig informasjon om den globale bestanden av vågehval. Dette er i tråd med kravene som stilles i Konvensjonen i henhold til resolusjon 10.3 'Designation and role of Scientific Authorities'.

Vågehval (*Balaenoptera acutorostrata*) er utbredt i Atlanterhavet og Stillehavet på både den nordlige og sørlige halvkule. Tre underarter er anerkjent: Nordatlantisk vågehval, Nord-Stillehavs vågehval og dvergvågehval.

Vågehvalen er en utpreget migrerende art og kan finnes i polare, tempererte og tropiske havområder, både langs kysten og i åpent hav. Spesielt voksne hunner samles ved høyere breddegrader for å spise om sommeren. Det er i disse områdene det meste av hvalfangst finner sted og hunner er overrepresentert i fangsten. Man vet lite om bevegelsesmønsteret og formeringsbiologien til vågehvalen.

Den internasjonale hvalfangstkommisjonen (IWC) har delt opp Nord-Atlanteren og Nord-Stillehavet i flere nivåer av forvaltningsenheter. Det foretas målinger av bestandsstørrelsen til vågehval mer eller mindre regelmessig innen forvaltningsenhetene samt i andre deler av utbredelsesområdet. Den internasjonale naturvernunionens (IUCN) siste anslag for den globale vågehvalbestanden fra 2018 var på 200 000 voksne individer. Bestandstrenden er ukjent. Graden av bestandsstruktur innad i hver underart er omdiskutert.

I Nord-Atlanteren har man observert at bestanden forflytter seg nordover både om sommeren og vinteren, og denne utviklingen er antatt å fortsette som en konsekvens av global oppvarming.

Vågehvalen påvirkes negativt av å bli påkjørt av båter, av å havne som bifangst eller på andre måter sette seg fast i fiskeutstyr eller søppel, og av støy og forurensning. Det er imidlertid uvisst hvordan dette påvirker på bestandsnivå. Historisk sett førte hvalfangst til en sterk reduksjon av bestanden og det er fortsatt en betydelig årsak til unaturlig dødelighet. De langsiktige konsekvensene av forurensning og klimaendringer er ukjent.

På 1980-tallet ble det innført et hvalfangstmoratorium av den internasjonale hvalfangstkommisjonen som overholdes av de fleste land. Vågehvalen står på Appendix I (norsk liste A) til den konvensjonen for internasjonal handel med truede arter (CITES) som innebærer et forbud mot internasjonal kommersiell handel. Norge har reservert seg mot denne listingen og behandler vågehval som en Appendix II (norsk liste B) art. Norge har opprettholdt kommersiell hvalfangst og er den største eksportøren av vågehvalkjøtt. Japan står for mest innførsel av vågehvalkjøtt fra Norge.

Kunnskapsgrunnlaget for vågehval er i stor grad basert på forholdsvis få observasjoner innen geografiske områder som utgjør bare deler av utbredelsesområdet. Det er derfor vanskelig å beregne bestandsstørrelse, bestandsstruktur og bestandsutvikling med sikkerhet. Kunnskapen om grunnleggende biologiske egenskaper som migrasjon, reproduksjon og demografi er mangelfull.

Abbreviations

IWC – International Whaling Commission

RMP – Revised Management Procedure

IMR – Institute of Marine Research in Norway

IUCN -The International Convention for Conservation of Nature

CITES - The Convention on International Trade in Endangered Species of Wild Fauna and Flora

NEA - The Norwegian Environment Agency

VKM - Norwegian Scientific Committee for Food and Environment

PAM - Passive Acoustic Monitoring

NMP - New Management Procedure

CPUE - Catch Per Unit Effort

CLA - Catch Limit Algorithm

NAMMCO – North Atlantic Marine Mammal Commission

NMDR - Norwegian Minke Whale DNA Registry

JARPN - Japanese Whale Research Programs in the Northwestern Pacific Ocean

WGBYC – Working Group on By-catch of Protected Species

T-NASS – Trans North Atlantic Sighting Surveys

Background as provided by the Norwegian Environment Agency

The Norwegian Environment Agency herby refers to the cooperation agreement between the Norwegian Environment Agency and VKM on 31 January 2019, as well as the mandate for assignments to VKM on risk assessment in 2019, and formally requests VKM to conduct a scientific compilation of knowledge regarding Minke whale (*Balaenoptera acutorostrata*). The Norwegian Environment Agency is the Management Authority under Cites and hereby designates that VKM for this assignment has the role of Norwegian Scientific Authority in accordance with the requirements set in the Convention text and in accordance with resolution 10.3 'Designation and role of Scientific Authorities'.

Minke whales are listed on CITES appendix I. Norway has a reservation for this listing and therefore treats the species as if it were on appendix II. The Norwegian Environment Agency receives applications for export and import of the species.

Terms of reference as provided by the Norwegian Environment Agency

The Norwegian Environment Agency asks VKM for a scientific compilation of knowledge on minke whales globally.

The compilation shall contain the following information/sections:

- Distribution: An account of the species' current geographical distribution globally, with information on possible separate subpopulations. Information on any changes/trends in distribution must also be included.

- Habitat and life history: A brief summary of which habitat the species lives in and its general life history (e.g., reproduction, survival, migration and age structure).

- Population size and trends: Historical and current population size(s) and any trends in population size on a global scale and in subpopulations.

- Habitat trends: Information on any changes in the habitat of minke whales over time that may have an impact on the species. To be seen in connection with any trends in population size.

- Population structure: Information on any changes / trends in demographics (global and subpopulations).

- Threats: A summary of the threats facing the species with a brief discussion of the relative degree of severity (e.g., disease, pollution, competition, habitat loss, capture, etc.).

- Monitoring: Overview of which monitoring programs which monitors population sizes and harvests of minke whales (national and international).

- Trade: Information on national and international trade in the species. The information must include; description of how the species is harvested from nature, what types of specimens/products are common in trade, quantification of international trade with any trends and any trends/changes in demand. The information must also include any illegal trade/capture.

1 Methodology and data

1.1 Literature search and selection

The Web of Science, core collection[1] was used for literature collection using the following search terms: "common minke whale", "minke whale", "*balaenoptera acutorostrata*" to conduct the initial searches. We also performed general searches in Google Scholar. Articles and their reference lists were then screened for information relevant to the Terms of Reference. In addition to peer reviewed literature, general information about the common minke whale was found on the website of the IUCN Red List[2], the website of the National Oceanic and Atmospheric Administration (NOAA)[3], and the website of the North Atlantic Marine Mammal Commission (NAMMCO)[4], a substantial amount of information relating to common minke whale biology and management published in reports issued by the International Whaling Commission[5], NAMMCO and NOAA. The 2019 VKM report on common minke whale was used to obtain information pertaining to management of the population of the Northeastern Atlantic (VKM, 2019). Data on commercial trade was found using the CITES Trade Database[6].

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[1] https://clarivate.com/products/web-of-science/

[2] https://www.iucnredlist.org/searchquery=minke%20whale&searchType=species

[3] https://www.fisheries.noaa.gov/about-us

[4] https://nammco.no/topics/common-minkewhale/

[5] https://iwc.int/home

[6] https://trade.cites.org/

2 Compilation of knowledge on the global population of common minke whale (*Balaenoptera acutorostrata*)

2.1 Distribution

There are two closely related species of minke whales, the common minke whale (*Balaenoptera acutorostrata*) and the Antarctic minke whale (*B. bonaerensis*) (Rice, 1998). The two species have overlapping geographic distributions, and hybridization resulting in fertile offspring has been documented (Glover et al., 2013). Common minke whale has three subspecies: the North Atlantic common minke whale (*B. acutorostrata acutorostrata*), the North Pacific common minke whale (*B. acutorostrata scammoni*), and the dwarf common minke whale (unnamed subsp.) (Rice, 1998).

This compilation concerns the common minke whale, which is native to, at least, the following countries (where they are regularly observed within the Exclusive Economic Zones): Anguilla, Antarctica, Antigua and Barbuda, Argentina, Australia, Bahamas, Bangladesh, Belgium, Bermuda, Bonaire, Sint Eustatius and Saba (Saba, Sint Eustatius), Brazil, Canada, Cape Verde, Chile, China, Cuba, Curaçao, Denmark, Dominica, Dominican Republic, Ecuador, Faroe Islands, France, French Guiana, Gambia, Germany, Greece, Greenland, Guadeloupe, Iceland, Indonesia, Ireland, Israel, Italy, Japan, Korea, Democratic People's Republic of, Korea, Republic of, Mauritania, Mexico, Morocco, Mozambique, Netherlands, New Caledonia, New Zealand, Norway, Papua New Guinea, Portugal, Puerto Rico, Russian Federation, Saint Martin (French part), Saint Pierre and Miquelon, Senegal, Sint Maarten (Dutch part), South Africa, Spain, Svalbard and Jan Mayen, Sweden, Taiwan, Province of China, Thailand, Tunisia, Turks and Caicos Islands, United Kingdom, United States, Uruguay, Virgin Islands, British, Virgin Islands, U.S.A. and Western Sahara.

Common minke whales migrate seasonally and can travel long distances. Generally, populations feed in higher latitude coastal waters during summers and migrate towards more equatorial areas during winters. The common minke whale is a relatively small whale (7-10 meters), and its elusive behavior makes it difficult to track. Hence, little is known about its whereabouts most of the year (Risch et al., 2019b).

2.1.1 Survey methods

Monitoring of populations, data gathering and research on common minke whales have in the past been tightly linked to commercial whaling. Most knowledge is therefore available on the hunted populations. Surveys of distribution and abundance are regularly undertaken within predefined areas (Figures 1 and 2). Systematically spaced transects of the survey areas are covered by ship or plane, most commonly using human observers to count animals. The sightings are then transferred to abundance estimates through statistical modelling (see VKM, 2019 pp 26-27 for detailed description). Satellite telemetry has proved to be difficult for common minke whales (Vikingson, 2015), however, Vikingsson and Heide-Jørgensen (2015) tracked a whale from Iceland to beyond the Azores (at 28° N). As the common minke whale is a vocal species, Passive Acoustic Monitoring (PAM), utilizing networks of underwater sound recorders, has been used to study its migratory patterns (e.g., Risch et al., 2014b, Risch et al., 2019a). Photo-identification is used to study distribution and migration patterns of the common minke whale in the Northeast Pacific[7]. At the Great Barrier Reef, tourism vessels are utilized in a photo-identification program of dwarf common minke whales in which underwater images provided by divers are used in research (summarized in Risch et al., 2019b).

2.1.2 North Atlantic common minke whale

The summer feeding grounds of the North Atlantic common minke whales are found in the North-, Norwegian- and Barents Seas, the coastal waters of Iceland, East- and West Greenland, Newfoundland and Labrador (Horwood, 1989) and further south around the British Isles and in the Gulf of St Lawrence (Risch et al., 2019a). Telemetry and acoustic monitoring have been used to track migrating minke whales and show various routes to the southern wintering grounds (e.g., Víkingsson and Jørgensen 2015, Risch et al., 2014b). Sightings have been recorded in Spain and Portugal, Western Sahara, Mauritania, Senegal and the Cape Verde Islands, and common minke whales also occur year-round off the Canary Islands and the Azores (summarized in Cooke, 2018). At least a part of the population of common minke whales in the western North Atlantic appears to migrate to the Caribbean during winter (Bolaños-Jiménez et al., 2021). Results from passive acoustic monitoring support the data from sightings regarding absence of whales from the North Sea during winter months (Risch et al., 2019a). Distributional shifts of the North Atlantic common minke whale towards the North have been observed over the last decade (NAMMCO, 2018, Haug et al., 2017, Pike et al., 2020).

2.1.3 North Pacific common minke whale

In summer, North Pacific common minke whales occur across the North Pacific Okhotsk Sea, Bering Sea, along the USA West Coast, around the Aleutian Islands and north to the Gulf of Alaska and the Chukchi Sea. There appears to be a year-round subpopulation off California. Data from Korea and Japan indicate seasonal southbound migrations of common minke whales in the western North Pacific, with unknown final destinations. Common minke whales

[7] https://mersociety.org/minke

have been detected both acoustically and visually around the Mariana Islands and Hawaii during winter (summarized in Cooke, 2018 and Risch et al., 2019b).

2.1.4 Dwarf common minke whale

The distribution of dwarf common minke whales spans the entire southern hemisphere. They are found close to the Antarctica during the summer months and in temperate and warmer waters during winter when they are reported in areas off Australia (such as the Great Barrier Reef), South America, and South Africa (Millmann et al., 2021). They are sympatric with Antarctic minke whales in large parts of their distribution range (Acevedo et al., 2011).

2.2 Habitat and life history

2.2.1 Habitat

Common minke whales occur in polar, temperate, and tropical waters in both coastal and offshore areas worldwide.

2.2.2 Ecology

Common minke whales are baleen feeders and forage mainly on crustaceans, plankton, and small schooling fish such as herring (*Clupea harengus*), capelin (*Mallotus villosus*) and Japanese anchovy (*Engraulis japonicus*). The diet varies according to availability of prey species (Cooke, 2018, Haug et al., 2017). In the Southern Hemisphere, the main food source is krill (order Euphausiacea).

Energy is stored in blubber and visceral fat. Blubber and fat are also important for thermal insulation, structural support, locomotion and buoyancy (Gunnlaugsson et al., 2020). Fat deposition occurs during the feeding season, and blubber thickness and girth measurements are used to study the feeding ecology of the species.

Bogstad et al. (2015) describe competition between common minke whales and other predators with similar prey preferences, like Atlantic cod (*Gadus morhua*), harp seal (*Pagophilus groenlandicus*) and possibly sea birds, in the Barents Sea. It has been suggested that competition between Atlantic cod and the common minke whales for the same prey could play an important role in the predator-prey dynamics in the Barents Sea ecosystem (Solvang et al., 2021).

Sighting data (2002–2014) indicate a large degree of spatial overlap between common minke whales and other migratory baleen whales, dolphins and killer whales (*Orcinus orca*) in the summer foraging areas in the waters around the Svalbard Archipelago (Storrie et al., 2018). Common minke whales from all subspecies are subject to predation by killer whales (Ford et al., 2005).

Common minke whales communicate acoustically through a variety of sounds and distinct vocalizations vary depending on geographic area. A "boing" sound is produced by North Pacific common minke whales (Rankin and Barlow, 2005), while 'star-wars' vocalization has been attributed to Australian dwarf common minke whales (Gedamke et al., 2001). North Atlantic common minke whales produce low-frequency pulse trains (Mellinger et al., 2000, Risch et al., 2014a).

2.2.3 Life history

Common minke whales reach sexual maturity between five and seven years of age, and most mature females become pregnant every year (Haug et al., 2011). Mating normally occurs in late winter (Cooke, 2018). The gestation period is approximately 10 months and females can give birth to one calf annually. The locations of breeding and calving grounds are unknown and information about mating behavior has never been observed and is therefore lacking. The expected lifespan of a common minke whale is 30-50 years (Song et al., 2016).

Common minke whales are considered solitary and are usually sighted individually or in small groups. There is evidence of sexual segregation during summer, with the larger females aggregating in feeding grounds at higher latitudes (e.g., Horwood, 1989, Haug et al., 2011).

Several studies demonstrate strong female biased sex ratio in the catch from the northernmost areas (e.g., Andersen et al., 2003; Anderwald et al., 2011; Quintela et al., 2014). The pregnancy rate of female whales hunted in the Northeast Atlantic is high, and 131 of the 350 females caught in 2018 carried fetuses. The proportion of females in the catch in 2018 was 77% (VKM, 2019). In an older study from the Barents Sea, as much as 94% of the mature females caught were pregnant (Christensen et al., 1981).

2.3 Population size and trends

2.3.1 Global

The International Convention for Conservation of Nature (IUCN) last assessed the global common minke whale population in 2018 to a total of 200,000 mature individuals. The population trend is unknown (Cooke, 2018).

2.3.2 Subpopulations

The International Whaling Commission (IWC), which is responsible for whale management, recognizes three populations of the common minke whale: North Atlantic, North Pacific and Southern Hemisphere (dwarf common minke whale). Each common minke whale population is subdivided into several areas for management and monitoring purposes (the whales within each area are often referred to as stocks, see Table 1). These areas are again subdivided into 'small areas' (North Atlantic, Figure 1) or 'subareas' (North Pacific, Figure 2). The purpose of the smaller management units is to avoid depletion in any area when setting hunting quotas (see section 2.7.2).

Estimates of current population size, known as abundance estimates, are derived from a combination of fieldwork and statistical modelling. The uncertainty of the abundance estimates is therefore always included, usually a 95% confidence interval (CI) or coefficient of variation (CV). All abundance estimates are submitted to the IWC Scientific Committee and reviewed by an expert group. The latest IWC approved abundance estimates for the North Atlantic and North Pacific are found in Table 1.

Table 1. The International Whaling Commissions' population size estimates accompanied by 95% Confidence Intervals (CI).

Population	Stock	'Best' estimate	Approximate 95% CI	Year
North Atlantic	Northeastern	90,000	62,000 – 128,000	2008-2013
	Central	50,000	30,000 – 83,000	2005-2007
	West Greenland	5,100	2,100 – 12,000	2015
North Pacific	North West Pacific and Okhotsk Sea (O-stock)	20,000	13,000 – 30,000	2003
	Sea of Japan (J-stock)	4,200	2,700 – 6,300	2004-2006

IWC Whale population estimates. https ://iwc.int/estimate. Accessed 08.01.2022

2.3.2.1 North Atlantic

The current abundance estimate for the entire North Atlantic is 180,000 common minke whales (NAMMCO, 2019).

Whaling in the North Atlantic takes place in five small areas within the Central (CM) and Eastern (EB, EC, EN, ES (again divided into ESW and ESE) medium regions, as shown in Figure 1. These are surveyed individually, but the abundance estimates are combined when hunting quotas are set (see section 2.7.1.2). Abundance estimates for the period 1989 to 2019 are presented in Table 2.

Table 2. Abundance estimates for Central (CM or Jan Mayen) and Eastern North Atlantic 1989-2019, each accompanied by a coefficient of variation (CV).

Year	CM (Jan Mayen)	Eastern	Total	Reference
1989	2,650 (CV 0.484)	64,730 (CV 0.192)	67,380 (CV 0.190)	Schweder et al., 1997
1995	6,174 (CV 0.357)	112,125 (CV 0.104)	118,299 (CV 0.103)	Schweder et al., 1997
1996-2001	26,718 (CV 0.14)	80,487 (CV 0.15)	107,205 (CV 0.13)	Skaug et al., 2004
2002-2007	26,739 (CV 0.39)	81,401 (CV 0.15 0.23)	108,140 (CV 0.23)	Bøthun et al., 2009
2008-2013	10,991 (CV 0.26)	89,623 (CV 0.12)	100,615 (CV 0.11)	Solvang et al., 2015
2014-2019*	37,020 (CV 0.261)	104,692(CV 0.172)	149,722 (CV 0.152)	Bjørge et al., 2021

*These estimates have not yet been reviewed by the IWC Scientific Committee.

The almost 50% increase in the 2014-2019 abundance estimate as compared to the estimate for the period 2008-2013 (see table 2) is believed to reflect a shift in whale distribution rather than an increase in absolute abundance (Bjørge et al., 2021). Moreover, the sighting results in the small area, CM, in 2021 was lower than the results in 2016, and the abundance estimate for the North Atlantic is therefore expected to decrease again for the 2020-2025 survey cycle according to the Norwegian Institute of Marine Research (Bjørge et al., 2021).

The abundance estimate based on arial and shipboard surveys in European waters in 2016 was 14,759 (CV = 0.319) (Hammond et al., 2021). For Icelandic waters (CIC in Figure 1), analysis of data collected in aerial surveys from 1986-2016 indicate a 75% decrease in the abundance of common minke whale since 2001. The latest abundance estimate for Icelandic waters, from 2016 was 13,497 (CV = 0,5) animals (Pike et al., 2020).

For the Canadian East Coast, the latest abundance estimates from 2016 were 13,008 (CV = 0,46) for Newfoundland/Labrador and 6,158 (CV = 0,40) for Nova Scotia/Gulf of St. Lawrence. The latest estimate from 2015 was 5,095 (CV = 0,46) for West Greenland and 2,762 (CV = 0,47) for East Greenland[8].

2.3.2.2 North Pacific

No abundance estimate exists for the number of common minke whales in the entire North Pacific.

In addition to the two populations of the western North Pacific mentioned in Table 1 (commonly referred to as the J-stock and the O-stock, see also section 2.5.2), the IWC recognizes a stock of common minke whales in the "remainder" of the North Pacific. The latest abundance estimates for the remainder population were 636 (CV=0.72) for California-Oregon-Washington (2020) and 438 (CV = 1.05) for Hawaii (2016). No estimate is available for Alaska[8].

2.3.2.3 Southern Hemisphere

No abundance estimate exists for common minke whale from the Southern Hemisphere because the population is indistinguishable from the more numerous and partially sympatric Antarctic minke whale in most of the available quantitative sighting data (Cooke, 2018).

2.4 Habitat trends

A distributional shift in the North Atlantic towards the north in summer and winter has been suggested by direct observations of common minke whales in the Canadian Hudson Bay (Hidgeon and Ferguson, 2010), increase in takes in the northern communities of West Greenland (NAMMCO, 2012), and surveys from Norway (Solvang et al., 2015). A dietary change observed for the common minke whales in Icelandic waters could be a response to shifts in prey distribution due to global warming (Vikingsson et al., 2015). Furthermore, sightings of calves in Northeast Atlantic during winter (Kavanagh et al., 2018) could indicate a northward shift in calving grounds. There has been a significant increase in the number of sightings of common minke whales in the Arctic over the past few decades (van Weelden et al., 2021). Their distribution might expand further into the Arctic Ocean following the withdrawing ice edge (Haug et al., 2017).

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[8] https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-species-stock#cetaceans---large-whales

2.5 Population structure

The three subspecies of common minke whales are defined by differences in geographical origin, morphology and genetics (Rice, 1998, Millmann et al., 2021).

The estimated body length at maturity differs among the populations: 8.2m for males and 8.8m for females in North Atlantic common minke whales, 7.5m for males and 8.0m females in North Pacific common minke whales, and 6.6m for males and 7.0m for females of the dwarf common minke whale (reviewed by Murase et al., 2020).

Analyses of mitochondrial DNA (mtDNA) suggests that the common and Antarctic minke whale diverged in early Pliocene, approximately 4.7 million years ago, while the common minke whales differentiated on the Northern Hemisphere during a cold period in the Pleistocene, about 1.5 million years ago (Pastene et al., 2007).

North Atlantic and North Pacific common minke whales form separate mtDNA clades (groups). The same applies to Western South Atlantic- and Western South Pacific dwarf common minke whales (Millmann et al., 2021). The South Atlantic dwarf common minke whales mtDNA is in fact more closely related to that of North Atlantic common minke whales than to that of other dwarf common minke whales (Pastene et al., 2010). The results from bi-parentally inherited markers (microsatellites) were less clear than that for the maternally inherited mtDNA, but showed significant differentiation between the two populations of dwarf common minke whale (Millmann et al., 2021).

It should be noted that as the geographic locations of the common minke whale's mating and breeding grounds are unknown, information about the number, sizes and potential structuring of the breeding populations is lacking. Conclusions about the genetic structure of the common minke whale breeding populations would require sampling on breeding grounds.

The International Whaling Commission applies the sub-areas defined for North Atlantic and North Pacific common minke whales (Figure 1 and 2) when attempting to assess if substructure exists within these populations.

2.5.1 North Atlantic common minke whale

The North Atlantic consists of the Northeast Atlantic, Central North Atlantic, West Greenland, and Canadian East Coast (which includes the U.S. east coast). IWC operates with the so-called medium areas, including Eastern (E), Central (C) and Western (W) (see Figure 1).

The consensus from several studies seems to be that the three distinct mtDNA lineages in North Atlantic common minke whales show no geographical pattern (Andersen et al., 2003; Anderwald et al., 2011; Quintela et al., 2014). However, some studies based on microsatellites suggest genetic structure within the North Atlantic (Andersen et al., 2003; Anderwald et al., 2011). No genetic differentiation was found within the North East Atlantic using both mtDNA and microsatellites, neither geographically or among age classes (Quintela et al., 2014). In IWC Scientific Committee's latest review of stock structure of the North Atlantic, hypotheses involving 1, 2, or 3 breeding stocks are considered equally plausible (IWC, 2014).

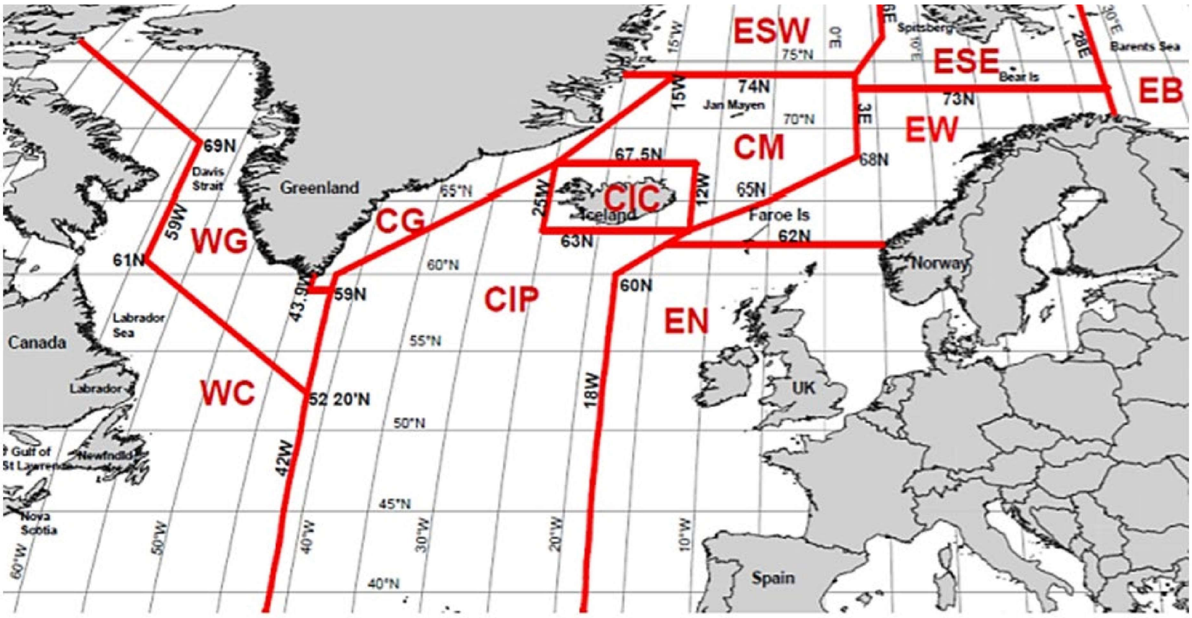

Figure 1. The North Atlantic management areas for common minke whale as defined by the International Whaling Commission. The North Atlantic region is divided into 3 medium areas (Western (W), Central (C), Eastern (E)), that are further divided into 11 small areas.

2.5.2 North Pacific common minke whale

The North Pacific common minke whale is divided into two stocks by the International Whaling Commision: Eastern J-stock (East China Sea, Sea of Japan, and Yellow Sea) and Western O-stock (Pacific waters and Sea of Okhotsk). Common minke whales in eastern parts of the North Pacific are assigned to a "remainder" stock that is less explored.

The J- and O- stocks are further divided into 22 sub-areas (Figure 2). The IWC Scientific Committee debates how these areas should be distributed between stocks, to what degree the J- and O- stocks mix, and whether a third stock (a Y-stock overlapping with the J-stock) exists (IWC SC, 2019). Genetic analysis of western North Pacific common minke whales indicates a genetic structure largely concurring with the J- and O- stock delineation (Goto et al., 2017).

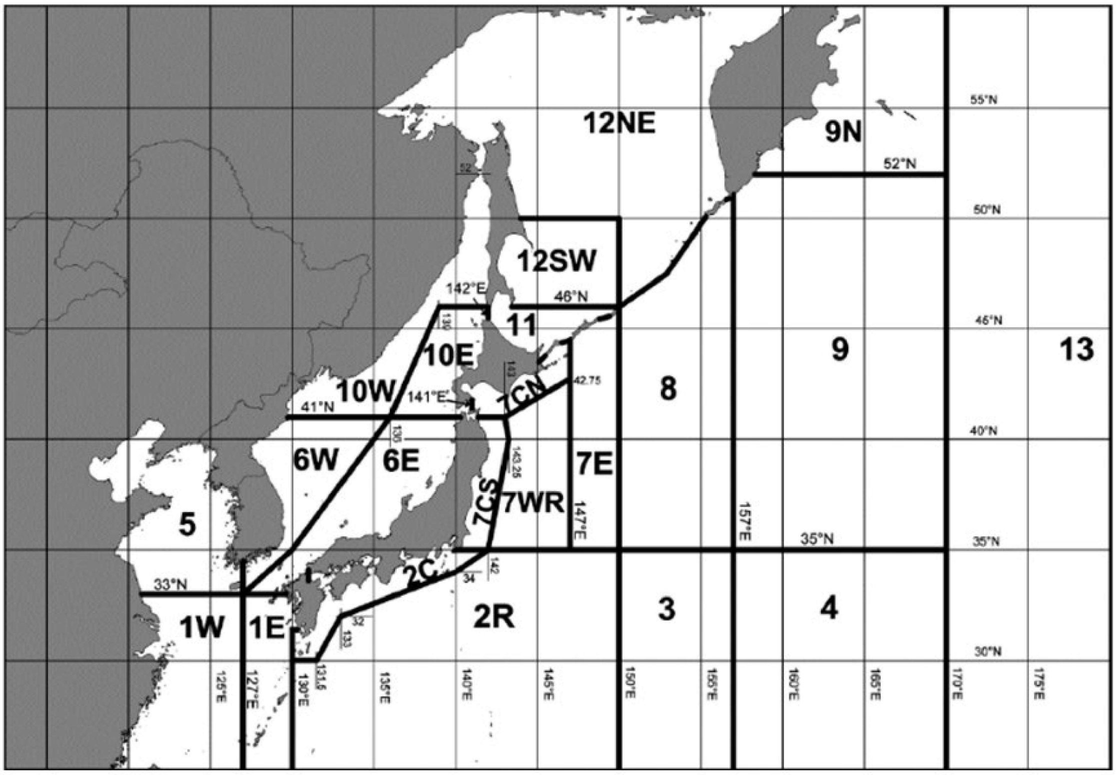

Figure 2. The North Pacific subareas for common minke whale management defined by the International Whaling Commission.

2.6 Threats

2.6.1 Whaling

IUCN lists 'Fishing & harvesting aquatic resources' as the main threat to the common minke whale (Cooke, 2018), primarily due to historical declines in numbers caused by commercial whaling. The hunt for minke whales became considerable after a decline in the populations of the larger, and more desirable whales, caused by overexploitation in the 1930s. Commercial whaling then presumably reduced the population to half its former size before whaling was banned in the 1980s (Cooke, 2018). Whaling is still the major cause of unnatural mortality. Since 2010, altogether 9221 common minke whales have been killed by various forms of whaling (see 2.7.1 and Appendix I).

2.6.2 Bycatch and fatal injuries from entanglement

The International Whaling Commission has estimated that at least 300,000 cetaceans (order including whales, dolphins and porpoises) are accidentally caught in fishing gear every year (IWC, 2017). Compared to larger whale species, minke whales are more likely to die as result of entanglement, because they are less likely to reach the surface when weighted down by fishing gear (Knowlton et al., 2016; Ryan et al., 2016). The Scottish Entanglement

Alliance found that of 51 common minke whales reported entangled in fishing gear during the period 2008-2018, 43 (86%) had drowned (MacLennan et al., 2021). Particularly high levels of by-catch and entanglement of the J- stock of common minke whales have raised serious concerns in the IWC Scientific Committee (IWC, 2010; Song et al., 2010). From 1996 to 2014, common minke whales by-caught in Korean waters alone exceeded the estimated level of potential biological removal (i.e. the level of mortality that should not be exceeded in order to maintain sustainability) for this population (Song, 2016). Bycatch is considered a significant threat to the survival of common minke whales in Korean waters (Song, 2016). There are few incidents of bycatch of common minke whales reported by the International Council of the Exploration of the Sea (ICES) Working Group on Bycatch of Protected Species (WGBYC) for the period 2008-2012 (ICES WGBYC 2010-2014). However, due to their small size, near-shore and shelf occurrence, and preference for commercially targeted fish species, minke whales might be vulnerable to entanglement, particularly in gill nets (Reeves et al., 2013), creel lines and ropes (Northridge et al., 2010). A thorough review of common minke whale records for southern parts of the eastern North Atlantic found evidence of net entanglement in the Azores, Canary Islands and Senegal (Reeves et al., 2013). In records from the North Atlantic US coastline between 1970 and 2009, the cause of death could be determined for 176 of 396 common minke whale carcasses; 101 deaths (57%) were caused by entanglement in fishing gear (Van Der Hoop et al., 2012). This is consistent with a study on common minke whale carcasses washed ashore in Scotland between 1990 and 2009, which found that entanglement, mostly in creel lines, accounted for about 50% of all mortalities of stranded whales (Northridge et al., 2010).

2.6.3 Climate change

Numerous reviews concerning the possible impacts of climate change upon marine mammals predict that their distribution, prey preference and long-term recruitment will be affected (e.g., IWC, 1997; 2009; Laidre et al., 2008; MacLeod, 2009; Haug et al., 2017; van Weelden et al., 2021). Furthermore, ongoing decline of sea ice in the Arctic may lead to more ship traffic in areas currently used intensively by baleen whales (Thomas et al., 2015). Common minke whales seem to extend their summer range northwards (e.g., Higdon and Ferguson, 2011; Haug et al., 2017; Solvang et al., 2015), most likely as a response to changes in prey distribution due to a warming climate (Haug et al., 2017; Nøttestad et al., 2015). More research is needed to understand the impacts of climate-induced changes in distribution and movement.

2.6.4 Habitat degradation and pollutants

Marine debris (e.g., plastic) has become a pervasive problem with large impacts on marine life and more than 60% of cetacean species have already been shown to be adversely affected (Fossi et al., 2018). Microplastics can be ingested directly and potentially indirectly from prey species (krill and copepods) by whales, and their accumulation may pose a health threat (e.g., Fossi et al., 2012; Germanov et al., 2018). A study of common minke whales from the Barents Sea found heavy metal contaminations below seafood safety limits (Maage et al., 2017). High levels of toxic persistent organic pollutants (POPs), known to reduce reproductive success in marine mammals, were detected in the blubber of western North Pacific common minke whales (Yasunaga and Fujise, 2020). Ocean acidification negatively affects marine calcareous organisms of which several are prey to the common minke whale (Macko and Fantasia 2018; Thomas et al., 2015).

2.6.5 Ship strikes

Ship strikes, both fatal and non-fatal, represent a threat for whales, including common minke whales, and the frequency is most likely underestimated (Risch et al., 2019b). Along the east coast of the United States from 1970 to 2009, 17 out of 396 (4.3%) of documented common minke whale mortality events were due to ship strikes (van der Hoop et al., 2012). All trans-Arctic shipping routes converge at the narrow (85 km) and shallow (50m) Bering Strait and common minke whales feeding there are therefore at risk of injury or death by ship strike[9].

2.6.6 Anthropogenic noise

Common minke whales have been suggested to react to sonar (Sivle et al., 2015) by prolonged diving and thus experiencing metabolic stress (Kvadsheim et al., 2017). Increased risk of mass strandings of marine mammals during use of naval sonar has been documented (Hohn et al., 2006; Parsons, 2017). Anthropogenic noise may also negatively affect many whale species' abilities to communicate acoustically (Cholewiak et al., 2018; Harris et al., 2019; Risch et al., 2019b).

2.6.7 Unusual mortality events (strandings)

Since January 2017, elevated common minke whale mortalities have occurred along the Atlantic coast of the USA, from Maine to South Carolina. A total of 118 individuals have been found dead. Two previous Unusual Mortality Events involving common minke whales have occurred in the same region in 2003 and 2005. These events involved 22 and 10 individuals, respectively. Examination of several carcasses revealed evidence for human caused injuries or infectious disease, but more research is needed[10].

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[9] https://iucn-csg.org/baleen-whales-in-the-cross-hairs-potential-for-increased-ship-strike-risk-in-and-near-bering-strait/

[10] https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2021-minke-whale-unusual-mortality-event-along-atlantic-coast

2.6.8 Tourism

The interest of whale-watching has increased rapidly during the last decades (Christiansen et al., 2013). Repeated disturbances caused by human – wildlife interactions, although not lethal, can have long term consequences for cetacean populations (Lusseau et al., 2006). Whale watching boats have reportedly affected common minke whale feeding behaviour off the coast of Iceland (Christiansen et al., 2013).

2.6.9 Relative severity of threats

Based on the current information, the threat factors cannot be directly compared and sorted by the level of risk they pose to the common minke whale population. Large population declines in both common minke whale and other whale populations in the beginning of the 20th century was caused by overexploitation (Cooke, 2018). However, well-regulated whaling might not pose a threat to the survival of the species if quotas are set at sustainable levels. As described above, mortalities due to both ship strikes and fatal injuries from bycatch and entanglement are well documented, but the effects on population level are not well understood. Likewise, the impacts from both other anthropogenic sources such as noise from sonars, disturbance from e.g., tourism, marine debris (e.g., plastic) and other pollutants all have observed negative effects on behavior or physiology, but the effects on population level are unknown. Negative effects from global warming could be expected to become more pronounced as the climate continues to change in the future.

2.7 Monitoring

2.7.1 The international whaling commission (IWC)

IWC is responsible for the management of common minke whale stocks. In 1982, the International Whaling Commission (IWC) introduced a pause (termed the 'moratorium') in commercial whaling on all whale species, starting from the 1985/1986 Antarctic catching season. The moratorium is binding on all members of the IWC. Iceland, Norway and the Russian Federation have, however, entered reservations to the moratorium. The IWC Scientific Committee has developed the revised management procedure (RMP, see section 2.7.1.2) and evaluates (implementation review) the abundance estimates that are used to set hunting quota.

2.7.1.1 Whaling

<u>Commercial whaling:</u> Iceland and Norway have resumed commercial whaling and decide their own catch limits, but must provide information on their catches and associated scientific data to the IWC. Commercial catches from 2010-2020 amounted to 6337 common minke whales, see Appendix I for a table of annual catches by nation.

Special permit whaling: Killing of whales for scientific research purposes (special permit whaling) is regulated by individual governments. Since 2008, Japan has been the only country reporting scientific whaling to IWC. Japan left the IWC in 2019 and began to catch whales commercially in its own waters during the same year. Japan caught 1091 common minke whales for scientific research purposes between 2010 and 2019[11]. The registered commercial catch by Japan was 44 in 2019 and 95 in 2020 (see Appendix I, Table A.6.1).

Aboriginal subsistence whaling: Four IWC member countries conduct aboriginal subsistence hunts today: Denmark (Greenland), Russia (Chukotka), St Vincent and the Grenadines (Bequia) and the United States (Alaska). Aboriginal subsistence hunting is categorized differently by the IWC than commercial whaling and is not subject to the moratorium. The IWC's Scientific Committee provides advice on the sustainability of catch limits as specified by each of the Aboriginal subsistence whaling countries. The number of common minke whales killed in aboriginal subsistence hunts 2010-2020 was 1793[12], all in Denmark (Greenland). The current (2019 to 2025) catch limits for aboriginal subsistence whaling include an annual strike limit of 20 whales for East Greenland and 164 for West Greenland for the years 2019 – 2025[13].

2.7.1.2 The revised management procedure (RPM)

The revised management procedure (RMP)[14] was developed by the IWC's Scientific Committee to ensure sustainable catch limits for commercial whaling. Its three main objectives are:

1. Catch limits should be as stable as possible.
2. Catches should not be allowed on stocks below 54% of the estimated maximum number of whales that the environment can support (aka 'carrying capacity', that equals the estimated pre-catching population).
3. The highest possible continuing catch should be obtained from the stock.

The catch limit algorithm (CLA) is a key component of the RPM and requires two essential pieces of information:

1) Estimates of the number of whales ('abundance estimates') taken at regular six-year intervals, and the statistical uncertainty associated with the estimates.

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[11] https://iwc.int/table_permit

[12] https://iwc.int/table_aboriginal

[13] https://nammco.no/topics/common-minke-whale/#1475844711542-eedf1c7b-5dde

[14] https://iwc.int/rmpbw

2) Estimates of numbers of past catches (allowing for the uncertainty in historic records) and numbers of present catches (assumed to be known reliably).

The IWC's Scientific Committee has chosen 0.72 as its recommended tuning level, meaning that quotas (if the moratorium was to be lifted) should be set at a level where the whale population stabilizes at 72% of the carrying capacity. This is to ensure that conservation objectives receive the highest weight.

The abundance estimates used for setting hunting quotas have to be officially approved by the Scientific Committee of the International Whaling Commission through their Implementation Review.

In Norway, the Institute of Marine Research (IMR) uses the Revised Management Procedure tuned to 0.60 for calculating common minke whale harvest quotas. Norway hunts whales within the Central (CM) and Eastern (EB, EC, EN, ES) Medium areas (see Figure 1). The last catch in the Central area (CM) was one individual in 2010. Within the Eastern area, most whales are caught within ES (Svalbard) where the whale stock is strongly female biased (NAMMCO, 2020a; Bjørge et al., 2021). Abundance estimates from the small areas are merged when setting quotas. The quota for 2021 is 1278 animals.

In 2019, the Marine Research and Freshwater Institute of Iceland issued sustainable catch limits for common minke whales for the years 2019-2023 to an annual catch of 217 (catch limit 0.4-0.5% per year).

Japan has set the catch limits for the O stock based on the Norwegian CLA code (tuning level 0.6) to annual catch of 180[15].

2.7.2 Other international management and monitoring programs

North Atlantic Marine Mammal Commission (NAMMCO): Cooperation between Faroe Islands, Greenland, Iceland and Norway on management of marine mammals. The Scientific Committee of NAMMCO coordinates surveys undertaken by the member countries.

Trans North Atlantic Sightings Surveys (T-NASS): The North Atlantic Sightings Surveys (NASS) are a series of internationally coordinated cetacean surveys. The survey area encompasses much of the northern North Atlantic between Norway and North America. Large ships are used to cover the offshore areas, whereas some coastal areas are covered by aircraft[16].

[15] https://www.jfa.maff.go.jp/j/whale/attach/pdf/index-63.pdf

[16] https://nammco.no/topics/19-may-2020-new-article-on-cetacean-abundance-estimates/

Small Cetaceans in European Atlantic waters and the North Sea (SCANS): Small Cetaceans in European Atlantic waters and the North Sea (SCANS) is a program for large-scale ship and aerial surveys to study the distribution and abundance of cetaceans in European Atlantic waters.

National Oceanic and Atmospheric Administration (NOAA): Stock assessment reports on common minke whales for North America are made by National Oceanic and Atmospheric Administration (NOAA) Fisheries, U.S. Department of Commerce. The regions surveyed for common minke whales include Alaska, Canadian Eastern Coastal, California-Oregon-Washington and Hawaii.

Cetacean Offshore Distribution and Abundance (CODA): Produces estimates of abundance in offshore waters beyond the continental shelf to inform assessments of conservation status of all cetacean species in the European Atlantic.

2.7.3 National management

Fisheries and Oceans Canada (DFO): Undertakes large-scale passive acoustic monitoring surveys in Canadian waters.

ObSERVE Programme –Ireland: Data has been collected through acoustic and arial surveys of the Irish Atlantic Margin since 2014.

Japanese Whale Research Programs in the Northwestern Pacific Ocean (JARPN): The Japanese Whale Research Programs in the Northwestern Pacific Ocean studies the whales caught under 'special permit whaling' (see section 2.7.1.1 above). The research program has been through two phases:

Phase I 1994-1999 investigated stock structure and feeding ecology, and Phase II 2000-2016 investigated feeding ecology, pollutants and stock structure.

The Japanese DNA register for large whales contains individual DNA-profiles of nearly all whales caught legally in Japan[17].

The Norwegian Minke Whale DNA Register (NMDR): A DNA- register was established in the early 1990s as part of the management of common minke whales in Norwegian and adjacent waters, at the time when Norway reinstated harvest of common minke whales (Skaug et al., 2010; Glover et al., 2012; Haug et al., 2015, Bjørge et al., 2021). Tissue is sampled from all common minke whales caught under the Norwegian catch quota. The tissue undergoes standardized genetic analysis resulting in a DNA profile for each individual whale. All legally caught common minke whales are registered and can be tested against the DNA of sold

[17] https://www.icrwhale.org/pdf/SC-57-SD6.pdf

meat (Haug et al., 2015). The register was originally established to avoid illegal hunting of common minke whales, but the DNA data is also used for research, e.g., on population structure, hybridization, family-relationships and estimations of population sizes (Skaug et al., 2010).

2.8 Trade

2.8.1 Hunting methods

Commercial hunting of common minke whales is mostly done from relatively small vessels from which the whales are shot with harpoons tipped with explosive grenades. Lines attached to the harpoons are used to haul the dead whales aboard, while an electronic automated computer system (the Blue Box system) monitors and collects data (NAMMCO, 2011). In aboriginal subsistence whaling (see section 2.7.1.1), some animals are still hunted from open boats with rifles (NAMMCO, 2020b).

2.8.2 Regulation of international trade

The common minke whale has been listed on Appendix I of CITES since 1986, under the order listing of *Cetacea* spp. An exception is the population of West Greenland, which is included in Appendix II[18]. The common minke whale has been listed in Annex A of the EU Wildlife Trade Regulations, also under the order listing of *Cetacea* spp. since 1997.

Nine propositions to transfer stocks of *Balaenoptera acutorostrata* from Appendix I to Appendix II have been rejected by the CITES Conference of the Parties (CoP), see table in Appendix II.

2.8.3 Legal trade

The CITES Appendix I listing of common minke whales excludes most countries from import or export of any products from common minke whales. However, Norway, Japan, Iceland and Palau hold reservations against the Appendix I listing and may trade internationally. The Faroe Islands are not a member of CITES.

Trade almost exclusively concerns meat, with a few exceptions of bones and carvings. All commercial trade that has been reported to the CITES trade database (trade.cites.org) for the years 2010 to 2019 is listed in Appendix III. Since 2014, Norway has been the only exporter of whale meat. Japan by far imports the largest quantities and the demand has increased, as suggested by the rise in traded volumes over time (see Appendix III).

[18] https://www.cites.org/eng/app/reserve.ph

2.8.4 Illegal trade

Japan and Norway have both developed DNA registers for whales destined for commercial sale. These can, however, only be accessed through the appropriate national authorities. Genetic testing (opportunistic sampling) of whale meat sold in restaurants in the USA and South Korea in 2009 revealed illegal trade. The DNA tests furthermore detected meat from the three red listed whale species Atlantic minke whale (Near Threatened), fin whale (*Balaenoptera physalus,* Vulnerable) and sei whale (*B. Borealis,* Endangered) (Baker et al., 2010).

3 Uncertainties

The common minke whale is among the most difficult whale species to count during visual surveys (Pike et al., 2009). This is due to its relatively small size and that it occurs individually or in small groups that surfaces only for a very short period (Pike et al., 2020; Risch et al., 2019b). The abundance estimates for the same survey areas varies substantially between years (e.g., Bjørge et al., 2021; Pike et al., 2020). It is uncertain to what extent distributional shifts affect the variability in the local population size estimates (Bjørge et al., 2021). It is also uncertain whether the surveyed areas contain a mixture of whales from different breeding populations (IWC, 2014; IWC SC, 2019). Population trends are consequently difficult to assess with certainty.

The relative impact of various threats on the survival of common minke whales is uncertain.

The estimates and assumptions that feed into the Revised Management Procedure introduce various types of uncertainties (see VKM, 2019 for details). The common minke whale is relatively long-lived, slowly reproducing and highly migratory, which are factors that complicate detection of rapid changes in population status.

The extent of illegal trade of whale meat (and potentially other products) is uncertain.

4 Data gaps

VKM identified the following data-gaps:

- Lack of knowledge on migratory patterns and location of breeding grounds.
- Lack of data of age and gender structure of populations.
- Lack of precise estimates of population size and trends.
- Lack of knowledge on the extent of ongoing distributional shifts.
- Lack of knowledge on genetic structure of breeding populations.
- Lack of data on bycatch, entanglement and other mortalities.
- Lack of knowledge of impact of pollutants on survival and fecundity.
- Lack of knowledge on the impact of climate change.
- Lack of knowledge about illegal trade.

5 References

Acevedo, J., C. Olavarría, J. Plana, A. Aguayo-Lobo, A. Larrea, and L. A. Pastene. 2011. Occurrence of dwarf minke whales (Balaenoptera acutorostrata subsp.) around the Antarctic Peninsula. Polar Biology 34:313-318. Doi: 10.1007/s00300- 010- 0884- y

Andersen, L. W., E. W. Born, R. Dietz, T. Haug, N. Øien, and C. Bendixen. 2003. Genetic population structure of minke whales Balaenoptera acutorostrata from Greenland, the North East Atlantic and the North Sea probably reflects different ecological regions. Marine Ecology Progress Series 247:263-280.

Anderwald, P., A. K. Daníelsdóttir, T. Haug, F. Larsen, V. Lesage, R. J. Reid, G. A. Víkingsson, and A. R. Hoelzel. 2011. Possible cryptic stock structure for minke whales in the North Atlantic: Implications for conservation and management. Biological Conservation 144:2479-2489.

Baker, C. S., D. Steel, Y. Choi, H. Lee, K. S. Kim, S. K. Choi, Y.-U. Ma, C. Hambleton, L. Psihoyos, R. L. Brownell, and N. Funahashi. 2010. Genetic evidence of illegal trade in protected whales links Japan with the US and South Korea. Biology Letters 6:647-650.

Bjørge, A., N. Øien, M. Biuw, T. Haug, and K. T. Nilssen. 2021. Norwegian marine mammal scientific advisory board 2021. Advice on research, conservation and management.

Bogstad, B., H. Gjøsæter, T. Haug, and U. Lindstrøm. 2015. A review of the battle for food in the Barents Sea: cod vs. marine mammals. Frontiers in Ecology and Evolution 3:29.

Bolaños-Jiménez, J., E. Morteo, L. Bouveret, A. Henriquez, J. Luksenburg, C. A. D. Alfonso, N. Lara, and A. A. Mignucci-Giannoni. 2021. On the spatial-temporal distribution of the minke whales (Balaenoptera acutorostrata and B. bonaerensis) in the Wider Caribbean Region and adjacent western tropical North Atlantic. SC/68C/NH/01Rev01, International Whaling Commission, paper IWC/SC/68C/NH/01.

Bøthun, G., H. J. Skaug, and N. I. Øien. 2009. Abundance of minke whales in the Northeast Atlantic based on survey data collected over the period 2002-2007. Paper SC/61/RMP2.

Cholewiak, D., C. W. Clark, D. Ponirakis, A. Frankel, L. T. Hatch, D. Risch, J. E. Stanistreet, M. Thompson, E. Vu, and S. M. Van Parijs. 2018. Communicating amidst the noise: modeling the aggregate influence of ambient and vessel noise on baleen whale communication space in a national marine sanctuary. Endangered Species Research 36:59-75.

Christensen, I., A. Jonsgbrd, and C. Rwvik. 1981. Catch statistics for minke whales (Balaenoptera acutorostrata) and killer whales (Orcmics orca) caught by Norway in 1979. Report of the International Whaling Commission 31: 635-7.

Christiansen, F., M. Rasmussen, and D. Lusseau. 2013. Whale watching disrupts feeding activities of minke whales on a feeding ground. Marine Ecology Progress Series 478:239-251.

Cooke, J. G. 2018. Balaenoptera acutorostrata. The IUCN Red List of Threatened Species 2018: e.T2474A50348265. http://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T2474A50348265.en.

Ford, J. K., G. M. Ellis, D. R. Matkin, K. C. Balcomb, D. Briggs, and A. B. Morton. 2005. Killer whale attacks on minke whales: prey capture and antipredator tactics. Marine Mammal Science 21:603-618.

Fossi, M. C., C. Panti, M. Baini, and J. L. Lavers. 2018. A review of plastic-associated pressures: cetaceans of the Mediterranean Sea and eastern Australian shearwaters as case studies. Frontiers in Marine Science 5:173.

Fossi, M. C., C. Panti, C. Guerranti, D. Coppola, M. Giannetti, L. Marsili, and R. Minutoli. 2012. Are baleen whales exposed to the threat of microplastics? A case study of the Mediterranean fin whale (Balaenoptera physalus). Marine pollution bulletin 64:2374-2379.

Gedamke, J., D. P. Costa, and A. Dunstan. 2001. Localization and visual verification of a complex minke whale vocalization. The Journal of the Acoustical Society of America 109:3038-3047.

Germanov, E. S., A. D. Marshall, L. Bejder, M. C. Fossi, and N. R. Loneragan. 2018. Microplastics: no small problem for filter-feeding megafauna. Trends in ecology & evolution 33:227-232. DOI: https://doi.org/10.1016/j.tree.2018.01.005.

Glover, K. A., T. Haug, N. Øien, L. Walløe, L. Lindblom, B. B. Seliussen, and H. J. Skaug. 2012. The Norwegian minke whale DNA register: a data base monitoring commercial harvest and trade of whale products. Fish and Fisheries 13:313-332. DOI: doi:10.1111/j.1467-2979.2011.00447.x.

Glover, K. A., N. Kanda, T. Haug, L. A. Pastene, N. Øien, B. B. Seliussen, A. G. Sørvik, and H. J. Skaug. 2013. Hybrids between common and Antarctic minke whales are fertile and can back-cross. BMC genetics 14:1-11.

Goto, M., M. Taguchi, and L. A. Pastene. 2017. Distribution and movement of 'O'and 'J'stock common minke whales in waters around Japan based on genetic assignment methods. Technical Reports of the Insfitute of Cetacean Research (TEREP-ICR):37-43.

Gunnlaugsson, T., G. A. Vikingsson, S. D. Halldórsson, B. Þ. Elvarsson, T. Haug, and C. Lydersen. 2020. Body mass, muscle, blubber and visceral fat content and their seasonal, spatial and temporal variability in North Atlantic common minke whales. Journal of Cetacean Research and Management 21:59-70.

Hammond, P., C. Lacey, A. Gilles, S. Viquerat, P. Boerjesson, H. Herr, K. Macleod, V. Ridoux, M. Santos, M. Scheidat, J. Teilmann, J. Vingada, and N. Øien. 2021. Estimates of cetacean abundance in European Atlantic waters in summer 2016 from the SCANS-III aerial and shipboard surveys. Wageningen Marine Research. Final report revised June 2021.

Harris, C. M., S. W. Martin, C. Martin, T. A. Helble, E. E. Henderson, C. G. Paxton, and L. Thomas. 2019. Changes in the Spatial Distribution of Acoustically Derived Minke Whale (Balaenoptera acutorostrata) Tracks in Response to Navy Training. Aquatic Mammals 45.

Haug, T., A. Bjørge, N. Øien, S. Ziryanov, and A. Golikov. 2011. Marine mammals. The Barents Sea, Ecosystem, Resources, Management. Half a century of Russian-Norwegian on. Cooperation. Edited by Jakobsen, T. and Ozhigin, VK Tapir Academic Press, Trondheim:395-430.

Haug, T., B. Bogstad, M. Chierici, H. Gjøsæter, E. H. Hallfredsson, Å. S. Høines, A. H. Hoel, R. B. Ingvaldsen, L. L. Jørgensen, and T. Knutsen. 2017. Future harvest of living resources in the Arctic Ocean north of the Nordic and Barents Seas: a review of possibilities and constraints. Fisheries Research 188:38-57.

Higdon, J. W., and S. H. Ferguson. 2011. Reports of humpback and minke whales in the Hudson Bay region, eastern Canadian Arctic. Northeastern Naturalist:370-377.

Hohn, A. A., D. S. Rotstein, C. A. Harms, and B. L. Southall. 2006. Report on marine mammal unusual mortality event UMESE0501Sp: Multispecies mass stranding of pilot whales (Globicephala macrorhynchus), minke whale (Balaenoptera acutorostrata), and dwarf sperm whales (Kogia sima) in North Carolina on 15-16 January 2005.

Horwood, J. W. 1989. Biology and exploitation of the minke whale. CRC Press, Inc.

IWC. 1997. Report of the IWC workshop on climate change and cetaceans. Report of the International Whaling Commission 47: 293–313.

IWC. 2009. Report of the IWC workshop on climate change and cetaceans. IWC/SC/61/Report 4, 1–31.

IWC. 2014. Report of the AWMP/RMP Joint Workshop on the stock structure of North Atlantic common minke whales. SC/65b/REP04.

IWC SC. 2019. Report of the IWC Scientific Committee. IWC/SC/68A. Available at: https://www.mofa.go.jp/files/000490890.pdf.

Kavanagh, A. S., G. Kett, N. Richardson, E. Rogan, and M. J. Jessopp. 2018. High latitude winter sightings of common minke whale calves (Balaenoptera acutorostrata) in the Northeast Atlantic. Marine Biodiversity Records 11:1-5.

Knowlton, A. R., J. Robbins, S. Landry, H. A. McKenna, S. D. Kraus, and T. B. Werner. 2016. Effects of fishing rope strength on the severity of large whale entanglements. Conservation Biology 30:318-328.

Kvadsheim, P. H., S. DeRuiter, L. D. Sivle, J. Goldbogen, R. Roland-Hansen, P. J. Miller, F.-P. A. Lam, J. Calambokidis, A. Friedlaender, and F. Visser. 2017. Avoidance responses of minke whales to 1–4 kHz naval sonar. Marine pollution bulletin 121:60-68.

Laidre, K. L., I. Stirling, L. F. Lowry, O. Wiig, M. P. Heide-Jørgensen, and S. H. Ferguson. 2008. Quantifying the sensitivity of Arctic marine mammals to climate-induced habitat change. Ecol Appl 18:S97-125.

Lusseau, D., S. M. Lusseau, L. Bejder, and R. Williams. 2006. An individual-based model to infer the impact of whalewatching on cetacean population dynamics. IWC SC/58/WW7 Report to the 58th meeting of the International Whaling Commission Scientific Committee, St. Kitts and Nevis.

Macko, S. A., and C. M. Fantasia. 2018. An Overview of Ocean Acidification: Relationships. Pages 391-417. In: The Marine Environment and United Nations Sustainable Development Goal 14. Brill | Nijhoff.

MacLennan, E., L. Hartny-Mills, F. L. Read, S. J. Dolman, A. Philp, K. E. Dearing, D. Jarvis, and A. C. Brownlow. 2021. Scottish Entanglement Alliance (SEA) - understanding the scale and impacts of marine animal entanglement in the Scottish creel fishery. NatureScot Research Report 1268.

MacLeod, C. D. 2009. Global climate change, range changes and potential implications for the conservation of marine cetaceans: a review and synthesis. Endangered Species Research 7:125-136. Doi:10.3354/esr00197.

Milmann, L., M. Taguchi, S. Siciliano, J. E. Baumgarten, L. R. Oliveira, V. H. Valiati, M. Goto, P. H. Ott, and L. A. Pastene. 2021. New genetic evidences for distinct populations of the common minke whale (Balaenoptera acutorostrata) in the Southern Hemisphere. Polar Biology:1-15.

Murase, H., D. Palka, A. Punt, L. Pastene, T. Kitakado, K. Matsuoka, T. Hakamada, H. Okamura, T. Bando, and T. Tamura. 2020. Review of the assessment of two stocks of Antarctic minke whales (eastern Indian Ocean and western South Pacific). J. Cetacean Res. Manage. 21:95-122.

Maage, A., B. M. Nilsen, K. Julshamn, L. Frøyland, and S. Valdersnes. 2017. Total mercury, methylmercury, inorganic arsenic and other elements in meat from minke whale (Balaenoptera acutorostrata) from the north east Atlantic Ocean. Bulletin of environmental contamination and toxicology 99:161-166. Doi: 10.1007/s00128-017-2106-6.

NAMMCO. 2011. North Atlantic Marine Mammal Commission (NAMMCO). (2011). Report of the NAMMCO Expert Group meeting on the assessment of whale killing data. In NAMMCO Annual Report 2010. NAMMCO, Tromsø, Norway, 57–84. Available at https://nammco.no/topics/annual-reports/.

NAMMCO. 2012. North Atlantic Marine Mammal Commission. 2012. Report of the nineteenth meeting of the Scientific Committee. In: NAMMCO Annual Report 2012. NAMMCO, Tromsø, Norway, pp. 263-550.

NAMMCO. 2018. NAMMCO scientific committee report of the working group on abundance estimates. https://nammco.no/wp-content/uploads/2019/02/12-sc-25_report_aewg_may-rev-october-2018_rev.pdf.

NAMMCO. 2019. NAMMCO-North Atlantic Marine Mammal Commission (2019). Report of the Scientific Committee 26th Meeting, October 29 – November 1, Tórshavn Faroe Islands. Available at: https://nammco.no/topics/scientific-committee-reports/.

NAMMCO. 2020a. NORWAY - PROGRESS REPORT ON MARINE MAMMALS 2020. SC/29/NPR-N. Available at: https://nammco.no/wp-content/uploads/2021/03/npr-norway-2020.pdf

NAMMCO. 2020b. NATIONAL PROGRESS AND DATA REPORTING 2020.GREENLAND - PROGRESS REPORT ON MARINE MAMMALS. Available at: https://nammco.no/wp-content/uploads/2021/03/npr-2020-greenland.pdf.

Nøttestad, L., B. A. Krafft, V. Anthonypillai, M. Bernasconi, L. Langård, H. L. Mørk, and A. Fernö. 2015. Recent changes in distribution and relative abundance of cetaceans in the Norwegian Sea and their relationship with potential prey. Frontiers in Ecology and Evolution 2:83.

Northridge, S., A. Cargill, A. Coram, L. Mandleberg, S. Calderan, and R. Reid. 2010. Entanglement of minke whales in Scottish waters; an investigation into occurrence, causes and mitigation. Contract Report. Final Report to Scottish Government CR/2007/49.

Parsons, E. 2017. Impacts of Navy sonar on whales and dolphins: Now beyond a smoking gun? Frontiers in Marine Science 4:295.

Pastene, L. A., J. Acevedo, M. Goto, A. N. Zerbini, P. Acuna, and A. Aguayo-Lobo. 2010. Population structure and possible migratory links of common minke whales, Balaenoptera acutorostrata, in the Southern Hemisphere. Conservation Genetics 11:1553-1558.

Pastene, L. A., M. Goto, N. Kanda, A. N. Zerbini, D. Kerem, K. Watanabe, Y. Bessho, M. Hasegawa, R. Nielsen, and F. Larsen. 2007. Radiation and speciation of pelagic organisms during periods of global warming: the case of the common minke whale, Balaenoptera acutorostrata. Molecular Ecology 16:1481-1495.

Pike, D. G., T. Gunnlaugsson, J. Sigurjónsson, and G. Víkingsson. 2019. Distribution and abundance of cetaceans in Icelandic waters over 30 years of aerial surveys. NAMMCO Scientific Publications 11.

Pike, D. G., T. Gunnlaugsson, J. Sigurjónsson, and G. A. Víkingsson. 2020. Distribution and Abundance of Cetaceans in Icelandic Waters over 30 Years of Aerial Surveys. NAMMCO Scientific Publications 11.

Quintela, M., H. J. Skaug, N. Øien, T. Haug, B. B. Seliussen, H. K. Solvang, C. Pampoulie, N. Kanda, L. A. Pastene, and K. A. Glover. 2014. Investigating population genetic structure in a highly mobile marine organism: the minke whale Balaenoptera acutorostrata acutorostrata in the North East Atlantic. PLoS One 9:e108640.

Rankin, S., and J. Barlow. 2005. Source of the North Pacific "boing" sound attributed to minke whales. The Journal of the Acoustical Society of America 118:3346-3351.

Reeves, R. R., K. McClellan, and T. B. Werner. 2013. Marine mammal bycatch in gillnet and other entangling net fisheries, 1990 to 2011. Endangered Species Research 20:71-97.

Rice, D. W. 1998. Marine mammals of the world. Systematics and distribution. Special publication 4. The Society for Marine Mammalogy: Lawrence, Kansas.

Risch, D., U. Siebert, and S. M. Van Parijs. 2014a. Individual calling behaviour and movements of North Atlantic minke whales (Balaenoptera acutorostrata). Behaviour 151:1335-1360.

Risch, D., M. Castellote, C. W. Clark, G. E. Davis, P. J. Dugan, L. E. Hodge, A. Kumar, K. Lucke, D. K. Mellinger, and S. L. Nieukirk. 2014b. Seasonal migrations of North Atlantic minke whales: novel insights from large-scale passive acoustic monitoring networks. Movement ecology 2:1-17.

Risch, D., T. Norris, M. Curnock, and A. Friedlaender. 2019b. Common and Antarctic minke whales: Conservation status and future research directions. Frontiers in Marine Science 6:247.

Risch, D., S. C. Wilson, M. Hoogerwerf, N. C. Van Geel, E. W. Edwards, and K. L. Brookes. 2019a. Seasonal and diel acoustic presence of North Atlantic minke whales in the North Sea. Scientific reports 9:1-11.

Ryan, C., R. Leaper, P. G. Evans, K. Dyke, K. P. Robinson, G. N. Haskins, S. Calderan, N. van Geel, O. Harries, and K. Froud. 2016. Entanglement: an emerging threat to humpback whales in Scottish waters. Paper SC/66b/HIM/01 submitted to the International Whaling Commission Scientific Committee.

Schweder, T., H. J. Skaug, X. Dimakos, M. Langaas, and N. Øien. 1997. Abundance estimates for Northeastern Atlantic minke whales. Estimates for 1989 and 1995. Report of the International Whaling Commission 47:453-484.

Sivle, L. D., P. H. Kvadsheim, C. Curé, S. Isojunno, P. J. Wensveen, F.-P. A. Lam, F. Visser, L. Kleivanec, P. L. Tyack, and C. M. Harris. 2015. Severity of Expert-Identified Behavioural Responses of Humpback Whale, Minke Whale, and Northern Bottlenose Whale to Naval Sonar. Aquatic Mammals 41.

Skaug, H. J., T. Haug, and N. Øien. 2010. Hva kan et register over vågehvalens DNA fortelle om atferd og biologi? Institute of Marine Research. Pp:10-15.

Skaug, H. J., N. Øien, T. Schweder, and G. Bøthun. 2004. Abundance of minke whales (Balaenoptera acutorostrata) in the Northeast Atlantic: variability in time and space. Canadian Journal of Fisheries and Aquatic Sciences 61:870-886.

Solvang, H. K., T. Haug, T. Knutsen, H. Gjøsæter, B. Bogstad, S. Hartvedt, N. Øien, and U. Lindstrøm. 2021. Distribution of rorquals and Atlantic cod in relation to their prey in the Norwegian high Arctic. Polar Biology 44:761-782.

Solvang, H. K., H. J. Skaug, and N. I. Øien. 2015. Abundance estimates of common minke whales in the Northeast Atlantic based on survey data collected over the period 2008-2013. Paper submitted to the IWC Scientific Committee 66a, San Diego 22.

Song, K.-J. 2016. Current stock situation and measures for the management and conservation of minke whales (Balaenoptera acutorostrata) in Korean waters. Ocean & Coastal Management 119:164-168.

Song, K. J., Z. G. Kim, C. I. Zhang, and Y. H. Kim. 2010. Fishing gears involved in entanglements of minke whales (Balaenoptera acutorostrata) in the East Sea of Korea. Marine Mammal Science 26:282-295.

Storrie, L., C. Lydersen, M. Andersen, R. B. Wynn, and K. M. Kovacs. 2018. Determining the species assemblage and habitat use of cetaceans in the Svalbard Archipelago, based on observations from 2002 to 2014. Polar Research 37:1463065.

Thomas, P. O., R. R. Reeves, and R. L. Brownell Jr. 2015. Status of the world's baleen whales. Marine Mammal Science 32:682-734.

Van Der Hoop, J. M., M. J. Moore, S. G. Barco, T. V. Cole, P. Y. DAOUST, A. G. Henry, D. F. McAlpine, W. A. McLellan, T. Wimmer, and A. R. Solow. 2012. Assessment of management to mitigate anthropogenic effects on large whales. Conservation Biology 27:121-133. DOI: 10.1111/j.1523-1739.2012.01934.x.

van Weelden, C., J. R. Towers, and T. Bosker. 2021. Impacts of climate change on cetacean distribution, habitat and migration. Climate Change Ecology 1:100009.

Víkingsson, G. A. 2015. Decadal changes in distribution, abundance and feeding ecology of baleen whales in Icelandic and adjacent waters. A consequence of climate change? PhD thesis. The Arctic University of Norway.

Vikingsson, G. A., and M. P. Heide-Jørgensen. 2015. First indications of autumn migration routes and destination of common minke whales tracked by satellite in the North Atlantic during 2001–2011. Marine Mammal Science 31:376-385.

Víkingsson, G. A., D. G. Pike, H. Valdimarsson, A. Schleimer, T. Gunnlaugsson, T. Silva, B. Þ. Elvarsson, B. Mikkelsen, N. Øien, and G. Desportes. 2015. Distribution, abundance, and feeding ecology of baleen whales in Icelandic waters: have recent environmental changes had an effect? Frontiers in Ecology and Evolution 3:6.

VKM. Rueness, E.K., Asmyhr, M.G., Kausrud, K., Nilsen, E.B., Øien, N., de Boer, H., Eldegard, K., Hindar, K., Hole., L.R., Järnegren, J., Kirkendall, L., Måren, I.E., Nielsen, A., Thorstad, E. B. and Velle, G. (2019). A CITES risk assessment for the common minke whale (Balaneoptera acutorostrata). Opinion of the Panel on Alien Organisms and Trade in Endangered Species (CITES) of the Norwegian Scientific Committee for Food and Environment. VKM report 2019: 10, ISBN: 978-82-8259-326-7, ISSN: 2535-4019. Norwegian Scientific Committee for Food and Environment (VKM), Oslo, Norway.

VKM (2019). Kriterier for forfatterskap og faglig ansvar i VKMs uttalelser. https://vkm.no/download/18.48566e5316b6a4910fc2dbd6/1561035075341/VKMs%20forfatterskapskriterier_revidert%20versjon%2020.06.2019.pdf

Yasunaga, G., and Y. Fujise. 2020. Consentration of persistent organic pollutants (POPs) in three species of baleen whales in the western North Pacific 鯨類資源研究 2:39-53.

6 Appendix I

6.1 Commercial catches and trade of common minke whale

Table A.6.1. Numbers of whales killed in commercial whaling per year for the period 2010-2020.

Nation	Area			
2010				
Norway	NE Atlantic		468	
Iceland			60	
			528	
2011				
Norway	NE Atlantic		533	
Iceland			58	
			593	
2012				
Norway	NE Atlantic		464	
Iceland			52	
			516	
2013				
Norway	NE Atlantic		594	
Iceland			35	
			629	
2014				
Norway	NE Atlantic		736	
Iceland			24	
			760	
2015				
Norway	NE Atlantic		660	
Iceland			29	
			689	
2016				
Norway	NE Atlantic		591	
Iceland			46	
			637	
2017				
Norway	NE Atlantic		432	
Iceland			17	
			449	
2018				

Nation	Area			
Norway	NE Atlantic		454	
Iceland			6	
			460	
2019				
Norway	NE Atlantic		429	
Japan	Japan		33	
Japan	NW Pacific		11	
			473	
2020				
Norway	NE Atlantic		503	
Japan	Japan		95	
			598	
		Total	6337	

Table A.6.2. Lists CITES trade reports for commercial trade (exporter reported quantity, CITES purpose code: T, commercial) from 2010 to 2019.

Year	Exporter	Importer	Quantity (kg)
2010	Norway	Faroe Islands	1000
2011	Faroe Islands	Iceland	30
2011	Japan	Iceland	692*
2011	Norway	Faroe Islands	468
2012	Greenland	Denmark	104
2012	Faroe Islands	Iceland	10

2012	Faroe Islands	Norway	500
2012	Japan	Iceland	1779
2012	Norway	Japan	30
2012	Norway	Faroe Islands	500
2013	Iceland	Japan	100,000
2013	Iceland	Norway	5000*
2013	Norway	Faroe Islands	2000
2013	Norway	Japan	40,709
2014	Norway	Faroe Islands	1000
2014	Norway	Iceland	10,000
2014	Norway	Japan	96,341
2015	Norway	Faroe Islands	6000
2015	Norway	Iceland	20,000
2016	Norway	Faroe Islands	864

2016	Norway	Japan	199,000
2017	Norway	Faroe Islands	864
2017	Norway	Japan	214,765
2018	Norway	Faroe Islands	432
2018	Norway	Iceland	4308
2018	Norway	Japan	148,267
2019	Norway	Faroe Islands	864
2019	Norway	Iceland	3000
2019	Norway	Japan	200,182

Data from trade.cites.org, accessed November 18. 2021.

*Reported by importing country, where report of export is missing.

In addition, 10,000 kg derivatives and was imported by Japan from Iceland in 2013, 909kg meat originating in Iceland was re-exported from Norway to Japan in 2014, and 40 kg bones were imported to Denmark from Greenland in 2016.

7 Appendix II

Table A.7.1. Listing proposals to the CITES Conference of the Parties (CoP), all of them rejected.

Meeting	Year	Proposal #	Proponent	Stock(s)
CoP13	2004	4	Japan	Okhotsk Sea – West Pacific, north-east Atlantic stock and north Atlantic central
CoP12	2002	4	Japan	Northern hemisphere
CoP11	2000	16	Japan	southern hemisphere
CoP11	2000	17	Japan	Okhotsk Sea - West Pacific
CoP11	2000	18	Norway	Northeast Atlantic and North Atlantic Central
CoP10	1997	20	Japan	Okhotsk Sea - West Pacific
CoP10	1997	21	Japan	Southern hemisphere
CoP10	1997	22	Norway	Northeast Atlantic and North Atlantic Central
CoP9	1994	10	Norway	Northeast Atlantic and North Atlantic Central

https://speciesplus.net/species#/taxon_concepts/8