Annex E

Report of the Sub-Committee on Aboriginal Subsistence Whaling (ASW)

Participants: Walløe (Convenor), Nelson (co-Convenor), Aguilar, Arakaki, Allison, Baba, Babey, Baird, Bell, C., Bell, E., Bickham, Bierlich, Brandon, Brownell, Butterworth, Calambokidis, Cassani, Chauca Huánuco, Choi, Cipriano, Citta, De Moor, Demaster, Doniol-Valcroze, Donovan, Double, Fyfe, Gallego, Galletti, Givens, Goetz, Gushcherov, Haelters, Harris, Hielscher, Holm, Höschle, Houtman, Iida, Iñíguez Bessega, Jaramillo Legorreta, Jimenez, Katara, Katsumata, Kelly, Kim, Kiszka, Kitakado, Lang, Leal, Lee, Lent, Litovka, Lundquist, Mallette, Matsuoka, O'Loughlin, Palka, Palsbøll, Pampoulie, Pastene, Porter, Punt, Reeves, Robbins, Salvador, Scheimreif, Schubert, Scordino, Seakamela, Sigurðsson, Simmonds, Staniland, Stimmelmayr, Suydam, Svoboda, Tamura, Thomas, Tiedemann, Torres, Urbán, Vrooman, Wade, Webster, Weinrich, Weller, Wilberg, Wilson, Witting, Wulff, Yasokawa, Yoshida, Zerbini.

1. OPENING REMARKS

The 2023 meeting of the Sub-Committee on Aboriginal Subsistence Whaling (ASW) was held on 25-30 April 2023. The Convenor (Walløe) and Co-Convener (Nelson) worked with the Secretariat to plan the Sub-Committee meeting. The Convener introduced himself and welcomed all Sub-Committee members to the 2023 ASW meeting. He also invited the Co-Convener, Nelson, to introduce himself.

2. ELECTION OF CHAIRS

Walløe and Nelson were willing and elected to serve as Chair and Co-Chair for the Sub-Committee meeting.

3. APPOINTMENT OF RAPPORTEUR

The Chair proposed that the Convener and co-Convenor serve as rapporteurs for the meeting.

4. AVAILABLE DOCUMENTS

The following documents were discussed at the meeting: SC/69A/O/04rev1; SC/69A/ASW/02; SC/69A/ASW/04; SC/69A/IST/01-04; SC/69A/CMP/16-17; SC/69A/CMP/21; SC/69A/ASI/03/rev2; SC/69A/E/08; Eguchi *et al*. (2022a), Harris *et al*. (2022), Bierlich *et al*. (in press), Willoughby *et al*. (2022a), Willoughby *et al*. (2022b), Polyakova *et al*. (2023), Eguchi *et al*. (2022b), Citta *et al*. (2023).

5. STOCKS SUBJECT TO ABORIGINAL SUBSISTENCE WHALING (ASW)

5.1 New information and progress on recommendations

5.1.1 Eastern Canada/West Greenland bowhead whales

SC/69A/O/04Rev1 reported on the Canadian subsistence hunt of Eastern Canada-West Greenland (EC-WG) bowhead whales for the year 2022 within the Nunavut Settlement Area (NSA) and the Nunavik Marine Region (NMR).

The Department of Fisheries and Oceans Canada licenses bowhead whale hunts upon written confirmation that the appropriate Regional Wildlife Organization has approved the hunt plan. The combined maximum allowed take is seven (7) EC-WG bowhead whales per year.

For the 2022 season, a total of three (3) bowhead whales were reported taken for EC-WG in the NSA. Of these three (3) whales reported, one (1) was male and two (2) female.

The Sub-Committee thanked Canada, a non-member nation, for providing this important information, and welcomed Canadian participants at this and future meetings.

SC/69A/ASI/03Rev2 reported on a fully corrected abundance estimate of 888 (CV 0.46) bowhead whales in 2022 (see Annex D (ASI) for details), covering the spring feeding area in West Greenland.

One (1) female bowhead whale was taken off West Greenland in 2022 (SC/69A/O/04rev1). No samples were obtained from the catch, but 50 biopsies were obtained from bowhead whales in Disko Bay during Spring 2022.

The Sub-Committee noted that an annual review of management advice was not required and agreed that the new information provided did not require calling for an early *Implementation Review* (IWC, 2019).

5.1.2 Bering-Chukchi-Beaufort Seas bowhead whales
SC/69A/ASW/04 reported that no bowhead whales were taken in Russian waters.

The bowhead harvest report SC/69A/ASW/02 provides an annual summary of the Alaskan Native subsistence harvest of bowhead whales (*Balaena mysticetus*). In 2022, 68 bowhead whales were struck during the Alaskan aboriginal subsistence hunt, of which 53 were landed. The total number of whales struck and landed in 2022 was higher than the average for the previous 10 years (2012-21: mean struck=58.6, SD=11 and mean landed=46, SD=8.61; respectively). The efficiency (no. landed/no. struck) of the hunt (78%) in 2022 was consistent with the average for the past 10 years (2012-2021: mean of efficiency=79%; SD=0.053). Spring hunts are logistically more difficult than autumn hunts because of the difficulty in accessing open water and changing sea ice thickness and dynamics. The hunting efficiency during spring is usually lower than in autumn, which was the case during 2022. In 2022, the efficiency of the spring hunt (68%) was lower than the previous 10-year average (2012-21; mean spring efficiency=71%; SD=0.10). The efficiency of the 2022 autumn hunt (93%) was the same as the average autumn hunting efficiency over the past ten years (2012-21; mean autumn efficiency=93%; SD=0.08). Fifteen whales were struck and lost in 2022. Of those 15 whales, four were lost due to equipment malfunction (e.g., harpoon failure), six whales were lost when they swam into or under the ice, four whales sank, and one whale was lost for an unknown reason. Of the harvested whales, 26 were female and 27 male. Based on total length (≥13.7m in length), six of the females were presumed mature. One whale was pregnant with a midterm male foetus that was 1.7m long, and another was pregnant with a foetus estimated to be 1m long.

Willoughby *et al*. (2022b) present Bering-Chukchi-Beaufort seas stock of bowhead whales (*Balaena mysticetus*) carcass data collected in 2019 during aerial surveys in the eastern Chukchi (EC) and western Beaufort (WB) seas. Results from an investigation into the probable cause of death for bowhead whale carcasses photo-documented in 2019 add to the long series of consistent information on floating and beach-cast bowhead whale carcasses in the region previously reported by Willoughby *et al*. (2020). Briefly, the 2019 carcass data suggest an increased occurrence of probable killer whale (*Orcinus orca*) predation on bowhead whales in the WB. From July to October 2019, 11 bowhead whale carcasses were photo-documented in the EC and WB study areas. Of the 11 carcasses documented, seven had injuries consistent with probable killer whale predation - two in the EC and five in the WB. Probable cause of death could not be assigned to four carcasses. No carcasses were associated with aboriginal subsistence hunting. Despite similar annual survey effort, 2019 had several notable violations compared to 2009-18, with 2019 having the highest annual number of documented carcasses and the most categorized as probable killer whale predation. The location where most carcasses were found shifted from the EC to the WB. More carcasses in the WB were categorized as probable killer whale predation during 2019 than in 2009-18 combined. These results will be valuable for evaluating future trends in bowhead mortality, concurrent with rapid oceanographic changes and increases in anthropogenic activities.

Citta *et al*. (2023) reported that winter sea ice extent in the Bering Sea was thought to be largely decoupled from Arctic declines until recently (2017-19). During those years, the traditional winter range of BCB bowheads in the Bering Sea was mostly devoid of sea ice. Using satellite tag data collected during 2009-19 (27 prior to ice declines, seven after ice declines), they show that the winter range of tagged bowhead whales shifted north with the retreating ice edge, with significant overwintering north of Bering Strait. Dive data suggested that, prior to the ice decline when whales were distributed in deeper water closer to the shelf break, they spent more time near the seafloor and less time near the surface. The authors found no change in body condition of yearling or subadult whales harvested at Utqiaġvik following ice declines; however, post-weaning whales (whales ~ two-five years of age) had a statistically significant decline in body condition, which could have been due to changes in sea ice or reflect negative density dependence given increases in whale abundance and density. The authors noted that body condition of post-weaning whales rebounded after 2019 and suggested more analysis of body condition data is warranted and stated that a more detailed analysis of body condition data will be presented at the next SC meeting. The authors expect that overwintering in the Chukchi Sea will become more common as winter sea ice declines in the Bering Sea.

The Sub-Committee **welcomes** the new information on bowhead whales. The Sub-Committee noted that an annual review of management advice was not required and **agreed** that the new information provided did not require an early *Implementation Review* (IWC, 2020). The next AWMP *Implementation Review* of the Alaskan and Chukotka bowhead whale hunt is scheduled to start in 2025.

5.1.3 North Pacific gray whales
Information on the 2022 subsistence hunt of gray whales in Russia was presented in SC/69A/ASW/04. In 2022, the Association of Indigenous Peoples of Chukotka distributed the Russian part of the block quota among the communities and 16 local whaling communities were involved in whaling.

During the 2022 season, 124 tries (strikes) for gray whales were used; only five gray whales were struck and lost with harpoons due to the outbreaks in a storm and 119 whales were landed. A total of 57 males and 66 females were identified. Two 'stinky' gray whales were also harvested; their meat, mantak, intestines and carcasses destroyed.

Mean body length of gray whales taken was 10.6m with mean body weight 13.6 tons (in 2021 – 10.4m and 13.4 tons). The largest whale taken was a female (14.5 m and 32.4 tons) and the smallest was also a female (7.2m and 5.4 tons). There was no large whale that accompany the smallest whale taken and there were no signs of milk in its stomach. The females taken were not lactating nor had a foetus; about 20 of the landed whales had various injuries and traumas mainly caused by killer whale attacks. Mean thickness of blubber was 127mm.

Polyakova *et al*. (2023) provides information on solving the mystery of the Chukotka stinky gray whales. Gray whales (*Eschrichtius robustus*) constitute an important part of the diet of Chukotka Native population, reaching 30% of consumed food for the inland Chukchas. The problem of 'stinky' whales is that the meat of some harvested species possessed a strong medicinal/chemical odour. The hypotheses explaining the phenomenon ranged from bio-toxins to oil spills. To understand the problem, various tissues of normal and stinky gray whales were collected in 2020-21 and analysed using headspace solid phase micro-extraction with Gas Chromatography – Mass Spectrometry. Dozens of smelly organic compounds were identified among over 500 compounds detected in the samples. The most interesting analytes related to the off odour are bromophenols. The most probable suspect is 2,6-dibromophenol with strong iodoformic odour, perfectly matching that of the 'stinky' whales. Quantitative results demonstrated its levels were up to 500-fold higher in the 'stinky' whales' tissues. The source of 2,6-dibromophenol is likely polychaetes, producing 2,6-dibromophenol and colonising near shore waters where whales feed. Therefore, the mystery of the stinky whales may be considered resolved.

SC/69A/IST/02 provides an updated assessment of all known reports of gray whale non-hunting, human-caused injuries and mortalities (NHHCIM) during 1924-2021. The paper provides new data for 2019 to 2021 and adds additional cases that were not documented in past assessments that occurred prior to 2019 (Scordino *et al*., 2020). The primary sources of NHHCIM are entanglements and ship strikes. Reporting of NHHCIM was most common in the regions of California and northern California through northern British Columbia, likely due to well-established stranding networks in those regions. During the five most recent years of data collection (2017-21) there were an average of 14.3 NHHCIM per year, which was substantially more than during the previous five-year period of 2012-16 which had 9.9 NHHCIM per year.

SC/66A/IST/03 assesses the rate of anthropogenic and killer whale scarring on live PCFG gray whales observed in northwest Washington during 2014-20 and compares the observed rates of scarring to published studies of scarring of Sakhalin Island gray whales due to anthropogenic sources (Bradford *et al*., 2009) and killer whale attacks (Weller *et al*., 2018). The study found that of 139 PCFG gray whales, 11.5% had scarring from entanglements, 5% had scarring from vessel strikes, and 21.6% had scarring from killer whale attacks. The observed rates of entanglement scarring of PCFG whales were less than was previously reported for Sakhalin Island gray whales (Bradford *et al*., 2009) and was slightly greater for PCFG whales for vessel strikes, but the differences were not statistically significant. A significantly greater proportion of gray whales observed at Sakhalin Island had killer whale scars than did PCFG gray whales observed in northwest Washington. This study, Bradford *et al*. (2009) and Weller *et al*. (2018), all likely underreport the true frequency that gray whales were scarred due to poor photo coverage of the posterior portion of the caudal peduncle and of the fluke which are the body regions most commonly scarred by entanglement injuries and killer whale attacks. The finding of no significant differences in scarring from anthropogenic sources between PCFG and Sakhalin Island whales suggests that whales in the two regions likely have similar mortality rates from non-hunting anthropogenic sources. Willoughby *et al*. (2022a) also provided information about killer whale and gray whale interactions in eastern Chukchi Sea, 2009-19. Out of the total 59 gray whale carcasses documented, images were obtained for 56 carcasses. The majority (41) of imaged gray whale carcasses had injuries consistent with probable killer whale predation, and were photo documented every year except 2010 (when no carcasses were seen) and 2011. Eight carcasses were suspect killer whale predation. Cause of death could not be determined for seven carcasses.

SC/69A/IST/04 presents a review of new scientific findings on gray whales relevant for assessing whether the current state of nature is within the tested parameter space evaluated during the 2020 IR. The paper presents reviews on stock structure hypotheses, gray whale health and strandings, human removals by both hunting and non-hunting sources, abundance and calf counts, population growth rates, immigration into the PCFG, parameterization of the Makah hunt, and future catastrophic events (unusual mortality events - UMEs). For almost all factors, it appears that the current status of the gray whale population is within the parameter space evaluated during the 2020 IR. The exception is that it appears that UMEs are occurring more frequently and potentially at a greater magnitude than was previously evaluated (Fig. 1). Preliminary modelling presented in SC/69A/IST/01 suggests that the performance of the Gray Whale SLA and Makah Whaling Management Plan are likely robust to recent and future UMEs of NFG gray whales and reductions in productivity of PCFG, at least under the initial parameterizations taken into account during exploratory modelling. In light of the current UME, and related overview on the status of ENP gray whales provided here, a plan is needed

regarding what steps (if any) the IWC SC needs to take to be confident in the ASW management advice it provides for gray whales in advance of the 2024 Commission deliberations on renewing the gray whale catch limit quota.

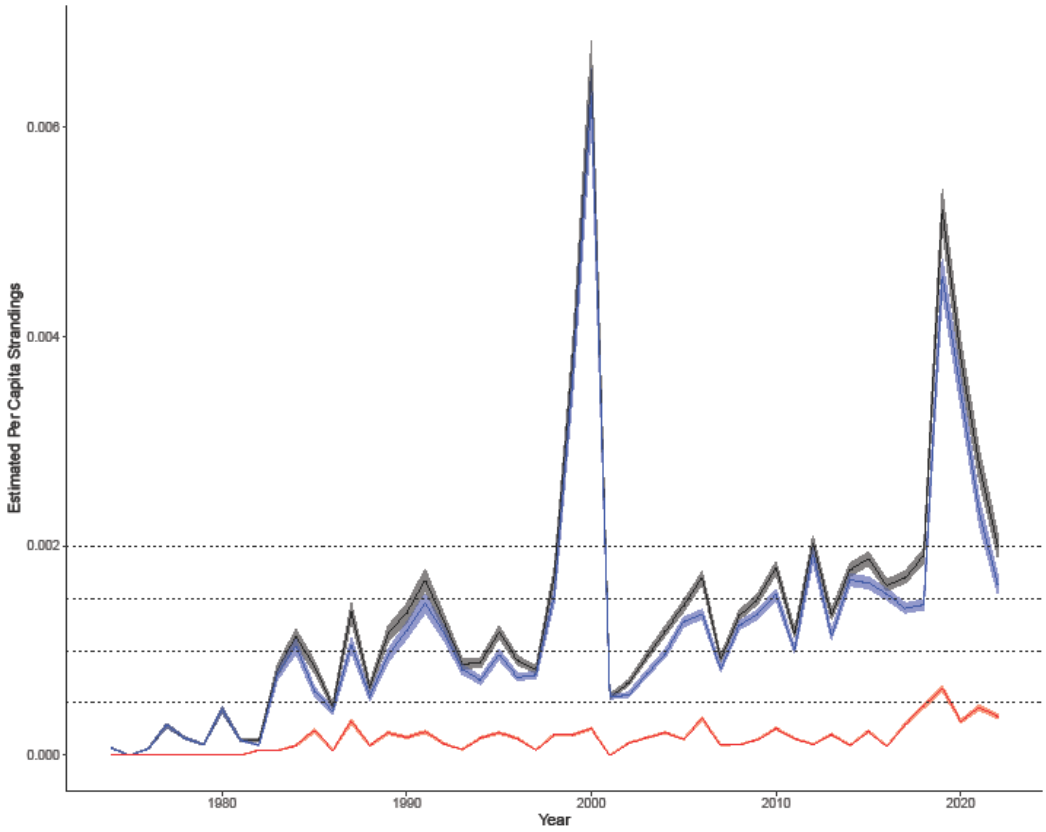

Fig. 1. Annual per capita U.S. Eastern North Pacific gray whale strandings from 1970-2022. Red indicates strandings with evidence of human interactions (vessel strike, fishing gear entanglement); blue indicates strandings with no evidence of human interactions; grey indicates total per capita strandings. Per capita stranding rates were calculated by dividing the number of recorded strandings by the estimated annual abundance from an integrated population dynamics model (Stewart *et al*., in press). Horizontal dotted lines are reference lines for 0.0005, 0.001, 0.0015 and 0.002 recorded strandings per capita (SC/69A/E/08).

SC/69A/CMP/16 reports on the evaluation of a whale's body condition that provides an indicator of its health and reproductive condition and is indirectly an indicator of the environment's health. During the 2023 season in Laguna San Ignacio (LSI), Baja California Sur, Mexico, 618 gray whales were photographed, from which the body condition of 444 single adult whales (male or female without a calf) and 82 mothers with calves (Mc) were evaluated. The percentage of single adult whales with 'good body condition' was 70% (*n*=311), 'fair' 21.2% (*n*=94) and 'poor' 8.8% (*n*=39). The body condition of mothers with calves was 82.9% 'good' (*n*=68), 13.5% 'fair' (*n*=11) and 3.6% 'poor' (*n*=3). The percentage of single whales with 'good' and 'fair' body conditions increased in 2023 compared to 2019-22 period; meanwhile, the percentages of whales with 'poor' body condition decreased, being the lowest since the Unusual Mortality Event (UME) began in 2019.[1] The percentage of Mc with 'fair' and 'poor' body condition was the highest from the last three years. Still, the number of Mc observed in 2023 was the highest in the last five years. The data suggest an improvement in gray whales' body condition and an increasing reproduction (calving) rate.

SC/69A/CMP/17 reports that unusual Mortality Events (UME) occur when mortalities of marine mammals increase above an average annual rate. In 2019 the U.S. National Oceanic and Atmospheric Administration (NOAA) declared a gray whale UME along the North Pacific Coast of North America and continued until 2022. Gray whale stranding records were collected in Mexico between 1 January and 11 April 2023 and documented at least 33 gray whales stranded along the Pacific coast of Baja California, Mexico. As in previous years, most strandings (*n*=27) occurred in the Ojo de Liebre lagoon (LOL) and the surrounding areas. Of the total number, 19 were female gray whales, and 14 were males. The age classes of the dead whales were: eight adults, four subadults, five yearling whales and 16 calves. The number of

[1] The term Unusual Mortality Event (UME) in this report is used in its literal meaning and not as defined by the National Oceanic and Atmospheric Administration (NOAA) Fisheries: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-unusual-mortality-events .

strandings in 2023 was similar to the stranding numbers before the UME started in 2019. The primary age class of stranded whales was calves, as is usually the case in the non-UME years.

According to SC/69A/CMP/21, beginning in 2018, observations in Laguna San Ignacio (LSI) and the Bahía Magdalena (BM) complex were characterized by declining gray whale body condition, low calf counts, and higher mortality rates. They indicated the pending Unusual Mortality Event (UME), which continued from 2019 through 2022. Information gathered in 2023 in these gray whale wintering areas suggests that the UME may be slowing and included: fewer individual whales in 'poor' body condition, the first increase in the numbers of calves observed during the previous five winters of low counts, and fewer stranded dead whales in these areas. In LSI, the number of single adult (non-calf) whales counted in vessel surveys during 2023 was 194 on 6 March, higher than in the previous five winters. Compared to previous winters from 2018-22, counts of females with calves increased throughout the winter, with the highest count of 37 pairs observed on 19 March 2023. The highest gray whale survey count in BM was obtained on 19 February in the most southerly aggregation area of Bahía Almejas and was 295 single adult whales and three female-calf pairs. In central Bahía Magdalena, gray whale counts were greatest on 18 February, with 97 adult whales and two female-calf pairs. In the northern Canal de Santo Domingo, a high count of 14 single whales was observed on 17 March, and a high count of 12 female-calf pairs on 20 February.

The Sub-Committee received information from various sources regarding abundance of eastern North Pacific gray whales. Eguchi *et al*. (2022a) provided a new estimate of the abundance of eastern North Pacific gray whales in 2022 based on shore-based surveys of southbound whales migrating past central CA. The 2022 estimate (16,650 whales, 95% CI 15,170-18,335) represents an approximate 40% decline in abundance since 2016. The SWG reviewed and endorsed this estimate (see Annex D, item 2.1.5).

Harris *et al*. (2022) provided updated abundance estimates for gray whales from the Pacific Coast Feeding Group (PCFG), a small group of ENP whales that has been recognized by the SC as demonstrating strong seasonal fidelity to the Pacific Northwest. As of 2020, the PCFG abundance is estimated to be 212 individuals (SE=17.9, Nmin=198) within the PCFG range. The SWG reviewed and endorsed this estimate (see Annex D(ASI), item 2.1.5).

Eguchi *et al*. (2022b) provided estimates on eastern north Pacific gray whale calf production from 1994-2022 using the Bayesian approach. The estimate of total calf production in 2022 was 216.7 (SE=33.4, 95% CI=159-290), which was the lowest estimate since the survey started in 1994. Reproductive rates of ENP gray whales have been very low for the last few years, with the calf production estimates in 2019 (356; 95% CI 283-450) and 2021 (383; 95% CI 300-481) also being some of the lowest in the time series (Fig. 3). Two previous periods of low calf production also lasted for three-four years each (1999-2001 and 2007-10). Two of the three recorded periods of low calf production have coincided with Unusual Mortality Events (UMEs; 1999-2000 and 2019-22) and corresponding declines in abundance. Furthermore, there was a linear relationship between estimated abundance and estimated calf production. The estimated abundance for ENP gray whales between 1994 and 2022 ranged from 16,033 in 2002 to 26,960 in 2016 (Eguchi *et al*., 2022b). The proportion of mother-calf pairs to total abundance ranged from 0.013 in 2022 to 0.068 in 1998. This pattern suggests that the factors driving or mediating rates of ENP gray whale fecundity and mortality may be similar. While ENP gray whales have shown long-term resilience to fluctuations in abundance for which a direct cause has yet to be determined.

Bierlich *et al*. (in press) provided information on an investigation of morphological differences (length, skull, fluke span) and compared length-at-age growth curves between ENP and PCFG whales. It found that while PCFG and ENP whales have similar growth rates, PCFG whales reach smaller asymptotic lengths. Additionally, PCFG whales have relatively smaller skulls and flukes than ENP whales. This paper was reviewed by the SDDNA Working Group; details of that discussion can be found in Annex O (item 2.1).

SC/69A/E/08 reported provided an update on the eastern north Pacific gray whale (*Eschrichtius robustus*) 2019-2023 Unusual Mortality Event (UME). From December 17, 2018, to April 5, 2023, a total of 638 Eastern North Pacific gray whales (*E. robustus*) stranded along the Pacific coast of North America across three countries (Canada, Mexico, United States). 216 whales were reported in 2019 (including two whales from December 2018), 172 in 2020, 115 in 2021, 105 in 2022, and 30 as of 5 April 2023. On the West Coast of the United States, the 122 stranded whales reported in 2019, 79 in 2020, 55 in 2021, and 47 in 2022 exceeded the annual mean stranding rate of 29 ± 10 whales between 2001-2018. Strandings occurred along the entire range of the eastern north Pacific gray whale, including in the wintering, migratory, and feeding areas, with most whales recorded in U.S waters documented in spring and early summer when gray whales are near the end of their seasonal fast.

The Sub-Committee welcomed the information on gray whales.

The Sub-Committee noted the information on unusual mortality occurring in the years 2019–2022 and the Sub-Committee has referred this to the IST for advice on whether a new *Implementation Review* is required.

Attention: SC, ASW, IST, CG

With respect to matters related to hunts of north Pacific gray whales, the Sub-Committee:

(1) ***reiterates*** *previous advice that biological data, genetic samples and photographic data from Russia continue to be collected from live and harvested whales and analysed to provide information on stock structure and biology; and*

(2) ***recommends*** *collaborative sharing and integration of data from all ASW countries (e.g., photo-id catalogues, genetic samples) to inform conservation and management actions.*

5.1.4 Common minke whale stocks off East Greenland
17 minke whales (seven male, ten female) were landed in 2022 (SC/69A/O/04rev1). None was struck and lost. Samples were taken from four of the 17 common minke whales that were landed in East Greenland.

5.1.5 Common minke whale stocks off West Greenland
139 minke whales (36 males and 103 females) were landed in 2022 (SC/69A/O/04rev1). 10 were struck and lost. There were 149 strikes. Samples were taken from 66 of the 139 common minke whales landed in West Greenland. The Sub-Committee agreed that an annual review of management advice was not required and noted that the review of the performance of the G-common minke SLA is appropriate to provide management advice to the Commission on both the West and East Greenland common minke whale hunts.

5.1.6 Fin whales off West Greenland
Four (4) fin whales (one male and three female) were landed in 2022 (SC/69A/O/04rev1). None was struck and lost. Samples were obtained from the four fin whales landed in West Greenland. The Sub-Committee noted that an annual review of management advice was not required and agreed that the new information provided did not require calling for an early *Implementation Review* (IWC, 2020).

5.1.7 Humpback whales off West Greenland
One (1) female humpback whale was landed in 2022 (SC/69A/O/04rev1). None was struck and lost. One (1) whale was also bycaught. Samples were obtained from the humpback whale landed in West Greenland. The Sub-Committee noted that an annual review of management advice was not required and agreed that the new information provided did not require calling for an early *Implementation Review* (IWC, 2020).

5.1.8 Humpback whales off St. Vincent and The Grenadines
Information on the subsistence hunt of humpback whales off St. Vincent and The Grenadines for 2022 was presented in SC/69A/O/04rev1. No humpback whale was taken for 2022. One humpback was struck and lost in the waters surrounding Bequia.

The Sub-Committee noted that an annual review of management advice was not required and agreed that the new information provided did not require any change to its existing management advice (IWC, 2020).

5.2 Annual workplan
In 2024, the Sub-Committee will review new biological information and catch information on species and stocks subject to aboriginal subsistence whaling. The Sub-Committee will also work with IST in providing advice for all the aboriginal hunts and continue to monitor and evaluate the gray whale mortality events.

6. BUDGET REQUESTS

The Sub-Committee has no budget request.

7. ADOPTION OF THE REPORT

The report was adopted on 30 April 2023, at 14:00.

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Appendix 1

AGENDA

1. Convener's opening remarks
2. Election of chairs
3. Appointment of rapporteurs
4. Available documents
5. Discussion of stocks subject to ASW
    - 5.1 New information and progress on recommendations
        - 5.1.1 Eastern Canada/West Greenland bowhead whales
        - 5.1.2 Bering-Chukchi-Beaufort Seas bowhead whales
        - 5.1.3 North Pacific gray whales
        - 5.1.4 Common minke whale stocks off East Greenland
        - 5.1.5 Common minke whale stocks off West Greenland
        - 5.1.6 Fin whales off West Greenland
        - 5.1.7 Humpback whales off West Greenland
        - 5.1.8 Humpback whales off St. Vincent and the Grenadine
    - 5.2 Annual workplan
6. Budget requests
7. Adoption of report