Annex M

Report of the Sub-Committee on Other Northern Hemisphere Whale Stocks (NH)

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1. INTRODUCTORY ITEMS

1.1 Opening remarks
Cholewiak welcomed the participants.

1.2 Election of Chairs
Cholewiak was elected as Chair with co-chair support from Robbins.

1.3 Adoption of Rapporteurs
Goetz was appointed as rapporteur.

1.4 Adoption of agenda
The adopted Agenda is given as Appendix 1.

1.5 Review of available documents
The documents available to the sub-committee were identified as: SC/69A/NH/01, SC/69A/NH/02, SC/69A/NH/03, SC/69A/NH/04/Rev1, SC/69A/NH/05, SC/69A/NH/06, SC/69A/NH/07/Rev1, and Soldevila *et al.* (2022).

2. EVALUATION OF POTENTIAL NEW IN-DEPTH ASSESSMENTS

2.1 North Pacific blue whales
Blue whales in the North Pacific are generally considered to comprise two populations: the eastern North Pacific (ENP population), and in the central and western North Pacific (CWNP population). In 2016, the Committee assessed the ENP population as 'almost recovered' (IWC, 2017) and has been evaluating the data available to assess blue whales in the less studied central and western North Pacific. A verbal update was provided of the existing data and data still needed before an assessment of North Pacific blue whales can be undertaken. The ENP population has been assessed and accepted by the Scientific Committee (Monnahan *et al.,* 2015), but no assessments exist for CWNP blue whales. Historical catches have been separated between ENP and CWNP, but there was considerable uncertainty in the spatial models (fitted to song data) due to catches with missing months and uncertain locations (Monnahan *et al.,* 2014). Additionally, the catch data are available in the form of 1,000 realisations of time series that encompass this uncertainty.

The greatest source of uncertainty in population structure is that a different song was recorded in the western North Pacific off Hokkaido at 145°W (Širović *et al.,* 2017). In addition, it is not clear whether blue whales formerly caught off Japan in the late 1800s and early 1900s (Gilpatrick and Perryman, 2008) are a possible third population or were occupying a region no longer occupied by CWNP blue whales after whaling.

For ENP blue whales, abundance estimates have recently been updated (Calambokidis and Barlow, 2020). These are similar to previous estimates, with abundance estimated to be near pre-whaling levels, and displaying an increasing trend of 2-3% per year. These could be the basis for an updated ENP blue whale assessment and have been endorsed by the SC and ASI as Category 1A in 2022 (IWC, 2022, p.84).

For CWNP blue whales, the POWER surveys in the North Pacific have been completed and are ready for the provision of an abundance estimate. In addition, there are JARPN surveys and other Japanese surveys that cover the remainder

of the western North Pacific west of the area covered by the POWER surveys. The highest priority for a CWNP assessment is to provide abundance estimates for this population from both the POWER surveys and the western North Pacific Japanese surveys. Together these cover the entire range of CWNP blue whales, and abundance estimates from these surveys are required to run a population model of this population.

An intersessional e-mail correspondence group previously compiled and evaluated data for use in a future assessment (Branch *et al.,* 2019). In addition to the previously mentioned abundance estimates for ENP blue whales (Calambokidis and Barlow, 2020), it was mentioned that the following information is also available to inform a possible assessment:

(1) Kanaji *et al.* (2017) compiled data from a wide variety of Japanese surveys throughout the North Pacific for small cetaceans, but data were also obtained for blue whales that would inform the distribution of CWNP blue whales;

(2) Moore *et al.* (2002) used SOSUS data to locate positions of calling blue whales off the Aleutians through to Kamchatka, which delineates the north-western extent of CWNP blue whales;

(3) Atkinson *et al.* (2020) used progesterone in blubber samples to estimate that 32-34% of female ENP blue whales were pregnant. This is lower than the 39% estimated for pygmy blue whales (Branch, 2008) and 40% for Antarctic blue whales (Ohsumi, 1979); and

(4) Wood *et al.* (2021) conducted an analysis of blue whale song occurrence in the central and western North Pacific Ocean.

The sub-committee **welcomed** this update and **agreed** that obtaining an abundance estimate for CWNP blue whales at the next SC meeting remains the top priority.

In discussion, the sub-committee was advised about a genomics project underway by Sremba (Oregon State University) which includes central North Pacific blue whale samples from the POWER cruise. It was noted that the outcome of this project may be available by the next SC. In addition, the sub-committee received information that next year's POWER cruise will take place in the northern central Pacific which could provide additional data on North Pacific blue whales.

Attention: SC

*The sub-committee continues its work to assess blue whales in the North Pacific, especially in the central and western areas. To advance this work, the sub-committee **reiterated** its previous recommendation that an abundance estimate for central-western North Pacific blue whales using data from IWC-POWER and JARPN/JARPN II surveys is critical for the assessment and looks forward to receiving this information at the next SC meeting (IWC, 2019, p.29).*

2.2 North Atlantic sei whales

The movements, distribution, abundance, and stock structure are not well understood for North Atlantic sei whales. Therefore, this species continues to be in the pre-assessment stage and the sub-committee **agreed** that an intersessional email correspondence group under Cholewiak would continue to consider information as it becomes available. Abundance estimates available for sei whales in the western North Atlantic can be found in Annex D, Item 2.1.8.

2.3 North Atlantic right whales

SC/69A/NH/06 provided an update on the North Atlantic right whale (NARW) population status. The NARW population continues to decline, with a median total abundance estimated at 340 individuals (95% credible interval 333-347) at the end of 2021. The model results continue to show a diverging sex ratio, with an estimate of only 143 (95% CI: 137-149) females in the population during 2021. A total of 37 deaths were observed from 2016-2020, with entanglements and vessel strikes each accounting for 11 of the deaths. One perinatal calf was found dead, presumably from natural causes. The cause of death for the remaining 14 cases was undetermined. Based on the abundance model (Pace *et al.,* 2017; 2021) an estimated 136 (95% CI: 121-195) NARW died during 2016-2020 which is more than three times the number of observed deaths. Since the start of 2021, four deaths have been documented, all in U.S. waters: a calf and an adult died from vessel strike, one adult from chronic entanglement, and one perinate from maternal abandonment. In the 2023 calving season, 11 females were observed with calves; ten of those females were known to have calved previously and they ranged in age from greater than 20 years to at least 45 years old. One of the known females had her first documented calf at age 10. A recent random forest model applied to live injured whales suggested that current assessment methods underestimate the risk for injury cases lacking details or long-term observations (Carretta and Henry, 2022).

SC/69A/NH/01 described U.S. management efforts to promote NARW recovery. The U.S. Government continues to address the two primary threats, entanglement in fishing gear and vessel strikes. The Unusual Mortality Event (UME), declared in 2017, is ongoing and included 98 individuals (36 deaths, 33 serious injuries, and 29 morbidities) as of March 2023. In 2022, the U.S. National Oceanic and Atmospheric Administration (NOAA) developed a morbidity protocol to better understand the UME. The U.S. also released the 'North Atlantic Right Whale Road to Recovery' in 2022, a

document that outlines a holistic approach to halting the current population decline and achieving species recovery. The paper describes recent rulemakings and technological innovations to reduce the two primary threats, as well as transboundary collaboration with Canada, and minimising threats related to offshore wind development. Although the Atlantic Large Whale Take Reduction Plan has been in place since 1997, it has not been successful at reducing mortality and serious injury to below the stock's potential biological removal level. As a result, in 2021 the Plan was amended to require additional gear modifications, time-area closures, and gear marking in lobster and Jonah crab trap/pot fisheries, which represent approximately 99% of the vertical buoy lines in all fisheries addressed by the plan. Despite the Atlantic Large Whale Take Reduction Team deliberations on additional measures in 2022, U.S. Congress mandated that the 2021 regulations were sufficient to ensure that the lobster and Jonah crab fisheries are in full compliance with the U.S. Marine Mammal Protection Act and Endangered Species Act through 2028. Thus, any additional regulations will not come into effect before 2029.

SC/69A/NH/01 also reported on U.S. efforts to reduce vessel strikes including mandatory speed restrictions of 10 knots or less for vessels equal to or greater than 19.8m (65 feet) in length in Seasonal Management Areas (SMAs) along the east coast of the U.S. or at specific times of the years when right whales are likely to be present. Based on an assessment of those vessel speed regulations, NOAA published a proposal (87 FR 46921) in August of 2022 to: (1) modify spatio-temporal boundaries of current speed restriction in SMAs; (2) expand speed restrictions to include most vessels greater than or equal to 10.7m (35 ft) and less than 19.8m (65 ft) in length; (3) create a Dynamic Speed Zone framework to implement mandatory speed restrictions when right whales are known to be present outside active SMAs; and (4) update the speed rules safety deviation provision. Public comments on the proposal are currently being reviewed with final action projected to occur in 2023. NOAA is keen to promote the use of innovative technologies and management practices to offer vessel operators additional options to reduce speed. Additionally, NOAA continues to work extensively with the Canadian government. The U.S. and Canada held two joint workshops in 2022, and plan to convene workshop later in 2023 to improve transboundary understanding of North Atlantic right whale distribution and movements. Finally, the U.S. is committed to reaching renewable energy goals, one of which is to evaluate and address environmental impacts associated with the development of offshore wind energy. In addition to working with the Atlantic Large Whale Take Reduction Team, NOAA Fisheries is supporting the development of innovative fishing technologies (often called 'ropeless' or 'on-demand' fishing) that eliminate persistent buoy lines.

The sub-committee thanked the U.S. for providing updates about North Atlantic right whales and recognises the substantial efforts underway to improve the understanding of the population's status and to reduce human impacts.

In discussion, the sub-committee examined the trends in NARW survival and reproduction. An apparent increase in the survival rate in 2020 was noted. However, the sub-committee questioned the narrow credible interval around the last data point, particularly in light of COVID-related effort reductions and presumably lower sample sizes. Survival rates are still well below historical levels, and the last data point should not be assumed to be an indication of population recovery. It was also clarified that while there was less effort during years affected by COVID-19, the recapture rate underlying the analysis was still high. The sub-committee noted the possibility that the reduced effort due to COVID-19 resulted in fewer carcasses being discovered and investigated for cause of death, and it was agreed that this could particularly be the case for floating carcasses offshore. The sub-committee also discussed that providing a measure of uncertainty around birth rates could improve understanding trends over time, and it was clarified that both modelling and photo-ID data indicate a very low rate of missed (i.e. undocumented) calving events on an annual basis.

The sub-committee expressed interest in seeing population projections to help interpret the future implications of observed population trends. It was noted that NOAA Fisheries plans to conduct a population viability analysis to look at the risk of extinction over the next 100 years under different management scenarios including recently enacted or proposed fisheries management strategies.

With respect to management updates, the sub-committee discussed the risk of small vessels currently not subject to speed restrictions striking NARWs and the value of using outreach and signage to better inform recreational mariners. Regarding the topic of entanglements in fishing gear, details and discussion of U.S. efforts to develop 'on-demand' or ropeless fishing technology can be found in Annex J (HIM, Agenda Item 12.5). The sub-committee also inquired about the trans-boundary co-ordination between the U.S. and Canada to recover and analyse entangling gear. It was clarified that the countries co-ordinate and communicate often and effectively to keep each other apprised on such topics. Members also reiterated interest in receiving regular updates from Canada on its right whale research and mitigation efforts (IWC, 2022, p.51). The sub-committee was advised that the IWC Secretariat reached out to relevant contacts in Canada during SC69A in order to facilitate future updates.

The sub-committee recalled its discussion last year about satellite tagging research and the potential application to NARWs to better understand their movements and critical habitats (IWC, 2022, p.50). The sub-committee received confirmation that the development of a new implantable satellite tag has continued, and that research on tag performance is being conducted on Southern right whales off Argentina. A U.S. workshop to compile and consider

information on the performance and health impacts of satellite tags on NARWs is planned to take place in 2023. The sub-committee would welcome an update on workshop outcomes at the next SC meeting.

Attention: SC, G

*The sub-committee **strongly reiterated** its serious concern over the status of North Atlantic right whales, and the urgent need for both the U.S. and Canada to eliminate human-caused North Atlantic right whale mortality.*

*The sub-committee **recognised** that ship strikes and entanglement in fishing gear are the two major causes of North Atlantic right whale mortality (IWC, 2021, p.41) and **strongly supported** efforts to reduce these, and:*

*(1) **expressed** grave concern about the Congressionally-imposed halt to further entanglement mitigation measures specific to lobster and Jonah crab trap/pot fisheries in U.S. East Coast waters until 2029, and **strongly recommended** accelerated efforts to develop, test, and adopt methods of fishing that reduce the potential to entangle right whales (such as ropeless technologies);*

*(2) **recognised** that despite existing speed mitigation measures, small vessels can also cause mortality and serious injury of North Atlantic right whales. The sub-committee acknowledged that the U.S. federal government is considering applying current speed restrictions to vessels equal to and greater than 10.7 metres (35 feet) up to 19.8 metres (65 feet) and **strongly recommended** the U.S.A. adopt the proposed measures;*

*(3) **recognised** that recreational boaters may be less aware of existing regulations and, therefore, **recommended** outreach efforts be directed specifically toward these mariners;*

*(4) **encouraged** an update from Canada on its research and management initiatives at the next meeting; and*

(5) ***encouraged** updates from the U.S. on its management efforts and their outcomes, including the results of population viability analyses and updates from a planned satellite tagging workshop.*

2.4 North Atlantic humpback whales

A Comprehensive Assessment of North Atlantic humpback whales was completed in 2002 (IWC, 2002; 2003). In 2018, the Committee agreed that it was timely to consider a range-wide In-depth assessment (IWC, 2019, p.133) and has since been collecting and evaluating available data.

In SC69A, the sub-committee received results from two of the first ocean-scale studies of North Atlantic population structure since the completion of the Comprehensive Assessment. SC/69A/NH/02 and SC/69A/NH/05 provided new, independent information on this topic based on genetic approaches and photo-identification data, respectively. Further details on these studies and sub-committee discussions can be found in Annex O (SDDNA, Agenda Item 2.2). However, the majority of the available data about North Atlantic breeding grounds still comes from the Greater Antilles of the Caribbean. Humpback whales are less well studied in other parts of the Wider Caribbean Region and the waters off west Africa. The sub-committee received two papers addressing these data gaps.

SC/69A/NH/03 reviewed published and gray literature for records of humpback whales in the southern Gulf of Mexico, southern Caribbean, southeastern Caribbean, Central America, and the Guianas. The sources of information reviewed ranged from online biodiversity platforms (such as OBIS SEAMAP), social media, news sites, and the authors' own field books. A total of 228 records were compiled for the years 1913 through 2023. These included sightings (60.1%), intentional takes (20.2%), acoustic detections (15.4%), strandings (3.9%), and bycatch (0.4%). Scientific activities and citizen-based contributions generated 81.1% and 18.9% of the records, respectively. Most of the records (82.8%) were concentrated in the southern (54.6%) and southeastern Caribbean (28.2%). The presence of humpback whales in Aruba, Bonaire and Curacao, Venezuela and French Guiana in the period August-November was consistent with when Southern Hemisphere humpback whales are expected to be on their tropical breeding grounds. The low number of records in Central America is consistent with what has been found for killer, false killer, pilot, and minke whales, and may be the result of low research effort, low maritime traffic, low cetacean densities, or a combination of these factors. Documented threats to humpback whales in the study area include bycatch, direct takes, and disturbance from maritime traffic and oil and gas activities. The authors' concluded that the two peaks in monthly presence of humpback whales in the study area probably reflected the presence of whales from the Northern Hemisphere (winter-spring) and Southern Hemisphere (summer-autumn). Southern whales likely belong to Breeding Stock A. The authors' concluded that these results indicate a need for increased monitoring and research efforts in these less well-studied areas.

The sub-committee thanked the authors of SC/69A/NH/03 for the considerable effort required to consolidate information from such a diverse array of sources.

SC/69A/NH/07/Rev1 reported on the results of a passive acoustic monitoring study conducted off Dakar, Senegal, from June 2021 to January 2023. This study evaluated the temporal occurrence of humpback whale song and the potential use of this habitat as a breeding area for both Northern and Southern Hemisphere humpback whale populations. No

song was detected during the single boreal winter period. However, humpback song was detected during two austral winter periods, in September 2021 and from July-November 2022, corresponding to the Southern Hemisphere breeding season. Song structure was compared to a sample recorded in August 2022 from Conkouati, Republic of Congo, and was found to match all phrase types. While there were relatively few days with detections of song in 2021, humpback song was much more consistently present during the austral winter of 2022, with a peak daily occurrence of 17hr/day in August. The lack of humpback whale song during the boreal winter does not necessarily indicate a lack of animal presence, and strandings data does indicate the presence of humpback whales in Senegal in boreal winter months. However, the results reinforce previous reports of Southern Hemisphere humpback whales occurring in the North Atlantic, off West Africa and Cape Verde Islands (CVI). Acoustic monitoring effort is ongoing, and additional studies are needed to determine whether this region serves as a breeding area for populations from both hemispheres.

In discussion, the sub-committee commented that the large difference in number of acoustic detections between the two austral winter periods was both unexpected and unusual for a breeding ground. It was also noted that more whales were detected on Southern Hemisphere breeding grounds (such as off Réunion Island) in 2022 than in the previous year, which corresponded to the timing of increase in acoustic detections in Senegal in the 2022 austral winter. Therefore, it is possible that this phenomenon is part of a larger pattern of breeding ground use in those years. It was clarified that the song had not been compared to recordings from CVI specifically, but the authors did conduct a preliminary comparison to western North Atlantic song from the U.S. east coast and found no shared phrase types.

The sub-committee noted with interest that both SC/69A/NH/03 and SC/69A/NH/07rev1 described seasonal patterns of humpback whale presence that suggested movement of individuals from the Southern Hemisphere into known or potential Northern Hemisphere breeding areas. In support of these findings, the sub-committee received information that North Atlantic samples had been genetically compared to samples from Gabon. The Gabon samples clustered separately from those from the North Atlantic, but there were a few eastern North Atlantic individuals with a 100% or 50% South Atlantic genome, suggesting occasional dispersal and even gene flow. These apparent migrants and hybrids were sampled on feeding areas (Iceland and Ireland), in the Mediterranean Sea or at CVI in the boreal summer. On the other hand, sub-committee members were informed of an apparently opposite movement in the western North Atlantic: two humpback whale strandings occurred in the boreal winter in northern Brazil, one in December 2008 and one in February 2019. It was noted that a sample was collected from the first for genetic analysis by a local university, but the status of that work was not known. Skin samples may be also available from strandings of eight juvenile humpback whales that stranded in the boreal winter along the coast north of Dakar (2016-21); samples are currently housed at the Smithsonian National Museum of Natural History, Washington D.C., USA.

The sub-committee emphasised the great value of tissue samples (from biopsies, sloughed skin or carcasses) for genetic analyses and fluke photographs to better understand humpback whales in under-sampled areas of the North Atlantic. Such areas include, but are not limited to, the Caribbean coast of South America, the Virgin Islands and northwestern extent of the Lesser Antilles, as well as the Cape Verde Islands and west coast of Africa. Members discussed that the photo-identification and genetic studies, anticipated to be of greatest importance, involve matching to previously sampled individuals and/or their relatives (in the case of genetics). It is therefore critical that data be shared with the groups that maintain the ocean-scale datasets of record for North Atlantic humpback whales. The North Atlantic Humpback Whale Catalog (NAHWC, photo-identification) and the Marine Evolution and Conservation Group at the University of Groningen (genetics) each curate data from thousands of individual humpback whales. Collaborating with these groups therefore provides the highest probability of matching a sampled individual by photo-identification or genetics to another part of the North Atlantic. It was clarified that the NAHWC is not available online, nor is it fully represented within citizen science platforms like HappyWhale. Instead, images should be sent directly to the NAHWC (contact nahwc@coa.edu for details). It was noted that for genetic analysis as well, the consistency of having the same laboratory generating microsatellite data for all of the samples that will be compared is important. The sub-committee acknowledged that the timing for receiving any new data (including telemetry or passive acoustic data, in addition to genetic data and photo-ID) to contribute to the In-depth assessment will be important to receive intersessionally or by SC69B.

In addition to the new information presented above, abundance estimates of humpback whales in the western North Atlantic are available from NOAA line-transect surveys. Further details and discussion of this topic can be found in Annex D (ASI, Agenda Item 2.1.8). The sub-committee **agreed** that an intersessional email correspondence group under Robbins would continue to compile and evaluate information for assessment.

Attention: C, CG, SC, R

*The sub-committee continues to collect and evaluate information relevant to an In-depth Assessment of North Atlantic humpback whales. It particularly **reiterated** the following previous **recommendations** (IWC, 2019, p.18; 2020, p.131; 2021, p.47; 2022, p.52):*

(1) collection of data and information from the understudied areas in the Caribeean and eastern North Atlanic;

(2) analysis of MONAH project data from the West Indies to estimate humpback whale abundance; and

(3) conduct a virtual intersessional workshop, if needed, and an in-person meeting in 2023 or 2024 to examine available information in the context of assessment.

*The sub-committee further **recommended** transmission of existing samples from humpback whales that stranded along the coast of Senegal and Brazil in the boreal winter to the University of Groningen for analysis.*

*The sub-committee **urged** that relevant data be submitted as soon as possible to the specific repositories that are undertaking large-scale analyses of photo-identification data (North Atlantic Humpback Whale Catalog, College of the Atlantic, USA) and genetic data (Marine Evolution and Conservation group, University of Groningen, the Netherlands).*

*It also **recommended** that the ICG prepare detailed guidance for data holders on the mechanisms of data sharing with these archives, the nature of the resulting collaborations and other practicalities.*

*The sub-committee also **encouraged** the presentation of the results of a synthesis of satellite tagging data from North Atlantic feeding and breeding grounds by Kettemer and colleagues at SC69B (see IWC, 2021, p.47).*

2.5 Rice's whales

The Rice's whale (*Balaenoptera ricei*, Rosel *et al.,* 2021) numbers fewer than 100 individuals and is the only year-round resident baleen whale in the Gulf of Mexico. The sub-committee has previously expressed serious concern about this stock (IWC, 2022, p.53) and is monitoring ongoing research and management efforts.

The status of current Rice's whale research was summarised, beginning with a new publication on call variation and occurrence in the northwestern Gulf of Mexico beyond the known core habitat. Soldevilla *et al.* (2022) described multiple call type variants associated with the long moan that is the most commonly described vocalisation and is predominantly heard in the western Gulf of Mexico. Long-term passive acoustic moorings were deployed in 2016-2017, both within the core habitat and along the central and western portion of the Gulf in areas consistent with previous observations. Long moan calls were detected in the central-western Gulf and were more variable than, and differed slightly from, the calls typically detected in the eastern Gulf. Whether this variation in call type occurs at the individual or population level is unknown. No confirmed long moan calls of the 'eastern' type were heard at western sites, while the long moan variants from the western region were heard on 21 days (6.4% of the time) at eastern sites. This study confirmed that Rice's whales are found within the central to the western Gulf, particularly in water depths between 100 and 400 metres. It was suggested that differences in call type between locations may indicate that call-type may be context-specific, with some behaviours and associated calls occurring in one location while others occur at a different location. However, Rice's whale call types have not been linked to behaviour, thus, the reason for the observed spatial variation remains undetermined.

It was further reported that results from predictive density modelling in the northern Gulf of Mexico agree with historical whaling records and acoustic detections, suggesting that Rice's whales occur more broadly throughout the Gulf. It was noted that the results also highlight the importance of the 200-m isobath and indicate that Rice's whales may prefer areas on the northwestern shelf break (e.g., Roberts *et al.,* 2016a; 2016b). Density models also predicted suitable habitat in the southern Gulf, but these areas have yet to be explored visually or acoustically for the occurrence of Rice's whales.

Information was provided on several ongoing and upcoming projects, including the Listen GOMEX project which proposes to deploy 14 acoustic recorders throughout the Gulf of Mexico to better understand Rice's whale occurrence and distribution. Attention was also drawn to two additional scientific publications, one describing prey species and feeding selectivity using stable isotopes (Kiszka *et al.,* 2023), and the other examining the energetics and cost of locomotion from telemetry tags (Soldevilla *et al.,* 2017).

Regarding management, the sub-committee was informed that 'Critical Habitat' (i.e. specific geographic areas that contain physical or biological features essential to conservation) for Rice's whales is currently being considered under the U.S. Endangered Species Act (Section 4) using results of the density models and passive acoustic monitoring. While there is increasing interest in wind energy development in the region, particularly in the western and nearshore areas, these areas do not currently overlap with areas of known Rice's whale occurrence. However, if wind energy development expands into offshore waters, it could potentially pose a risk to Rice's whales. Data on Rice's whale are also being used to inform site placement of potential aquaculture sites. It was concluded that the high level of anthropogenic activities in the region, including oil and gas exploration and extraction, fisheries, shipping, and the 2010 Deepwater Horizon oil spill, highlight the need to improve protection and better understand the distribution, ecology, and risks of this endangered whale.

The sub-committee **welcomed** this new information and **acknowledged** the considerable amount of work that has been conducted by the U.S. to understand and protect Rice's whales.

In discussion, the sub-committee commented on the importance of linking Rice's whale sounds to their behaviour, and in particular, distinguishing between calls and songs. The sub-committee suggested that the characteristics of the long moan vocalisation is consistent with song, which would indicate association with male reproductive displays. The sub-committee further inquired if acoustic data were used in the density models and it was clarified that these data were not included due to the propagation distances and lack of data on call rates. The sub-committee cautioned that there is potential for underestimating animal abundance if call types are found to have spatially explicit variation (i.e. estimating call types that are present only in the core area will result in an artificially low abundance estimate) or sex-biased production, as is the case with reproductive displays in most baleen whales.

The sub-committee also suggested re-examining two whale specimens mentioned in Miller (1928) from the coast of Campeche, Mexico, along the western side of the Yucatan Peninsula. Miller identified these specimens as sei whales based on photographs and Mead (1977) agreed with Miller. Therefore, the sub-committee agreed that it would be prudent to re-examine the historical specimens and/or the photographs to verify species identification.

Finally, the sub-committee received information that The Open Ocean Disaster Response Plan includes efforts to enhance reporting and response capability for large whale strandings, focusing on Rice's whales, in the Gulf of Mexico.

Attention: SC

*The sub-committee **reiterated** its serious concern about Rice's whale, an isolated population in the Gulf of Mexico with an estimated abundance of only around 50 animals (IWC, 2019, p.26; 2020, p.31; 2021, p.48; 2022, p.53) and **recognised** the substantial amount of work that has been conducted by the U.S.A. on research and management initiatives. It **welcomed** additional updates at SC69B.*

Specifically, the sub-committee:

*(1) **recommended** the continuation and expansion of acoustic research efforts, including into basic differences between sexes and among behaviours, to better understand species biology and spatio-temporal variation;*

*(2) **reiterated** its recommendation to resume on-water monitoring to collect the data necessary to estimate abundance and to gather other essential information about this species (IWC, 2019, p.52);*

*(3) **encouraged** the continued use of citizen science and outreach as valuable tools for collecting opportunistic data on Rice's whales;*

(4) ***recommended** re-examination of two historic balaenopterid specimens from the coast of Campeche, to confirm species ID.*

3. NEW INFORMATION ON OTHER NORTHERN HEMISPHERE STOCKS

3.1 North Atlantic blue whales

The North Atlantic blue whale continues to be in the pre-assessment stage until additional information becomes available. Abundance estimates of blue whales are available from NOAA line-transect surveys in the western North Atlantic. Further details and discussion on this topic can be found in Annex D (ASI, Item 2.1.8).

3.2 North Atlantic common minke whales

The North Atlantic common minke whale is currently experiencing an unusual mortality event in the western North Atlantic along the U.S. eastern coast. Further details on this event are provided under Item 3.5. The sub-committee continues to welcome additional information as it becomes available.

New abundance estimates of common minke whales in the western North Atlantic are available from NOAA line-transect surveys. Details and discussion on the topic can be found in Annex D (ASI, Item 2.1.8).

3.3 East Greenland-Svalbard-Barents Sea (Spitsbergen) bowhead whales

There was no new information available to the sub-committee. The sub-committee continues to welcome new information to improve understanding of Spitsbergen bowhead whales.

3.4 North Pacific right whales

Two genetically distinct populations of North Pacific right whales (NPRW) (*Eubalaena japonica*) are currently recognised (Pastene et al. 2022); the eastern stock occurs in the Gulf of Alaska, Bering Sea, British Columbia, California and Hawaii, and the western stock inhabits water off and around China, Japan, Korea, and Russia, including the Sea of Okhotsk. The NPRW was the main target of coastal whaling in Japan from the 10th century until late in the 19th century and was

heavily exploited in the 19th and early 20th centuries by the international whaling industry in the North Pacific, including in the Okhotsk Sea. The most recent estimate of abundance for the eastern population is approximately 30 individuals, although this estimate does not include animals from the Gulf of Alaska (Wade *et al.,* 2011, LeDuc *et al.,* 2012). There is no reliable population estimate for the western population, but it is thought to be between 400 and 1,100 animals, and possibly increasing since the 1990s (Matsuoka *et al.,* 2021).

3.4.1 Eastern North Pacific right whales

A report was heard on the outcome of the Pacific Marine Assessment Program for Protected Species (PacMAPPS) survey from 1-26 August 2021, beginning and ending in Kodiak, Alaska. Over the course of the survey, two NPRW sightings occurred: one sighting of two animals within the designated 'Critical Habitat' area (i.e. specific geographic areas that contain physical or biological features essential to conservation) located in Barnabas Trough, Gulf of Alaska, and the other was first detected acoustically south of Trinity Islands. One animal from each of the two sightings was new to the catalogue maintained by the Alaska Fisheries Science Center's Marine Mammal Laboratory, Seattle, U.S.A. Two of the other animals had been seen previously; the animal in Barnabas Trough was seen off Haida Gwaii in British Columbia earlier in 2021 while one animal near Trinity islands was seen previously over Barnabas Trough in 2006. During the second sighting, a variation of gunshot song originally documented in the Bering Sea was acoustically detected. As it is currently thought that only males sing, this suggests that at least one male right whale was present during the encounter.

A summary was also provided of eastern North Pacific right whale sightings between 2018 and 2022, which consisted of 11 sightings of 16 individuals, of which five were new to the photographic database. One animal sighted just south of St. Lawrence Island was re-sighted three weeks later in Russian waters off Chukotka. A sighting of two animals feeding in Unimak Pass in February 2022 is the first visual evidence of winter presence of eastern NPRW in the Bering Sea. An additional five sightings (7 individuals) occurred outside of Alaska, highlighting the broad range of NPRWs. These included whales sighted off the U.S. west coast as well as multiple sightings west of Vancouver Island and Haida Gwaii. Moreover, there were four observations (5 individuals; three near St. Lawrence Island and one in the northern Gulf of Alaska) that were not documented by photographs or video reported during this period. One of the sightings near St. Lawrence Island included a possible calf. Lastly, a single NPRW was sighted off Monterey, California on 5 March 2023.

It was stated that despite the precarious status of the NPRW, and the grave status of the genetically distinct eastern North Pacific right whale population, resources to conduct additional research are limited. The U.S. is conducting passive acoustic monitoring in areas that overlap with the range of the eastern population that could contribute valuable information on NPRW occurrence. A better understanding of anthropogenic risks to eastern NPRW as well as additional information on abundance, foraging areas, wintering areas, and migration routes is urgently needed. Ship-based surveys augmented by passive acoustic monitoring and prey sampling should be initiated to enable collection of data for an updated photographic or genetic mark-recapture abundance estimate and to gain a better understanding of their overlap with potential threats.

The sub-committee welcomed this update. Members also emphasised that the IWC POWER cruises are providing the main source of data on NPRWs outside of the Bering Sea including sightings, individual identifications, and genetic data.

In discussion, the sub-committee inquired about additional photographic or genetic samples that could be used to update the abundance estimate for the eastern NPRW population. It was stated that for all samples held at SWFSC (including POWER 2017 and 2018), mtDNA control region data have been generated. However, nuclear DNA for the six POWER 2017 and 2018 samples have yet to be analysed and could be used to update the genetic recapture abundance estimate. However, it was further clarified that all samples were collected from individuals that were photo-identified, and so a photo-identification-based abundance estimate could be undertaken instead. It was also noted that analysing the new samples for nuclear DNA could provide useful information on the relatedness of the individuals.

The sub-committee was informed about a Ph.D. project currently underway at Duke University using stable isotope analysis of baleen plates to study the migratory patterns and seasonal distribution of NPRWs as well as to gain insight into their diet and possible seasonal fasting. Thus far, the baleen plates from five individuals have been analysed, including two from confirmed sexually mature males and three from whales of unknown age and sex. Preliminary results indicate that there are potentially two overwintering areas used by NPRWs, with evidence that one individual has used two different overwintering areas over the sampling period. Due to COVID-19, the research has been constrained to baleen plates from eastern NPRWs that are housed in the USA. Assessing the feasibility of analysing samples from other countries, especially Japan and the Russian Federation, is planned for the future. In particular, if baleen samples from females can be identified, they might provide information on the location of calving grounds.

Attention: SC, CG, R

The eastern North Pacific right whale population is considered one of the most endangered populations of a large whale species in the world with an estimate of ~30 animals as of 2008. Despite the precarious status of this species, and the grave status of the genetically distinct eastern North Pacific right whale population, resources to conduct research have been extremely limited. The sub-committee therefore:

(1) ***encouraged*** *the U.S. and other stakeholders to prioritise support for research on eastern North Pacific right whales;*

(2) ***agreed*** *that the IWC-POWER cruises provide an important platform for detecting and sampling (photographic and genetic data) North Pacific right whales and* ***recommended*** *that this work continue;*

(3) ***encouraged*** *the U.S. to update the population estimate of eastern North Pacific right whales using the photographic and/or genetic data from the additional six whales sampled during the 2017/18 POWER survey;*

(4) ***encouraged*** *the U.S. NOAA Fisheries, Alaska Fisheries Science Center to make every effort possible to analyse existing acoustic data;*

(5) ***recommended*** *that any acoustic data collected in the vicinity of the right whales sighted off Monterey on 5 March 2023 be analysed to better characterise their presence in the area; and*

(6) ***welcomed*** *the availability of new information on North Pacific right whales based on stable isotopes, and:*

(a) ***encouraged*** *an update of this work at SC69B; and*

(b) ***encouraged*** *collaborations with the Russian Federation and Japan to increase the number and demographic composition of baleen samples included in analyses.*

3.4.2 Western North Pacific right whales

SC/69A/NH/04rev1 was presented on behalf of the author. This paper summarises new records of western North Pacific right whales off the east coast of Kamchatka and provides evidence of NPRW entanglement and disturbance from tour boat operations. One of the two right whales sighted in the Okhotsk Sea in 2003 (Burdin *et al.,* 2004a, 2004b) showed evidence of entanglement and a deep scar resulting from an interaction with fishing gear. On 25 June 2019, drone footage of a right whale off the coast of Kamchatka showed cuts likely due to a past entanglement. Finally, one NPRW sighted on 19 July 2022 off eastern Kamchatka showed evidence of previous injuries: one animal had a scar on the head indicative of fishing gear entanglement and the other had scarring on the caudal peduncle. In an effort to minimise disturbance, researchers were not able to obtain sufficient photographs of these animals. However, four tour boats in the area were observed chasing the whales to get as close as possible to the animals to provide an opportunity for tourists onboard to photograph the animals. The interaction caused noticeable behavioural changes of two NPRWs which left the area at considerable speed. The author noted that whale watch operators could provide valuable citizen science data, contributing to the photo-identification catalogue but suggested that a local Code of Ethics be established for boat operators to mitigate disturbance to these animals.

SC/69A/NH/04rev1 noted that problems associated with anthropogenic activity are increasing, which can significantly slow the rate of population recovery, and that it is necessary to develop and adopt a multi-year program for monitoring the western population of NPRW. A photo-ID catalogue of western NPRWs is being created by the Russian Federation, which will allow individual identification, the ability to assess health and injuries, and should be matched with the larger Japanese database in the future. This will allow for the development of measures to protect the western population. Additionally, efforts to reduce the likelihood of entanglement, determine population size, and better understand distribution and habitat are needed to protect this population.

The sub-committee thanked the author for bringing this work forward.

Members noted that the entanglement scars observed on western NPRWs, particularly at the base of the flukes, are comparable to those regularly observed on North Atlantic right whales. Entanglement injuries can be diagnosed from images, particularly lateral views of the insertion point of the caudal peduncle, as is currently done to assess entanglement risk to North Atlantic right whales (Knowlton *et al.,* 2012). As tourism increases, particularly in coastal waters off Kamchatka where western NPRWs are present in the summer, citizen science could obtain such images as well as photographs for assessing individual identification, distribution and health. However, the ultimate value of such efforts would depend on successfully managing potential disturbance from whale watch vessel approaches. Members also discussed the importance of international collaboration to develop a unified photo-identification database of western NPRW sightings which could be matched to the larger Japanese database.

The sub-committee **noted** that the historical northern limit of the NPRW was the Komandor Islands and that recent sightings have occurred in the western Bering Sea. The sub-committee received additional information on some

northern NPRW sightings, around the Commander Islands and northward into the Bering Sea, that did not match individuals in the eastern NPRW catalogue held at the Alaska Fisheries Science Center. However, a genetic sample from one individual observed off Chukotka matched a haplotype only found in eastern NPRW population (Filatova *et al.,* 2019). Therefore, it is unclear to which population other northern sightings should be assigned.

Attention: SC, CG, R

The western population of North Pacific right whales remains poorly understood and current abundance estimates, range between 400 and 1,100 animals. Anthropogenic threats appear to be increasing. Therefore, the sub-committee:

(1) ***welcomed*** *the new information provided by Burdin and* ***encouraged*** *that every effort be made to match North Pacific right whale photographs between the Japanese and Russian catalogues;*

(2) ***recognised*** *that there have been several North Pacific right whale interactions with fishing gear (Tajima et al., 2018) and these whales are at increased risk of entanglement, particularly in the northern part of their range as is currently experienced by bowhead whales (George and Thewissen, 2021) and* ***encouraged*** *new information in this topic.*

(3) ***encouraged*** *a review of past abundance estimates and a synthesis of new information that could be used to generate new abundance estimates for western North Pacific right whales for submission to ASI;*

(4) ***recognised*** *the potential opportunities and challenges associated with whale watching on this species, and therefore:*

(a) ***recommended*** *using citizen science to collect photographic and drone-acquired data that can be contributed to existing North Pacific right whale catalogues and to better determine North Pacific right whale distribution, movement, health and anthropogenic impacts including evidence of entanglements; and*

(b) ***recommended*** *that a local Code of Ethics be developed for tour boats to reduce potential disturbance to North Pacific right whales (e.g. Kamchatka).*

3.5 Unusual mortality events affecting northern stocks

The sub-committee received an update from Wilkin on large whale Unusual Mortality Events (UMEs) declared in the western North Atlantic Ocean. Since 2016, three UMEs for baleen whales have been declared by the US National Marine Fisheries Service in the western Atlantic Ocean along the coast of Canada and the United States. These three concurrent and ongoing events involve humpback whales (*Megaptera novaeangliae;* 2016-present), North Atlantic right whales (*Eubalaena glacialis,* 2017-present), and common minke whales (*Balaenoptera acutorostrata,* 2017-present). To date, over 431 whales are included as part of these UMEs: 191 humpback, 98 North Atlantic right, and 142 minke whales. Although the reasons for stranding have differed among the three species, all three have had evidence of human interaction in a subset of whales, including vessel strikes in humpback whales, rope entanglements and vessel strikes in North Atlantic right whales, and entanglements in minke whales. Additionally, a subset of minke whales has had evidence of infectious disease, which has been identified as a *Brucella* infection. Strandings and injury rates for North Atlantic right whales continue at elevated levels. Minke whale strandings have returned to near baseline, and a closure package for this UME is in preparation. Humpback whale stranding rates were declining in 2022, but an increase in deaths was observed beginning in December 2022. Between December 2022 - April 2023, 22 humpback whales stranded along the Atlantic coast (as well as 10 whales of other species for a total of 32 large whales). Due to this recent increase, the humpback UME remains open. The population-level impacts of these elevated stranding rates are unclear, but are especially concerning for North Atlantic right whales, as the most recent population estimate is fewer than 350 whales. Given the large numbers of whales involved in UMEs, there are unique opportunities to collect samples that may inform stock assessment or other scientific questions.

The sub-committee thanked the author for updates on the UMEs affecting three whale species along the US East Coast.

The sub-committee discussed the value of data that can be obtained during UMEs, both for understanding those events and as an opportunity to increase the amount of data available for population studies. The sub-committee was updated on work being undertaken to identify the individual animals involved in the humpback whale UME, which is an important step in that case for assessing population-level impacts. Genetic analysis of skin samples from minke whales involved in the UME are also being used to characterise affected individuals and to contribute to ocean-scale population genetics work. The sub-committee recognises that the samples would have value for additional population structure analyses.

Attention: S, SC, CG, G

The sub-committee:

(1) ***welcomed*** *new information on Unusual Mortality Events with respect to North Hemisphere whale stocks, and* ***encouraged*** *additional updates at the next SC meeting;*

(2) ***encouraged*** *that genetic samples and other data continue to be shared to assist with population studies;*

(3) ***recommended*** *that available data from UMEs be catalogued in a way that they can be easily requested by the Scientific Committee.*

4. WORKPLAN

The sub-committee agreed to the workplan in Table 1. Intersessional correspondence groups were continued to advance work under Items 2.2 and 2.4 (see Annex V for details of these groups).

Table 1

Summary of the work plan for NH.

Item	Intersessional 2023/24	2024 Annual Meeting (SC/69B)
North Pacific blue whales		Consider new information for assessment
North Atlantic sei whales	Collect data for future in-depth assessment	Review new information
North Atlantic right whales		Review new information
North Pacific right whales		Review new information
North Atlantic humpback whales	Collect data for future in-depth assessment	Consider new information for assessment
Rice's whale		Review new information
All other stocks		Review new information

5. ADOPTION OF REPORT

The report was adopted at 16:11 on 2 May 2023. Cholewiak and Robbins thanked the sub-committee and the rapporteur for her hard work, and the sub-committee expressed its thanks.

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Appendix 1

AGENDA

1. Introductory Items
   - 1.1 Opening remarks
   - 1.2 Election of chairs
   - 1.3 Appointment of rapporteurs
   - 1.4 Adoption of agenda
   - 1.5 Review of available documents
2. Evaluation of potential new in-depth assessments
   - 2.1 North Pacific blue whales
   - 2.2 North Atlantic sei whales
   - 2.3 North Atlantic right whales
   - 2.4 North Atlantic humpback whales
   - 2.5 Rice's whales
3. New information on other northern hemisphere stocks
   - 3.1 North Atlantic blue whales
   - 3.2 North Atlantic common minke whales
   - 3.3 East Greenland-Svalbard-Barents Sea (Spitsbergen) bowhead whales
   - 3.4 North Pacific right whales
   - 3.5 Unusual mortality events affecting northern stocks
4. Work plan
5. Adoption of report