# SC/68A/GEN/02

# List of Documents

INTERNATIONAL
WHALING COMMISSION

**Draft Document List SC/68a**

03 May 2019

**SC/68a/ASI**

01. Diallo, S.T. Research plan for a COMHAFAT cetacean sighting survey in coastal waters of western North Africa in winter 2020. 7pp. A plan is proposed for a cetacean sighting survey conducted by COMHAFAT in coastal waters of western North Africa in winter 2020. The study area is set mainly off Guinea, except for shallow waters less than 20 m for safe sailing. The purpose of this survey is to accumulate further information on distribution and abundance of whales including small cetaceans in the COMHAFAT zone. In this zone, zigzag track lines with around 1,013.2 nm of length are placed in the area. A 15-days survey period will be set in winter of 2020 season (in January and/or February of 2020). In the western North Africa, it is dry season in winter. Rain is scarce and wind is not so strong. Furthermore, it is expected that baleen whales migrate to the low latitudinal waters in winter. Thus, this season is thought to be suitable for cetacean sighting survey. The survey is started off Conakry, and finished off Guinea EEZ. The research vessel, GENERAL LANSANA CONTE of Guinea (198 tons), will be used. Researchers from COMHAFAT member states conduct the survey. Scientists from nonmember states, however, can be onboard, if the COMHAFAT and vessel capacity allow it. Cetacean searching is conducted from line transect method, under good weather condition (Beaufort wind scale of 3 or less and greater than 2 nm in visibility). Researchers search the sea surface for cetaceans from the vessel following the pre-determined track lines at around 10 knots. The normal closing mode survey is carried out, in which closing is made for all cetacean species encountered at searching.
02. Mogoe, T., Yoshimura, I., Katsumata, T., Ohkoshi, C., Bando, T. and Matsuoka, K. Results of the NEWREP-A dedicated sighting survey during the 2018/19 austral summer season. 20pp. This paper reports the results of the dedicated whale sighting survey in the Antarctic Areas III-E (035°E–070°E, south of 60°S) under the NEWREP-A in the 2018/19 austral summer season. The dedicated sighting vessel (SV) conducted the survey under two survey modes, Normal Passing mode (NSP) and Independent Observer mode (IO) from 13 December 2018 to 19 February 2019. The total searching distance in the research area was 2,960.6 n.miles (5,483.0km), including 1,374.3 n.miles covered in NSP and 1,586.3 n.miles in IO mode. The survey coverage was 77% in the northern stratum and 95% in the southern stratum. A total of four baleen whale species, blue (15 schools/25 individuals), fin (216/499), Antarctic minke (140/250) and humpback (591/950) whales, and at least three toothed whale species including, sperm (77/77), southern bottlenose (4/8) and killer (11/151) whales were sighted by primary sightings in the research area. Estimated Angle and Distance experiments were conducted in the research area. Routine photo-ID and biopsy sampling on large whales were also conducted. A total of 52 photos were obtained from 24 blue, 22 humpback and 6 killer whales. A total of 22 biopsy samples (skin and blubber) was also collected from nine blue, two fin and 11 humpback whales using the Larsen biopsy system. A total of six marine debris was observed. The sighting data were validated and have already been submitted to the IWC Secretariat. Krill and oceanographic surveys were also conducted along the track lines designed for sighting surveys. The results are reported separately.
03. Matsuoka, K., Hakamada, T., Yoshimura, I., Katsumata, T., Kasai. H. and Miyashita, T. Results of the Japanese dedicated cetacean sighting survey in the western North Pacific in 2018. 11pp. A systematic large-scale vessel-based sighting survey was conducted in 2018 by Japan to examine the distribution and abundance of large whales in the western North Pacific. The research area was set between 35° N and 46° N and between 135° E and 150° E (sub-areas 11, 10E, 7CN and 7CS for common minke whale). The survey was conducted between 28 April and 27 May. The research vessels Yushin-Maru No.2 and Kaiyo-Maru No.7 were engaged. A total of 2,869.9 n.miles was searched by the passing mode in the research area. Coverage of the searching efforts of the planned cruise track line was 85% for sub-area 11, 87% for sub-area 10E, 90% for sub-area 7CN and 89% for sub-area 7CS. High-density areas of fin, common minke and humpback whales were observed in sub-areas 11, 10E and 7CS. Fin whales were sighted most frequently in the research area. In total, five large whale species including fin (61 schools / 110 individuals), sei (3), Bryde's (8/10), common minke (48/50), humpback (32/39) and sperm (7/13) whales were sighted during the cruise. Photo-ID images were collected from humpback (10 individuals) whales. Biopsy skin samples using a Larsen system were collected from fin (2), sei (2) and humpback (1) whales. The sighting data was submitted to the IWC secretary based on the SC guideline and will contribute to the work on management and conservation of large whales by the IWC SC.
04rev1. Matsuoka, K., Crance, J., James, A., Yoshimura, I. and Kasai, H. Cruise report of the 2018 IWC-Pacific Ocean Whale and Ecosystem Research (IWC-POWER). 68pp. IWC-POWER cruises in the North Pacific follow the series of IWC/IDCR-SOWER (Southern Ocean Whale and Ecosystem Research) cruises that were conducted in the Antarctic since 1978. The 9th annual IWC-POWER cruise was conducted between 03 July and 25 September, 2018 in the central Bering Sea. The survey was conducted aboard the Japanese R/V Yushin-Maru No. 2. Researchers from the IWC, the US, and Japan participated in the survey. The survey was conducted using methods based on the guidelines of the IWC/SC. The acoustic survey was included for the 2nd time to acoustically monitor for the presence of marine mammals, with particular importance for detecting and locating North Pacific right whales. Survey trackline coverage was 75.3 % (planned distance of 2,237.9 n.miles) of the original trackline, with a total of 1,685.5 n.miles in Passing with abeam closing mode (NSP) and Independent Observer passing mode (IO). Additionally, 421.6 n.miles were surveyed during transit between Japan and the research area. During the entire cruise, sightings of: blue (8 schools / 12 individuals), fin (135/199), sei (5/7), common minke (17/17), North Pacific right (3/3), humpback (86/122), gray (27/88), sperm (35/36), Baird's beaked (2/24) and killer (20/136) whales were observed. Fin and humpback whales were the most frequently sighted large whale species. Gray whales were only sighted north of 64N. A solitary NP right whale was sighted north of 64N near St. Lawrence Island in the Central Bering Sea. There were no sightings of blue or sei whales in the Bering Sea. Photo-identification data were collected for 3 North Pacific right, 41 gray, 8 blue, 69 fin, 39 humpback, 33 killer and 4 sperm whales. Two of three right whale sightings were detected and localised using acoustics. A total of 76 biopsy (skin and sometimes blubber) samples were collected from 6 blue, 24 fin, 29 humpback, 7 gray, 3 North Pacific right and 7 killer whales using the Larsen sampling system. A total of 253 sonobuoys were deployed, for a total of almost 700 monitoring hours. Species detected include fin whales, detected on 46.5% of sonobuoys (101 buoys), sperm whales (72 buoys,

33.2%), killer whales (56 buoys, 25.8%), right whales (27 buoys 12.4%), and humpback whales (24 buoys, 11%). Other species detected include gray whales (10 buoys, 4.6%), Baird's beaked whales (1 buoy, 0.5%), probable fish grunts (7 buoys, 3.2%), a double knock sound that we believe is attributed to fish (1 buoy, 0.5%), and possible earthquakes (2 buoys, 1%). A total of 19 objects of marine debris were observed, considerably less than previous cruises. All survey procedures were in accordance with the guidelines set forth and agreed upon by the SC. The 9th annual cruise of this programme was successfully completed and provided important information on cetacean distribution, in particular gray, fin and North Pacific right whales, in an area where limited survey effort had been conducted in recent decades, in a poorly-known and logistically difficult area. These results will contribute to the aforementioned objectives of the IWC/SC.

05. Hakamada, T., Takahashi, M., Matsuoka, K. and Miyashita, T. Revised research plan for a dedicated cetacean sighting survey in 2019. 11pp. This paper presents a revised sighting survey plan for western North Pacific in 2019. The original plan was presented to the IWC SC in 2018, which included sub-area 6E to be covered by Yushin –maru No. 2 (YS2) and sub-areas 7WR and 7E to be covered by Kaiyo-maru No. 7 (KY7) in May-June 2019. The revised plan presents two differences regarding the original one: i) sub-areas 7WR and 7E will be covered in May-June by two vessels, Yushin-maru No. 1 (YS1) and Yushin-maru No. 3 (YS3), instead of one; ii) an additional survey will be carried out in sub-area 7WR from August to September 2019 by one vessel (KY7). The main objective of the surveys is to investigate the distribution and abundance of common minke whales in those sub-areas. The sighting protocols are the same in all surveys.
06. Oien, N.I. Report of the Norwegian 2018 survey for minke whales within the Small Management Area EN- the North Sea and fjord surveys for harbour porpoises in western Norway. 10pp. As part of a six-year program over the period 2014-2019 with the aim to get a new estimate of minke whale abundance in the Northeast Atlantic at the end of the period, the North Sea Small Management Area EN, and the Norwegian Sea block EW4, were surveyed with one vessel during the summer June-August 2018. The intended total survey area comprised of four offshore blocks which all received a reasonable coverage. About 3,137 nautical miles of primary search effort was conducted within these survey blocks. The most common species sighted were harbour porpoise and minke whale. Apparently the minke whale sighting rate in the North Sea was about 50 % higher in 2018 than in the previous survey year 2009. Minke whales also seemed to have a more northern distribution in the North Sea in 2018 than in 2009. Fjords in western Norway were surveyed and revealed relatively high densities of harbour porpoises which are supposed to be a significant contribution to their North Sea abundance estimates.
07. **Slooten, E.**

**SC/68a/ASW**

01. Canada. 2019 Update: Inuit subsistence harvests of Eastern Canada-West Greenland bowhead whales in Canadian waters. 1p. A small Inuit subsistence harvest of Eastern Canada-West Greenland (EC-WG) bowhead whales occurs annually in Canadian waters. This fishery is subject to provisions of the Nunavut Agreement (NA), the Nunavik Inuit Land Claims Agreement (NILCA), the Fisheries Act and its supporting regulations.
02. Suydam, R., George, J.C., Person, B.T., Stimmelmayr, R., Sformo, T.L., Pierce, L., VonDuyke, A., de Sousa, L., Acker, R., Sheffield, G. and Baird, A. Subsistence harvest of bowhead whales (Balaena mysticetus) by Alaskan Natives during 2018. 9pp. In 2018, 68 bowhead whales (Balaena mysticetus) were struck during the Alaskan subsistence hunt resulting in 47 animals landed. The total number of whales struck and the number landed in 2018 was higher than the averages for the previous 10 years (2008-2017: mean struck = 55.3; SD = 9.8 and mean landed = 42.6; SD = 7.2; respectively). The efficiency (# landed / # struck) of the hunt (69%) was lower than the average over the past 10 years (mean of efficiency = 77.4%; SD = 6.6%). Total mortality was estimated at 64 animals after the fate of the struck and lost whales was considered. Spring hunts are logistically more difficult than autumn hunts because of challenging and dynamic environmental conditions, difficulty in accessing open water, and changing sea ice thickness and dynamics. The hunting efficiency during spring is usually lower than autumn, which was the case in 2018. In 2018, the efficiency of the spring hunt (51%) was lower than the previous 10 years (2008-2017; mean efficiency = 69%) and lower than the 2018 autumn hunt (100%). Twenty-one whales were struck and lost in 2018, including one in the northern Bering Sea during the winter. Of the other 20 whales, six were lost under the sea ice, five whales died and sank, three were harvested but had to be cut loose during towing because of unsafe conditions, five whales were lost because of equipment malfunction, and no explanation was given for why one whale was struck and lost. No whales were struck and lost during the autumn hunt. Of the harvested whales, 23 were females and 24 were males. Based on total length (>13.7 m in length), seven of the females were presumed mature. Three of the mature females were closely examined. Of those, two were pregnant, one with a term fetus (4.2m long), one with a small fetus (4.5cm long), and one female was lactating. In 2018, we collected genetic samples from 35 harvested and 9 satellite tagged and biopsied whales.

**SC/68a/CMP**

01. Crespo, E.A. and Coscarella, M.A. The Southwestern Atlantic Southern Right Whale, Eubalaena australis: updated population rate of increase. 16pp. This paper reports on aerial surveys conducted to estimate the relative abundance and trend in the growth of the southern right whale (Eubalaena australis) population from Península Valdés. The number of whales counted tripled from 1999 to 2018. The year 2018 was the year in which we counted the highest number of whales ever recorded, totaling 1605 wales in a 4 hours coastal flight. We modeled the number of whales, number of calves, number of Solitary Individuals and number of individuals in Breeding Groups using as predictive variables the Year, the Julian day and Julian day2 by means of generalized linear models. The rate of increase decreased from near 7% in 2007 to 1.03% and 3.38% for the total number of whales and number of calves, respectively for 2018. Trends in the rates of increase for the total number of whales and the number of calves were negative (-0.757% and -0.397%, respectively). We conclude that whales are still increasing their abundance, while the rate of increase is starting to fluctuate near zero for the total number of whales and it continues to be positive for the calves. Differences in the rates of increase of the group types and changes in habitat use are consequence of a density dependence process.

02. Nakamura, G., Yoshida, H., Terai, R., Konishi, K., Isoda, T., Nishiwaki, S., Taru, H., Suzuki. S. and Kato, H. Status report of conservation and researches on the Western North Pacific gray whales in Japan, May 2018-April 2019. 8pp. Following the IWC Resolution 2001-3, 2004-1 and 2005-3, this paper presents most recent status of conservation and research on the western gray whale conducted by Japan. In total of three POP sightings have been reported from the coast of Japan. Two sightings of gray whales were reported from the coast of Ishikawa and Fukui prefecture, in the Sea of Japan, which were eventually identified as an identical animal. Another sighting was reported from Miyake island, one of the Izu archipelago, in the North Pacific. One stranding occurred in Kanagawa prefecture. No anthropogenic mortality due to entanglement has been reported from the adjacent waters off Japan during the period from May 2018 to April 2019.
03. Heaton, S. and Clark, A. Conservation Management Plans: outcomes of the mid-term review and improving communication between SC-CMP and SWG-CMP. 38pp. The mid-term review of the CMP Work Plan resulted in some changes to the CMP development and implementation process, which were endorsed by the Commission at IWC67. This paper provides a summary of the key outcomes of the review, and outlines the main changes to the CMP process. Of particular importance to the SC-CMP are the changes made to the nomination process, including that proponents are no longer required to submit a nomination before developing a CMP if the Scientific and Conservation Committees have identified the relevant species/population as a priority CMP candidate. The CMP funding guidelines were also updated to improve financial transparency and accountability, and to increase the onus for participating range states to explore and exhaust (to the extent appropriate in the circumstances) external funding avenues before approaching the Commission for financial support. To support the new nomination process, this paper recommends a procedure for ensuring that all relevant Commission bodies maintain a common and up-to-date understanding of which cetacean species/populations are priority candidates for CMPs. This paper also proposes a process for improving communication between the SC-CMP and SWG-CMP on CMP funding.

**SC/68a/E**

01. Hall, A. Cummings, C. and Kershaw, J. Pollution 2020 - Cetacean contaminant mapping tool. 11pp. A mapping tool to display published data on the concentration of persistent organic pollutants and mercury in cetacean tissues, on a global scale, has been created. The purpose is to allow researchers to quickly view, and explore visually, trends in the concentrations of commonly monitored contaminants over time. The tool will be made available online through the IWC website.
02. van Elk, N. Euthanasia of large whales in the Netherlands. 8pp. This report describes an alternative method for euthanising large whales after they are stranded. It gives a detailed description of the method, gives go and no go criteria for applying this method and finally outlines briefly what arguments were considered to be in favor of applying this specific method.
03. Holm, P. and Hall, A. Potential mitigation measures for reducing exposure of cetaceans to persistent organic pollutants (POPs). 8pp. As asked by the subcommittee 'Environmental concerns' at SC 68a we here present a paper summarising the potential mitigation measures for reducing exposure of cetaceans to polychlorinated biphenyls (PCBs) in particular and persistent organic pollutants (POPs) in general. Firstly, a brief summary on the environmental occurrence, the exposure situation of cetaceans and some remarks on the effects of POPS on cetceans is given. Secondly, suggestions to prevent and control the exposure of cetaceans to POPs and approaches to reduce the risks associated with POP pollution in our environment are listed. In conclusion, we are convinced that the only realistic and sustainable answer is a reduction in usage of hazardous compounds.
04. Stockin, K.A., Mazzariol, S., Chansue, N., Deaville, R., Grover, D., Gulland, F.M.D., Hall, A.J., Hernandez-Mora, G., Marcondes, M.L., Matilla, D., Meyer, M., Moore, K.M.T., Porter, L., Rowles, T.K., Schninin, A.P., Siebert, U., Smith, S., Stimmelmayr, R. and Uhart, M. IWC Strandings Initiative Guidance for International Training and Emergency Response Requests. 3pp. This paper outlines the procedures and criteria proposed by the Strandings Expert Panel (SEP) of the IWC Strandings Initiative to (i) inform decision-making on training requests and (ii) outline Strandings Initiative procedures during emergency response requests. The Committee is asked to review these protocols and provide any comments or suggested amendments.
05. Stockin, K.A. Progress Report by the IWC Strandings Coordinator April 2018–April 2019. 3pp. This paper provides a progress update for the IWC Strandings Initiative from April 2018-April 2019 and details of planned upcoming work. A draft proposed workplan for 2020-2022 will be presented to the next meeting of the Scientific Committee in 2020.

**SC/68a/EM**

01. Wada, A., Mogoe, T., Kasahara, K., Ohkoshi, C., Sasaki, Y. and Tamura, T. Results of the krill and oceanographic survey under the NEWREP-A in the Antarctic in 2018/19. 11pp. The krill and oceanographic surveys were conducted in the Antarctic Area III-E and IV during the 2018/19 austral summer season as part of fourth dedicated sighting survey of the New Scientific Whale Research Program in the Antarctic Ocean (NEWREP-A). These surveys, which were conducted by two research vessels Yushin Maru No. 2 (YS2) and Kaiyo Maru No. 7 (KY7), are associated with the main objective II of NEWREP-A. The krill survey was conducted along the zig-zag tracklines designed for the whale sighting survey. Acoustic data using quantitative echosounders EK80 (YS2) and EK60 (KY7) were recorded continuously for total 72 days and 7,195n.miles. Net sampling using a small ring net (YS2 and KY7) and an Issak-Kid Midwater Trawl (IKMT) (KY7) was carried out to identify species and size composition of plankton echo signs at 54 stations and 22 stations respectively. Oceanographic observations were also conducted at 144 stations using a Conductivity-Temperature-Depth profiler (CTD) and seawater sampling occurred at 16 stations. Calibration among EK80 and EK60 quantitative echosounders, and simultaneous samplings between small ring net and IKMT were also conducted. Krill and oceanographic data are currently being examined, and results will be reported in related CCAMLR working groups.
02. Solvang, H. Haug, T. and Øien, N. Recent development in temporal and geographical variation in body condition of common minke whales (Balaenoptera acutorostrata acutorostrata) in the Northeast Atlantic. 17pp. The common minke whale (Balaenoptera acutorostrata acutorostrata) is a boreo-arctic species, and the summer period is generally

characterized by intensive feeding and consequently seasonal fattening at high latitudes. The fat deposited is stored as energy reserves for overwintering at lower latitudes where feeding is greatly reduced. It is therefore expected that their body condition on the summer grounds will reflect food availability during their most intensive feeding period and thus indicate how well the high latitude ecosystems can support the populations. During the commercial catch operations on feeding grounds in Norwegian waters, body condition data (blubber thickness and girth) have been collected from 13,216 common minke whales caught in 1993-2018. Using this time series to investigate associations between body condition and time/area in minke whales, we applied several statistical approaches. The analyses revealed a significant negative trend from the start until 2015. After 2015, the trend was reversed and body condition values increased significantly. It has previously been suggested that there may be a link between the decreased minke whale body condition and the abundance of the Barents Sea cod stock which increased to a record high level between 2006 and 2015. Recruitment to the cod stock in more recent years has been low with a subsequent and continuous decrease in the total stock after 2015 to a current level which is presumably approximately 60% of the 2015 level. Interestingly, the observed common minke whale body condition was at its lowest in 2015, whereafter it has increased. This may support a connection between cod abundance and feeding conditions for other top predators such as common minke whales.

## SC/68a/HIM

01. Punt, A.E., Francis, T.B., Siple, M. and Williams, R. The Ocean Modelling Forum Working Group on the Marine Mammal Protection Act Import Provisions. 5pp. The Ocean Modeling Forum at the University of Washington, Seattle, USA, has convened a working group in response to the MarineMammal Protection Act Import Provisions, issued in 2016 by the US National Oceanographic and Atmospheric Administration (NOAA). The rule requires nations that wish to continue exporting fish or fish products to the United States to adhere to bycatch standards comparable to those of the United States. The working group, which is developing scientific tools, resources and guidelines to help nations comply with the rule, is an international team of scientists led by André Punt and Tessa Francis of the University of Washington and the UW Ocean Modeling Forum, and Rob Williams of Oceans Initiative. In addition, representatives from the NOAA Offices of 'International Affairs and Seafood Inspection' and 'Protected Resources' are participating as invited experts. The working group is funded by the Lenfest Ocean Program, and has four planned projects. The first two address steps in setting and applying bycatch standards: estimating abundance and assessing bycatch rates. The third will develop an online tool to synthesize data and evaluate potential management strategies. The fourth will further evaluate the applicability of the Potential Biological Removal method, the primary US bycatch standard.
02. MacLennan, E., Leaper, R. and Dolman, S. Interim report from the Scottish Entanglement Alliance (SEA) on previously undocumented fatal entanglements of minke whales (Balaenoptera acutorostrata) in Scottish inshore waters. 4pp. Mortality due to entanglement in static fishing gear is a growing concern for minke whales (Balaenoptera acutorostrata) in Scottish waters, however a thorough understanding of these incidents is lacking. In a bid to address this six organisations have partnered to form the Scottish Entanglement Alliance (SEA), to better understand the scale and impacts of marine animal entanglement. To achieve this, Scottish inshore creel fishermen have been participating in short, semi-structured interviews to gather data on the frequency of entanglements within the last 10 years, and the consequences of these events. 109 interviews have been completed to date, and 68% of those questioned have reported experiencing at least one marine animal entanglement in the specified timeframe. Of the 105 separate entanglement incidents involving a range of cetacean and other species reported, 37 have involved minke whales. 30 of these have been fatal and none have previously been formally recorded, revealing a much higher rate of entanglement for this species than previously reported. These reports have also come from interviews representing less than 10% of the creel fishing effort, suggesting that the true entanglement rate is much higher.

## SC/68a/IA

01. Punt, A. Further updated progress report: A multi-stock model for North Pacific sei whales. 19pp. The age-, sex-, and season-structured population dynamics model developed to conduct an assessment of North Pacific sei whales is updated based on the recommendations of the IA sub-committee in 2018. The model can now utilize minimum abundance estimates, account for differential probabilities of tag reporting as a function of number of hits, and better handle situations in which catches in some years are high relative to the estimates of available numbers. Preliminary base-case models are undertaken for single-stock, 3-stock, and 5-stock hypotheses. The base-case model for the 5-stock hypothesis cannot convergence as it appears to be over-parameterized so the (draft) sensitivity tests are based on the single-stock and 3-stock hypotheses. Several issues arising from the results require additional consideration by the IA sub-committee.
02. Clapham, P., Baker, S., Calambokidis, J., Cheeseman, T., Donovan, G., Ivashchenko, Y., Kato, H., Kitakado, T., Matsuoka, K., Palka, D., Punt, A., Urban, J., Wade, P.R., Yoshida, H. and Zerbini, A. Report of the Intersessional Working Group on the Comprehensive Assessment of North Pacific Humpback Whales. 4pp. During SC67a, an intersessional Working Group was formed to advance work on the Comprehensive Assessment of North Pacific Humpback Whales. At SC67b in 2018, some progress was reported with regard to clarification of stock structure in both feeding and breeding areas, and four potential modeling scenarios based upon a simplified stock structure were proposed; this led to a new intersessional work plan. During the 2018-2019 intersessional period, substantial work was made on an automated photo-id matching algorithm that underlay the website happywhale.com. In addition Ted Cheeseman has developed a collaboration with many of the major contributors of humpback whale photos in the North Pacific. Together with the new algorithm, this now provides an opportunity to conduct a large-scale updated matching exercise across much of this ocean basin. The results of such an exercise are expected to further refine our understanding of population structure and interchange rates in the North Pacific, including for areas that were under-represented during the SPLASH project (e.g. Russia). In light of this development, the Working Group agreed that it makes sense to further delay the work led by Baker and Wade until the updated matching is completed and the population structure of North Pacific humpback whales has been clarified. The Working Group then agreed on a list of work for the next year to insure progress with this Comprehensive Assessment.

**SC/68a/IST**

01. Punt, A., Brandão, A. and Witting, L. Results of carryover analyses for West Greenland fin, minke and bowhead whales. 6pp. Projection results to evaluate carryover provisions for West Greenland fin, minke and bowhead whales are provided for the five carryover scenarios previously evaluated for the Bering-Chukchi-Beaufort Seas bowhead whales and humpback whales off West Greenland.

0.2rev1. Punt, A. Results of Trials to Evaluate the Interim Allowance Strategy for West Greenland Bowhead and Fin Whales. 47pp. The framework developed during the 2015 Annual Meeting of the Scientific Committee to evaluate an 'interim allowance' strategy is applied to West Greenland bowhead and fin whales based on the agreed Strike Limit Algorithms for these two groups of whales. The values for the 'mandatory' performance statistics for the 'phase-out' and 'interim allowance' strategy suggest that adopting the 'interim allowance' strategy has no substantial impact on risk, while at the same time leading to a better ability satisfy need and to lower inter-annual variation in strike limits.

**SC/68a/NH**

01. Corkeron, P. and Pace III, R.M. Status of North Atlantic right whales: an update. 3pp. North Atlantic right whales (Eubalaena glacialis) continue to decline in number. The best current estimate of their abundance is 411 (95% Bayesian credible intervals 389-430) individuals alive at the end of 2017, down from an estimate of 451 at the start of 2016. No calves were observed to be born in 2018, down from five in 2017, and 14 in 2016. To date (late February 2019), seven calves are known to have been born in the winter 2019 season. Evidence is strengthening that the apparently increased occupancy of the Gulf of St Lawrence by North Atlantic right whales is in response to prey shifts, which are driven by ecosystem changes, that are in turn a result of climate changes. Evidence that chronic entanglement in fishing gear is a significant physiological stressor of North Atlantic right whales is becoming clearer. Two recent studies have assessed the extent to which the recovery of North Atlantic right whales has been constrained by anthropogenic mortality. Initial indications is the management actions taken by Canadian authorities in the Gulf of St Lawrence in 2018 were successful.
02. Corkeron, P., Pace III, R.M. and Van Parijs, S.M. Population structure of humpback whales in the southeastern Caribbean: an update. 3pp. The current status of the populations of humpback whales breeding in Caribbean waters remains unresolved. Complicating the status assessment, is there are two competing hypotheses to explain the stock structure of humpback whales in Caribbean waters; 1 versus 2 stocks. The two-stock hypothesis is that there is a larger, more northern stock occurs in Caribbean waters in December to early March, and a second, smaller population occurs in the more southeastern part of the Caribbean from mid-March to late May. If any of the humpback whales hunted in the St Vincent and the Grenadines Aboriginal Subsistence fishery are taken from late March to June, then they may be from a stock for which there is no estimate of abundance. The Caribbean Humpback Acoustic Monitoring Project (CHAMP) was a multi-institutional cross-Caribbean survey that used passive acoustic recorders, in December 2016 to June 2017, to investigate the relationship between the southeastern and northern Caribbean animals. The timing of recorded songs supports the two-population hypothesis. However, a definitive answer will require a more substantial biopsy/photographic sampling program in the southeastern Caribbean at the appropriate time (late March – June), coupled with sampling in the waters off Iceland, Norway, and elsewhere off northern Europe, and matching across sampling programs to develop a mark-recapture abundance estimate of animals from the waters of the southeastern Caribbean. Also a further analysis of the characteristics of the songs recorded by CHAMP might shed more light on the feeding grounds used by animals in the southeastern breeding grounds.
03. Southeast Fisheries Science Center. Update on the Gulf of Mexico (Bryde's) Whale Research—2018-2019. 1p. The Gulf of Mexico Bryde's whale was listed as endangered under the U.S. ESA in April 2019 https://www.fisheries.noaa.gov/feature-story/noaa-lists-gulf-mexico-brydes-whales-endangered. The NMFS Southeast Fisheries Science Center (SEFSC) has a variety of ongoing research projects aimed at improving understanding of these whale's distribution, range and habitat use to better document the total geographic range, including 6 passive acoustic studies. The NMFS SWFSC received funds from the Gulf of Mexico RESTORE Act to conduct research on the trophic relationships and improve understanding of the physical, oceanographic, and biological features defining critical habitat for Gulf of Mexico Bryde's whales. This project began in June of 2017 and will continue through May 2020. It includes three seasonal ship-based surveys to assess the habitat, spatial distribution, and foraging ecology using a multi-faceted approach that integrates visual and acoustic monitoring, environmental sampling, trawling, biopsy sampling for genetic, stable isotope and pollutant analyses, and deployment of animal-borne tags. Models will be developed from the resulting data that will identify key trophic interactions, improve characterization of Bryde's whale habitat, and provide information to managers that will inform restoration and population recovery activities. The resulting data and analysis will be integrated into the evaluation of critical habitat features for the Gulf of Mexico Bryde's Whale. A Bryde's whale stranded off Florida in January 2019 and a full necropsy was conducted. Vessel strike and noise projects are proposed as restoration projects for the Open Ocean Restoration funds from the Deepwater Horizon oil spill.

**SC/68a/SH**

01. Vermeulen, E., Wilkinson, C. and Thornton, M. Report on 2018 southern right whale aerial survey, South Africa. 24pp. This document reports on the 2018 southern right whale aerial survey, conducted along the southern Cape coast, South Africa.
02. Goto, M. and Taguchi, M. Genetic analyses on stock structure of fin whales in the Indo Pacific region of the Antarctic feeding grounds. 13pp. The stock structure of fin whales in the Indo Pacific region of the Antarctic feeding grounds was investigated using 478bps mitochondrial (mtDNA) control region sequences and genotypes at sixteen microsatellite loci for a total of 108 genetic samples collected in Areas III-VIW under the JARPA, JARPAII, NEWREP-A and SOWER cruises. The observed haplotype diversity was extremely high (0.993 across all samples) with large number of singletons, and mtDNA diversities represented by haplotype (0.984-1.000) and nucleotide (0.0111-0.0115) diversities were comparable among three sample populations, i.e., POP1 (-70°E), POP2 (70°E-160°E) and POP3 (160°E) which were defined based on the genetic analyses without a prior population grouping, i.e., STRUCTURE, PCA and geographic cline of genetic variations. In addition, insignificant departures from Hardy-Weinberg equilibrium and FIS estimates observed in each sample population and across all samples suggested a lack of genetic structure of this

species. This was supported by hypothesis tests, i.e., heterogeneity tests and pairwise FST estimates, among the sample populations using both markers. This inference was also consistent with the haplotype network with no distinct clusters of samples corresponding to sampling localities. On the other hand, the geographical cline of FIS estimates gradually shift to the positive in the east of 130°E, which implied a mixing of different stocks in the eastern part of the present survey area. Taking this observation together with the findings suggesting a lack of genetic structure of this species, further consideration with a greater number of samples, particularly in Areas I, V and VI, will be needed to conclude the genetic structure of the Antarctic fin whales.

03. Kershaw, J.L., Carroll, E.L., Torres, L. and Hall, A.J. Steroid hormone extraction and quantification validation in Southern right whale (Eubalaena australis) blubber biopsy samples. 8pp. Despite an increasing understanding of the migratory movements and population structure of Southern right whales (Eubalaena australis), there is still little data to assess individual health, and by extension, population health and resilience to environmental and anthropogenic pressures. Data on the reproduction, health and energetic status from hormone profiles from individual animals can help to fill this gap. Preliminary results for the extraction and quantification of two steroid hormones, progesterone and cortisol, from blubber biopsy samples collected incidentally to skin sample collection in the Campbell Islands in 2014 are presented here. Cortisol extraction and quantification using a commercially available Enzyme Linked Immunosorbent Assay (ELISA) was validated for this species. Measured cortisol concentrations were within the ranges of those measured in the blubber of other cetaceans studied to date. Measured progesterone concentrations were indicative of concentrations measured in immature or resting females of other cetacean species. However, these results require confirmation with further validation of the use of the commercially available progesterone ELISA trialled here, particularly in relation to sample storage conditions.
04. Galletti, B., Attard, C.R.M., Barlow, D.R., Burton, C., de Vos, A., Double, M., Gill, P., Jenner, C., Jenner, M-N., Möller, L.M., Olson, P., Salgado-Kent, C. and Torres, L.G. Southern Hemisphere Blue Whale Catalogue: preliminary results of IWC comparisons between Australia, New Zealand and Sri Lanka regions. 8pp. Blue whales are known to occur off Australia, New Zealand and Sri Lanka but little is known about their long-term movements. The Southern Hemisphere Blue Whale Catalogue is a platform to share individual photo-identification catalogues among blue whale research groups. Comparisons of 698 photo-identified blue whales from seven different research groups working in the Perth Canyon (western Australia), Geographe Bay (western Australia), Bonney Upwelling (southern Australia), around New Zealand, and Sri Lanka provided eighteen whales resighted between different areas. Matches were found within Australian catalogues and within New Zealand catalogues but no matches were found between regions. Some blue whales initially sighted in the Perth Canyon, Geographe Bay and the Bonney Upwelling were subsequently resighted in any of these three regions, representing a high level of connectivity among these sites and providing support that there is one distinct population of blue whales in Australia. Recaptures within New Zealand but not between Australia and New Zealand support the suggestion of New Zealand blue whales being a separate population. No matches to Sri Lanka suggest it is a separate population or, as indicated previously, a different subspecies. Further efforts are needed to compare photo-identification catalogues from these regions with other catalogues from the eastern South Pacific and Southern Ocean to better understand population structure.
05. Pérez-Álvarez, M.J., Kraft, S., Olavarría, C., Urbán, J., Nigenda-Morales, S., Viloria, L., Wayne, R., Archer, F., Moraga, R., Sepúlveda, M., Santos-Carvallo, M., Pavez, G. and Poulin, E. Contrasting phylogeographic patterns among Northern and Southern Hemisphere fin whale populations revealed by new data from the Southeastern Pacific and Gulf of California. 6pp. Three sub-species of fin whales are currently considered valid: Balaenoptera physalus physalus in the Northern Hemisphere (NH), and B. p. quoyi and B. p. patachonica in the Southern Hemisphere (SH). The latter was described as a pygmy-type sub-species located in low to mid latitudes in the SH. In the NH, a strong genetic differentiation was previously detected between North Pacific (NP) and North Atlantic (NA) fin whales, which lead to a current debate of a taxonomic division between these two groups. Additionally, a highly isolated population has been detected in the Gulf of California (GoC), Mexico. Little is known, however, for the SH, impeding a global biogeographic and taxonomic revision of the taxon. This study includes sequences previously reported for NA, NP, and South Atlantic (SA), the first samples of the Southeast Pacific (SEP) (n=37 as well as new mtDNA sequences from GoC (n=107) improving the worldwide phylogeographic and demographic picture of the species. SEP sequences recovered 25 haplotypes with nine shared by two or more individuals, a haplotype diversity (h) of 0.979 and nucleotide diversity ($\pi$) of 0.8%. In contrast GoC showed only five haplotypes ($h = 0.3$ and $\pi = 0.06\%$). A strong genetic structure was observed as previously between (1) NP and the GoC populations, the latter being a differentiated unit under a recent population expansion process and (2) more robustly between NP and SP populations, where a low and unidirectional and rare dispersal event flow from SP to NP was further confirmed. Contrary to the NH, (3) no significant phylogeographic structure was detected within the SH (SP and Atlantic Southern Ocean; $\Phi ST = 0.00582$, $p = 0.235$), which suggests the existence of a single evolutionary unit and challenge the validity of the proposed pygmy fin whale sub-species. Finally, (4) B. physalus would include four major population units (three for the NH and one for the SH).

**SC/68a/SM**

01. Rojas-Bracho, L. Report of the Eleventh meeting of the Comitee Internacional para la Recuperacion de la Vaquita (CIRVA). 34pp. CIRVA made a series of recommendations during its 11th meeting that includes immediate, near, medium and long term actions to prevent extinction of the vaquita. The report also covers the resluts of the acoustic monitoring programme, the biopsy and photo id survey, net removal Program and assessment of enforcement, an update on alternative gear development efforts, socio-economics and markets and post-VCPR efforts.
02. Cosentino, M., Avila, I., Collins, T., Gallego, P., Ingram, D., Reeves, R., Simmonds, M.P., Slooten, E., Suydam, R. and Trujillo, F. Aquatic Wild Meat Database - Report of the Intersessional Correspondence Group. 7pp. The document is the report of the work of the IWC Aquatic Wild Meat Database Intersessional Correspondence Group. The group discussed the research questions the 'Aquatic Wild Meat Database' (https://aquaticbushmeat.shinyapps.io/wildmeat/) could help answer and assess the best approach for data validation and quality control. The questions were grouped into six main topics: Geography; Trends in use over time; Species, sex, and age class; Uses; Acquisition; and Data Sources. The groups recommends the following actions from the

IWC: Summarize any possible recommendations for action from the Scientific Committee and timeframes; Include the utilisation of small cetaceans as an agenda item for the Working Group on Non-Deliberate Human-Induced Mortality of Cetaceans (HIM) in conjunction with (or instead of) the SubCommittee on Small Cetaceans (SM); and Encourage IWC member countries to contribute to the database.

03. Vermeulen, E., Atkins, S., Bouveroux, T., Chivell, W., Cockcroft, V., Conry, D., Elwen, S.H., Gennari, E., Gridley, T., Gopal, K., Hörbst, S., James, B.S., Kirkman, S., Penry, G., Pistorius, P., Thornton, M., Vargas-Fonseca, O.A. and Plön, S. The SouSA Consortium: Protecting South Africa´s Indian Ocean humpback dolphin. 13pp. This report summarizes the general knowledge and conservation threats to Indian Ocean humpback dolphins (Sousa plumbea) in South Africa and explains the SouSA Consortium, a South African national research collaboration to improve the conservation of the species.

**SC/68a/SP**

01. Bando, T., Yoshida, T., Nakai, K., Yoneyama, Y., Oshiyama, D., Tsunekawa, M., Kawabe, S., Yamaguchi, F., Teruya, S., Eguchi, H., Mogoe, T. and Tamura, T. Results of the fourth biological field survey of NEWREP-A during the 2018/19 austral summer season. 16pp. This paper reports the results of the biological sampling of Antarctic minke whales during the fourth New Scientific Whale Research Program in the Antarctic Ocean (NEWREP-A) conducted in Area III (0°-70°E, south of 60°S) during the 2018/19 austral summer season. The paper also reports the results of the sighting surveys and non-lethal experiments. Two sighting and sampling vessels (SSVs) and one research base vessel engaged in the survey for 72 days. A total of 362 sightings (involving 602 individuals) of Antarctic minke whale were made during 3,907 n.miles of searching distance. A total of 333 Antarctic minke whales (186 males and 147 females) were sampled, and a number of biological samples and data required for the two main objectives of NEWREP-A were obtained from each whale taken. In Area III-West, the survey was conducted early in the season (December to early February) for the first time since the start of JARPA survey in 1987/88. A total of 245 Antarctic minke whale (143 males and 102 females) were sampled in Area III-West. The obtained samples will contribute to elucidation of the stock structure of Antarctic minke whales, especially to elucidation of the western boundary of the Indian Ocean stock (I-stock). A total of eight southern right and 36 humpback whales were photo-identified and biopsy samples were collected from eight southern right, 29 humpback, two fin and one Antarctic minke whales in and transit to the research area. The samples and data collected in this survey are available for interested national and international scientists under the guidelines for research collaboration posted at the home page of the Institute of Cetacean Research (ICR): http://www.icrwhale.org/NEWREP-AProtocol.html.
02. Konishi, K., Nakai, K., Kanbayashi, J., Umeda, K., Kanaiwa, M., Mure, H., Teruya, S., Tsunekawa, M., Kawabe, S., Eguchi, H. and Tamura, T. Cruise Report of the New Scientific Whale Research Program in the western North Pacific (NEWREP-NP) in 2018 –Offshore component. 14pp. This paper reports the results of the second biological survey of sei and common minke whales under the New Scientific Whale Research Program in the western North Pacific (NEWREP-NP)-offshore component. The survey was conducted in part of sub-Areas 7 (7WR and 7E), 8 and 9, north of 35°N from May to August 2018. Two sighting sampling vessels (SSVs) and one research base vessel were engaged in the survey for 90 days. A total of 48 sightings (involving 50 individuals) of common minke whale and 289 sightings (involving 413 individuals) of sei whales were made during 6,422 n.miles of searching distance. A total of 43 common minke whales and 134 sei whales were sampled as originally planned. Sei whales were all sampled along the predetermined tracklines in the Normal survey which was designed in a systematic way, and common minke whales were sampled along both the Normal survey and the Special survey track lines which were designed for areas where the density of common minke whales was expected to be high. Overall searching effort was optimized and the research area was covered adequately. Biological samples and data required for the two primary objectives of NEWREP-NP were obtained from each whale sampled. In particular earplugs for age determination and reproductive organs for sexual maturity determination were collected from all individuals. Preliminary biological analyses were conducted and results are presented in this paper. Sardine and mackerels were major prey species for sei and common minke whales. Three blue whales were photo-identified, and biopsy samples were collected from one blue, seven sei and one common minke whale. Satellite tags were deployed on 8 sei and one common minke whale and the locations were obtained for all of these individuals. The samples and data collected in this survey will be available for interested national and international scientists under the guidelines for research collaboration in NEWREP-NP.
03. Isoda, T., Ito, N., Shimetani, K., Nakamura, G., Kumagai, S., Takahashi, M., Ogihara, M., Hirose, A., Kim, Y., Nishimura, F., Yamamoto, R., Watanabe, H., Koda, N., Yagi, G., Murata, H., Sazawa, R., Ogawa, M., Fukuyoshi, M., Hatanaka, T., Murono N., Takahashi, T., Noda, A., Mogoe, T., Oikawa, H., Yasunaga, G. and Kato, H. Cruise Report of the New Scientific Whale Research Program in the western North Pacific (NEWREP-NP) in 2018 - Pacific coastal component. 18pp. The second survey of the NEWREP-NP Pacific coastal component was conducted in sub-areas 7CS and 7CN, which consisted of three surveys based in Ayukawa, Hachinohe and Kushiro ports. The survey in Ayukawa was conducted from 5 to 30 April 2018, using four small-type whaling catcher boats as sighting/sampling vessels. The survey in Hachinohe was conducted from 4 to 31 May 2018, using four small-type and one large-type whaling catcher boats as sighting/sampling vessels. The survey in Kushiro was conducted from 5 September to 4 October 2018, using five small-type whaling catcher boats as sighting/sampling vessels. Searching for common minke whales and sampling took place in coastal waters about 50 n.miles from Ayukawa, Hachinohe and Kushiro Ports. All common minke whales sampled were landed at the NEWREP-NP research stations established in Ayukawa, Hachinohe and Kushiro, where biological examination was conducted. During the survey in Ayukawa, a total of 27 primary sightings (27 individuals) of common minke whale were made during 3,366.3 n.miles of searching distance (337.2 hours). A total of 18 common minke whales (eight males and ten females) were sampled. The dominant prey species was sand lance (adult) and Japanese sardine. During the survey in Hachinohe, a total of 45 primary sightings (45 individuals) of common minke whale were made during 3875.0 n.miles of searching distance (439.9 hours). A total of 33 common minke whales (19 males and 14 females) were sampled. The dominant prey species was Japanese sardine and krill. During the survey in Kushiro, a total of 39 primary sightings (45 individuals)

of common minke whale were made during 3,524.1 n.miles of searching distance (355.9 hours). A total of 29 common minke whales (22 males and 7 females) were sampled. The dominant prey species was Japanese sardine. In total 80 common minke whales were successfully collected attaining the planned annual target sample size in the Pacific. Biological samples and data required for Primary Objective I and Ancillary Objectives I and II of NEWREP-NP were obtained from all animals sampled.

**SC/68a/WW**

01. Vogel, A., Cockcroft, V. and Vermeulen, E. Seafari A global and free app to report marine mammal sightings and access citizen science data. 6pp. Seafari is a free and user friendly application to report marine mammal sightings, search effort and strandings (soon to come) from anywhere in the world. Its uniqueness is found in the open and easy access to the collected data, making the app not only useful as a whale-watching app for local users to find out "what has been seen, where and when" or to keep record of their own sightings, but also as a valuable collector of citizen science data for relevant research projects. Its global use is strongly encouraged, with the aim to generate extensive data on the spatial and temporal distribution of marine mammal species. With this application, the creators anticipate that the widespread use of mobile technology can aid significantly in the data collection of marine mammals, especially of elusive species and in remote locations (e.g. offshore, remote islands, etc.).

**SP Ad Hoc Plenary Sessions on Special Permits**
**SC/68a/SP**

01. Bando, T., Yoshida, T., Nakai, K., Yoneyama, Y., Oshiyama, D., Tsunekawa, M., Kawabe, S., Yamaguchi, F., Teruya, S., Eguchi, H., Mogoe, T. and Tamura, T. Results of the fourth biological field survey of NEWREP-A during the 2018/19 austral summer season. 16pp. This paper reports the results of the biological sampling of Antarctic minke whales during the fourth New Scientific Whale Research Program in the Antarctic Ocean (NEWREP-A) conducted in Area III (0°-70°E, south of 60°S) during the 2018/19 austral summer season. The paper also reports the results of the sighting surveys and non-lethal experiments. Two sighting and sampling vessels (SSVs) and one research base vessel engaged in the survey for 72 days. A total of 362 sightings (involving 602 individuals) of Antarctic minke whale were made during 3,907 n.miles of searching distance. A total of 333 Antarctic minke whales (186 males and 147 females) were sampled, and a number of biological samples and data required for the two main objectives of NEWREP-A were obtained from each whale taken. In Area III-West, the survey was conducted early in the season (December to early February) for the first time since the start of JARPA survey in 1987/88. A total of 245 Antarctic minke whale (143 males and 102 females) were sampled in Area III-West. The obtained samples will contribute to elucidation of the stock structure of Antarctic minke whales, especially to elucidation of the western boundary of the Indian Ocean stock (I-stock). A total of eight southern right and 36 humpback whales were photo-identified and biopsy samples were collected from eight southern right, 29 humpback, two fin and one Antarctic minke whales in and transit to the research area. The samples and data collected in this survey are available for interested national and international scientists under the guidelines for research collaboration posted at the home page of the Institute of Cetacean Research (ICR): http://www.icrwhale.org/NEWREP-AProtocol.html.
02. Konishi, K., Nakai, K., Kanbayashi, J., Umeda, K., Kanaiwa, M., Mure, H., Teruya, S., Tsunekawa, M., Kawabe, S., Eguchi, H. and Tamura, T. Cruise Report of the New Scientific Whale Research Program in the western North Pacific (NEWREP-NP) in 2018 –Offshore component. 14pp. This paper reports the results of the second biological survey of sei and common minke whales under the New Scientific Whale Research Program in the western North Pacific (NEWREP-NP)-offshore component. The survey was conducted in part of sub-Areas 7 (7WR and 7E), 8 and 9, north of 35°N from May to August 2018. Two sighting sampling vessels (SSVs) and one research base vessel were engaged in the survey for 90 days. A total of 48 sightings (involving 50 individuals) of common minke whale and 289 sightings (involving 413 individuals) of sei whales were made during 6,422 n.miles of searching distance. A total of 43 common minke whales and 134 sei whales were sampled as originally planned. Sei whales were all sampled along the predetermined tracklines in the Normal survey which was designed in a systematic way, and common minke whales were sampled along both the Normal survey and the Special survey track lines which were designed for areas where the density of common minke whales was expected to be high. Overall searching effort was optimized and the research area was covered adequately. Biological samples and data required for the two primary objectives of NEWREP-NP were obtained from each whale sampled. In particular earplugs for age determination and reproductive organs for sexual maturity determination were collected from all individuals. Preliminary biological analyses were conducted and results are presented in this paper. Sardine and mackerels were major prey species for sei and common minke whales. Three blue whales were photo-identified, and biopsy samples were collected from one blue, seven sei and one common minke whale. Satellite tags were deployed on 8 sei and one common minke whale and the locations were obtained for all of these individuals. The samples and data collected in this survey will be available for interested national and international scientists under the guidelines for research collaboration in NEWREP-NP.
03. Isoda, T., Ito, N., Shimetani, K., Nakamura, G., Kumagai, S., Takahashi, M., Ogihara, M., Hirose, A., Kim, Y., Nishimura, F., Yamamoto, R., Watanabe, H., Koda, N., Yagi, G., Murata, H., Sazawa, R., Ogawa, M., Fukuyoshi, M., Hatanaka, T., Murono, N., Takahashi, T., Noda, A., Mogoe, T., Oikawa, H., Yasunaga, G. and Kato, H. Cruise Report of the New Scientific Whale Research Program in the western North Pacific (NEWREP-NP) in 2018 - Pacific coastal component. 18pp. The second survey of the NEWREP-NP Pacific coastal component was conducted in sub-areas 7CS and 7CN, which consisted of three surveys based in Ayukawa, Hachinohe and Kushiro ports. The survey in Ayukawa was conducted from 5 to 30 April 2018, using four small-type whaling catcher boats as sighting/sampling vessels. The survey in Hachinohe was conducted from 4 to 31 May 2018, using four small-type and one large-type whaling catcher boats as sighting/sampling vessels. The survey in Kushiro was conducted from 5 September to 4 October 2018, using five small-type whaling catcher boats as sighting/sampling vessels. Searching for common minke whales and sampling took place in coastal waters about 50 n.miles from Ayukawa, Hachinohe and Kushiro Ports. All common minke whales sampled were landed at the NEWREP-NP research stations established in Ayukawa, Hachinohe and Kushiro, where biological examination was conducted. During the survey in Ayukawa, a total of 27 primary sightings (27 individuals) of common minke whale were made during 3,366.3 n.miles of searching distance (337.2 hours).

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04. Yoshida, H., Shimetani, K., Maeda, H., Nakamura, G., Ogihara, M., Hirose, A., Yamamoto, R., Watanabe, H., Koda, N., Yagi, G., Uruma, H., Murata, H., Kumagai, S., Sazawa, R., Takahashi, T., Fukuyoshi, M., Ogawa, M., Noda, A. and Kato, H. Cruise Report of the New Scientific Whale Research Program in the western North Pacific (NEWREP-NP) in 2018 -Coastal component off Abashiri in the southern Okhotsk Sea. 23pp. The second survey of the NEWREP-NP coastal component off Abashiri, northern Japan (southwestern part of the sub-area 11), was conducted in the southern Okhotsk Sea, from 1 to 30 August 2018. The survey was carried out using five small-type whaling catcher boats as sampling vessels, in coastal waters mainly within about 40 nautical miles from Abashiri port. Common minke whales collected were landed at the NEWREP-NP research station for biological examination. During the survey, a total of 4,013.7 nautical miles (400.6 hours) was searched and the 91 schools (93 individuals) of common minke whales were encountered. Sightings of 114 schools (163 animals) of fin whales, and of a humpback whale were also made. Of 93 common minke whales encountered, 47 animals were collected. Ear plugs and eye lenses for age determination and gonad for reproductive study were collected from all the whales. Sex of animals caught was biased towards the female (16 males and 31 females), as same with the last year's survey. But, in the second half of the survey, i.e., on or after 16 August, more males were collected (12 males and 8 females). Average body length of males was 6.62m (SD=1.02, Range=4.40-7.58m) and 7.37m (SD=0.98, Range=4.79-8.55m) for females. Of 16 males, 12 were sexually mature (75.0%) and 26 of 31 females attained to sexual maturity (83.9%). The 21 mature females were pregnant. Stock assignment was conducted from nuclear microsatellite data. Of 47 animals collected, 28 (59.6%) were assigned to J stock and 15 (31.9%) were identified as O stock. The remaining four animals could not be assigned. Proportion of J stock animals increased from the first half of the survey (58.3%) to the second half (73.7%). Eleven of 15 females identified as J stock and 8 of 13 O stock females were pregnant. From foetus body length, conception date was estimated using the growth formula. Results show long tailed distribution of conception date with a peak around March. The distribution shape was almost same with that observed in the previous study on conception date in the southern Okhotsk Sea. Dominant prey species detected from whale forestomach was Krill (59.6%), followed by Japanese sardine (38.3%). An animal feed on Pacific herring (2.1%). In the first half of the survey, krill was major prey species (92.6%) and sardine was little observed (7.4%). But, in the second half, sardine was more frequently taken (80.0%).

**Reports from intersessional meetings**
**SC/68a/Rep**

01. Report of the 2018 meeting of the IWC-POWER Technical Advisory Group (TAG). 12-14 October 2018, Tokyo, Japan. 26pp.
02. Report of the Planning Meeting for the 2019 IWC-POWER cruise. 15-16 October 2018, Tokyo, Japan. 15pp.
03. Report of the Joint U.S. Office of Naval Research, International Whaling Commission and U.S. National Oceanic and Atmospheric Administration Workshop on Cetacean Tag Development, Tag Follow-up and Tagging Best Practices. 6-8 September 2017, Maryland, USA and 19-20 June 2018, Seattle, USA. 35pp.

**Documents for information**
**SC/68a/ForInfo**

01. Huijser, L.A.E., Bérubé, M., Cabrera, A.A., Prieto, R., Silva, M.A., Robbins, J., Kanda, N., Pastene, L., Goto, M., Yoshida, H., Víkingsson, G.A. and Palsbøll, P.J. 2018. Population structure of North Atlantic and North Pacific sei whales (Balaenoptera borealis) inferred from mitochondrial control region DNA sequences and microsatellite genotypes. *Conserv. Genet.* 19:1007-1024. Currently, three stocks of sei whales (Balaenoptera borealis) are defined in the North Atlantic; the Nova Scotian, Iceland-Denmark Strait and Eastern North Atlantic stocks, which are mainly based upon historical catch and sighting data. We analyzed mitochondrial control region DNA (mtDNA) sequences and genotypes from 7 to 11 microsatellite loci in 87 samples from three sites in the North Atlantic; Iceland, the Gulf of Maine and the Azores, and compared against the North Pacific using 489 previously published samples. No statistically significant deviations from homogeneity were detected among the North Atlantic samples at mtDNA or microsatellite loci. The genealogy estimated from the mtDNA sequences revealed a clear division of the haplotypes into a North Atlantic and a North Pacific clade, with the exception of one haplotype detected in a single sample from the Azores, which was included in the North Pacific clade. Significant genetic divergence between the North Atlantic and North Pacific Oceans was detected (mtDNA ΦST = 0.72, microsatellite Weir and Cockerham's Θ = 0.20; p < 0.001). The coalescent-based estimate of the population divergence time between the North Atlantic and North Pacific populations from the sequence variation among the mtDNA sequences was at 163,000 years ago. However, the inference was limited by an absence of samples from the Southern Hemisphere and uncertainty regarding mutation rates and generation times. The estimates of inter-oceanic migration rates were low (Nm at 0.007 into the North Pacific and at 0.248 in the opposite direction). Although estimates of genetic divergence among the current North Atlantic stocks were low and consistent with the extensive range of movement observed in satellite tagged sei whales, the high uncertainty of the genetic divergence estimates precludes rejection of multiple stocks in the North Atlantic.
02. Schnitzler, J.G., Reckendorf, A., Pinzone, M., Autenrieth, M., Tiedemann, R., Covaci, A., Malarvannan, G., Ruser, A., Das, K. and Siebert, U. 2019. Supporting evidence for PCB pollution threatening global killer whale

population. *Aquat. Toxicol.* 206:102-104. A recent Science report predicted the global killer whale population to collapse due to PCB pollution. Here we present empirical evidence, which supports and extends the reports' statement. In 2016, a neonate male killer whale stranded on the German island of Sylt. Neonatal attributes indicated an age of at least 3 days. The stomach contained ~20 mL milk residue and no pathologies explaining the cause of death could be detected. Blubber samples presenting low lipid concentrations were analysed for persistent organic pollutants. Skin samples were collected for genotyping of the mitochondrial control region. The blubber PCB concentrations were very high [SPCBs, 225 mg/kg lipid weight (lw)], largely exceeding the PCB toxicity thresholds reported for the onset of immunosuppression [9 mg/kg lw ΣPCB] and for severe reproductive impairment [41 mg/kg lw ΣPCB] reported for marine mammals. Additionally, this individual showed equally high concentrations in p,p'-DDE [226 mg/kg lw], PBDEs [5 mg/kg lw] and liver mercury levels [1.1 μg/g dry weight dw]. These results suggest a high placental transfer of pollutants from mother to foetus. Consequently, blubber and plasma PCB concentrations and calf mortality rates are both high in primiparous females. With such high pollutant levels, this neonate had poor prerequisites for survival. The neonate belonged to Ecotype I (generalist feeder) and carried the mitochondrial haplotype 35 present in about 16% of the North Atlantic killer whale from or close to the North Sea. The relevance of this data becomes apparent in the UK West Coast Community, the UK's only resident orca population, which is currently composed of only eight individuals (each four males and females) and no calves have been reported over the last 19 years. Despite worldwide regulations, PCBs persist in the environment and remain a severe concern for killer whale populations, placing calves at high risk due to the mother-offspring PCB transfer resulting in a high toxicological burden of the neonates.

03. Vermeulen, E., Bouveroux, T., Plön, S., Atkins, S., Chivell, W., Cockcroft, V., Conry, D., Gennari, E., Hörbst, S., James, B.S., Kirkman, S., Penry, G., Pistorius, P., Thornton, M., Vargas-Fonseca, O.A. and Elwen, S.H. 2018. Indian Ocean humpback dolphin (*Sousa plumbea*) movement patterns along the South African coast. *Aquatic Conserv.: Mar. Freshw. Ecosyst.* 28:231-240. The Indian Ocean humpback dolphin was recently uplisted to 'Endangered' in the recent South African National Red List assessment. Abundance estimates are available from a number of localized study sites, but knowledge of movement patterns and population linkage between these sites is poor. A national research collaboration, the SouSA project, was established in 2016 to address this key knowledge gap. Twenty identification catalogues collected between 2000 and 2016 in 13 different locations were collated and compared. 2. Photographs of 526 humpback dolphins (all catalogues and photos) were reduced to 337 individuals from 12 locations after data selection. Of these, 90 matches were found for 61 individuals over multiple sites, resulting in 247 uniquely, well-marked humpback dolphins identified in South Africa. 3. Movements were observed along most of the coastline studied. Ranging distances had a median value of 120 km and varied from 30 km up to 500 km. Long-term site fidelity was also evident in the data. Dolphins ranging along the south coast of South Africa seem to form one single population at the western end of the species' global range. 4. Current available photo-identification data suggested national abundance may be well below previous estimates of 1000 individuals, with numbers possibly closer to 500. Bearing in mind the poor conservation status of the species in the country, the development of a national Biodiversity Management Plan aimed at ensuring the long-term survival of the species in South Africa is strongly recommended. At the same time, increased research efforts are essential, particularly to allow for an in-depth assessment of population numbers and drivers of changes therein. 5. The present study clearly indicates the importance of scientific collaboration when investigating highly mobile and endangered species.
04. Braulik, G., Wittich, A., Macaulay, J., Kasuga, M., Gordon, J., Davenport, T.R.B. and Gillespie, D. 2017. Acoustic monitoring to document the spatial distribution and hotspots of blast fishing in Tanzania. *Mar. Pollut. Bull.* 125:360-366. Destructive fishing using explosives occurs in a number of countries worldwide, negatively impacting coral reefs and fisheries on which millions of people rely. Documenting, quantifying and combating the problem has proved problematic. In March–April 2015 231 h of acoustic data were collected over 2692 km of systematically laid transects along the entire coast of Tanzania. A total of 318 blasts were confirmed using a combination of manual and supervised semi-autonomous detection. Blasts were detected along the entire coastline, but almost 62% were within 80 km of Dar es Salaam, where blast frequency reached almost 10 blasts/h. This study is one of the first to use acoustic monitoring to provide a spatial assessment of the intensity of blast fishing. This can be a useful tool that can provide reliable data to define hotspots where the activity is concentrated and determine where enforcement should be focused for maximum impact.
05. Braulik, G.T., Kasuga, M., Wittich, A., Kiszka, J.J., MacCaulay, J., Gillespie, D., Gordon, J., Said, S.S. and Hammond, P.S. 2017. Cetacean rapid assessment: An approach to fill knowledge gaps and target conservation across large data deficient areas. *Aquatic Conserv.: Mar. Freshw. Ecosyst.* 1-15. Many species and populations of marine megafauna are undergoing substantial declines, while many are also very poorly understood. Even basic information on species presence is unknown for tens of thousands of kilometres of coastline, particularly in the developing world, which is a major hurdle to their conservation. 2. Rapid ecological assessment is a valuable tool used to identify and prioritize areas for conservation; however, this approach has never been clearly applied to marine cetaceans. Here a rapid assessment protocol is outlined that will generate broad-scale, quantitative, baseline data on cetacean communities and potential threats, that can be conducted rapidly and costeffectively across whole countries, or regions. 3. The rapid assessment was conducted in Tanzania, East Africa, and integrated collection of data on cetaceans from visual, acoustic, and interview surveys with existing information from multiple sources, to provide low resolution data on cetacean community relative abundance, diversity, and threats. Four principal threats were evaluated and compared spatially using a qualitative scale: cetacean mortality in fishing gear (particularly gillnets); cetacean hunting, consumption or use by humans; shipping related collision risk and noise disturbance; and dynamite fishing. 4. Ninety-one groups of 11 species of marine mammal were detected during field surveys. Potentially the most important area for cetaceans was the Pemba Channel, a deep, high-current waterway between Pemba Island and mainland Africa, where by far the highest relative cetacean diversity and high relative abundance were recorded, but which is also subject to threats from fishing. 5. A rapid assessment approach can be applied in data deficient areas to quickly provide information on cetaceans that can be used by governments and managers for marine spatial planning, management of developments, and to target research activities into the most important locations.
06. Braulik, G. and Stern, D. 2019. Tanzania Whale Network January 2019 Newsletter. 2pp. [Available at: *http://www.iucn-csg.org/wp-content/uploads/2019/01/Tanzanian-Whale-Network-Report-Jan-19-final.pdf*].

07. Nelms, S.E., Barnett, J., Brownlow, A., Davison, N.J., Deaville, R., Galloway, T.S., Lindeque, P.K., Santillo, D. and Godley, B.J. 2019. Microplastics in marine mammals stranded around the British coast: ubiquitous but transitory? *Sci. Rep.* 9:1075. Plastic pollution represents a pervasive and increasing threat to marine ecosystems worldwide and there is a need to better understand the extent to which microplastics (<5mm) are ingested by high trophic-level taxa, such as marine mammals. Here, we perform a comprehensive assessment by examining whole digestive tracts of 50 individuals from 10 species whilst operating strict contamination controls. Microplastics were ubiquitous with particles detected in every animal examined. The relatively low number per animal (mean=5.5) suggests these particles are transitory. Stomachs, however, were found to contain a greater number than intestines, indicating a potential site of temporary retention. The majority of particles were fibres (84%) while the remaining 16% was fragments. Particles were mainly blue and black (42.5% and 26.4%) in colour and Nylon was the most prevalent (60%) polymer type. A possible relationship was found between the cause of death category and microplastic abundance, indicating that animals that died due to infectious diseases had a slightly higher number of particles than those that died of trauma and other drivers of mortality. It is not possible, however, to draw any firm conclusions on the potential biological significance of this observation and further research is required to better understand the potential chronic effects of microplastic exposure on animal health, particularly as marine mammals are widely considered important sentinels for the implications of pollution for the marine environment.
08. Weilgart, L. 2018. The impact of ocean noise pollution on fish and invertebrates. Report for OceanCare, Switzerland. 24pp. The report contains highly relevant information on the impact of ocean noise on prey species with consequences on whale welfare: Most fish and invertebrates vitally depend on sound. Here, 115 studies of different anthropogenic underwater noise sources, 66 fish and 36 invertebrate species are reviewed. Noise impacts include body malformations, higher egg or immature mortality, delays in development, growth, metamorphosing, and settling. Zooplankton suffered high noise mortality. Noise caused massive internal injuries, cellular damage to statocysts and neurons causing disorientation and death, and hearing loss, even 96 hours post-exposure. Stress impacts were documented, including increased stress hormones, metabolic rate, oxygen uptake, cardiac output, parasites, irritation, distress, and mortality rate, e.g. from disease and cannibalism; and decreased body condition, growth, weight, consumption, immune response, and reproductive rates. DNA integrity and overall physiology were compromised. Animals showed alarm responses, increased aggression, hiding, and flight reactions; and decreased anti-predator defense, nest digging, nest care, courtship calls, spawning, egg clutches, and feeding. Noise caused more distraction, food-handling errors, and predation vulnerability, and decreased foraging efficiency, feeding, and schooling. Masking reduced communication quality and distance. Some commercial catches dropped substantially, with larger fish leaving. Increased bycatch rates and decreased fish abundance were observed. Key invertebrate ecological services, e.g. water filtration, mixing sediment layers, and bioirrigation, were impacted. When noise compromises population biology and ecology, fisheries and human food security are also affected. Turtles, sharks, and rays were underrepresented in noise impact studies. Research on marine animals' survival, reproduction, population viability, and ecosystem function, is vital. Long-term, realistic noise field studies also considering cumulative and synergistic effects, along with stress indicators, are needed.
09. Monnahan, C., Acevedo, J., Hendrix, N., Gende, S., Aguayo-Lobo, A. and Martinez, F. 2019. Population trends for humpback whales (*Megaptera novaeangliae*) foraging in the Francisco Coloane Coastal-Marine Protected Area, Magellan Strait, Chile. *Mar. Mam. Sci.* 20pp. In 2003 a feeding aggregation of southeastern Pacific humpback whales (Megaptera novaeangliae) was reported in the Magellan Strait. While Chile established its first marine national park in the Strait to protect humpback whale habitat, fatal ship strikes remain a concern because of overlap with a busy shipping lane. To better understand population risk, we estimated abundance and survival for this population using Bayesian robust-design mark-recapture models fit to photographic data from 2004 to 2016. Overall, the model estimated a total of 204 whales (95% CI: 199–210) during the last 12 yr, and 93 (95% CI: 86–100) in the 2016/2017 austral summer. The population grew at 2.3% (CI: 2.1%–3.1%), an annual increase of two whales. Annual survival (including calves) was estimated at 0.892 (CI: 0.871–0.910). Our results corroborate a persistent feeding population, but one that is increasing relatively slowly. Owing to its vulnerability stemming from its small size, coupled with significant overlap with a busy shipping lane, we argue this subpopulation is at significant risk from ship strikes and may be one of the few populations where anthropogenic mortalities could regulate population dynamics. We therefore encourage continued monitoring via photographic mark-resighting surveys, and analyses explicitly investigating potential population-level ship strike effects.
10. Scheidat, M., Couperus, B. and Siemensma, M. 2018. Electronic monitoring of incidental bycatch of harbour porpoise (Phocoena phocoena) in the Dutch bottom set gillnet fishery (September 2013 to March 2017). Wageningen Marine Research Report C102 18. 78pp. This study assessed the bycatch of harbour porpoise (Phocoena phocoena) in the Dutch commercial bottomset gillnet fishery, which is one of the priorities defined in the Dutch "Harbour porpoise conservation plan". The results showed that bycatches occur in both single-walled gillnets (GNS) as well as trammel nets (GTR) and that the average annual bycatch of harbour porpoise for this fleet was 23 (95% C.I. 2-44) during the study period. This translates to an annual mortality of between 0.05 and 0.07% of the Dutch harbour porpoise population (with a maximum worst case value of 0.3%). ASCOBANS (resolutions 3.3 and 5.5) advises to follow the "precautionary objective to reduce by-catches to less than 1% of the best available population estimate". This study did not include mortality caused by other fishing fleets operating in Dutch waters.
11. FAO. 2018. Report of the Expert Workshop on Means and Methods for Reducing Marine Mammal Mortality in Fishing and Aquaculture Operations, Rome, 20-23 March 2018. FAO Fisheries Aquaculture Report 1231. v+116pp. One of the greatest threats to species and population survival of marine mammals with their relatively slow growth and low fecundity comes from inadvertent interaction with, or capture in, fishing and aquaculture operations. FAO members have expressed great concern about bycatch of marine mammals at recent sessions of the Committee on Fisheries (COFI). At its Thirty-First Session in 2014 the Committee reiterated its support for FAO's ongoing work on bycatch management and reduction of discards, and requested FAO to expand its efforts to effectively implement the International Guidelines on Bycatch Management and Reduction of Discards, addressing all fishing gears where bycatch, including, inter alia, that of marine mammals, and discards were a problem. At its Thirty-Second Session in 2016, the committee welcomed the offer of the United States of America to fund an expert workshop to review the findings of recent international marine mammal bycatch workshops. Within this context, FAO convened the Expert Workshop on Means and Methods for Reducing Marine Mammal Mortality in Fishing and Aquaculture Operations in Rome, Italy from 20 to 23 March 2018, which was attended by twenty-seven experts in marine mammal science and bycatch mitigation. The workshop reviewed the current

state of knowledge on the issue of marine mammal bycatch, and evaluated the efficacy of different strategies and measures for mitigating bycatch and their implementation. The workshop produced some key technical outputs, including an extensive review of techniques across different gear types and species, together with a summary table and a draft decision-making tool (decision tree) which could be used to support management decision-making processes. The workshop recommended that FAO develop Technical Guidelines on means and methods for prevention and reduction of marine mammal bycatch and mortality in fishing and aquaculture operations in support of FAO's Code of Conduct for Responsible Fisheries and as a supplement to International Guidelines on Bycatch Management and Reduction of Discards. The workshop also recommended that FAO consider establishing a global capacity development programme to support developing States in the application of the proposed guidelines.

12. Frantzis, A., Leaper, R., Alexiadou, P., Prospathopoulos, A. and Lekkas, D. 2019. Shipping routes through core habitat of endangered sperm whales along the Hellenic Trench, Greece: Can we reduce collision risks? *PLoS ONE* 14(2):e0212016. The Mediterranean sperm whale population is listed as 'Endangered". The Hellenic Trench is the core habitat of the eastern Mediterranean sperm whale sub-population that numbers two to three hundred individuals. Major shipping routes running on or very close to the 1000 m depth contour along the Hellenic Trench are causing an unsustainable number of shipstrikes with sperm whales reviewed in this paper. Sperm whale sighting and density data were combined with specific information on the vessel traffic in the area (e.g., types of vessels, traffic patterns, speed and traffic density), in order to estimate the risk of a whale/ship interaction. Routing options to significantly reduce ship strike risk by a small offshore shift in shipping routes were identified. The overall collision risk for sperm whales in the study area would be reduced by around 70%, while a maximum of 11 nautical miles would be added to major routes and only around 5 nautical miles for the majority of ships. No negative impacts were associated with re-routing by shipping away from sperm whale habitat and there would be additional shipping safety and environmental benefits. A significant contribution to the overall conservation status of the marine Natura2000 sites in the area and very important population units of threatened species such as Cuvier's beaked whales, monk seals and loggerhead turtles would be achieved, by the reduction of shipping noise and reduced risk of any oil spills reaching the coasts, which are also important touristic destinations in Greece.
13. Panti, C., Baini, M., Lusher, A., Hernandez-Milan, G., Bravo Rebolledo, E.L., Unger, B., Syberg, K., Simmonds, M.P. and Fossi, M.C. 2019. Marine litter: One of the major threats for marine mammals. Outcomes from the European Cetacean Society workshop. *Environ. Pollut.* 247:72-79. Marine litter is a pollution problem affecting thousands of marine species in all the world's seas and oceans. Marine litter, in particular plastic, has negative impacts on marine wildlife primarily due to ingestion and entanglement. Since most marine mammal species negatively interact with marine litter, a first workshop under the framework of the European Cetacean Society Conference, was held in 2017 to bring together the main experts on the topic of marine mammals and marine litter from academic and research institutes, non-governmental organisations, foundations and International Agreements. The workshop was devoted to defining the impact of marine litter on marine mammals by reviewing current knowledge, methodological advances and new data available on this emerging issue. Some case studies were also presented from European waters, such as seals and cetaceans in the North, Baltic, and Mediterranean Seas. Here, we report the main findings of the workshop, including a discussion on the research needs, the main methodological gaps, an overview of new techniques for detecting the effects of marine litter (including microplastics) on marine mammals and, also, the use of citizen science to drive awareness. The final recommendations aim to establish priority research, to define harmonised methods to detect marine litter and microplastics, enforce networking among institutions and support data sharing. The information gathered will enhance awareness and communication between scientists, young people, citizens, other stakeholders and policy makers, and thereby facilitate better implementation of international directives (e.g., the Marine Strategy Framework Directive) in order to answer the question about the actual status of our oceans and finding solutions.
14. Di Guardo, G., Centelleghe, C. and Mazzariol, S. 2018. Cetacean Host-Pathogen Interaction(s): Critical Knowledge Gaps. *Front. Immunol.* 9:2815. doi:10.3389/fimmu.2018.02815. Within the broad range of viral and non-viral pathogens infecting cetaceans, CetaceanMorbillivirus (CeMV), Herpesvirus (HV), Brucella ceti, and Toxoplasma gondii are of special concern, due to their impact(s) on the health and conservation of free-ranging cetacean populations worldwide. The most "paradigmatic" example in this direction is represented by CeMV, which throughout the last 3 decades has caused more than 10 mass mortality outbreaks among different cetacean species and populations across the globe. There are still a number of critical "knowledge gaps" regarding "cetacean host(s)-pathogen(s) interaction(s)," These "knowledge-deficient areas" may be identified as follows: (1) characterization of the cell receptor(s) allowing infection; (2) interaction(s) and effects of chemical pollutants on the expression levels of the aforementioned cell receptors; (3) pathogenetic evolution of the concerned infections in T helper 1 (Th1)-dominant versus (vs.) Th2-dominant cetacean individuals; (4) effects of pregnancy-associated immune status on the infectious potential of the herein dealt pathogens; (5) usefulness of cetaceans and their pathogens as models for human disease. This article addresses each of the aforementioned knowledge gaps.
15. Galligan, T.M., Balmer, B.C., Schwacke, L.H., Bolton, J.L., Quigley, B.M., Rosel, P.E., Ylitalo, G.M. and Boggs, A.S.P. 2019. Examining the relationships between blubber steroid hormones and persistent organic pollutants in common bottlenose dolphins. *Environ. Pollut.* 249:982-991. Odontocete cetaceans bioaccumulate high concentrations of endocrine disrupting persistent organic pollutants (POPs), including dichlorodiphenyltrichloroethane (DDT), dichlorodiphenyltrichloroethylene (DDE), and dichlorodiphenyldichloroethane (DDD) e collectively DDTs e but few studies have explored DDTs-mediated endocrine disruption in cetaceans. Herein, we use remotely collected blubber biopsies from common bottlenose dolphins (Tursiops truncatus) inhabiting a site with high localized DDTs contamination to study the relationships between DDTs exposure and steroid hormone homeostasis in cetaceans. We quantified blubber steroid hormone concentrations by liquid chromatography-tandem mass spectrometry and blubber POP concentrations by gas chromatography-mass spectrometry. We detected six steroid hormones in blubber, including progesterone (P4), 17-hydroxyprogesterone (17OHP4), androstenedione (AE), testosterone (T), cortisol (F), and cortisone (E). Sampled dolphins (n ¼ 62) exhibited exposure to DDT, DDE, DDD, chlordanes (CHLDs), mirex, dieldrin, hexachlorobenzene, polychlorinated biphenyls (PCBs), and brominated diphenyl ethers (BDEs). Using principal components analysis (PCA), we determined that blubber DDTs primarily loaded to the first principal component (PC1) explaining 81.6% of the total variance in POP exposure, while the remaining POPs primarily loaded to the PC2 (10.4% of variance). PC1 scores were negatively correlated with blubber T in males and blubber F in females, suggesting that exposure to DDTs impacted androgen and corticosteroid

homeostasis. These conclusions were further supported by observed negative correlations between T and o,p'-DDE, o,p'-DDD, and p,p'-DDD in males sampled in the fall, and between F and the six individual DDTs and P6DDTs in females. Overall, these results suggest that POP-mediated endocrine disruption may have occurred in this stock of dolphins, which could negatively impact their health and fitness. However, this study relied on uncontrolled incidental exposures, making it impossible to establish a causal relationship between DDTs exposure and endocrine effects. Importantly, this study demonstrates that remotely collected blubber biopsies are a useful matrix for studying endocrine disruption in marine mammals.

16. Arabian Sea Whale Network. 2018. Arabian Sea Whale Network Newsletter October 2018. Issue 3. 7pp. This is a newsletter prepared by the Arabian Sea Whale Network, with updates from research and conservation projects around the Arabian Sea and neighbouring areas.
17. Minton, G., Kema Kema, J.R., Todd, A., Korte, L., Maganga, P.B., Migoungui Mouelet, J.R., Nguema, A.M., Moussavou, E. and Nguélé, G.K. 2017. Multi-stakeholder collaboration yields valuable data for cetacean conservation in Gamba, Gabon. *Afr. J. Mar. Sci.* 39(4):423-433. Private industry, the Government of Gabon and two international NGOs collaborated to conduct marine surveys off the coast of Gabon, Central Africa. Surveys addressed multiple objectives of surveillance and monitoring, the documentation of the distribution of and threats to the marine megafauna, and capacity-building among government agents and local early-career scientists. During 22 days of survey effort over a two-year period, observers documented humpback whales Megaptera novaeangliae, bottlenose dolphins Tursiops truncatus, Atlantic humpback dolphins Sousa teuszii and common dolphins Delphinus delphis. Humpback whale presence was limited to the months of July to November. Bottlenose dolphins were present year-round and photo-identification of individuals indicated a closed, resident population, with an abundance estimate of 118 (CV= 21.6%, 95% CI 78–180). Small open-decked fishing vessels with gillnets were observed concentrated around river mouths within 2 km of shore, while commercial trawlers were at least 10 km offshore; all were confirmed to be registered and legal. Observations of marine turtles, flocks of marine birds, and floating logs and other debris were sparse. This multi-stakeholder collaboration to conduct a marine survey can serve as an effective model by which funding and logistic support from private industry paired with technical expertise from NGOs and academic institutions can benefit marine and coastal conservation.
18. Nunny, L. and Simmonds, M.P. 2019. A Global Reassessment of Solitary-Sociable Dolphins. *Front. Vet. Sci.* 5:331. This paper reports on recent cases drawing on published and unpublished sources. Since 2008, 32 solitary dolphins have been recorded including 27 bottlenose dolphins (25 Tursiops truncatus and two Tursiops aduncus), two striped dolphins and three common dolphins. Four solitary belugas have also been recorded. There are some ten solitary dolphins and one beluga known at the present time. . In many instances, the interactions with people that may follow their original isolation, and which typically become more intense over time, have created situations where the welfare of the animal has been compromised by disturbance, injury, the feeding of inappropriate items and aggressive human behavior. Several solitary-sociable dolphins have also been deliberately injured and killed by humans. People who interact with these dolphins may also put themselves at risk of injury.