ICELAND

PROGRESS REPORT ON MARINE MAMMALS IN 2017

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I INTRODUCTION

The following text reports on studies on marine mammals in Icelandic and adjacent waters in 2016. Most of the studies were conducted by the Marine Research Institute. In co-operation with various research partners including Húsavík Research Centre (HRC), Húsavík Whale Museum (HWM); Faxaflói Cetacean Research project (FCR), Innovation Centre, Iceland (ICI); Keldur, Institute for Experimental Pathology (KIEP); The Institute of Natural History (INH); University of Iceland (UI), University of British Columbia in Canada, University of Barcelona in Spain, University of St Andrews in Scotland, Icelandic Seal Center (ISC), BioPol, Hólar University Collage, the University of Stockholm, Natural history museum of Sweden, Natural History Museum of Denmark, Maine University and University of Southern Denmark in Odense, University of Potsdam. Queries for information on research were sent to all offices, individuals and private commercial platforms such as whaling and whale watching companies known to have been involved in marine mammal research or data collection during the period.

II RESEARCH BY SPECIES 2017

Fin whale

No fin whaling was conducted in Iceland in 2017 and thus the proposed sampling program was postponed. A whale research team from the University of British Columbia has conducted various research projects on fin whales at the whaling station in Hvalfjörður in recent years. In recent years the research program focused on analysis of anatomical features related to engulfment feeding and diving in fin whales. This includes a study of many structures in the head and thorax including diaphragm, arteries, nerves and muscles in the ventral groove blubber and tongue, esophagus, pharynx, lung and baleen. The aim is two-fold: 1. to understand how rorqual whales have evolved the capacity to engulf extremely large volumes of water containing prey, filter the prey items from the water, and swallow the prey rapidly with total protection of the airway. 2. to explore mechanisms that protect against adverse effects of rapid descent in the ocean that must cause transient pressure gradients in the thorax, vascular system, and lungs.

Starting in 2014, a research collaboration has been established between the marine mammal research group of the University of Barcelona, led by Alex Aguilar and Asunción Borrell, and the MFRI. The objective is to validate and expand the use of a number of chemical tracers to investigate the ecology and demographic structure of baleen whales, particularly fin and common minke whales. Research has focused on the use of stable isotopes of various elements (C, N, O, S), trace elements, as well as biochemical and molecular markers. A number of communications to conferences has already been presented on the validation of faeces to assess diet in baleen whales and on the use of baleen plates to investigate migration and winter destinations of fin whales.

Common minke whale

Biological sampling from the common minke whale hunt in Iceland continued under the auspices of the MFRI. For all minke whales, the mitochondrial Control Region and a standard set of 16 nuclear microsatellites is genotyped for population/stock assessment in collaboration with the University of Potsdam.
Studies continued at the MFRI on the development of a new ageing method for common minke whales.
The HRC in Húsavík contined their long-term photo-identification and sightings studies of minke whales in Skjálfandi bay.
A new estimate of abundance of common minke whales in coastal Icelandic waters from a 2016 aerial survey was presented in 2017.

Humpback whale

As in 2015 and 2016 humpback whales were the primary species of a whale observation effort onboard two capelin survey vessels 4-29 Sept 2017. Results were similar to the earlier years, but because of delays due to machine problems the observation effort was terminated in 2017 before the area of highest density of capelin and supposedly humpback whales was covered.
The humpbacks have been concentrated in the area where capelin was detected and this is of interest regarding ecosystem modelling for determination of sustainable catch limits for the capelin stock.

The HRC in Húsavík contined their long-term photo-identification and sightings studies of humpback whales in Skjálfandi bay. The MFRI continued their photo-identification studies including the development of the central national humpback whale photo-id database:
https://www.hafogvatn.is/en/research/whale-research/whale-photo-id

Blue whale

The HRC in Húsavík continued their long-term photo-identification and sightings studies of blue whales in Skjálfandi bay. Acoustic tags were deployed on two blue whales in Skjálfandi Bay.

Killer whale

In 2017 the MFRI conducted a field season in Vestmannaeyjar during June, July and August, continuing a long-term project on killer whales that started in 2008. The current focus of the project is to investigate dietary specialisation in killer whales and thus the field work focused on collecting information on prey targeted and dietary preferences of individual whales by collection of photo-identifications, observation of feeding events and collection of skin biopsy samples. There was also the addition of a land-based station that allowed for a broader monitoring of variations in the occurrence of killer whales as well as other cetaceans in the local marine ecosystem.

The Icelandic killer whale catalogue containing over 400 killer whale individuals identified between 2006 and 2015 was published on the MFRI web in 2017:
https://www.hafogvatn.is/static/research/files/hv2017-005pdf

White-beaked dolphins

The HRC in Húsavík contined their long-term photo-identification and sightings studies of white-beaked dolphins in Skjálfandi bay. C-PODS were deployed in Skjálfandi Bay for detection of white-beaked dolphins.
Efforts to estimate bycatch of white-beaked dolphins in fisheries continued at the MFRI.

Harbour porpoise

Efforts to estimate bycatch of harbour porpoises in fisheries continued at the MFRI. Accoustic porpoise deterrents (pingers) were tested for the first time in the Icelandic cod gillnet fishery in April of 2017, but their use showed no reduction in porpoise bycatch, as 7 porpoises got caught in nets with pingers, while 5 porpoises got caught in control nets nearby. A more detailed analysis of this experiment is underway and should be published later this year.

Collaboration of the MFRI with the University of Potsdam on harbour porpoise genetic research is ongoing (Lah et al. 2016). Among the objectives of this study is estimation of population size based on close kin analysis. For all harbour porpoises, the mitochondrial Control Region and a standard set of 15 nuclear microsatellites is genotyped for population/stock assessment and close-kin-based estimation of population size. Furthermore, multiple nuclear Single Nucleotide Polymorphisms (SNPs) are typed in a representative subset of samples. In 2017 fishermen for the first time received a payment for each harbour porpoise DNA tissue sample that they send in to the MFRI, and this is clearly resulting in an increase in samples and in the recording of by-catch.

Efforts to estimate bycatch of harbour porpoises in fisheries continued at the MFRI.

C-PODS were deployed in Skjálfandi Bay for detections of harbour porpoises.

Other (multi) cetacean species

During 7. June- 1. July 2017 the MFRI participated in a cetacean sightings cruise conducted onboard the RRS Discovery and organized by the Sea Mammal Research Unit. University of St Andrews, Scotland. The cruise collected data on cetacean and seabird distribution, as well as oceanography in the sub-polar frontal zone between the UK and Canada

Harbour seals

A report presenting results on the status of the Icelandic harbour seal population (based on the survey from 2016) was published in 2017 (Thorbjörnsson et al. 2017). Due to the observed severe decrease in the population, factors contributing to mortality are currently investigated. As an example, research on timing of pupping period and population identity has been initiated. A new harbour seal census is planned for 2018.

The effect of seal watching tourism on the behaviour and distribution of harbour seals has been studied by ISC and MFRI since 2008, together with interdisciplinary research on seal watching management. An evaluation on existing seal watching codes of conduct was published during the year (Öqvist et al., 2017). The perception of marine mammal watching tourists towards marine mammal conservation and management in Iceland was investigated by ISC and MFRI in co-operation with Stockholm University and analysis is ongoing.

The MFRI and ISC initiated a photo-identification pilot study in 2017, including testing software and creating a foundation for a photo-id database.

In 2017, a study on vocalisations and behaviour of male Icelandic harbour seals during the mating season was initiated by UI and MFRI in cooperation with the University of Southern Denmark in Odense.

A study of harbour seal genetics was initiated in 2016, in cooperation between MFRI, ISC and the Natural history museum of Denmark and analysis is ongoing.

Grey seals
To estimate the current status of the Icelandic grey seal population, a census was conducted during the pupping period in 2017 and analysis is currently ongoing. A project was initiated in October 2016 where five grey seal pups were tagged with satellite tags to map habitat use and the analysis is ongoing.

A study of grey seal genetics was initiated in 2016, in cooperation between MFRI, ISC, the Natural history museum of Denmark and Main University, and analysis is ongoing.

Other (multi) pinniped species

A project investigating environmental toxicants in seals in Icelandic waters was initiated by MFRI during 2017.

III ONGOING (CURRENT) RESEARCH

Cetaceans
Apart from several ongoing long-term studies continuing in 2018, a new research project on humpback whale movements and feeding ecology will be initiated in September 2018 by the MFRI.

Pinnipeds
A harbour seal census is planned for 2018 by the MFRI. Research on timing of pupping period and pup production has also been initiated.

Research on interactions between seals and fisheries will continue with further investigation on mapping seal habitat/abundance for example with application of satellite tags and by increasing knowledge on by-catch. Analysis of harbour seal diet in river mouths in the north west of Iceland (by ISC and IMFR) initiated in 2008, with special efforts put on investigating the effect of seals on salmonids will continue.

A study on the effect of land- and boat based tourism on the spatial and behavioural haul-out patterns of harbour seal and the interdisciplinary research on seal watching management initiated in 2008 by ISC and MFRI will continue the following years. Some results regarding the perception of marine mammal watching tourists towards marine mammal conservation and management in Iceland was recently published (Burns et al., 2018) and further analysis is ongoing (Granquist et al., in prep.).

IV ADVICE GIVEN AND MANAGEMENT MEASURES TAKEN

Cetaceans
Based on assessments conducted by the Scientific Committees of NAMMCO and the IWC, the MFRI recommended in 2017 that annual catches in 2018-2025 do not exceed 161 fin whales on the East Greenland – West Iceland management area and 48 fin whales in the East Iceland-Faroes management area. On the same basis the MFRI recommended in 2016 maximum annual takes of 224 common minke whales in the Icelandic continental shelf (CIC) area during 2016-2018.

Pinnipeds

Harbour seals: MFRI advices that direct hunt should be prevented and that actions must be taken to reduce by-catch of seals in commercial fisheries. MFRI also advices that a hunting management system should be initiated, and that reporting of all seal hunt should be mandatory.
Grey seals: MFRI will release advice based on the management objectives set for grey seals in Iceland only after the grey seal population estimate has been finalized in 2018.

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VI APPENDIX 1 - CATCH DATA

VII APPENDIX 2 - BY-CATCH DATA

a. Short narrative

Bycatch of marine mammals was monitored in all major fisheries in Icelandic waters in 2017, through logbook submissions, reports from onboard inspectors from the Directorate of Fisheries and in the MFRI annual gillnet survey. Draft report on bycatch in Icelandic fisheries was presented to the NAMMCO Bycatch working group in May 2017, and has since been edited to account for the recommendations of the group which will be reviewed by the group in March. In addition to this overview, a more detailed report will be released soon on bycatch in the lumpsucker gillnet fishery around Iceland.

By-catch in research surveys and when observed by inspectors on fisheries vessels is reported in Appendix 2. By-catch by fishermen now comes from electronic log-books only. Fishermen category "Lumpsucker nets" may include monk fish nets. It should be noted that reported numbers of by-catch is underrepresented to an uncertain extent and hence numbers should not be regarded as reliable. However, some increase has occurred in the by-catch reporting from fishermen the past year (see last year's *Iceland progress report* and the report from the NAMMCO Scientific Committee Working Group on By-catch, in Cph). There may be some overlap in the by-catch reported by fishermen and reports from the inspection. Genetic samples of all marine mammals (mainly harbour porpoises) are collected in the surveys. Fishermen voluntarily sent in around 20 samples of harbour porpoises per year in recent years, but in 2017 fishermen received a payment for each sample and 160 were received plus 10 foetuses by-caught in lumpsucker nets and cod nets in similar numbers and these are likely included in the fishermen reports. Numbers are given as requested in a separate sheet.

VIII APPENDIX 3 - STRANDINGS

a. Short narrative

All cetacean standings should be reported to the MFRI and when possible autopsies are conducted. genetic samples are stored in the genetic database at the institute.
Numbers are given as requested in a separate sheet.
No records are kept of pinniped strandings at the MFRI.