

## **Report of the Section on *Marine Birds and Mammals***

The meeting of the Section on *Marine Birds and Mammals* (S-MBM; under the auspices of the BIO Committee) was held virtually over two days (September 15 and 16, 2021) from 18:00–20:00 hours (PDT; UTC-7hrs) via Zoom, hosted by the PICES Secretariat. The meeting focused on the current activities of S-MBM and on preparations for next project associated with the S-MBM Terms of Reference.

Dr. Patrick O’Hara (Co-Chair, Canada) and Dr. Kaoru Hattori (Co-Chair, Japan) called the meeting to order and welcomed members and observers (*S-MBM Endnote 1*). S-MBM members representing Canada, China, Japan, Korea and USA were present. S-MBM members from Russia did not attend.

### AGENDA ITEM 1

#### **Adoption of agenda**

The agenda was reviewed and approved (*S-MBM Endnote 2*).

### AGENDA ITEM 2

#### **Membership changes**

None.

### AGENDA ITEM 3

#### **Reports from participants**

- a) Dr. Tsutomu Tamura provided a report on the 2020 International Whaling Commission Scientific Committee (IWC/SC) meeting held virtually (*S-MBM Endnote 3*). Dr. Tamura continues as observer, representing PICES. The IWC endorsed the 2020 POWER cruise conducted in the western North Pacific from July to September.
- b) Dr. O’Hara will continue developing linkages with WG 47 (Ecology of Seamounts), and will attend its first business meeting, which will be held virtually (June 16, 2021) in conjunction with the Science Board Inter-sessional Meeting (ISB-2021).
- c) World Seabird Conference has been postponed to October 2021 (and will be virtual). There are no other international symposia related to S-MBM activities.

### AGENDA ITEM 4

#### **Discussions**

##### a) *Review of Terms of Reference*

S-MBM reviewed its current Terms of Reference, with no changes recommended.

##### b) *Topic Session/Workshop proposed for PICES-2021*

One-day workshop: Anthropogenic stressors, mechanisms and potential impacts on Marine Birds and Mammals (see *S-MBM Endnote 4*).

c) *S-MBM project on “Climate and Trophic Ecology of Marine Birds and Mammals”*

Work on the 2015–2020 S-MBM project “Climate and Trophic Ecology of Marine Birds and Mammals” to estimate food consumption using a new generation of bioenergetic models (update Scientific Report 2000) was reviewed. Models are based on new combined datasets and will improve our understanding and allow us to predict the impacts of changing mid-trophic level micronekton communities on marine birds and mammals.

- Good progress in completing table about food consumption of marine mammals in this summer with a student
- Project report will be prepared by next Annual Meeting.
- Chapter for report (draft)
  - ① Introduction (A. Trites)
  - ② Mammals
    - 1. Diets and consumption (A. Trites and T. Tamura)
  - ③ Birds
    - 1. Case study in breeding birds in EEZ Japan (Y. Watanuki)
  - ④ Discussion
  - ⑤ Appendices
    - 1. Updated tables
    - 2. Previous workshops and sessions

Four topic sessions and 3 workshops since 2016.

d) *Draft of S-MBM Activity Plan, 2021–2025 (see S-MBM Endnote 5)*

- Phases:
  - i. Identification and assessment of important stressors (anthropogenic and environmental) on MBMs, developing Pathways of Effects (POEs), and estimating potential impacts from these stressors.
  - ii. Use of MBMs as indicators of impacts regionally and among regions.
  - iii. Comparative synthesis of information from phase 1 and 2 across the PICES region.
- Proposed upcoming workshops:
  - iv. Anthropogenic stressors (Yutaka Watanuki, Miran Kim, Patrick O’Hara)
  - v. Climate Change (Bill Sydeman, Kaoru Hattori, Patrick O’Hara)
  - vi. Forage fish changes (Hyun Woo Kim, Elliot Hazen)
  - vii. MBMs as indicators (Rolf Ream, Bill Sydeman)

2. *Next S-MBM meeting*

- The next PICES Annual Meeting will likely be virtual.

S-MBM requests a 2-day meeting with similar format to accommodate large time zone differences among PICES members.

***S-MBM Endnote 1***

**S-MBM participation list**

Members

Kaoru Hattori (Japan, Co-Chair)  
Patrick D. O’Hara (Canada, Co-Chair)  
Douglas F. Bertram (Canada)  
Ken Morgan (Canada)  
Andrew Trites (Canada)  
Xuelei Zhang (China)  
Tsutomu Tamura (Japan)  
Yutaka Watanuki (Japan)  
Yong-Rock An (Korea)  
Hyun Woo Kim (Korea)  
Miran Kim (Korea)  
Elliott L. Hazen (USA)  
Rolf R. Ream (USA)  
Willam Sydeman (USA)

Members unable to attend

China: Shuai Chen, Wei Lei, Liyuan Zhao  
Russia: Alexander Boltnev, Vjatcheslav P. Shuntov, Andrey Vinnikov

***S-MBM Endnote 2***

**S-MBM meeting agenda**

1. Call to order – Review Agenda (modify as needed)
2. Membership changes
3. Reports from participants
  - a) Report of IWC activities (T. Tamura)
  - b) International Symposium related to S-MBM activities
  - c) Other activities (if any)
4. Discussions
  - a) Review S-MBM Terms of Reference and change
  - b) Planning PICES 2021 Annual Meeting (Qingdao, China; Oct., 2021, if any)
    - ✓ Most workshops/sessions originally scheduled for 2020 will be pushed to PICES 2021.
    - ✓ Additional proposals may be submitted (How/When TBD)
- a) S-MBM project
  - ✓ Final products on 2015–2020 project “Climate and Trophic Ecology of Marine Birds and Mammals (Lead by A Trites)”
  - ✓ A new focal project in 2021–2025 “Interaction between MBMs and other ecosystem components and stressors” or others

*S-MBM Endnote 3*

**PICES Observer Report on the 2020 IWC Scientific Committee Meeting**

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The 68<sup>th</sup> Scientific Committee (SC) meeting

Meeting place: Virtual Meetings

Meeting period: May 11 to 24, 2020

Chair: Robert Suydam

Participants: 140 national delegates, 154 invited participants (IP), 25 observers, 12 representatives of specified intergovernmental organizations, and 21 staff IWC Secretariat

The IWC/SC consisted of the following ten sub-committees, three working groups and two *ad hoc* working groups:

▪ Sub-Committee

1. *Implementation Reviews and Simulation Trials\** (IST)
2. In-depth Assessment (IA)
3. Other Northern Hemisphere whale stocks (NH)
4. Other Southern Hemisphere whale stocks (SH)
5. Small Cetaceans (SM)
6. Whale Watching (WW)
7. Aboriginal Subsistence Whaling (ASW)
8. Conservation Management Plans (CMP)
9. Non-Deliberate Human-Induced Mortality of Cetaceans (HIM)
10. Environmental Concerns (E)

\* Sub-committee on *Implementation Reviews and Simulation Trials*, which includes the work of the former sub-committee on the Revised Management Procedure (RMP)

▪ Working Groups

1. Stock Definition/DNA testing (SD/DNA)
2. Ecosystem Modelling Approaches (EM)
3. Abundance Estimates, Stock Status and International Cruises (ASI)

▪ *Ad hoc* Working Groups

1. Photo-ID (PH)
2. Sanctuaries (SAN)

The 2020 Scientific Committee meeting, SC68B, was unlike any previous Committee meeting. The Committee needed to progress key items through virtual sessions (using Zoom) and/or email. The Committee leadership, including the Chair, Vice-Chair and Convenors, and the Secretariat created a new process based on careful discussion and preparation to determine the priority topics that could be addressed through a virtual meeting and revised the agenda to reflect these priorities.

The typical in-person meeting schedule consists of several days of pre-meetings or workshops, followed by two morning Plenary sessions to set the stage for the two-week Committee meeting. Following the two days of initial Plenary sessions are seven days of sub-group meetings and three days of Plenary to discuss a variety of issues and agree the Committee’s report. However, there were no Plenary sessions at SC68B. The information typically provided at the early Plenary sessions was instead provided via email in 2020. Similarly, the Plenary sessions that are usually held at the end of the Committee meeting were replaced by concluding sub-committee sessions to draft report work plans and budget proposals for 2021. As many as three concurrent sessions during that two-hour time slot were scheduled each day, for a total of 39 possible virtual sessions. That number of sessions was substantially reduced from about 110 sessions during a typical in-person meeting. This decrease in the amount of time available to meet in 2020 was reflected in a greatly reduced SC68B agenda.

The following topics are related to the North Pacific matters.

- **Implementation Reviews and Simulation Trials: Sub-Committee**  
The *Revised Management Procedure* (RMP) is the process developed by the IWC’s SC to estimate sustainable catch limits for commercial whaling of baleen whales. The RMP has two stages. The first is the *Catch Limit Algorithm* (CLA). The same CLA is used for all whale species and all areas. This is a mathematical formula which requires only the two most reliable pieces of information (abundance estimate of whales and past catch numbers) to calculate a safe catch limit. The second stage of the RMP is known as *Implementation* or *Implementation Review*. This is a review of all the available information on all the populations of a single species within a specific region (usually an ocean basin, for example the North Atlantic), at a particular time.
  1. The *Implementation Review* for gray whales in the western North Pacific was conducted in this meeting. Discussions focused on the three stock structure hypotheses and new abundance estimates.
  
- **In-depth assessment (IA): Sub-Committee**  
In this Sub-Committee, the in-depth assessment of several whale species is discussed. An in-depth assessment includes the examination of current stock size, recent population trends, carrying capacity and productivity. The following topics are related to the North Pacific.
  1. *Comprehensive Assessment of North Pacific sei whales*: An intersessional correspondence group was established to review the data used and to oversee the further development of the population model. The committee agreed to re-establish the intersessional group to enable completion of the assessment by the Committee next year.
  2. *In-depth assessment of western North Pacific common minke whales*: An intersessional workshop had been planned to further the in-depth assessment, but it had not been possible to hold it this year prior to the Committee meeting. The Committee reiterated its support for holding the workshop prior to SC68C.
  3. *Comprehensive Assessment of North Pacific humpback whales*: In 2019, the comprehensive Assessment of North Pacific humpback whales was postponed until the completion of a large-scale photo-id matching exercise.
  
- **Abundance Estimates, Stock Status and International Cruises (ASI): Working group**
  1. *North Pacific Sighting survey cruise (IWC-POWER)*: The IWC-POWER (North Pacific Ocean Whale and Ecosystem Research) program is an international collaborative effort coordinated by the IWC and Japan. The project includes line transect sighting for estimating population abundance and biopsy skin-sampling and photo ID for stock structure on major large cetaceans. It started in 2010.

2. The Committee endorsed the 2020 POWER cruise conducted in the western North Pacific from July to September (Figure 1). (The 2020 POWER cruise was expected to occur in the western Bering Sea, but because of difficulties in obtaining a permit to survey in Russian waters, this did not happen).

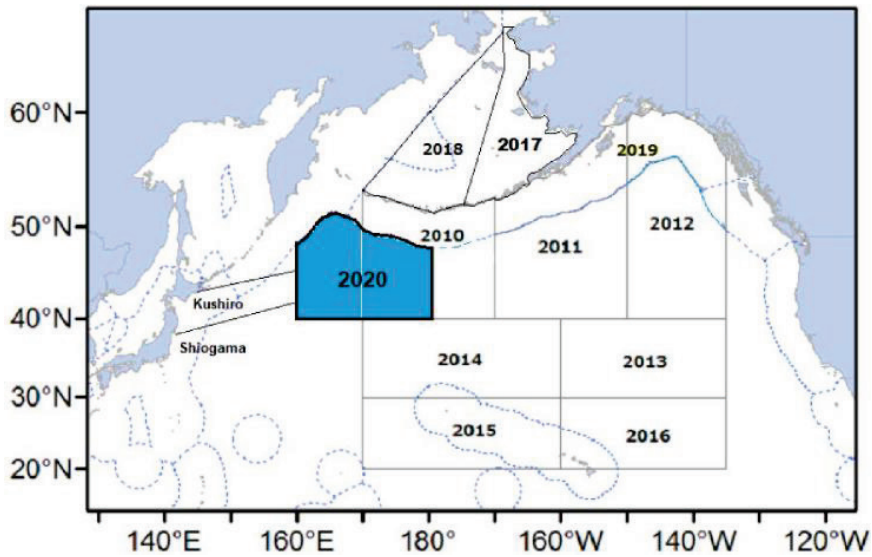


Figure 1. Survey strata and proposed trackline for POWER-cruise in 2020.

- Other matters

The SC also covers the other Sub-Committees and Working Groups such as environmental concerns, small cetaceans, whale watching, and by-catch, *etc.* The 2020 SC report of the IWC can be downloaded from <https://archive.iwc.int/pages/view.php?ref=17766&k=> .

This was the second year of office for the Chair (Robert Suydam) and the Vice-Chair (Alex Zerbini).

- 2021 Schedule

Scientific Committee (SC/68C), April 27 to May 14, 2021, <https://iwc.int/sc68c>

***S-MBM Endnote 4***

**Proposal for a Workshop on  
 “Anthropogenic stressors, mechanisms and potential impacts on Marine Birds and Mammals”  
 at PICES-2021**

Duration: 1 day

Conveners: Yutaka Watanuki (Japan), Miran Kim (Korea) Patrick O’Hara (Canada)

Anthropogenic stressors, such as climate change, plastic pollution, discharged toxins, fishery interaction, and noise pollution, impact marine birds and mammals, affecting their distributions and abundances. These stressors can act directly or indirectly on marine birds and mammals, and can pose a considerable challenge for marine conservation. Understanding how stressors affect marine birds and mammals is an important step in estimating and mitigating against these threats.

The aim of this workshop is to improve our understanding of anthropogenic stressors, and how they affect marine birds and mammals throughout the North Pacific Ocean. One of the main outcomes of the workshop will be the development of a Pathways of Effects style heuristic or conceptual model describing how stressors act on marine birds and mammals. Workshop participants will be invited to discuss a PICES region-by-region assessment of stressor importance, and how mechanisms of impact may differ among regions.

Potential Co-sponsoring organization: TBD

Potential Linkages within PICES:

- 1) MEQ/WG 42 – microplastics and other contaminants
- 2) FIS/WG 43 – indirect impacts on marine birds and mammals through forage fish
- 3) FIS/HD/WG 44 – POEs and climate change input into Ecosystem Assessments of Northern Bering Sea–Chukchi Seas

***S-MBM Endnote 5***

**S-MBM Activity Plan, 2021–2025**

2020.9.16

The S-MBM proposes to address the next stage of Climate and Trophic Ecology of Marine Birds and Mammals over the next 5 years. This program has been chosen because birds and mammals can have top-down effects on marine ecosystems and because birds and mammals respond to multiple scales of variability in the environment and their prey-base. We are completing our update of the 2000 report (Hunt *et al.*, 2000) on diets and food consumption of marine mammals with case studies from seabirds as well based on additional datasets and improved bioenergetic models. Combining this information with data on prey quantity, quality, composition and distribution will further allow us to understand and predict the impacts of prey on marine birds and mammals, as well as allow us to examine the influence of climate variability and change on trophic linkages and the distribution and abundance of marine birds and mammals in the North Pacific. In addition, our project will link directly with other PICES committees (*e.g.*, BIO, FIS, POC, MEQ), provide improved data needed on energy flow for ecosystem models for PICES sub-regions and broader LMEs, and will address the goals of FUTURE to forecast ecosystem status and understand how marine ecosystems in the North Pacific respond to climate change and human activities.

Our project is premised on the fact that marine birds and mammals (MBMs) are important top predators that respond directly to changes in and consume large amount of forage species. It also recognizes that MBMs can induce trophic cascades, and that they are susceptible to changes in marine food web structure and productivity as a result of both natural and anthropogenic impacts. MBMs overlap directly with anthropogenic stressors, such as climate change, plastic and other pollutants, increased shipping, and fishery interactions. Finally, many MBM are easily observed and highly mobile, and are considered sentinels of ecosystem status and health. As such, we believe the detailed analyses of MBMs we are proposing will contribute significantly to meeting the objectives of FUTURE 2.0.

The following describes 1) the rationale of our proposed project, 2) summarizes related past activities, and 3) describes potential activities or products to be accomplished by the S-MBM.

Our activity plan will focus on the “Interaction between MBMs and other ecosystem components and stressors.” This will include important sub-themes such as:

- Forecasting changes in forage species and response of top predators.
- Marine birds and mammals as ecological indicators and predictors of changing marine ecosystems.

Phases:

1. Identification and assessment of important stressors (anthropogenic and environmental) on MBMs, developing POEs, and estimating potential impacts from these stressors.
2. Use of MBMs as indicators of impacts regionally and among regions.
3. Comparative synthesis of information from phase 1 and 2 across the PICES region.

Upcoming possible workshop themes:

1. Anthropogenic stressors, mechanisms and potential impacts on MBMs (led by M. Kim, P. O’Hara and Y. Watanuki)
2. Climate change (including Marine Heat Waves) associated changes in migration patterns/distribution of MBM (led by W. Sydeman, K. Hattori and P. O’Hara)
3. Predicting changes in small pelagic prey fish and potential impacts on MBMs (led by H.W. Kim and E. Hazen)
4. MBMs as indicators of impacts (led by R. Ream and W. Sydeman)