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Proceedings of the regional re-evaluation of Ecologically and Biologically Significant Areas (EBSA) in the Beaufort Sea.

**November 20-22, 2012
Winnipeg, Manitoba**

**Chairperson: Joclyn Paulic
Editor: Shannon MacPhee**

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Foreword

The purpose of these Proceedings is to document the activities and key discussions of the meeting. The Proceedings may include research recommendations, uncertainties, and the rationale for decisions made during the meeting. Proceedings may also document when data, analyses or interpretations were reviewed and rejected on scientific grounds, including the reason(s) for rejection. As such, interpretations and opinions presented in this report individually may be factually incorrect or misleading, but are included to record as faithfully as possible what was considered at the meeting. No statements are to be taken as reflecting the conclusions of the meeting unless they are clearly identified as such. Moreover, further review may result in a change of conclusions where additional information was identified as relevant to the topics being considered, but not available in the timeframe of the meeting. In the rare case when there are formal dissenting views, these are also archived as Annexes to the Proceedings.

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SUMMARY

A regional science advisory meeting was held November 20–22, 2012 at the Freshwater Institute in Winnipeg, MB. The main objective of this meeting was to re-evaluate Ecologically and Biologically Significant Areas (EBSA) in the Beaufort Sea. A primary working paper summarised the information from a number of recent sources and provided the basis for the related science advice. In addition, meeting participants provided further supplementary information and discussed the importance of temporal and spatial scales in defining EBSAs. This re-evaluation of the Beaufort Sea EBSAs was conducted at the request of the Beaufort Sea Partnership to the Oceans Program of Fisheries and Oceans Canada (DFO), Central and Arctic Region, and is part of Canada's ongoing commitment to building a national network of marine protected areas.

As a result of this advisory meeting and based on existing EBSAs, a total of 18 EBSAs were defined within the Beaufort Sea Large Ocean Management Area. Several EBSA boundaries were adjusted based on either discrete (e.g., water depth contour, geographic extent of an island) or seasonally variable (e.g., sea-ice extent) features. Based on the new information presented in the primary working paper and participant's enhanced understanding of the EBSA criteria since the previous evaluation, three new EBSAs were added and the original EBSAs were either modified or amalgamated to form more defined areas. For each EBSA, the valued ecosystem components (VEC) and habitat features were defined and a level of confidence in the data and information used to define the EBSA were included.

This meeting included input from 22 experts from DFO (Science, Oceans Program), Parks Canada Agency, Environment Canada, Oceans North, the World Wildlife Fund, academia (University of Manitoba, Université du Québec à Rimouski) and the Fisheries Joint Management Committee (Inuvialuit). These proceedings summarize the meeting discussions. Additional publications from this process will be posted on the [DFO Canadian Science Advisory Secretariat website](#) as they become available.

Compte rendu de la réévaluation régionale des zones d'importance écologique et biologique (ZIEB) dans la mer de Beaufort

SOMMAIRE

Une réunion de consultation scientifique régionale a été tenue du 20 au 22 novembre 2012 à l'Institut des eaux douces de Winnipeg, au Manitoba. Le principal objectif de cette réunion était de réévaluer les zones d'importance écologique et biologique (ZIEB) dans la mer de Beaufort. Un document de travail principal résumait l'information provenant d'un certain nombre de sources récentes et servait de base aux avis scientifiques connexes. De plus, les participants à la réunion ont fourni de l'information supplémentaire et ont discuté de l'importance des échelles temporelles et spatiales dans le cadre de la définition des ZIEB. Cette réévaluation des ZIEB dans la mer de Beaufort a été effectuée par le Programme des océans de Pêches et Océans Canada (MPO), région du Centre et de l'Arctique, à la demande du Partenariat de la mer de Beaufort, et fait partie de l'engagement continu du Canada à l'égard de l'établissement d'un réseau national de zones de protection marine.

À la suite de cette réunion de consultation scientifique et en tenant compte des ZIEB existantes, on a défini un total de 18 ZIEB dans la zone étendue de gestion des océans de la mer de Beaufort. Plusieurs limites des ZIEB ont été ajustées en fonction de caractéristiques soient discrètes (p. ex. profondeur de l'eau, étendue géographique d'une île), soient variables selon les saisons (p. ex. étendue des glaces de mer). Selon la nouvelle information présentée dans le document de travail principal et la compréhension améliorée des participants des critères applicables aux ZIEB depuis la dernière évaluation, trois nouvelles ZIEB ont été créées et les ZIEB existantes ont été modifiées ou fusionnées pour former des zones mieux définies. Des composantes valorisées de l'écosystème et des composantes de l'habitat ont été définies pour chaque ZIEB, et un niveau de confiance à l'égard de l'information et des données utilisées pour définir les ZIEB a été inclus au processus.

Vingt-deux experts du MPO (Secteur des sciences, Programme des océans), de l'Agence Parcs Canada, d'Environnement Canada, d'Océans North, du Fonds mondial pour la nature, du milieu universitaire (Université du Manitoba, Université du Québec à Rimouski) et du Comité mixte de gestion de la pêche (Inuvialuit) ont fourni des commentaires dans le cadre de cette réunion. Le présent compte rendu résume les discussions tenues lors de la réunion. Toute autre publication découlant de cette réunion sera publiée lorsqu'elle sera disponible sur le [site Web du Secrétariat canadien de consultation scientifique du MPO](#).

CONTEXT

The identification of Ecologically and Biologically Significant Areas (EBSAs) in the Beaufort Sea Large Ocean Management Area (LOMA) is an important step towards a more comprehensive management approach for the marine environment. Properly identified, knowledge-based EBSAs will address a variety of Federal Government commitments (e.g., Arctic Council, Marine Protected Areas Network) and will also provide guidance for a number of regional planning initiatives (e.g., Marine Protected Areas, Beaufort Sea Integrated Ocean Management Plan). The Beaufort Sea LOMA Ecosystem Overview and Assessment Report was published in 2008 (Cobb et al. 2008) and contained the results of a series of workshops to identify EBSAs in the Beaufort Sea, based on a 2005 literature review. Many of the EBSAs identified were considered data deficient. Since then, new information from government and academic research has been published and the process that Fisheries and Oceans Canada (DFO) uses to identify EBSAs has evolved. DFO Science has been asked by DFO Oceans Program (at the request of the Beaufort Sea Partnership, Ecosystem Working Group) to re-evaluate current EBSAs in the Beaufort Sea LOMA.

INTRODUCTION

The meeting Chair, Joclyn Paulic, welcomed participants and the meeting began with a round-table of participant introductions (Appendix 1). A total of 22 experts were present from DFO (Science and Oceans Program), Environment Canada, Parks Canada Agency, World Wildlife Fund, University of Manitoba, Oceans North and the Fisheries Joint Management Committee. Some participants were unable to attend but provided written comments to the primary working paper in advance (Université du Québec à Rimouski, Environment Canada, DFO – Yellowknife Office). Shannon MacPhee was rapporteur for the meeting.

The Chair provided an overview of the Canadian Science Advisory Secretariat (CSAS) process, purpose, definition of consensus, and the expected output documents. Participants discussed the CSAS review process and then reviewed the meeting Terms of Reference (Appendix 2). It was noted that unlike the previous EBSA evaluation for the Beaufort Sea (Paulic et al. 2009), this process would review the geospatial layers used to define each EBSA and clearly identify the valued ecosystem component(s) (VEC). The meeting agenda (Appendix 3) was presented and agreed upon by participants.

Two working papers were presented at the meeting. The primary working paper prepared by D. Cobb re-evaluated the current Beaufort Sea EBSAs based on recent scientific, local and traditional ecological knowledge collected since 2005. A second working paper by Roy et al., based on unpublished data, summarized and recommended the identification of EBSAs for benthic VECs. These proceedings summarize the meeting discussions and present the key conclusions reached at the meeting. Additional publications from this process will be posted on the [DFO Canadian Science Advisory Secretariat website](#) as they become available.

PRESENTATION: RE-EVALUATION OF EBSAS IN THE BEAUFORT SEA LOMA

Presenter: Donald Cobb

Don Cobb presented a summary of the key results from the primary working paper, Information in support of the identification of Ecologically and Biologically Significant Areas (EBSAs) in the Beaufort Sea Large Ocean Management Area (LOMA). The definition of an EBSA was explained and the DFO identification criteria (DFO 2004) were reviewed. It was stressed throughout the presentation that human values (i.e., economic, cultural) are not to be considered in this process and that ocean and resource managers will take these factors into

consideration following this science advisory process. It was also made clear that EBSAs do not, in themselves confer any legal protection, but give decision-makers the critical scientific advice they need to plan for conservation and sustainable economic development.

A total of 24 EBSAs were presented in the working paper based on the evaluation using the DFO national criteria (DFO 2004). The evaluation used existing and new knowledge and information found in a literature review from 2004 to current. Each EBSA was identified by VEC (species and/or physical/oceanographic process and feature) under the criteria for uniqueness, aggregation or fitness consequences. Further to this evaluation, DFO provided a geospatial technician to produce digital maps of the layers of information at the relevant scale within the LOMA to facilitate EBSA boundary identification.

Participants then further discussed the differences between the identification of EBSAs in the past with this process and the lessons learned.

EBSA Criteria

Although Resilience and Naturalness are two key criteria of an EBSA evaluation framework, they were not considered deciding factors for the re-evaluation of the original Beaufort Sea EBSAs, due to a general lack of information for these criteria (DFO 2011a). The RACER (Rapid Assessment of Circumpolar Ecosystem Resilience) report (WWF 2011) was described by one participant as a method that the World Wildlife Fund uses to identify, map, and raise awareness about important areas in the Arctic which enhance ecological structure and functioning, and identifies key areas that are considered resilient in the face of a rapidly changing environment.

Data Confidence

The Chair explained that the term 'data deficient' had been removed from the EBSA process (DFO 2011a). It was suggested that 'data deficient' is typically a term used to describe a situation where not enough data are available to make a decision, but in the case of Arctic EBSAs decisions have been made, but EBSAs cannot be ranked against each other where data quality is low. Participants agreed that it was still important to document data quality and uncertainty (where information exists) for a given VEC under each EBSA criterion. When possible, participants agreed that representing the data confidence as a data layer would be preferential. A ranking system was proposed based on Chan et al. (2012). The ranking system was modified and accepted (Appendix 4) for this meeting.

Additionally, the role of Local and Traditional Ecological Knowledge (LEK/TEK) to identify significant areas within the scale of the larger LOMA was discussed at length. EBSAs must be supported by science and are typically based on published or accessible reports, but it was agreed that personal communications can be used if referenced appropriately. It was also noted that TEK is an important part of the EBSA identification process (DFO 2011a), and that detailed information can come from community workshops (Cobb et al. 2008, Paulic et al. 2009). For some EBSAs (e.g., De Salis Bay), there are no scientific data and local knowledge alone was used in the EBSA identification process. However, in practice it was difficult to evaluate the Uniqueness, Aggregation, or Fitness Consequences of an EBSA based on TEK within the context of the larger LOMA and therefore it was suggested that TEK/LEK may be its own data layer.

Connectivity

Participants discussed the importance of ecological/biological linkages between EBSAs and that this was one of the criteria for MPA network design in order to capture ecological functionality. This feature has not previously been evaluated in the EBSA process but it was agreed that connectivity is relevant to this science advice and should be included in the Science Advisory

Report. The group agreed to also informally refer to the Alaskan EBSAs in the primary working paper in order to acknowledge connectivity and the scale of the entire Beaufort Sea, irrespective of the administrative boundaries. There was also some discussion on whether it is more practical to divide EBSAs into smaller units, or to have single large management units. It was agreed that this would be dependent on the VEC in discussion.

Seasonality

Participants discussed the importance of seasonal variability in features that are not geographically constrained (e.g., sea ice extent, advection of upwelled waters, movement of pelagic biota and marine mammals), and that these features do affect EBSA boundaries and connectivity. It was agreed that components that are seasonally variable will be captured as GIS layers in a future report.

Community Consultation

The DFO Oceans Program will conduct consultations to present the re-evaluated EBSA boundaries to community members. Additionally, it was noted that the community conservation plans have been revised since the Beaufort Sea EBSAs were first developed, and that the Inuvialuit will be conducting another evaluation of the community conservation plans in the near future. Participants agreed that it would be beneficial to unite the DFO EBSAs with the community conservation planning exercise. Given that community conservation plans are spatially data-limited, DFO EBSA layers would be a useful addition to these plans.

The Chair summarized a number of points that participants agreed upon during the lengthy discussion following the presentation. Specifically, that the EBSA re-evaluation exercise has demonstrated the need to be more specific with respect to seasonality, data types and information sources, areas of data gaps, and the need to ensure that EBSAs actually address management needs.

ASSESSMENT OF EBSAS IN THE BEAUFORT SEA LOMA

Participants were asked to provide and discuss any new relevant biological/ecological information regarding the proposed EBSAs from the primary working paper with respect to the three main DFO EBSA criteria - Uniqueness, Aggregation and Fitness Consequences by VEC. Participants also discussed the addition and/or removal of some EBSAs from the list of proposed EBSAs from Cobb's primary working paper.

Participants agreed that there must be some justification for changing an EBSA (shifting boundaries, merging, adding, or removing) otherwise the validity of the process is in question.

For each VEC and EBSA criteria, participants provided justification of changes to the EBSA, ranked the level of confidence in the data used to identify the EBSA (Appendix 4) and the importance of each EBSA criterion to each identified VEC (very high, high, medium, low, very low).

The group discussed at length, the terms used to describe areas of migration and/or travel. It was decided that 'travel corridors', previously identified as 'migratory corridors', should be identified and ranked under the Foraging, Aggregation criteria not Uniqueness. Migration is the relatively long-distance movement of animals from one habitat to another usually on a seasonal basis and therefore local movements in the Beaufort Sea within travel corridors are typically associated with foraging not seasonal changes or large-scale population movement.

For all EBSAs, the boundaries were updated using GIS software and updated bathymetric information. During the original EBSA identification (Paulic et al. 2009), boundaries were drawn by hand and loosely followed bathymetry and physical features (when relevant). These hand-

drawn maps were then digitized in ArcGIS. Participants agreed that even if an EBSA boundary was unchanged during this process the new GIS data layer should be used for any future mapping to more accurately reflect the boundaries and the features associated with that EBSA.

A summary of the changes made to the original list of EBSAs (Paulic et al. 2009), and those EBSAs proposed in the primary working paper are provided in Table 1. However, it was agreed that the detailed information (rationale and maps) would be included in Cobb's final paper which participants agreed should be published as a CSAS Research Document. The Science Advisory Report (SAR) will include the main points discussed in the process of re-evaluating each EBSA (VEC, criteria and confidence rankings).

During the meeting each candidate EBSA proposed in the primary working paper was evaluated by the group and the final EBSAs were selected and their boundaries identified. The following are the main discussion points for each EBSA:

MACKENZIE ESTUARY AND NEARSHORE BEAUFORT SHELF

Participants agreed that the original Shallow Bay, Beluga Bay and nearshore Kugmallit Corridor EBSAs should be combined because of similarities in both the physical and chemical properties of the area and the similarities of criteria ranking for the identified VECs. The offshore boundary generally follows the 20 m depth contour and the boundary of landfast ice. The original Kugmallit Canyon EBSA was further discussed and concluded to be an independent EBSA based on several VECs that are distinct from those of the Mackenzie Estuary and Nearshore Beaufort Shelf, including high benthic diversity and function (50 m depth). Following the discussions for this group of areas, it was agreed by participants that a discussion on variation in EBSA boundaries based on ice margins and a cautionary paragraph on cross-shelf advection of water masses should be included in the final Research Document.

There was also some discussion on the characteristics of land-fast versus grounded ice. Participants agreed that definitions of ice features should be included in a glossary in the SAR.

With the new EBSA boundaries for the Mackenzie Estuary and Nearshore Beaufort Shelf EBSA, participants agreed that the criteria previously identified for Beluga (aggregation, foraging) should be changed to aggregation, seasonal refugia; since Beluga are often found to have empty stomachs within this area. Ice scours were added as a defining feature of the EBSA relative to the rest of the Shelf, which could drive benthic community structure and seasonality. It was also noted that underwater pingos are a unique feature in the area, but with unknown biological importance. Arctic Cod were removed as a VEC since they are widely dispersed across the Shelf.

BEAUFORT SHELF BREAK AND SLOPE

There was consensus by participants to combine the Beaufort Shelf Break and Shelf Slope EBSAs, originally separated in the primary working paper, due to a lack of distinction in biological importance between the two areas. Participants based their decision on the physical oceanographic properties and new unpublished survey data that suggests that these shelf and slope habitats are not different with respect to the fish communities.

Table 1. Summary of the changes made during the November 2012 advisory meeting to the original, existing list of EBSAs (Paulic et al. 2009). * denotes when revision to the boundaries were made but no significant changes were made to the rationale for the EBSA.

Original EBSA (Paulic et al. 2009)	New EBSA
Herschel Island/Yukon North Slope	Yukon North Slope*
Mackenzie Trough	Mackenzie Trough*
Shallow Bay	Mackenzie Estuary and Nearshore Beaufort Shelf
Beluga Bay	
Kugmallit Corridor (nearshore portion)	
Beaufort Shelf Break	Beaufort Shelf Break and Slope*
Kugmallit Corridor (offshore portion)	Kugmallit Canyon
Husky Lakes	Husky Lakes
Liverpool Bay (northeastern portion)	Cape Bathurst/Ballie Island
Cape Bathurst Polynya	
Liverpool Bay (southern portion)	Liverpool Bay*
Horton River	Horton River*
Cape Bathurst Polynya	Cape Bathurst Polynya*
Thesiger Bay (southern portion)	
Banks Island Flaw Lead	Western Banks Island
Thesiger Bay (Sachs Harbour)	
De Salis Bay	De Salis Bay*
Walker Bay	Diamond Jenness
Albert Islands/Safety Channel	
Minto Inlet	
Kagloryuak River	
Pearce Point	Southern Amundsen Gulf
Hornaday River	Darnley Bay Nearshore Migration and Feeding Corridor (DFO 2011b)
Viscount Melville Sound	Viscount Melville Sound*
	Arctic Basin Multi-year Pack Ice (DFO 2011c)
	Archipelago Multi-year Pack Ice (DFO 2011c)

HUSKY LAKES

The original justification for identifying the Husky Lakes EBSA was reiterated during the meeting, including the rarely observed physiological plasticity of some fish species (e.g., Lake Trout, Arctic Grayling). The boundary for the Husky Lakes EBSA was adjusted to include the southernmost basin (Basin 1) due to the importance of the area to freshwater salmonids in the lower region. Beluga were removed from the Uniqueness criteria since Beluga in the Husky Lakes are not considered to contribute significantly to Beluga population dynamics and there is actually an intervention program to keep Beluga out of Husky Lakes.

LIVERPOOL BAY

Participants agreed to move the boundaries of the Liverpool Bay EBSA south to meet up with the Husky Lakes EBSA to include fish spawning areas (e.g., Lake Trout, Pacific Herring). The importance of kelp beds in Liverpool Bay was not ranked because of insufficient data. Marine fishes were removed as a VEC and replaced with Saffron Cod and Pacific Herring.

HORTON RIVER

This EBSA was originally identified based on the importance of the freshwater corridor to Arctic Char. Participants agreed that upwelling was not a unique feature for this EBSA and was removed as rationale.

SOUTHERN AMUNDSEN GULF

The Southern Amundsen Gulf EBSA is a new EBSA. Franklin Bay was proposed as a candidate EBSA for discussion during the meeting in the primary working paper. At the time of writing the working paper, Franklin Bay was assumed to be a winter refuge for large under-ice aggregations of Arctic Cod, since it was the first and only place where dense cod aggregations were observed in the LOMA. New unpublished survey data now suggests that Arctic Cod are associated with the halocline across broader spatial scales and therefore the Franklin Bay EBSA was not accepted by meeting participants.

Instead of listing Franklin Bay as an individual EBSA, participants decided to combine the unique and important features of northern Franklin Bay with those of the Cape Parry Offshore Marine Feeding Habitat and the Darnley Bay Offshore Ice-edge Habitat (DFO 2011b). Franklin Bay is considered to be unique in the LOMA because the landfast ice-edge persists longer than any other across the rest of the Canadian Beaufort due to its alignment with prevailing winds. It was suggested that since land-fast ice comprises ~5% of total sea ice within the entire LOMA, all land-fast ice could be considered unique, however this was not accepted, although it may be considered in any future EBSA exercise.

Participants agreed that mapping the boundaries of this EBSA would require more information from the Canadian Ice Service to better define the buffer around the ice-edge; however, the boundaries for Cape Parry and northern Darnley Bay that were agreed to in the meeting evaluating the area of interest for MPA development (2011b) would remain. There was some discussion that haul-out data may not be the best measure of seal breeding areas, and that other useful proxies may also be important (e.g., Polar Bear kill sites). One participant noted that a 2013 publication of the Inuvialuit Polar Bear Traditional Knowledge Study would include mapping features that support Polar Bear habitat would contribute relevant information to this EBSA.

DARNLEY BAY NEARSHORE MIGRATION AND FEEDING CORRIDOR

This EBSA was originally referred to as the Hornaday River EBSA (Paulic et al. 2009), however, following scientific advice for marine protection related to MPA development in this area, the EBSA boundaries were updated and redefined (DFO 2011b). Participants agreed that the boundaries and name for the area identified in the DFO (2011b) publication should be accepted as the EBSA for the Beaufort Sea. There was some discussion about the seasonal variability and dynamics of the Hornaday River plume.

Participants reviewed the original EBSA criteria table and made some further refinements. Capelin were removed from the Aggregation criteria since the only evidence of Capelin within the EBSA is from presence/absence data from Arctic Char stomach contents. Additionally, a recent coastal survey near Paulatuk suggested that Capelin are found in low abundance and further west than originally suspected.

DE SALIS BAY

There was a discussion that there was 'low' data confidence in the information used to originally define this EBSA. The information was based on historical local use of the area for harvesting Beluga, Arctic Char and Bowhead Whale from schooners. There was a discussion that continued human use over long time periods may be a metric of productivity rather than a human value. It was suggested that the number of people using the area would indicate data quality in this layer, which is based solely on TEK. Upwelling is assumed to be important here, but only inferred from animal occurrences. No new information for the area, Participants agreed that there was no new information, with which to change the original assessment.

THESIGER BAY

The Chair explained that participants may wish to further define the boundaries of the Thesiger Bay EBSA, which was previously defined based on LEK/TEK. It was also noted that some bias may exist in the original rationale for this EBSA since it was defined by local resource users. Not all users were present at the original meeting to identify the EBSA. There was a question about how human use, which may be based on proximity to the community rather than on EBSA criteria, (e.g., aggregations of marine mammals), may bias the Uniqueness and Aggregation criteria in this area. The original VECs identified for this EBSA are dependent on the fast ice edge and therefore the Thesiger Bay EBSA was removed and the features/VECs were incorporated within the Cape Bathurst Polynya EBSA. There was some discussion on combining the Cape Bathurst Polynya and Cape Bathurst / Baillie Island EBSAs, but these were kept separate based on several defining features.

DIAMOND JENNESS

No additional research was conducted in this area of the LOMA. Participants decided to combine the Walker Bay, Minto Inlet/Kuujjua River, Albert Islands/Safety Channel and Kagloryuak River EBSAs based on the rationale that Arctic Char, the defining VEC in these EBSAs use the entire coastline for feeding. It was also noted that the secondary rationale for these EBSAs was Ringed Seal breeding habitat within the bays. Based on these features the boundary for the new EBSA was refined.

VISCOUNT MELVILLE SOUND

Bowhead Whale were removed from the Aggregation criterion as only two animals were recently tracked in this area.

WESTERN BANKS ISLAND

After a short discussion participants agreed to extent this EBSA boundary to the western shoreline of Bank's Island in order to include Polar Bears and Sea Birds as VECs. Subsequently, the name was changed from 'Banks Island Flaw Lead' to 'Western Banks Island'.

CAPE BATHURST POLYNIA

Participants were asked to help further define the boundary of this Cape Bathurst Polynya, the only large polynya in the LOMA, which is highly variable inter-annually. Participants worked to refine these boundaries by adding a seasonal component to the VECs.

CAPE BATHURST / BALLIE ISLAND

There was some discussion regarding the seasonal nature and biological significance of upwelling in this EBSA. Participants discussed at length the physical oceanography of the area and upwelling events. Given the significance of the oceanography and the general issue with defining the absolute boundaries, participants decided to ascribe seasonal information to each VEC, where data exist. For example, the Bowhead Whale VEC is a biological feature that exists in summer within the EBSA; while Sea birds and Sea ducks are spring VECs (staging and feeding) and benthos do not show seasonality within the EBSA.

Based on this discussion, it was decided that a new EBSA would need to be identified west of the Cape Bathurst/Ballie Island EBSA. The new EBSA would include the Kugmallit Canyon.

MULTI-YEAR PACK ICE EBSAs

During the Arctic EBSA identification process conducted in 2011 (DFO 2011c), participants identified two EBSAs with boundaries that extend into the Beaufort Sea LOMA. The Arctic Basin and Archipelago Multi-year Pack Ice EBSAs (DFO 2011c) were identified for the presence of unique structural and physical multi-year pack ice and ice-edge habitat, and the associated Beaufort Gyre (within the Arctic Basin). There was a suggestion to change the term 'multi-year ice' to 'thick ice' to give the feature more longevity if multi-year pack ice disappeared with climate warming, but there was no consensus on this. The group agreed to include this as a new EBSA and to populate the EBSA Criteria table with the Arctic EBSA data from DFO (2011c). It was suggested to extend the boundary of the Arctic Basin Multi-year Pack Ice EBSA further south to Sachs Harbour. There was a lengthy discussion about the southern boundary but no consensus was reached so the southern boundary remains unchanged from the DFO (2011c).

There was a lengthy discussion on the variable nature of the EBSA boundaries based on multi-year pack ice because the sea-ice feature is highly variable both inter-annually and seasonally. Participants discussed options for dealing with EBSA boundaries that are temporally variable, such as delineating boundaries based on flexible definitions (e.g., confidence limits such as the 30 year mean), rather than on inflexible integer values, such as bathymetric lines or geographic areas. These types of analysis would be needed in order to further refine these EBSA boundaries.

PRINCE OF WALES STRAIT

It was suggested in the primary working paper that participants should consider adding the Prince of Wales Strait as a new EBSA. After discussion, participants decided that although the area is used by marine mammals (e.g., Beluga, seals) as a travel corridor, it would not be added as an EBSA due to insufficient data. Often physical oceanographic properties are used to support biological evidence to justify an EBSA, and that while there are some interesting

features in the Prince of Wales Strait (e.g., tidal mixing) the biological consequences of these physical features are unknown.

SPECIAL NOTE ON EBSA BOUNDARIES FOR ARCTIC CHAR

By convention, the 20 m depth contour was used to define boundaries for EBSAs based on criterion related to Arctic Char. There was some discussion on the possibility of ordering the rivers containing Arctic Char by priority, and then ranking their relative importance within the LOMA (e.g., the West Coast salmon stock ranking process was referenced here). There were questions as to whether every char river should be included as an EBSA. Another suggestion was to apply a buffer (perhaps the 20 m contour) and define the entire LOMA coastline as an EBSA, then divide the coastline into different management zones based on specific conservation objectives. This suggestion was based on the rationale that high biological diversity occurs near the shoreline, that almost 80% of the coastline within the LOMA has been incorporated within an EBSA, and that it is highly likely that the additional ~20% was not included due to lack of TEK or scientific data. There was some agreement amongst participants on the importance of the coastline, but concern about its usefulness for management purposes. Additionally, it is unprecedented to consider all coastal areas as significant within DFO EBSAs. No consensus was reached during this meeting as to how to address this issue.

DRAFTING OF THE SCIENCE ADVISORY REPORT

The Chair drafted key points to include in the Science Advisory Report (SAR) and reviewed them with the group. Participants contributed additional information and a draft outline was produced during the meeting. The information and level of detail to include in the SAR were discussed. It was agreed that the SAR should provide only concise summary information useful to managers, whereas the detailed scientific background, the new data brought forward and the additional discussion points should be reserved for the Research Document. Participants also agreed that the Proceedings would outline the changes made to the original EBSAs identified in Paulic et al. (2009).

Meeting participants were also asked to review the changes made to the EBSA boundaries during the meeting. The final GIS shape file for the Beaufort Sea EBSAs and the associated metadata will be produced during the drafting of the SAR. Participants agreed that a single map of EBSAs should be included in the SAR and each individual EBSA should be presented in the accompanying Research Document.

OTHER CONSIDERATIONS

Follow-up is required regarding the production and storage of the more detailed EBSA data layers. These maps will contain the biological and ecological data layers that were used to assist in the identification of the EBSAs. Participants agreed that this information would take time to collect and produce and therefore will not be presented within the products of this meeting, rather a future DFO Technical Report.

Conservation objectives were not fully discussed during the meeting and are not included in the reports being produced from the meeting. Evaluation of conservation objectives will need to be undertaken in the future.

At the onset of the meeting, participants were provided two working papers (Cobb and Roy et al.). Information and data from the paper presented by Roy et al. focused exclusively on the benthic features within the LOMA. Meeting participants decided that this paper should be incorporated with the primary working paper by Cobb and published as one Research Document.

During the meeting a number of comments and concerns were expressed over terminology used during the meeting and in the meeting products. It was agreed by participants to include a Glossary section in the SAR and the final Research Document.

Finally, participants questioned whether any follow-up community consultations were planned by the DFO Oceans Program to communicate the revised EBSAs for the Beaufort Sea. The DFO Oceans Program does plan to organize and communicate this information in a future tour.

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- Cobb, D., Fast, H., Papst, M.H., Rosenberg, D., Rutherford, R., and Sareault, J.E. (ed.). 2008. [Beaufort Sea Large Ocean Management Area: Ecosystem Overview and Assessment Report](#). Can. Tech. Rep. Fish. Aquat. Sci. 2780: ix + 188 p.
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APPENDIX 1: LIST OF PARTICIPANTS

Name	Affiliation
Burton Ayles	Fisheries Joint Management Committee
Leah Brown	Fisheries and Oceans Canada – Oceans
Don Cobb	Consultant
Ryan Galley	University of Manitoba
Lois Harwood*	Fisheries and Oceans Canada – Science
Kim Howland	Fisheries and Oceans Canada – Science
Ben Kissinger	Fisheries and Oceans Canada – Science
Lisa Loseto	Fisheries and Oceans Canada – Science
Brittany Lynn	Fisheries and Oceans Canada – Science
Shannon MacPhee (Rapporteur)	Fisheries and Oceans Canada – Science
Andy Majewski	Fisheries and Oceans Canada – Science
Francine Mercier	Parks Canada Agency
CJ Mundy	University of Manitoba
Joclyn Paulic (Chair)	Fisheries and Oceans Canada – Science
Louie Porta	Oceans North
Jim Reist*	Fisheries and Oceans Canada – Science
Pierre Richard	Fisheries and Oceans Canada – Science
Evan Richardson*	Environment Canada
Virginie Roy*	University of Quebec
Dan Slavik	World Wildlife Fund
Wojciech Walkusz	Fisheries and Oceans Canada – Science
Bill Williams	Fisheries and Oceans Canada – Science

*Participated as reviewers but were not able to attend the meeting.

APPENDIX 2: TERMS OF REFERENCE

Re-evaluation of Ecologically and Biologically Significant Areas (EBSAs) in the Beaufort Sea

Regional Peer Review – Central and Arctic Region

November 20-22, 2012

Winnipeg, MB

Chairperson: Joclyn Paulic

Context

The identification of Ecologically and Biologically Significant Areas (EBSAs) in the Canadian Arctic is an important step towards a more comprehensive management approach for the marine environment. Properly identified, knowledge-based EBSAs will address a variety of Federal Government commitments (e.g., Arctic Council, Marine Protected Areas Network) and will also provide guidance for a number of regional planning initiatives (e.g., Marine Protected Areas). The Beaufort Sea Large Ocean Management Area (LOMA) Ecosystem Overview and Assessment Report was published in 2008 (Cobb et al. 2008) and contained the results of a series of workshops to identify EBSAs in the Beaufort Sea based on a 2005 literature review. Many of the EBSAs identified were considered data deficient. Since then, new information from government and academic research has been published and the process that Fisheries and Oceans Canada (DFO) uses to identify EBSAs has evolved. DFO Science has been asked by DFO Ocean's program (under the request of the Beaufort Sea Partnership, Ecosystem Working Group) to re-evaluate current EBSAs in the Beaufort Sea LOMA.

Objectives

The objectives of this meeting are to re-evaluate the current EBSAs in the Beaufort Sea LOMA following DFO (2004) based on new information and if necessary revise the list of EBSAs. Additional meeting objectives are to:

- a) review current EBSA boundaries and modify if necessary,
- b) review the geospatial layers used to identify and define each EBSA, and
- c) formulate the corresponding conservation objective(s) for each EBSA.

Expected Publications

- Science Advisory Report
- Proceedings
- Research Document

Participation

- Fisheries and Oceans Canada (DFO) (Ecosystems and Oceans Science, and Ecosystems and Fisheries Management sectors)
- Environment Canada
- Fisheries Joint Management Committee
- Academia
- Other invited experts

References

- Cobb, D., H. Fast, M.H. Papst, D. Rosenberg, R. Rutherford., and J.E. Sareault (Editors). 2008. Beaufort Sea Large Ocean Management Area: Ecosystem Overview and Assessment Report. Can. Tech. Rep. Fish. Aquat. Sci. 2780: ii-ix + 188 p.
- DFO. 2004. Identification of Ecologically and Biologically Significant Areas. DFO Can. Sci. Advis. Sec. Ecosystem Status Rep. 2004/006.

APPENDIX 3: MEETING AGENDA

Re-evaluation of Ecologically and Biologically Significant Areas (EBSAs) in the Beaufort Sea

Central and Arctic Regional Advisory Meeting

November 20-22, 2012

Large Seminar Room

Freshwater Institute

Winnipeg, MB

Chair: Joclyn Paulic

DAY 1

- 1:00 Welcome & Introductions
- 1:15 Review Meeting Terms of Reference and Agenda – Joclyn Paulic
- 1:30 Overview of Main Working Paper – Don Cobb
- 2:00 Open Discussion on the Methods used to Identify EBSAs
- 2:30 – 2:45 Coffee
- 2:45 Cape Parry Offshore Marine Feeding Habitat
- 3:00 Darnley Bay Nearshore Migration and Feeding Corridor
- 3:15 Darnley Bay Offshore Ice-edge Habitat
- 3:30 Yukon North Slope
- 3:45 Mackenzie Trough
- 4:00 Mackenzie Estuary/Nearshore/Beaufort Shelf
- 4:15 Summary and Concluding Remarks
- 4:30 Day 1 Adjourns

DAY 2

- 9:00 Opening Remarks and Recap of Day 1 – Joclyn Paulic
- 9:15 Beaufort Shelf Break/Slope
- 9:45 Husky Lakes
- 10:00 Liverpool Bay
- 10:15 Cape Bathurst/Amundsen Gulf/Horton River/Franklin Bay
- 10:30 – 10:45 Coffee
- 10:45 Continued Discussion
- 11:30 – 12:30 Lunch (not provided)
- 12:30 Banks Island Flaw Lead
- 12:45 Thesiger Bay
- 1:00 De Salis Bay
- 1:15 Walker Bay

1:30 Minto Inlet
2:00 Albert Islands/Safety Channel
2:15 Kagloryuak River
2:30 Viscount Melville
2:45 – 3:00 Coffee
3:00 Arctic Basin/Beaufort Gyre
4:15 Summary and Concluding Remarks
4:30 Day 2 Adjourns

DAY 3

9:00 Opening Remarks and Recap of Day 2 – Joclyn Paulic
9:15 Review of Draft SAR
10:30 – 10:45 Coffee
10:45 Review of Draft SAR
12:00 Closing Remarks – Joclyn Paulic

APPENDIX 4: SYSTEM FOR RANKING DATA CONFIDENCE

Data Confidence	Description
Very Low	Little or no scientific information; no supporting data
Low	Limited scientific information; circumstantial evidence
Moderate	Moderate level of scientific information; first hand, unsystematic observations
High	Substantial scientific information; expert opinion
Very High	Extensive scientific/systematic information; peer-reviewed data sources/information
