



Development of an integrated fisheries co-management framework for new and emerging commercial fisheries in the Canadian Beaufort Sea

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ABSTRACT

The Canadian Beaufort Sea is one of the last places on Earth that has not experienced large-scale commercial fisheries. The aboriginal people of the western Canadian Arctic, the Inuvialuit, have become increasingly concerned about the potential effects of large-scale commercial operations on key subsistence species of fish and marine mammals and the marine ecosystem upon which they depend. A 1984 comprehensive land settlement agreement (treaty) between Canada and the Inuvialuit established a co-management regime for limited aspects of fish and marine mammal resource management, and gave the Inuvialuit rights to subsistence fisheries and existing commercial fisheries but no preference for new commercial fisheries. The Fisheries Joint Management Committee (the fisheries co-management body), the Canada Department of Fisheries and Oceans, the Inuvialuit Regional Corporation and the Inuvialuit Game Council have developed an integrated fisheries management framework agreement for the review and assessment of any proposed commercial fisheries within the Canadian Beaufort Sea. The agreement provides clarity and transparency for decision making and strengthens the protection of fish stocks. The development of the framework depended upon a history of cooperation between the parties and a bridging initiative by the Fisheries Joint Management Committee and an NGO that brought together the Inuvialuit and the government.

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1. Introduction

The Canadian Beaufort Sea is one of the last marine areas on earth that has not experienced large-scale commercial fisheries. The Beaufort Sea is located north of the mainland Northwest Territories and Yukon Territory west of the Canadian Arctic Archipelago and east of the Canada Basin, a deep oceanic basin within the Arctic Ocean. It extends approximately 750 km east from the Canada/Alaska border, past the Delta of the Mackenzie River, the largest Arctic river in North America, and, for this discussion, to the eastern boundary of the Amundsen Gulf. The area is characterized by a harsh climate [1]. The sea is ice-covered for much of the year but recently the ice-free period of summer is expanding due to climate warming [2]. Prior to European contact the aboriginal people of the area, the Inuvialuit, were among the

most prosperous people in the Arctic because of their access to marine and freshwater resources. They made use of, and continue to make use of beluga (*Delphinapterus leucas*) and bowhead whales (*Balaena mysticetus*), ringed seals (*Pusa hispida*) and anadromous Arctic char (*Salvelinus alpinus*) and Dolly Varden char (*Salvelinus malma*) as well as land mammals, birds and freshwater fishes [3–5]. In 1984 the Inuvialuit and the Government of Canada signed a modern comprehensive land settlement agreement, the Inuvialuit Final Agreement (IFA) [6], which gives the Inuvialuit increased control of their own destiny, including increased control over the fisheries and fish and marine mammal resources.

The Inuvialuit Settlement Region (ISR) has six permanent communities directly on the shores of the Beaufort Sea, and in the Mackenzie River delta. The population is small, less than 5500, and provision of municipal and government services is a major economic factor for all communities [7]. Oil and gas exploration on land and offshore was important in the 1970 s and 1980 s and then again in the 2000 s but is currently mostly inactive [8]. Commercial fisheries are very small and limited to anadromous char for

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local sales, but in the first decade of this century there were several expressions of interest in nearshore marine fisheries opportunities from fishers from southern Canada.

In recent years the Inuvialuit have become increasingly concerned about the potential effects of large-scale commercial fisheries operations on key subsistence species and the marine ecosystem. Prior to the IFA, fisheries were managed exclusively by the federal government's Department of Fisheries and Oceans (DFO). The IFA established a co-management regime, with the new Fisheries Joint Management Committee (FJMC) responsible for specified aspects of fisheries management in collaboration with the DFO and the Inuvialuit [6]. There are many different definitions of co-management. In the Canadian north it is a long-term management structure, established by treaty or land settlement agreement, which permits aboriginal people to share management responsibility with government for a specific system of natural resources. Co-management relationships in the Canadian Arctic are diverse. A particular role for the FJMC and other co-management organizations is that of a bridging or boundary organization linking different stakeholder groups in a wide range of activities [9]. These bridging, co-management organizations deal with a range of issues, and the networking that they lead helps address conflicts, builds trust, helps access resources and helps develop common goals and processes [9]. In the endeavour described in this paper the FJMC, working with an NGO, served as a bridge between Inuvialuit organizations and fishers, and the federal government to develop a framework for commercial fisheries management decision-making in the Beaufort Sea.

This paper describes and assesses the process undertaken by FJMC, the DFO, the Inuvialuit Regional Corporation (IRC) and the Inuvialuit Game Council (IGC) to develop a precautionary integrated fisheries management agreement that provides an innovative co-management framework for making decisions on any proposed commercial fisheries within the Canadian Beaufort Sea. It considers the current governance processes for fisheries management in the ISR, the changes over the past two decades in Inuvialuit attitudes to large scale commercial fisheries development, the history of engagement between the Inuvialuit, DFO and the FJMC on a range of fisheries and environmental issues, the legal and environmental context for a fisheries agreement, the new "decision key process", and implications for emerging fisheries in the Canadian Beaufort Sea and elsewhere. Throughout the description of the process we address the bridging role of the FJMC and its NGO partner, Oceans North Canada, and emphasize the roles that were crucial for this framework and may be of importance for similar developments elsewhere.

2. Fisheries management in the ISR

2.1. Fisheries management in Canada

In Canada the DFO has constitutional authority for sea, coastal, and inland fisheries. DFO exercises this authority through the *Fisheries Act* [10], ² *Oceans Act* [11], and the *Species at Risk Act* (SARA) [12], and their supporting regulations and policies.

The DFO's policies under the *Fisheries Act* are most relevant to the development of commercial fisheries in the Beaufort Sea. The Sustainable Fisheries Framework has four main elements: (1) conservation and sustainable use policies, (2) economic

policies, (3) governance policies and principles, and (4) planning and monitoring tools. Currently the Framework has seven conservation and sustainable use policies. It is generally implemented through Integrated Fisheries Management Plans (IFMPs) [13]. Two other policies are also relevant for the Beaufort Sea: the New Emerging Fisheries Policy and the Integrated Aboriginal Policy Framework. The New Emerging Fisheries Policy generally guides the development of new commercial fisheries through three stages: feasibility, exploratory, and commercial. The Integrated Aboriginal Policy Framework provides guidance to DFO employees in building respectful and mutually beneficial relations with Aboriginal groups. Its goals include enhancing involvement of Aboriginal groups in fishery management decision-making processes using a shared stewardship model, and continuing to manage fisheries consistent with the constitutional protection provided to Aboriginal and treaty rights by the *Constitution Act* and the *Fisheries Act* (see Section 4.1 below for elaboration for the ISR).

The *Oceans Act* enables the Minister of Fisheries and Oceans to lead and facilitate the development and implementation of plans for the integrated management of all activities or measures in or affecting estuaries, coastal waters, and marine waters. These actions are to be in collaboration with bodies established under land claims agreements. In the Beaufort Sea an Integrated Oceans Management Plan and a Marine Protected Area (MPA) have been established, a second MPA is near completion, and Ecological and Biologically Sensitive Areas (EBSAs) have been identified [14].

The SARA was enacted to prevent Canadian species, subspecies and populations from becoming extirpated or extinct, to provide for the recovery of endangered species, and to encourage the management of species to prevent them from becoming at risk. Under the *Act* species recovery strategies are mandated for endangered, threatened and extirpated species, and any such strategy must be prepared in cooperation with the relevant management board as established by a land claims agreement. In the Canadian Beaufort Sea the northern form of Dolly Varden, northern wolffish (*Anarhichas denticulatus*), the bowhead whale, and grey whale populations (*Eschrichtius robustus*) are listed in the species at risk public registry [15].

2.2. Fisheries co-management in the ISR

Fisheries in the Canadian Beaufort Sea are jointly managed by the Inuvialuit and the Government of Canada (DFO) through the FJMC co-management body. This co-management process was established through the IFA [6,16]. The IFA is built around Inuvialuit culture, rights and resources. Its goals are as follows:

- To preserve Inuvialuit cultural identity and values.
- To enable Inuvialuit to be equal and meaningful participants in the economy and society.
- To protect and preserve Arctic wildlife environment and productivity.

In the IFA the Inuvialuit gave up exclusive rights to their ancestral lands in exchange for guaranteed rights related to lands, money and wildlife (including fish). They also secured hunting and harvesting rights and the right to become part of wildlife management teams with the government.

The IFA led to the establishment of the Inuvialuit Regional Corporation (IRC) [17] that manages the rights and benefits arising from the agreement, the Inuvialuit Game Council (IGC) that represents the collective Inuvialuit interest in respect to wildlife, and five resource co-management boards [7,17]. The responsibilities of these boards are close to the more complete versions of co-management along the gradient of co-management from informing

² Section 91 of the Constitution Act (1982) defines the constitutional authority for fisheries as such: "the exclusive legislative authority of the Parliament of Canada extends to ...sea coast and inland fisheries..." Provincial governments may also exercise various responsibilities for the fishing industry based on their overall constitutional responsibilities for private property.

and consulting to community control and self-management [18], i.e. they are not just about informing, they are about true partnership and joint action.

The FJMC is the resource co-management board established under the IFA to co-manage fish and marine mammals in the ISR [19]. It also has assumed the lead for participation in actions under the *Oceans Act* and the *SARA*. Two members are appointed to the FJMC by Canada (the Minister of Fisheries and Oceans) and two members by the Inuvialuit (the IGC), and an independent chair is selected by the four appointed members. The FJMC reports to the Minister of Fisheries and Oceans. It has decision making roles, e.g. allocating subsistence quotas among communities and regulating fisheries on Inuvialuit lands, advising and recommending roles, e.g. on commercial fishing, research and environmental protection, and operational roles, e.g. conducting harvest assessments and coordinating between government agencies and Inuvialuit communities. The six community Hunters and Trappers Committees (HTCs) established under the IFA have responsibilities to sub-allocate community quotas of fish and marine mammals and to make local harvest by-laws.

The FJMC and its partners are well established organizations with a mutual history of cooperation on a range of fisheries-related issues from joint workshops on science and TEK, to harvest and environmental monitoring to the establishment of community conservation plans and marine protected areas. Considering criteria such as degree of trust, number of linkages, power sharing and use of knowledge amongst others, the relationship between the FJMC, DFO, the IGC and HTCs generally meets the criteria for a “mature stage” co-management relationship [20]. This is not meant to imply that the partners agree on all issues but in the long run relationships are generally effective and harmonious.

3. Prelude to the framework

Inuvialuit and co-management agencies and their relationships with governments and others evolved and matured after the signing of the IFA as did the attitudes and approaches of government personnel. Considered in this section are two broad changes that facilitated planning for commercial fisheries in the Canadian Beaufort Sea. First, the Inuvialuit's, governments' and co-managers' beliefs of the positive role that commercial fisheries might have for economic development in the ISR changed to skepticism and concern that only small local benefits and long term impacts on culturally important marine mammals and anadromous fish stocks might occur. Second the new institutional and operational mechanisms and practices between governments, co-managers and the Inuvialuit, and these were added to following the approval of the *Oceans Act*. These institutional and operational changes helped to build social capital, foster cross scale interactions and build trust amongst the parties, as well as formalize aspects of ocean and coastal social, economic and environmental planning.

3.1. Evolution of attitudes to commercial fisheries

The history of commercial fisheries in the Beaufort Sea has not been positive [21]. In 1889 American commercial whalers pursuing bowhead whales first arrived in the Canadian Beaufort Sea. By 1910 stocks were near extinction and whaling had ended. Inuvialuit were particularly disgusted that primarily the baleen was used and oil and meat were often discarded. It was not until 1989 that hunters from the ISR (community of Aklavik) were able to harvest a bowhead whale again. More recently outside interests continue to have a negative effect. The large population of ringed seals continues to be used for subsistence purposes but European

bans on seal pelts have destroyed small scale commercial sealing across the Canadian Arctic.

Beginning in the 1960s and through the 1970s and 1980s, the Government of the Northwest Territories (GNWT) and DFO saw commercial fisheries development as a potential driver of regional economic development in the North. Governments organized several attempts at developing fisheries (for char, Pacific Herring (*Clupea pallasii*), whitefish (*Corgonus* spp.) and invertebrates). The fisheries failed operationally and economically and, in the case of the anadromous char and whitefish, they encouraged over-fishing which devastated the populations some of which have still not returned to historical levels. None of these commercial ventures were sustained [21].

Following the signing of the IFA, local fishers recognized that they had enhanced control over resource development and asked the FJMC to assess opportunities for fishery development in the Canadian Beaufort Sea-Amundsen Gulf. None of the assessments were encouraging [22]. Nevertheless, following discussions between the FJMC and DFO and recognizing the increased interest in the potential for commercial fishery development the ISR, in 2002 DFO proposed the development of a Memorandum of Understanding (MOU) involving DFO, the FJMC, the GNWT and the Government of Yukon. Until an agreement was in place DFO committed that a successful application would have to meet DFO's policies on promoting Aboriginal participation in new fisheries and that “any exploratory or emerging fishery in the Beaufort Sea must involve proper representation of the Inuvialuit” [21]. However, the GNWT and the Government of Yukon had little interest in fisheries development at that time and there were no further discussions.

From 2002 to 2009 there was interest from entrepreneurs from outside the ISR in developing new large-scale commercial fisheries in the Canadian Beaufort Sea. There was at least one exploratory licence application each year and exploratory commercial fishing took place on two occasions, but with limited success. These commercial exploratory fishing ventures were attempting to locate stocks large enough to establish new commercial quotas for the Canadian Beaufort Sea. Target species were cod (mainly *Boreogadus saida*), crab, shrimp (*Pandalus* spp), prawn and halibut/turbot (*Reinhardtius hippoglossoides*).

In the middle years of the decade with better understanding of the Beaufort Sea ecosystem, frequent media reports of climate change and the possibility of a more ice free Arctic Ocean, and greater evidence of over-harvesting of fish stocks throughout the world's oceans, attitudes of Inuvialuit fishers and managers began to change. This view was supported at a national conference on coastal zone management in the ISR community of Tuktoyaktuk at which the Inuvialuit expressed an interest in a commercial fishery only if it did not affect the food chain of beluga whales, and the FJMC raised the possibility of a marine reserve to ensure protection of existing species for subsistence purposes [23]. One telling event was the participation of an Inuvialuit representative to the 2008 International Union on the Conservation of Nature in Barcelona at which he viewed a world map of over-fishing. He observed to the IGC “Every place in the world had red pins indicating over-fishing except the Arctic. We don't want that here!”.

3.2. Institutional and operational changes

A number of national and regional institutional changes in the late 1990s and the first decade of this century facilitated new considerations of the best approach to fisheries development in the Canadian Beaufort Sea and of what kind of fishing might be acceptable. Institutional factors flowing from the IFA were the goals of the IFA, and the terms of reference for the FJMC, the IGC,

HTCs and IRC all of which necessitate collaboration between the Inuvialuit and government. The FJMC also established a number of practices which bridge between the communities and the government. The practices include, amongst others: planning sessions, project coordination initiatives and workshops jointly organized by the FJMC, DFO and the Inuvialuit; meetings with HTCs and communities that often involved DFO staff; development of community subsistence harvest plans; government/community harvest and environmental monitoring; joint DFO-community projects at the working level facilitated by the FJMC; and regular meetings between the FJMC and DFO regional personnel to discuss research and management priorities and funding. The FJMC Chair meets with the IGC at least twice annually to discuss common issues, and the full FJMC meets periodically with the Minister of Oceans to identify priorities, opportunities and concerns, both additional examples of the FJMC's role as an organization bridging between the two different social worlds of government operations and aboriginal communities and accountable to each [24].

The *Oceans Act* also changed the relationship between the FJMC, the DFO and the Inuvialuit. The *Act* gave the DFO the lead for development and implementation of a national strategy for the management of estuarine, coastal and marine ecosystems [11]. This led to a series of planning and coordination activities [14] including but not restricted to a national Oceans Strategy in 2002, designating the Beaufort Sea as a management area of interest or Large Ocean Management Area (LOMA), the formation of a Regional Coordination Committee (RCC) as the overarching planning body for the Beaufort Sea LOMA, and establishing the Beaufort Sea Partnership (BSP) and associated working groups as the forum for stakeholder engagement. The FJMC, the DFO, the IGC and the IRC are all active participants in the RCC. An important detail is that the RCC is co-chaired by the IRC, the IGC, and DFO. Elsewhere in Canada LOMAs are chaired solely by DFO. Working groups to address governance, economic, ecosystem, cultural and other goals bring together representatives from government, Inuvialuit, co-management, and non-government organizations to work jointly on strategies and actions to address the goals. Significant environmental planning and protection initiatives involving all the parties were the establishment of an MPA in the Mackenzie Delta [25], the designation of another area as an area of interest in Darnley Bay, a step towards an MPA, and the identification of EBSAs for the Beaufort Sea [14,26].

These institutional changes and new practices resulting from the IFA and the *Oceans Act* have helped to bridge the two worlds of the Inuvialuit communities and government. The significance of these activities for the development of fisheries management planning is that they all involve the Inuvialuit, the federal government and co-management agencies working together. This cooperative work brings together different world views, fosters trust and respect, develops horizontal and vertical links and networks, uses both science and traditional ecological knowledge and generally strengthens social capital - all factors important for collaborative planning and actions [20] with respect to fisheries management in the ISR.

3.3. External drivers

At the end of the 2000s three events brought a sense of urgency to the need for some mechanism for cooperative assessments and approvals for any applications for new commercial fisheries in the Canadian Beaufort Sea. In 2008 and 2010 the five Arctic coastal states, Canada, United States of America, Denmark, Norway and Russia, held two meetings on coordination and co-operation in general. Between 2010 and 2015 there were at least three scientific meetings between the parties to identify ongoing

Arctic research and monitoring activities, and to develop the scientific information necessary to support the development of an international agreement on fishing in the international waters of the central Arctic Ocean. Meetings of senior officials in 2010, 2013 and 2014 ultimately led to the 2015 Oslo Declaration Concerning the Prevention of Unregulated High Seas Fishing in the Central Arctic Ocean [27]. The Oslo Declaration speaks to the lack of scientific understanding of the Arctic Ocean, the evolving nature of the marine ecosystems, the importance of subsistence fishing by aboriginal groups, the control of potential commercial fishing, responsibilities to aboriginal peoples of the Arctic, and the interests of Arctic indigenous peoples in the proper management of living marine resources in the Arctic Ocean [28].

In 2009 the United States of America government [29] approved a plan (Fishery management plan for fish resources of the Arctic Management Area) to prohibit the expansion of commercial fishing in federal Arctic waters, including the US Beaufort Sea waters, until researchers gather sufficient information on fish and the Arctic marine environment to prevent adverse impacts of commercial harvesting activity on the ecosystem.

In 2010 the Canada's Standing Senate Committee of Fisheries and Oceans reported on the management of fisheries and oceans in Canada's western Arctic [30]. The FJMC had met with the Senate Committee during its hearings. The FJMC positions were reflected in the recommendations of the Senate Committee viz., that DFO, in concert with the Inuvialuit, develop an agreement to give the Inuvialuit a key role in deciding on any future commercial fishing activity in the ISR and a policy regarding commercial future fishing in the Canadian Beaufort Sea similar to the USA's Arctic Fishery Management Plan.

4. Development of the integrated fisheries management framework

In 2008 the FJMC reviewed the 2002 proposal for an MOU, and concluded it needed to prepare itself for discussions on the future management of new commercial fisheries in the ISR. This was based mainly on the realizations that climate change might well bring more outside interest in commercial fisheries opportunities in the Beaufort Sea, that attitudes were changing with respect to the local economic opportunities for commercial fisheries and the potential for conflicts with subsistence fisheries, and that there was no agreed upon framework for assessing and approving new and emerging fisheries other than DFO policies and procedures developed primarily for large commercial fisheries on the Atlantic and Pacific coasts.

The first step in the development of a plan for managing commercial fisheries in the Canadian Beaufort Seas was a series of formal and informal consultations to discuss options with the HTCs' members (DFO staff attended the meetings). These consultations took place over a two year period in 2008 and 2009. Positions, desires and understandings evolved during the process. The conclusions were that the protection of the cultural and subsistence harvests of anadromous char, whitefish, seals and whales was the overwhelming concern of the Inuvialuit, and that "Large scale commercial fishing should be prohibited in the Beaufort Sea but small-scale commercial fisheries (conducted by either ISR beneficiaries or non-beneficiaries) that are only to supply local ISR community needs may be permitted subject to review by the FJMC and the HTCs and licensed by DFO as long as they meet the proper conditions on the nature of the fishery (gear, time, nets etc.), reporting of data etc."

The second step was the gathering of the background material and development of the necessary understanding of what was necessary. For this aspect the FJMC and DFO began working

cooperatively with an NGO, Oceans North Canada.³ Jointly the FJMC and Oceans North Canada completed the following:

- Attendance at the 2009 meeting of the North Pacific Fisheries Management Council at which the U. S. A. Arctic Fisheries Management Plan was adopted.
- A summary of the history of commercial fisheries in the Beaufort Sea [21].
- Two legal perspectives on Inuvialuit rights with respect to commercial fisheries in the Beaufort Sea and beyond. One was from a lawyer who regularly works with Inuvialuit, and the other, from an academic with a special interest in Arctic aboriginal development.
- A fisheries perspective on the current understanding/knowledge of the Beaufort Sea ecosystem [31].
- A special workshop that brought together Canadian and Alaskan scientists and managers and Inuvialuit and Inupiat fishers to address science and research needs to support ecosystem based management in the Beaufort Sea [32].

The third step was communication with DFO and the Inuvialuit. Between 2008 and 2011, responding to the wishes of the HTC and the regional, national and international events, a series of informal bi-lateral meetings were held involving the Chair of the FJMC, the Director of Oceans North Canada, the Regional Director General of DFO, the Chair of the IRC and the Chair of the IGC to discuss agency positions on commercial fisheries and greater collaboration on assessing potential new fisheries.

The ultimate result of these meetings was that in April 2011, DFO, the FJMC, the IGC and the IRC (the Parties) signed an MOU to develop a Beaufort Sea Integrated Fisheries Management Framework (BSIFMF or the Framework). This MOU represented a commitment from the Parties to work together to ensure sustainable management and orderly use and development of current and future fisheries and fish stocks within the marine waters of the ISR. The parties agreed that “insufficient data currently exist to describe the size and nature of the fish populations of the Canadian Beaufort Sea”. The development of the Framework would be supervised by a Steering Committee of senior personnel from each of the four Parties. A flexible working group of individuals from the agencies and co-chaired by the DFO and FJMC was established to develop the Framework. Specialist contractors, including NGO staff, participated as observers on the working group with the specific approval of the Steering Committee.

The Framework was developed by the working group over the next two years. Regular guidance was received on the elements and directions of the document. The FJMC met with the Minister of Fisheries and Oceans in May 2012 to provide an update on the progress and in May 2014 to request Ministerial approval. The Framework was approved by all Parties in August 2014 [33].

The Framework follows DFO's general format for species/stock IFMPs [13] but with three notable modifications. First, the DFO IFMPs are management plans for established fisheries. There are currently no extant commercial fisheries in the Beaufort Sea. The BSIFMF is a proactive framework for how any new commercial fisheries would be managed by the co-managers. Second the fact that the Framework is for fisheries that would lie within a land settlement area needed to be reflected. Third the lack of scientific and traditional knowledge of fish stocks also needed to be explicitly acknowledged.

The BSIFMF is a targeted approach to achieving ecosystem-based management and compatible sustainable fisheries development.

The initial concerns were the increased interest in large-scale commercial fisheries development and conservation initiatives related to commercial fishing in the adjacent waters of the Alaskan Beaufort Sea. The Parties objectives were: “to develop a framework for the orderly and sustainable management of current and future inshore and offshore marine fish and invertebrate stocks within the Canadian Beaufort Sea and a mechanism for provision of advice and recommendations to the Minister of Fisheries and Oceans and others with responsibilities related to fisheries of the Canadian Beaufort Sea.” The Steering Committee clearly wanted to go beyond the confines of the *Fisheries Act*. The guidelines for the working group referenced co-management and cooperation between partners, the rights of the Inuvialuit under the IFA, the principles of the *Oceans Act* and the LOMA, and uncertainties because of the lack of data on fish stocks and the marine environment. The Framework situates the commercial fisheries concerns within the broader context of threats to the health and sustainability of regional fish and marine mammal habitats and stocks. The following paragraphs summarize some of the key elements of the Framework.

4.1. The legal context

A legal assessment of the responsibilities for commercial fisheries in the Beaufort Sea was important to provide clarity and certainty for the various parties. As with most organizations, individuals involved in the management of fisheries in the ISR were generally well aware of their own legislation and mandate but not so aware of the legislation and mandate of other parties or how their perceived rights and responsibilities might overlap or come into conflict. Cooperative action depends on knowing where those overlaps occur and being prepared to “negotiate” or “compromise” in order to reach a consensus. Section 2 above summarizes the responsibilities of the DFO, the FJMC and the Inuvialuit for fisheries management in the ISR (details may be found elsewhere [13,19]). This section addresses four critical areas: legislative supremacy, the FJMC's powers to make recommendations to the Minister of Fisheries and Oceans, Inuvialuit rights to new commercial fisheries, and Canada's responsibilities to the Inuvialuit with respect to international fisheries discussions.

DFO exercises its constitutional authority through the *Fisheries Act*, *Oceans Act*, *SARA*, and their supporting regulations and policies. While DFO has primary responsibility for legislation and programs with respect to fisheries and the oceans it is not the sole authority (see Section 2.1 above). The IFA is a land claim agreement within the meaning of the Canadian Constitution, and any legislation including the *Fisheries Act* and discretionary powers under that *Act* must be interpreted in light of the commitments made by Canada in the IFA. Where there is any inconsistency or conflict between the IFA and the provisions of any other law the IFA prevails to the extent of the inconsistency or conflict [34].

The IFA defines the powers of the FJMC and the relationship between the FJMC and the Minister of Fisheries and Oceans. Of great import are the FJMC's power to make recommendations to the Minister since the Minister's response has to follow the requirements of the IFA. On receiving a recommendation the Minister shall implement, vary or reject the recommendation, and if varying or rejecting the recommendation must do so within 30 days with written reasons for the decision. The FJMC may then reconsider and submit a further recommendation for a final decision. This is a much stronger power than the power to provide advice. The power to recommend covers several matters but most important for the Framework, the power covers regulations regarding sport and commercial fishing on Inuvialuit lands “as well as waters where such fishing might be prohibited”. Bankes [35] argues that the power to make recommendations on the prohibition extends to waters throughout the ISR and that the word “such” evidently

³ Oceans North Canada is a partnership led by the Pew Charitable Trusts in collaboration with Ducks Unlimited.

qualifies the word “fishing” (i.e., it covers sport and commercial fishing) and not the word “waters”. Although the point is not perfectly clear, it is significant for the FJMC when it comes to making recommendations to the Minister to protect stocks throughout the ISR especially given the supremacy of the IFA.

The general assumption of Inuvialuit fishers is that “they are our fish”. Under the IFA that is correct for subsistence fisheries and for any Inuvialuit commercial fishery that was ongoing at the time of the signing of the IFA. But the IFA is quite clear that if the Inuvialuit wish to commercially harvest fish beyond those historic harvests they shall be treated on the same basis as other applicants. Hence their preferential access to new fisheries will depend on policies of the DFO, provisions of agreements such as this Framework, and any special economic and marketing arrangements of the Inuvialuit Development Corporation for an Inuvialuit commercial fishery.

It is crucial for Canada and the Inuvialuit to understand and consider management of fishery resources in Arctic international waters. These international waters will become more accessible as sea ice retreats. A fishery in these international waters could affect Canadian Beaufort Sea ecosystem components, existing fishery resources, and abundance of Inuvialuit subsistence species. Historically, Canada has dealt with unregulated international fishing impacting domestic fisheries just outside of its EEZ. The IFA gives the FJMC and the IGC the power to advise the Government on any new international agreements that might affect Inuvialuit fisheries. Any action by Canada in relation to fisheries outside the EEZ would trigger consultation requirements. This provides additional influence to help protect Beaufort Sea fish stocks.

4.2. The environmental context

From a fishery perspective, the main features of the Canadian Beaufort Sea are: (1) marine mammal and anadromous fish stocks are of food and cultural importance for Inuvialuit; (2) limited biological information exists for most fish and marine mammal stocks; (3) harvestable surpluses have not been determined for most populations of anadromous fish, marine fish and marine invertebrates; (4) generally productivity is low compared to the Alaskan Beaufort Sea, the Chukchi Sea, the Eastern Canadian Arctic and other oceans; (5) ice covers much of the area for much or all of the year; (6) food webs are relatively simple; and (7) Arctic cod is the key link in the food web that transfers energy from lower trophic levels to top predators [31]. Sufficient scientific information and traditional knowledge exist to manage some anadromous fisheries reasonably well. However, a dearth of scientific information and traditional knowledge exists for managing any marine fishery. There has been some recent progress in understanding some of the key links in the ecosystem, in particular the role of Arctic cod [36–39], but there is a lack of information on stock size, surplus biomass available for harvesting, and the effects of harvesting fish stocks on other components of the ecosystem.

The long-term health of regional fishery resources may be affected by one or more of the following ecosystem level stressors: (1) commercial fishing, (2) oil and gas development, (3) shipping, (4) aquatic invasive species, (5) contaminants, and (6) other climate change related stressors. Of particular concern is the effect new fisheries could have on Arctic cod, and thus on beluga whales, ringed seal, and Arctic char [33].

4.3. The decision key

A major feature of the management approach in the BSIFMF is the use of a decision key to assess proposals for new commercial fisheries and to recommend their acceptance, rejection or revision. A decision key is a decision-support tool commonly used in

operations research, and parallels traditional taxonomic keys. A decision key is simple to understand and interpret, provides explicit rules for decision-making, is easy to explain to partners and other stakeholders, and should help clarify for applicants the requirements and the process.

The decision key in the BSIFMF presents the steps to be used in assessing any application for a new commercial fishery in the Canadian Beaufort Sea. It assesses an application against a series of questions that represent the concerns, interests and responsibilities of the Parties for conservation and sustainable use of marine fishery resources, and reflects the information available for anadromous, inshore and offshore fisheries. It incorporates the precautionary approach, reflects ecosystem-based management, and meets the co-management, conservation and sustainable use obligations created in the IFA and under the *Fisheries Act*, *Oceans Act* and *SARA* and their regulations and policies. Important features of the decision key are that it identifies the roles of the DFO, FJMC, HTC and IRC in making decisions, and that it identifies policy requirements. The Inuvialuit concerns about large scale development, the current state of knowledge and understanding of the three types of potential fisheries, and the ecological and economic risks of an error provide a practical lens and context to help the Parties use the decision key.

The key has twelve steps: ten questions and two concluding requirements. Some questions are based on existing information that can be answered by DFO, whereas other questions require evaluation, consideration and consensus. Each step explicitly identifies the required actions that need to be undertaken to answer the question, the responsible party(ies) for each action, links to pertinent documents, and the rationale for the question. Each step identifies the possible outcomes of the assessment of that step. Outcomes of the steps are one or more of the following decisions: go to another step; the step is not applicable; recommend revision or rejection of the application; or recommend acceptance of the application. The two concluding requirements outline actions to be taken if acceptance of the application is recommended, or if revision or rejection of the application is recommended.

The ten questions represent the concerns, interests and responsibilities of the co-managers for conservation and sustainable use, and the information available for fisheries management. Three questions relate to protection of Inuvialuit subsistence fisheries and Inuvialuit rights: potential effects on Inuvialuit subsistence fisheries; consistency with responsibilities under the IFA; and whether a relevant community fishing plan exists. A related question is on the protection of important areas established under the *Oceans Act*, i.e. consistency with requirements of MPAs and EBSAs, and also community conservation plans which have an influence in identifying important areas for *Oceans Act* initiatives. Two questions relate to knowledge: knowledge of any harvestable surplus, and of effects on the target species, valued ecosystem components and the ecosystem. One question relates to gear type, vessel capacity and observer requirements. One question relates to consistency with *SARA*. One question is open ended: are there any reasons why the proposed fishery should not proceed. One question relates to overlap with responsibilities of adjoining jurisdictions.

Outcomes from the decision key may trigger follow-up actions. Such actions would depend in part on the outcome and the nature of the proposed fishery and its specifics. Outcomes may include development of the appropriate licensing and management conditions, research and monitoring requirements and compliance and education plans. If an application is approved, the Framework identifies that the ecosystem and precautionary approaches in DFO's New Emerging Fisheries Policy and Sustainable Fisheries Framework must be applied.

The Steering Committee will annually review implementation of the BSIFMF and report to the Parties. Based on current fisheries

issues affecting the ISR, inputs of the key partner and stakeholder groups, research results, harvest monitoring, community feedback, and other information, recommendations will be made for changes in priorities, policies, and requirements including proposed changes to the decision key or the Framework itself.

5. Discussion and conclusions

There are as yet no large or even medium scale commercial fisheries in Canadian Beaufort Sea. However, climate warming and economic opportunities brought about by fish stock failures in other parts of the world's oceans are raising interests from outside the ISR and concerns within the ISR. The new governance Framework will help to address some of those interests and concerns and provide some ideas for others. Prior to the BSIFMF any new commercial fishery application would have been assessed primarily under the *Fisheries Act* and its associated regulations, policies and procedures, instruments developed primarily for large scale commercial fisheries on the Atlantic and Pacific coasts, not for small Arctic fisheries where subsistence harvests of fish and marine mammals are critical to the indigenous people. This section addresses how the Framework has better prepared the Parties for development and control of any future commercial fisheries in the Beaufort Sea, how a co-management framework can help to expand a decision-making process from one narrowly based on a fisheries management mandate to one that considers other legislation and community inputs, and how a co-management agency can act as a bridge between government and communities for the development of resource management processes.

The BSIFMF meets legislative and policy requirements, clarifies roles and responsibilities for agencies and identifies licensing requirements for potential new fishers. The Framework brings greater certainty for future commercial operators. Local fishers and communities now can know what would be expected of them if they or an outside partner are granted a licence for a new fishery. Fishers from outside the ISR, either from elsewhere in Canada or outside of Canada, can know where Canadian and Inuvialuit priorities lie and can know what new knowledge and information must be produced and how a fishery must be conducted to ensure that any potential fishery will not negatively affect the critical Beaufort Sea ecosystem.

Also the Framework provides clarity and certainty for all the Parties with respect to their roles and responsibilities in the review and approval process. The IGC and local HTC's now can better understand their own opportunities for commercial fisheries development and their responsibilities for review and approval. The IRC and its associated corporations now will know more clearly what are their rights to commercial fishery development under the IFA and what responsibilities they have if they wish to pursue economic development of any local fishery. The FJMC has taken on a greater workload for scientific review and for a new process for bridging discussions between fishers, local communities and government, and has gained greater certainty over its responsibilities for commercial fisheries in the Beaufort Sea. The DFO has given up some of its ability to act independently, but now has a process to ensure its legislation and policies are applied to any new commercial proposal, has a formal means of addressing conflicts between fishers, industry and communities, and has partnerships that will work to minimize any such conflicts.

The development of the Framework and its explicit decision key demonstrate that land claim settlement agreements can provide alternative or complementary legal authority and procedures to existing federal legislation and policies in creating precautionary marine fisheries policy and could be a precedent for other areas. Hutchings and Post [40] and Bailey et al. [41] have described

the failure of the Canadian federal government to adequately live up to its responsibilities for the implementation of the *Oceans Act* and *SARA*. They have pointed out that the new provisions of the *Fisheries Act* do not allow for protection of fish habitat or of fish stocks if there is no commercial, recreational or aboriginal fishery. Hence fish habitat protection is a problem in the Canadian Beaufort Sea as there is at present no commercial or recreational fishery and the Inuvialuit fisheries are for stocks, anadromous char and marine mammals, not of current commercial interest to outside fishers. DFO acknowledges that aboriginal groups have frequently stated that all watersheds within Canada are important to their fisheries and their culture. Rice et al. [42] state that these concerns will be resolved by discussions with the aboriginal groups and it would be premature to draw conclusions about which species or ecosystems will not be protected by the new provisions because of the presence or absence of commercial recreational or aboriginal fisheries.

By ensuring that the co-management partners, the DFO, the FJMC, the HTC's and the IRC, are involved in review and approval of any applications for new commercial fisheries in the Beaufort Sea through the decision key process, the Framework strengthens the implementation of the precautionary principles of the *Fisheries Act*, and ensures that provisions of LOMA planning mechanisms, including MPAs and EBSAs, are fully considered as are the provisions of any *SARA* recovery plans. The Framework and the reviews and assessments required in the decision key could be considered a first step in establishing the position of the FJMC and the Inuvialuit in discussions such as those described in Rice et al. [42] and a step in ensuring the protection and/or sustainable use of currently unfished stocks. With respect to the fisheries of the Beaufort Sea, the Framework also supports Canada's negotiating position on fisheries and commitments in the Oslo Declaration in particular the recognition of the importance of subsistence harvesting, and the interests of the Inuvialuit in the proper management of living marine resources in the Arctic Ocean [28].

A multi-party agreement such as the BSIFMF can help advocate for improved government capability to respond to specific issues. Bailey et al. [41] decry the decline in departmental capacity for natural sciences and the lack of social science research on the oceans and have recommended a number of short-term and long-term changes to address these failures. They include, amongst others, full development of MPA monitoring programs, re-insertion of the habitat provisions of the *Fisheries Act*, adequate support for scientific programs and facilities, empowering scientists to communicate their findings, and through legislation that requires evaluation of government performance. To Bailey et al.'s [41] list of needs, we have one modest addition: that co-management regimes through development of fisheries management agreements, can provide an additional mechanism to ensure that the provisions and policies of the various Acts are fully lived up to. This Framework, in effect, provides a veto if the provisions are not met.

As in other DFO IFMPs, the foreword to the BSIFMF contains a general statement that the Framework is not legally binding and does not fetter the Minister of Fisheries and Oceans discretionary powers as set out in the *Fisheries Act*. It also states that the Minister can, for reasons of conservation or any other valid reasons, modify the agreement. The Framework's Foreword contains the proviso "consistent with the provisions of the Inuvialuit Final Agreement". Given the interpretation that the FJMC powers extend to recommending to the Minister "the identification of waters where such fishing may be prohibited" and that the IFA is protected under the Canadian Constitution, Ministerial actions are in reality "fettered" to some degree. It is unlikely that any Minister would attempt to make an arbitrary modification to the agreement or issue a licence to a new fisheries venture without the approvals set out in the Framework, especially given the likelihood of a

challenge by both the Inuvialuit and the FJMC.

Bridging or boundary organizations exist at the intersection of two different social worlds, for example between science and politics [24] and between scientists and resource users [9,43,44]. They involve individuals from both worlds and are accountable to both. They directly and through establishment of practices, procedures and other mechanisms bridge the gap between the two worlds and address common problems. The FJMC is such an organization. It has responsibilities or activities in both government and aboriginal worlds; it funds government and university science projects actively supporting community TK studies and harvest monitoring amongst others, its membership includes both government and Inuvialuit appointees, and it is accountable to both the Government of Canada and the Inuvialuit. It brings together Inuvialuit fishers and communities with DFO fisheries managers and scientists to address a range of common issues from the organization of community/science conferences on the renewable resources of the Beaufort Sea [45] to the development of beluga whale management plans [46] and IFMPs [47]. The FJMC played a leadership role in bringing together the Inuvialuit and DFO to discuss the implications of possible new commercial fisheries in the Arctic and how both the government and the Inuvialuit might begin to prepare for such an eventuality. The FJMC recognized early the need to bring the different groups together, assessed fishers' positions, prepared the background, discussed concepts and opportunities with leaders of the Inuvialuit and DFO, led the Steering Committee, and shared the lead on the Working Group with DFO.

Unique in these circumstances was the participation of an NGO, Oceans North Canada, as a partner. The FJMC brought long established close collaborative relationships with DFO and the Inuvialuit. Oceans North Canada brought funding for projects, new ideas, national and international contacts and technical expertise. However, to partner with an NGO, ultimately funded by a US Foundation, was problematic for both the Inuvialuit and for DFO. Inuvialuit perceptions of environmental NGOs are mixed and often negative - their primary experience being with NGOs that are critical of harvesting of marine mammals and not supportive of traditional northern lifestyles (e.g. [48]). This made it difficult for the Inuvialuit members of the FJMC and for members of the IGC and required frequent participation of Oceans North Canada and the FJMC chair at IGC meetings to address real or perceived concerns. DFO managers were also hesitant about involvement with an environmental NGO. The federal government at the time was very critical of environmental groups and in one occasion had attacked "environmentalists and other radical groups" for their "attacks" on the environmental assessment process [49]. The FJMC raised the issue of cooperation with NGOs in a meeting with the Minister of Fisheries and Oceans. The Minister supported the Framework initiative but was markedly cautious about the involvement of an NGO. Nevertheless regional DFO managers continued to work with Oceans North Canada on this project but through the FJMC not directly.

It is almost a truism in resource management that action, especially co-operative action leading to new governance processes, is facilitated by an obvious emergency or problem that convinces all relevant parties to come together to seek a solution. This was not the case in the development of the Framework. There was no large fishing industry demanding access to real or imagined resources. There was no evidence of stock collapse or over-fishing or evidence of impacts on subsistence harvests. This was a proactive approach to address a problem or threat that may be some years in the future. It is unlikely that the Inuvialuit and the government would initiate the development of a fisheries framework agreement without the long period of working together in a co-management regime and most particularly without the

bridging initiative of the FJMC and the NGO, Oceans North Canada, and the support and cooperation of DFO and the Inuvialuit partners. As Berkes [9] has pointed out leadership, trust and collaboration are important aspects of bridging between the different social worlds of fishers and governments. To these we would add the importance of a common goal. All parties to the Framework saw the opportunity, the benefits of a proactive approach and the problems that might occur if they waited for a trigger before agreeing on a process.

Some might argue that the potential for any fishery in the Beaufort Sea is small and distant from potential industrial or political pressure and thus any lessons are not likely to be relevant for others. However, it is useful to remember that small-scale fisheries are a priority for FAO, as they employ more than 90% of the world's capture fishers and provide many local communities with food and jobs [50]. The FAO voluntary guidelines for securing sustainable small scale fisheries and other practical guidelines for small scale fisheries [51–54] emphasize the importance of governance that involves local fishers in a meaningful way. As well we argue that expanding client input and clarifying roles and decision-making processes, such as the decision key used here, through a multi-party agreement can have a positive impact on fisheries management in any jurisdiction. We also conclude that involvement of a co-management agency and NGO bridging initiative between communities and fishers and the government could well hold promise for other fisheries if there is support for such an initiative at the appropriate levels.

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Glossary

- Bridging/Boundary Organization. These are organizations that exist at the intersection of two different social worlds, for example between government managers and resource users. They create and sustain meaningful and mutually beneficial links between the two social worlds.
- Co-management. There are many different definitions of co-management. In the Canadian north it is a long-term management structure, established by treaty or land settlement agreement, which permits aboriginal people to share management responsibility with government for a specific system of natural resources.
- Comprehensive Land Claims Settlement Agreement. In Canada this is a modern treaty by which the claims to traditional lands of an aboriginal people have been extinguished in exchange for specific rights, including title to some lands, cash, and rights related to renewable and non-renewable resource development and ownership amongst others.
- Decision Key. In this report it is used to assess applications for new commercial fisheries in the area. The term is a combination of a decision tree, a decision-support tool commonly used in operations research, and a taxonomic key, as used by biologists to identify objects and organisms. The decision key provides explicit rules for decision-making, is easy to explain to partners and other stakeholders and should help clarify for applicants the requirements of the process.
- Integrated Fisheries Management Framework. A planning framework for the conservation and sustainable use of fishery resources as well as a process by which a fishery will be managed for a period of time. They are intended to ensure integration of functional and technical expertise, integrated decision-making within areas subject to land claims agreements, identification and performance outputs, and input from resource users within a given fishery.
- Inuvialuit. These are the Inuit people of the western Canadian Arctic. They reached a comprehensive land settlement agreement with Canada in 1984.