Investigating the Certifiability of Nunatsiavut's Commercial Fisheries: The Case of the Marine Stewardship Council

By

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Abstract

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Marine Stewardship Council (MSC) certification uses market-based incentives to promote the development of sustainably managed fisheries and has brought benefits to fisheries worldwide. However, the MSC is criticized for not being appropriate for small-scale and data-poor fisheries. This study examined the potential for MSC certification to benefit the small-scale fisheries in Nunatsiavut, NL, by investigating the ability for the Arctic char, snow crab, and Greenland halibut fisheries to become MSC certified and the trade-offs that certification may bring. The OSMI Rapid Assessment Tool was used to evaluate each fishery against the MSC fisheries standard. The results suggest that the snow crab and Greenland halibut fisheries could likely achieve certification, though, the data-deficient Arctic char fishery would require management system improvements before becoming certified. Using a scoping literature review, the implications of MSC certification were identified and compared against the Nunatsiavut Government's governance principles to evaluate if pursuing certification would be recommended. It was determined that the resources and capacity required for certification would significantly impede these governance principles, though, they could be offset by benefits arising from potential market access and job creation, especially for Arctic char. However, these benefits would not be guaranteed. As well, the requirement of Western-style management and lack of inclusion of traditional knowledge in the MSC process may negatively impact the self-determination of Labrador Inuit. Hence, it is not recommended any species pursue MSC certification, though, conducting a pre-assessment of the Arctic char fishery may be a low commitment alternative that can still provide benefits.

Keywords: Nunatsiavut, Inuit co-management, small-scale fisheries management, Marine Stewardship Council, sustainable management, implications of certification, Arctic char

List of Abbreviations

CAD	Canadian Dollar
CHP	Conservation Harvest Plan
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DFO	Department of Fisheries and Oceans
EBSA	Ecologically and Biologically Significant Area
ETP	Endangered, Threatened, or Protected (species)
FIP	Fishery Improvement Project
GAC	Groundfish Advisory Council
IFMP	Integrated Fisheries Management Plan
IUU	Illegal, Unreported, and Unregulated
LIA	Labrador Inuit Association
LIC	Labrador Inuit Constitution
LILCA	Labrador Inuit Land Claims agreement
LISA	Labrador Inuit Settlement Area
MSC	Marine Stewardship Council
NAFO	Northwest Atlantic Fisheries Organization
NGC	Nunatsiavut Group of Companies
NGO	Non-Governmental Organization
NL	Newfoundland and Labrador
OEABC	Other Effective Area-Based Closures
OSMI	Oceans Seafood and Markets Initiative
PI	Performance Indicator
PSA	Productivity-Susceptibility Analysis
RA	Rapid Assessment Tool
SA	South Africa
SFA	Shrimp Fishing Area
TAC	Total Allowable Catch
TFPC	Torngat Fish Producers Co-op Society
TJFB	Torngat Joint Fisheries board
TWPCB	Torngat Wildlife and Plant Co-management Board
UoA	Unit of Assessment
USD	United States Dollar
VME	Vulnerable Marine Ecosystem

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Chapter 1: Introduction

Emerging from the growing concerns about the health of global fish stocks, seafood ecolabelling has become a widespread tool used to incentivize the sustainable harvest of fish resources (Washington & Ababouch, 2011). The idea behind seafood ecolabels is that the failure of many governments to sustainably manage a fishery can be addressed by providing market-based incentives for the fishing industry to develop eco-friendly practices. Ecolabels themselves are tags or logos that can be attached to a product that communicates to a consumer that the product was harvested in a particular way. To be able to use an ecolabel, the product must come from a fishery that was determined by the ecolabel organization, or third-party assessor, to have met their set standards for a sustainable fishery (Selden et al., 2016). The theory of change assumes that environmentally conscious consumers will be more likely to choose a product that was sustainably caught compared to one that is not labelled, thus providing the incentive for fisheries to improve their practices and become certified.

There are potential and realized market benefits from certification, including obtaining and/or retaining market access and/or price premiums (Roheim et al., 2011). For example, consumers have reported their preference for ecolabelled seafood, even if it means paying a higher price (Johnston et al., 2001). This stated preference does not always translate into practice when actually purchasing seafood, of course, and there are also criticisms of the theory of change for ecocertification regarding market benefits (Bailey et al., 2018; Stoll et al., 2019). Nevertheless, even in the absence of any market benefits, long-term benefits are expected from ecolabeling if practices shift from unsustainable to sustainable, helping to avoid fisheries collapses (Standing, 2009). Over the past two decades, the use of ecolabels has dramatically risen, with around 30 certification programs offering ecolabeling for seafood (Gutierrez et al., 2016). The rise in both demand and amount of seafood ecolabelled products are expected to continue, with more and more fisheries reporting benefits from the sustainable seafood movement (UNEP, 2009).

Given the benefits that ecolabeling has brought to other fisheries and the increasing share of certified products on the market, this research project looks to assess the potential for seafood ecolabeling to bring social, environmental and economic benefits to the Inuit commercial fisheries in Nunatsiavut, NL, Canada. Answering this question involves assessing both the current potential for their fisheries to become certified based on the MSC's three categories –

stock health, ecosystem impacts and management efficacy – as well as the potential trade-offs of positive and negative implications that ecocertification could have on the region.

1.1. Management Problem

Located in Northern Labrador, Nunatsiavut was formally constituted through the Labrador Inuit Land Claim Agreement in 2005 to form the semi-autonomous home to Northern Labrador Inuit with just over 2,500 inhabitants split among five communities (Figure1) (Statistics Canada, 2016). Labrador Inuit are a people of the land, highly reliant on the natural resources to support their way of life. However, European colonization in the 1700s and relocations by the provincial government have transformed their traditional lifestyle, and they have become increasingly dependent on imported food and other provisions for survival (Tourism Nunatsiavut, 2019). Since road infrastructure connecting the five communities is lacking, resupplying of the communities must be done by boat in the summer and by plane the rest of the time, leading to food shortages at times and disproportionately high food costs. This has intensified their struggles, especially in the two most northern communities Nain, where a 3.5L jug of orange juice can cost $27 (CBC, 2018). The Nunatsiavut Government is leading projects to help address the issue such as the Community Freezer programs, which was developed through a partnership with the St. John's-based NGO Food First NL designed to provide country foods to residents free of cost, though food insecurity is still on the rise (Inuit Tapiriit Kanatami, 2019). Across Nunatsiavut, an estimated 44% of households are experiencing moderate to severe food insecurity, with 61% of houses report being worried about food security (Nain Research Centre, 2004; Nunatsiavut Government, 2017). Given the continued dependence on the natural environment for subsistence, food insecurity and mental health are concerns moving forward under an era of uncertainty linked with climate change (Harper et al., 2015).

The effects of climate change are already being realized, with traditional aquatic-based foods such as Arctic char expected to be the most impacted (Allard & Lemay, 2012). Overall, the combination of these three stressors, colonization, a changing climate, and highs cost of living, have brought social and economic inequalities to communities in Nunatsiavut that are complex and interconnected, and that will require multiple initiatives to address (Aten & Bailey, 2018).

Given that all five communities in Nunatsiavut are situated on the coast, fishing is an important activity that has cultural, social and economic value. Directly, fishing promotes well-being and

food security through the subsistence Arctic char fishery and indirectly through wealth generated from commercial fishing activities (Snook et al., 2018). Although it would seem to make sense that keeping more of the commercially harvested species within the communities may help deal with rising food insecurity, commercial fisheries are already struggling to remain economically viable (Whalen et al., 2015). Northern shrimp is currently the keystone species commercially harvested in Nunatsiavut, and it is only through royalties generated from shrimp that other species can be harvested and processed in Nunatsiavut commercially (TJFB, 2017a). However, given the importance of the fishing sector to the communities in Nunatsiavut, initiatives to promote strengthening the sector have the potential to help address a range of issues in the region

Being both a fisheries management tool to promote the sustainable harvest of a stock and a market-based tool to provide social and economic advantages, it is worth investigating the role of ecocertifications in contributing to fisheries sustainability and development in Nunatsiavut. As such, this research will examine the potential certifiability of Nunatsiavut's commercial fisheries sector against the Marine Stewardship Council (MSC) fisheries standard and analyze any potential trade-offs inherent in pursuing such a market-based tool.

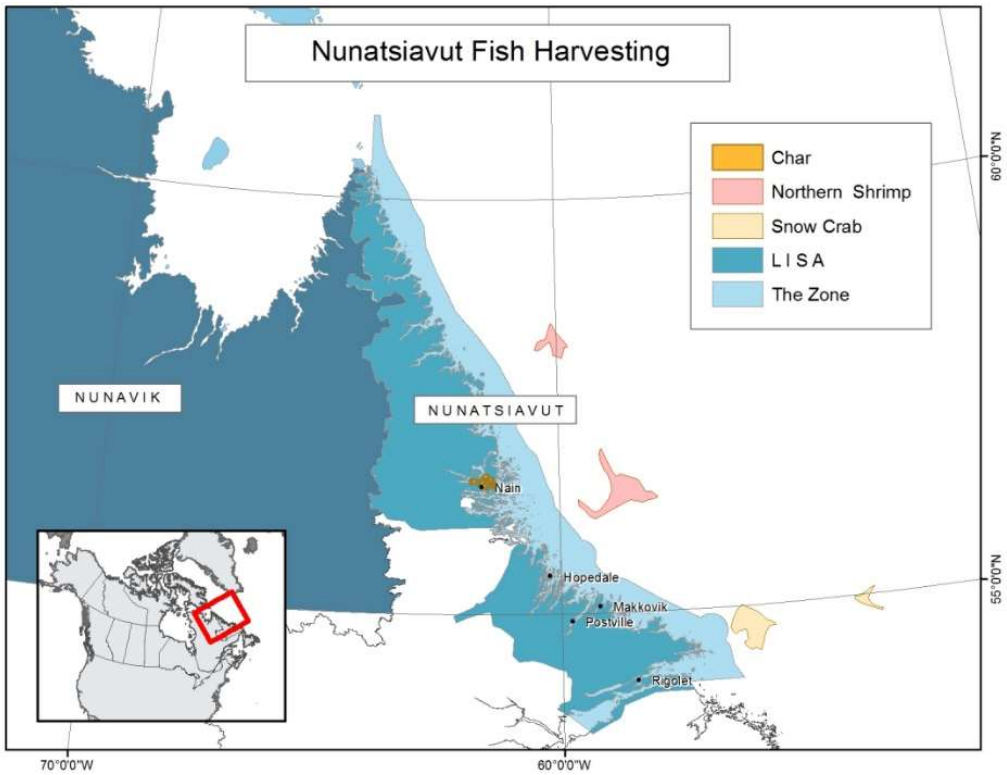

Figure 1. *Map of Nunatsiavut, NL, Canada, showing the communities, fishing locations and "the Zone." (©Torngat Wildlife, Plants, and Fisheries Secretariat).*

1.2. Research Question

This research project aims to answer the overarching research question:

Overarching research question: What is the potential for MSC certification of the commercial species in Nunatsiavut, and in what ways could certification contribute to the governance principles of the Nunatsiavut Government?

This research question is further divided into the following sub-questions:

Sub-question: What is the current extent that these fisheries meet the MSC fisheries standard (i.e., how are these fisheries likely to score if assessed through an MSC pre-assessment)? And

Sub-question: What might be the trade-offs required for proceeding with MSC assessment and presumed certification (i.e. what are the likely positive and negative implications on the governance principles of the Nunatsiavut Government if they were to proceed with MSC certification)?

Through answering these questions, this research aims to provide insight into the strong and weak areas of sustainability in Nunatsiavut's fisheries, identify the potential implications MSC certification could bring, and relate these to the underlying principles of self-determination and Inuit governance inherent in the formation of the Nunatsiavut Government. The report consists of five chapters. The remainder of Chapter 1 will provide an overview of the history of Nunatsiavut, the major authorities and players in the fishing industry, the major commercial fisheries in Nunatsiavut, and an overview of the Marine Stewardship Council. Chapter 2 provides details of the research methods used to undertake the study. Chapter 3 provides results in three sections. Finally, Chapter 4 provides a discussion of some potential costs, benefits and/or effects of pursuing MSC certification, with a recommendation of the suggested next steps.

1.3. Background

The following section provides relevant background information regarding the history, culture, and governance of Northern Labrador Inuit in the Nunatsiavut region, as well as the major authorities and players in Nunatsiavut's fisheries sector. This background is intended show how the fishing sector is managed and how the history of Northern Labrador Inuit has led to the formation of the fishing sector that exists today.

History of Labrador Inuit

Labrador Inuit are descendants of the prehistoric Thule Inuit (Tourism Nunatsiavut, 2019). Largely dependant on hunting for subsistence, early Labrador Inuit were drawn to the coast of Northern Labrador from Nunavut because of the abundance of wildlife on the land and at sea. For thousands of years, they lived off the land, relying heavily on aquatic sources of protein such as salmon, caribou and Arctic char for sustenance (Snook et al., 2018). However, the Labrador Inuit way of life changed in 1760 when Basque whalers first made contact and then again by Moravian Missionaries in 1770, who promoted Christianity and connected Northern Labrador to the trade networks in Europe (Nunatsiavut Government, n.d.). Over time, the Inuit way of life became more dependent on exporting Inuit products in exchange for European goods, which initially brought them economic success. However, this success did not last, and Labrador Inuit faced further erosion of their traditional way of life (Tourism Nunatsiavut, 2019). Their nomadic lifestyle was not encouraged by the Moravian Missionaries, and with settling into communities and increased European presence came diseases like smallpox and Spanish influenza that slowly killed the population. In the 1920s, the trading industry in Labrador crashed and was largely abandoned by the non-Inuit traders. Labrador Inuit were left dependant on external sources for goods but without a source of income (Nunatsiavut Government, n.d.). Their situation was made worse in the 1960s when Labrador Inuit's traditional territories were placed under control of the province of Newfoundland and Labrador (Tourism Nunatsiavut, 2019). Services and funding from missionaries were cut, and Labrador Inuit were forced to resettle throughout the Arctic and sub-Arctic.

Things began to turn around in 1973 when Labrador Inuit took the protection of their culture, health and well-being into their own hands by forming the Labrador Inuit Association (LIA) (Newfoundland and Labrador, 2015). The LIA gave a voice to Labrador Inuit, fighting for their rights as Indigenous People of Canada and for the ability to self-govern. After a thirty-year battle with the federal and provincial governments, the LIA successfully negotiated the Labrador Inuit Land Claims Agreement (LILCA), paving the way for Inuit self-governance and self-determination. The LILCA was officially signed in January 2005, granting Labrador Inuit semi-autonomous control over 72,520km^2 of land known as the Labrador Inuit Settlement Area (LISA). The LILCA also includes 48,690km^2 of ocean space adjacent to the settlement area

known as “the Zone.” Following the signing of the LILCA, the LIA formalized the Labrador Inuit Constitution (LIC) (2005), setting out the values and principles of the Labrador Inuit and officially naming the LISA “Nunatsiavut,” meaning “Our Beautiful Lands.” Following the signing of the LILCA, the Nunatsiavut Government was formed.

Nunatsiavut Government

The creation of the Nunatsiavut Government was precedent-setting in that it is the first Inuit region in Canada to achieve self-governance. While still part of the province of Newfoundland and Labrador and of Canada, the creation of the Nunatsiavut Government gave Labrador Inuit authority over areas including health, education, culture and language, justice, and community matters as well as the ability to create laws (LILCA, 2005). The formation of the Nunatsiavut Government was guided by the Labrador Inuit Constitution (LIC), which defines the goals and values of the Nunatsiavut Government and the rights and duties of its citizens. The LIC (2005) also sets out the principled approach used by the Nunatsiavut Government for decision-making. These Fundamental Principles (5), which highlight the connectedness of the Inuit way of life with the health of the environment, are:

1. Democracy and equality;
2. Preservation of the lands, waters, animals, and plants of our ancestral territory;
3. Pursuit of a sustainable economy;
4. Preservation of our culture and language; and
5. Pursuit of a healthy society;

The Nunatsiavut Government is split into the regional level and community level. At the regional level, members are elected to the Nunatsiavut Assembly, the decision-making body of the Nunatsiavut Government. Unlike majoritarian democracies, the Assembly operates as a consensus democracy, which considers as wide a range of opinions as possible to ensure the views of the minority are considered (LIC, 2005). In the Assembly, there are 16 voting members, including the President, ten ordinary members, and one AngajukKâk (similar to a mayor) from each of the five communities. The AngajukKâk are the link between the two levels of government and represent the needs of their community at the regional level. The Assembly is responsible for representing Labrador Inuit, for making laws for Nunatsiavut, and overseeing the actions of the Executive Council.

The second branch of the regional government is the Executive Council, which consists of the President, the First Minister of Nunatsiavut, the Treasurer and other Ministers appointed by the First Minister. The Executive council is to direct the implementation of laws and policy, coordinate the functions of all departments and administrations, and prepare and initiate legislation (LIC, 2005). Overseen by the Executive Council are seven departments representing the governing areas under the control of Labrador Inuit.

It is the Department of Lands and Natural Resources that is responsible for matters concerning lands, the environment, non-renewable and renewable resources. Through this department, the Nunatsiavut Government and the federal government are entered into a co-management agreement for the management of both terrestrial and marine resources (LILCA, 2005). To oversee the co-management of resources, the Torngat Wildlife, Plant and Fisheries Secretariat was established. The Torngat Secretariat is made up of two co-management boards, the Torngat Wildlife and Plant Co-management Board (TWPCB) and the Torngat Joint Fisheries Board (TJFB). While the objective of the Torngat Secretariat is to provide financial management, logistical, project management and analytical support for the two Boards, the Boards themselves play essential roles in the management of renewable resources in Nunatsiavut (Torngat Secretariat, 2019). The TWPCB is responsible for sustainably managing the renewable, land-based resources of Nunatsiavut, while the TJFB is responsible for the sustainable management of the renewable ocean-based resources.

Fisheries Management Authorities and Key Players

Under the Government of Canada's *Fisheries Act* (2019), the Minister of Fisheries and Oceans retains jurisdiction over all ocean resources, including the fisheries within the "Zone" adjacent to the LISA. Despite the ultimate authority resting with the Minister of Fisheries, Labrador Inuit still play an essential role in the management of Nunatsiavut's subsistence and commercial fisheries through the co-management agreement with the Department of Fisheries and Oceans (DFO). The following section outlines the various roles and responsibilities of the different authorities responsible for the management of Nunatsiavut's fisheries.

Torngat Joint Fisheries Board

The institution that is most involved in the management of the commercial fisheries in Nunatsiavut is the Torngat Joint Fisheries Board. The TJFB is the primary body in charge of

making recommendations to the Minister of Fisheries about the conservation of fish and fish habitat and the management of fisheries within the LISA, excluding the Inuit subsistence fisheries (Torngat Secretariat, 2019). Whereas the TWPCB has the power to implement total allowable harvests on species in the LISA, the TJFB does not have the power to alter the total allowable catch (TAC) of the commercially fished species in or adjacent to Nunatsiavut. This power remains under control of the Minister of Fisheries. Despite this, the TJFB is responsible for making recommendations to the Minister of Fisheries on issues such as appropriate region-wide TACs, the Labrador Inuit's share of the TAC, and other management- and allocation-related issues. As well, the TJFB can conduct research activities in the waters adjacent to Nunatsiavut to inform these recommendations (LILCA, 2005). The TJFB is composed of seven members, three appointed by the Nunatsiavut Government, two by the Federal Government, one by the Provincial Government, and an independent chair, making it a tripartite government body (Torngat Secretariat, 2019).

Nunatsiavut Government

The Nunatsiavut Government itself also plays a role in fisheries management in Nunatsiavut. While the TJFB advises for the commercial fisheries, the Nunatsiavut Government is responsible for providing recommendations on the Inuit subsistence fisheries to the Minister of Fisheries (LILCA, 2005). As well, the Nunatsiavut Government is responsible for designating Beneficiaries of the LILCA to fish under their commercial communal licences and other fishing enterprises (Nunatsiavut Government, 2018). The Nunatsiavut Government can also impose additional management measures on Beneficiaries to ensure the conservation of the resource. Currently, the Nunatsiavut Government holds commercial communal licences for northern shrimp, snow crab, and Arctic char as well as fishing enterprises for Greenland halibut and snow crab. The Fisheries Division falls under the Department of Lands and Natural Resources.

Nunatsiavut Group of Companies

While not a management authority, another key player in the fisheries sector is the Nunatsiavut Group of Companies (NGC). The NGC is the business arm of the Nunatsiavut Government with the goal of creating wealth for Nunatsiavut Beneficiaries by owning profitable, sustainable businesses (NGC, 2019). The range of business lines owned by the NGC is diverse, with companies in marine transportation, real estate, and construction, among other ventures. The

NGC also owns the fishing entity Nuluak, which holds Greenland halibut and crab quotas, as well as a half-share in an offshore shrimp licence. The NGC is also a part of the Northern Coalition, a non-profit organization that aims to ensure secure and equitable access to northern shrimp for Indigenous enterprises, providing the NGC access to additional shrimp quota (Northern Coalition, 2017). The NGC is actively pursuing additional fishing licences to increase access should they come up (NGC, 2019).

Torngat Fish Producers Co-operative Society

The Torngat Fish Producers Co-operative Society (TFPC), or "the Co-op," is the owner of two local fish processing plants and is another essential player in Nunatsiavut commercial fisheries. The Co-op was formed in 1980 by Labrador Inuit, who were looking to move control of the fisheries from private hands back to the local Inuit (Boutet, 2016). On behalf of the Beneficiaries of Nunatsiavut and their members, the Co-op currently operates Nunatsiavut's two fish processing plants, one in Nain that processes Arctic char and Icelandic scallop (when available) and one in Makkovik that processes snow crab and Greenland halibut. As well, the Co-op holds an offshore northern shrimp licence and receive additional quota from being a member of the Northern Coalition, though they do not fish their quota themselves (Business View, 2019). Instead, the Co-op receives royalties through a partnership with Mersey Seafoods, who fish and market their allocations. The profits generated from these royalties are redistributed into the operations of the fish plants in Nunatsiavut, allowing them to remain in operation despite being unprofitable (Foley et al., 2017). Being the only fish processors in Nunatsiavut, the Co-op continues to be an essential part of the commercial fisheries and community. At its peak, the Co-op supported 180 fishers and employed 220 plant workers (Boutet, 2016). However, due to hardships in the fishery, the number of workers that the Co-op directly employs is now closer to 90 (Boutet, 2016). Even so, they are still a significant seasonal employer in Nunatsiavut and an important player for maintaining Labrador Inuit presence in the region-wide fishery.

1.4. Nunatsiavut's Fisheries

The waters adjacent to Northern Labrador have provided for many fishing activities throughout history and continue to support one of the most crucial sectors in Nunatsiavut. Although not very large in scale, there is a diverse range of fisheries that are important to Labrador Inuit. This

section details the various species that are or have been important commercially to Labrador Inuit. These species represent the fisheries that could potentially benefit from MSC certification.

Northern Shrimp

Northern shrimp (*Pandalus borealis*) is currently the most economically valuable of Nunatsiavut's commercial fisheries. Although not traditionally targeted by Labrador Inuit, three offshore shrimp licences were granted to Labrador interests in 1978 (Foley et al., 2017), one of which is the licence that is currently held by the Torngat Fish Producers Co-op. It was not until 1987 that the Labrador Inuit Development Corporation (what is now the NGC) obtained its share of an offshore northern shrimp licence through the 50/50 joint venture company Pikalujak Fisheries. Although these licences provided a source of income for Labrador Inuit through royalties and limited employment, they rely on external companies to harvest their quota (Foley et al., 2017). After the signing of the LILCA (2005), the Nunatsiavut Government was ensured to be given access to shrimp resources in their adjacent waters. Since 2010, the TJFB has made recommendations to the Minister of Fisheries regarding shrimp fishing areas (SFAs) 4 and 5 (the areas adjacent to Nunatsiavut), proposing that the Nunatsiavut Government's share of the quota be increased to match the provisions of the LILCA (TJFB, 2017a). As of 2018/19, the Nunatsiavut Government has been granted 9.9% of the quota of SFA 5 and 10% of SFA 4 for a total quota of 3,941t, which does not include the quota for the offshore licences (DFO, 2018c).

The majority of the Nunatsiavut Government's allocations are fished inshore under their commercial communal licence for northern shrimp by Beneficiaries. In 2017, 98% of the Nunatsiavut Government's allocations were harvested by 23 designates, with the remaining quota transferred to the offshore fleet for royalties (TJFB, 2017a,b). Given the lack of a facility to process shrimp in Nunatsiavut, a deal was made with a processing plant in Charlottetown, NL, requiring all shrimp to be landed at their plant in exchange for a royalty paid to the Government per pound of shrimp landed (Foley et al., 2017). These royalties help support the Nunatsiavut Government's "Fishery Development Fund," which is set up to ensure that should fishery development opportunities arise, there is the potential to access them. However, there is the potential that if the Nunatsiavut Government receives adequate shrimp allocations, a shrimp processing plant could be developed in Nunatsiavut (Foley et al., 2017).

Snow Crab

Though not fished in Labrador until 1985, the snow crab (*Chionoecetes opilio*) fishery has become one of the most lucrative commercial fisheries in Nunatsiavut (Coombs et al., 2010c). In 1999, the LIA was granted a commercial communal licence for snow crab and allocations of 500t in NAFO area 2GHJ north of 54˚40' N. Together with the 100t of exploratory quota held by the Torngat Fish Producers Co-op, the snow crab fishery north of 54˚40' N was held entirely by Labrador Inuit. Total allocations have varied throughout the years due to concerns about the health of the stock but have remained an important species in Nunatsiavut (Coombs et al., 2010c). In the Newfoundland and Labrador region, most of the snow crab harvested is exported to the US and China (Figure 2).

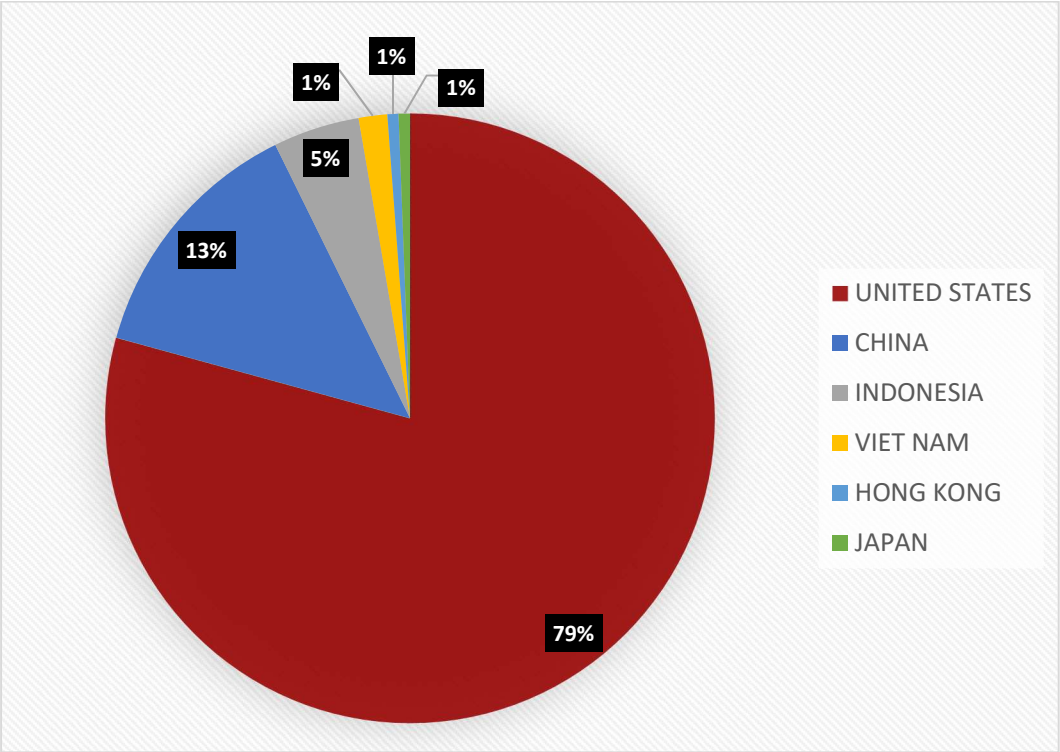

***Figure 2**. Global export destinations for Newfoundland and Labrador snow crab by value in 2018. (Data acquired from DFO Newfoundland and Labrador).*

Much like the northern shrimp fishery, the Nunatsiavut Government designates Beneficiaries to harvest snow crab under their commercial communal licence. Under this licence, up to a maximum of eight Beneficiaries can be designated to harvest the 310t of quota currently available to the Nunatsiavut Government in areas 2JN and 2H (DFO, 2018a). All the snow crab

harvested under this licence is landed in Makkovik at the Co-op's processing plant. The Nunatsiavut Government has also acquired additional enterprises with individual quota for snow crab in 2J south, giving them additional access to the resource. The snow crab harvested under these enterprises are not landed in Makkovik.

Greenland Halibut

The Greenland halibut (*Reinhardtius hippoglossoides*) or turbot fishery in Nunatsiavut is accessed in NAFO areas 2+3KLMNO through the allocations and licences held by the Nunatsiavut Government, as well as in area 0B through allocations held by the Co-op and NGC (Coombs et al., 2010b). Currently, the Nunatsiavut Government's allocations equal 3.38% of the TAC for areas 2+3K and 3.38% of the TAC in 3LMNO, which together amounted to 202t in 2019 (DFO, 2019e). However, the TJFB has repeatedly recommended to the Minister of Fisheries that the Nunatsiavut Governments allocations be increased to 650t to make the fishery economically viable and shift towards a more equitable distribution (TJFB, 2017d). The Nunatsiavut Government has not been issued a commercial communal licence for Greenland halibut and was only given allocations to the resource in 2013 (TJFB, 2017d). To access the resource, the Government has acquired multiple fishing enterprises that include competitive groundfish licences (DFO, 2016). Under these licences, the Nunatsiavut Government can either designate multiple Beneficiaries to harvest their allocations or designate a single Beneficiary to the licence to access the competitive quota for Greenland halibut in 2+3KLMNO. Given that sea ice in Nunatsiavut persists through spring, the competitive Greenland halibut quota can only be accessed by Beneficiaries for part of the fishing season because of a 75/25 split in the TAC between June/August (TJFB, 2017b). Greenland halibut fished under the Nunatsiavut Government allocations, and some of the competitive quota, is landed at the Co-op's Makkovik processing plant. Greenland halibut is generally harvested following the snow crab season, allowing continuous employment at the Makkovik fish plant in the summer. The primary market for Greenland halibut in Newfoundland and Labrador is Asia (Figure 3), although there is local knowledge suggesting that Nunatsiavut products target European markets (OK Society, 2013).

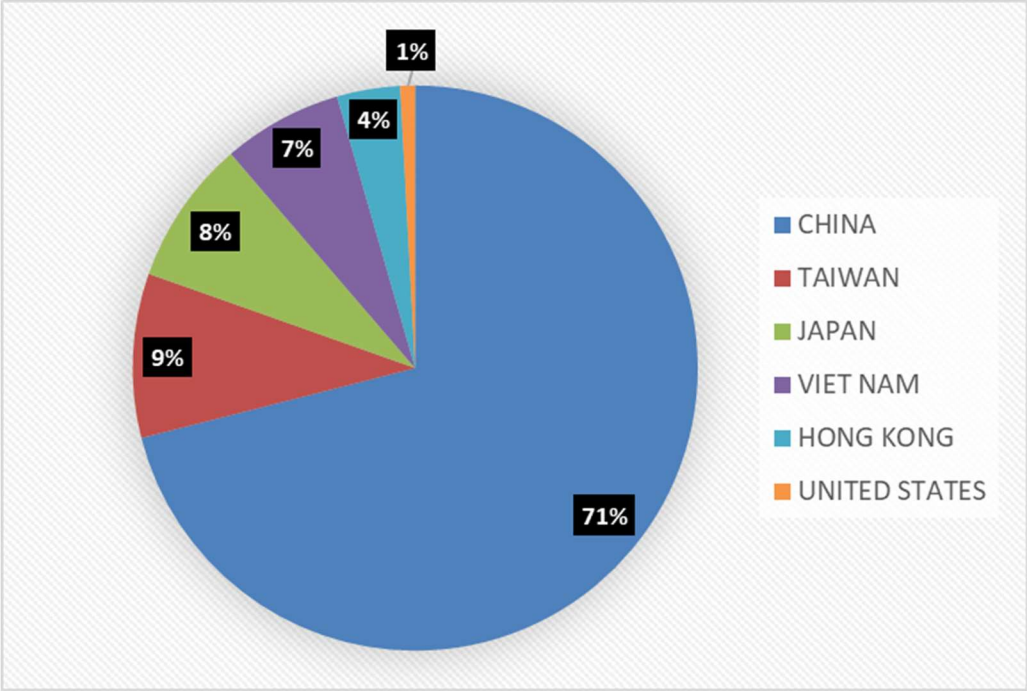

Figure 3. *Global export destinations for Newfoundland and Labrador Greenland halibut by value in 2018. (Data acquired from DFO Newfoundland and Labrador).*

Arctic Char

Arctic char (*Salvelinus alpinus*) is an anadromous, salmonid-like species that is culturally, socially, and economically important for Labrador Inuit. It is fished commercially and for subsistence and has a long tradition of use in Northern Labrador (TJFB, 2011). The continued importance of Arctic char in the culture and well-being of Nunatsiavut is evident, given its inclusion in the National Anthem of Nunatsiavut (LIC, 2005). The commercial Arctic char fishery represents a unique fishery as it is highly localized, occurring only within the waters adjacent to Nunatsiavut. It is managed by DFO as a limited-entry fishery with the only DFO issued licence currently being held by the Nunatsiavut Government. In this way, the Arctic char fishery represents a fishery run by Labrador Inuit for Labrador Inuit (Snook et al., 2018). As such, it is finding the balance between an economically viable fishery and a socially run fishery that is for the benefit of all residents of Nunatsiavut that remains the top priority for the management of the species (Beale et al., 2011).

Although still under the management authority of DFO, the Nunatsiavut Government can select up to 50 Beneficiaries to harvest Arctic char under their commercial communal licence (DFO, 2019a). The fishery takes place out of the community of Nain using mid-water gillnets. All char

that are harvested are processed at the Co-op's processing plant in Nain, providing seasonal employment to approximately 30 individuals (OK Society, 2018c). The TAC for Arctic char in Northern Labrador is currently 77t split across three stock complexes: Voisey Bay (14t), Nain Bay (32t), and Okak Bay (31t). However, all Arctic char is currently being harvested in the closest area, Nain Bay, given the small size and limited capacity of the commercial fleet. Nain Bay is also the area where most of the subsistence fishery occurs. Despite the social and commercial importance of Arctic char, there is little information on the health of the Arctic char stocks (TJFB, 2011). In the face of uncertainty, the Nunatsiavut Government has intentionally established limitations to levels that it believes is under-harvesting the stock (relative to notions of Maximum Sustainable Yield) in order to ensure the continued availability of char (Snook et al., 2018). It is the goal of the TJFB to work together with Co-op and Nunatsiavut Government to address the needs of the fishery and balance the social, economic and environmental aspects of the fishery (Beale et al., 2011). Currently, all the char caught in the commercial fishery is sold within NL, with approximately one-third of the total amount processed sold directly to the NG for the community Freezer programs (OK Society, 2018c). Most of the product is filleted or smoked and sold in the Co-op's Happy-Valley Goose Bay store (Figure 4).

Figure 4. *Smoked Arctic char product with the Co-op's custom packaging. (Photo Credit, Justin Schaible).*

Atlantic Salmon

Like Arctic char, Atlantic salmon (*Salmo salar*) has been an important species for Labrador Inuit for hundreds of years. Until the 1990s, the fishing industry in Northern Labrador was highly dependant on catches of Atlantic salmon (Snook et al., 2018). However, concerns over stock health throughout Atlantic Canada led to a moratorium on all commercial salmon fishing in Newfoundland and Labrador in 1992. Although a small number of salmon are still allowed to be

harvested for subsistence in Nunatsiavut, the moratorium remains today. On the upside, stocks of Atlantic salmon in Northern Labrador are beginning to exhibit signs of recovery, showing promise that the stock is rebuilding (DFO, 2018e). Atlantic salmon is the most common bycatch in the commercial Arctic char fishery.

Atlantic Cod

Atlantic Cod (*Gadus morhua*) is another species that has been traditionally important to Labrador Inuit (Coombs et al., 2010b). Like salmon, they were a vital species in Northern Labrador up until the 1990s. However, due to collapsed stocks, the once iconic Atlantic cod was placed under moratorium in 1992 (Snook et al., 2018). This moratorium remains today in NL, with cod stocks still having a low likelihood of recovery. Interestingly, and disappointingly, harvesters in Northern Labrador were not covered under the government assistance programs that went in to support high unemployment that accompanied the cod collapse in Newfoundland.

Iceland Scallop

Iceland scallops (*Chlamys islandica)* are a cold-water scallop species that are smaller than the lucrative Atlantic sea scallop. Although it is fished only intermittently in Northern Labrador, surveys have continuously turned up commercial quantities of scallop off Nain (Brothers & Barney, 1981). Though fishing has not occurred since 2007, the Co-op has offered to buy scallops, should they be fished, and process them at the Nain fish plant (Barker, 2019). Although they are labour intensive to process and fetch a lower market price than sea scallops, there is interest in finding a way to make the scallop fishery worthwhile economically to diversify the fishing sector (Barker, 2019).

1.5. The Potential use of Ecolabels

The Labrador Inuit way of life is deeply intertwined with the relationship Inuit have to the sea. For the residents of Nunatsiavut, marine spaces and fish resources are essential for maintaining economic, social and cultural wellness (Snook et al., 2018). Even with such a deep connection, balancing the social, environmental and economic aspects of the fishing sector is not an easy task. This is especially true for Nunatsiavut, where factors outside of the control of managers can have significant effects on the fisheries. These factors include high transportation and fuel costs, short and unpredictable fishing seasons, market fluctuations and limited data to make decisions on (Whalen et al., 2015). Ecolabeling has been reported to benefit fisheries in similar situations,

making it a potential instrument to help develop the fisheries in Nunatsiavut (UNEP, 2009). This potential is also evident by the Ocean Wise Recommendation of the Cambridge Bay Arctic char fishery in Nunavut (Ocean Wise, 2016). Ocean Wise is a Canadian seafood recommendation (as opposed to certification) program. As well, many large seafood retailers, such as Walmart and Canadian-based High Liner Foods, have made commitments to only source ecocertified products, with the number of retailers demanding ecolabeled products growing worldwide (Sampson et al., 2015). These commitments increase demand for certified products, but also may marginalize fisheries if they are not certified. Although this applies to seafood ecolabels in general, this research focuses on the case of MSC certification. MSC was chosen as it is currently the most recognized seafood ecolabel and, thus, is expected to have adequate information required for this research project. As well, it allows for the use of the OSMI Rapid Assessment Tool to quickly assess a fishery using the same Principles as an MSC assessment (see Chapter 2 for details).

1.6. Marine Stewardship Council (MSC)

Background and Certification Process

The Marine Stewardship Council was formed in 1998 through a partnership between World Wildlife Fund (WWF) and Unilever. Both organizations were inspired by the achievements of the Forest Stewardship Council (FSC) at promoting conservation and looked to develop a similar model for the certification of fisheries (Gulbrandsen, 2009). The idea behind the MSC's creation was to award sustainably managed fisheries with a certification label that could be used to differentiate their product from other non-certified products (Ponte, 2008a). After its creation, both partners stepped back, leaving the MSC a fully independent non-profit organization. In 2000, the Western Australia rock lobster fishery became the first fishery to be certified, followed by the Alaskan salmon fishery later that same year (MSC, 2017). Now, over 20 years later, over 220 fisheries are fully certified with another 46 in assessment, representing over 15% of global capture fisheries production (MSC, 2019a).

The MSC operates as a third-party certification scheme. This means that while the MSC defines the requirements for becoming certified (i.e., sets the standard), they rely on accredited third-party certification bodies to conduct the audit of applicant fisheries to see if fisheries meet MSC's fisheries standard. This way, the MSC is not directly involved in determining whether a fishery

meets their standards, allowing for an unbiased assessment. During an MSC assessment, a fishery is assessed against the MSC's three core Principles using several performance indicators (PIs) to score each Principle. For a fishery to be certified as sustainable and well-managed, it must achieve a score of at least 60 for all 28 PIs and have an average PI score above 80 for each of the three Principles. The core Principles are:

1. Sustainability of the target fish stock;
2. Environmental impact of fishing; and
3. Effectiveness of the management system

For a fishery to meet the requirements for Principle 1, it must not be operating in a way that will not reduce the health of the target stock over time, or if already depleted, that it does not hinder stock recovery. This Principle requires considering all sources of removal from the stock (e.g. bycatch from fisheries targeting other species), not just those fisheries/species looking to be certified. For Principle 2, a fishery must ensure that the structure, productivity, function and diversity of the ecosystem are maintained in the long-term. For Principle 3, a fishery must display that appropriate measures are in place for the management system to ensure that Principles 1 and 2 are met. Once certified, a fishery can maintain its certification for five years before requiring recertification (MSC, n.d.). If the fishery scores over 80 for all PIs, the fishery is certified with an unconditional pass. However, if it scores between 60 and 80 for any PI, it will be given a conditional pass, which requires the fishery to take action over the course of the certification period to raise the performance score of the associated PI above 80. These requirements are known as conditions. Each year after certification, a certified fishery must undergo an audit, which considers the changes that have occurred in the fishery and the progress towards working on any conditions of certification. After five years, the fishery must be re-assessed to maintain its certification. Since MSC certification is a private market-based tool, the cost of certification is often borne by the industry, though the initiator of certification can be any legally constituted organization ranging from harvesters to processors to governments. The organization or group of organizations that pursue certification make up the client group and can define who gets to be included in the unit of assessment (UoA). The client group is also responsible for ensuring that any required improvements are made (MSC, 2014). Given that the fishing industry in Nunatsiavut would be unlikely to be able to afford certification, this study

assumes that the Nunatsiavut Government would form the client group if a fishery were to pursue certification.

Concerns around MSC

Despite the rigorous process of getting certified, the structure of the MSC is not without concern. The most considerable concern comes from the accessibility of MSC certification to fisheries in developing countries, as is evident by there only being 28 certified fisheries from developing countries as of 2016 (Jaffry et al., 2016). Even with attempts to make certification accessible to all fisheries, many small-scale and developing country fisheries consider the resource requirements and costs associated with preparing, obtaining, and maintaining MSC certification a barrier to becoming certified (Pérez-Ramírez et al., 2012a). The accessibility of certification may even further marginalize such fisheries as they now must compete with certified products (Ponte, 2008a). On the other side, there is also criticism that the MSC fisheries standard is not stringent enough to ensure a fishery is actually sustainable (Christian et al., 2013). However, increasing the standard would make it even harder for data-poor fisheries to become certified. At the same time, the MSC wants its ecolabel to remain the gold standard for fishery certification. Bush et al. (2012) have referred to this challenge of balancing credibility, accessibility and environmental improvement as "the devil's triangle" for the MSC, as there is no easy fix. Steps towards improving access for developing countries fisheries, such as the risk-based framework approach or link with fishery improvement projects (FIPs), have shown to improve the certifiability of small-scale and developing country fisheries (Bush et al., 2012). However, there is still more that needs to be done to address this inequity. Because the MSC has been more successful in creating a market for sustainable fish (Ponte, 2008a), rather than actually transforming fisheries into a sustainable supply, various support infrastructure has been developed to continue supporting the theory of change, leading to additional criticisms of the efficacy of certifications as the right approach to sustainability (Stoll et al., 2019).

Assessing the potential use of MSC certification of Nunatsiavut's commercial fisheries represents a unique situation. There has already been a co-managed fishery to enter certification in the case of the Mexican red rock lobster fishery in Mexico (Pérez-Ramírez et al., 2012c). As well, there has also been an Indigenous fishery certified as the Waterhen Lake walleye and pike fishery in Manitoba is primarily harvested by Indigenous fishers (Forbes, 2015). However, if the

Nunatsiavut Government were to successfully apply for certification, it would be the first co-managed, Inuit-initiated fishery to do so. As well, despite being part of Canada, the location, size, and history of Nunatsiavut's fisheries have created similar restrictions to certification as fisheries in developing countries. Even though Nunatsiavut's fisheries are co-managed, many aspects of the fisheries remain data-poor. As well, the prevalence of food insecurity and lingering impacts of colonization in Nunatsiavut are more typical of developing countries than the rest of Canada (UNEP, 2009). Hence, the implications that certification could bring in Nunatsiavut will likely be similar to those realized in certified fisheries in developing countries, especially when they are also small-scale.

Chapter 2: Methodology

In this research project, the potential for using MSC certification to bring social, economic, and environmental benefits to Labrador Inuit was examined through the lens of the Nunatsiavut Government's Fundamental Principles. In order to answer the multiple research questions of this research project, the methodology was split into three sections. The first section scoped the fisheries in Nunatsiavut using a decision framework to identify which are potential candidates for becoming MSC certified. The second section used the Oceans Seafood and Markets Initiative (OSMI) Rapid Assessment Tool to assess the sustainability of the potential fisheries identified. Finally, the third section used a scoping literature review to identify the potential positive and negative implications of MSC certification. The identified implications that were determined to be relevant to Nunatsiavut were then applied to the Nunatsiavut Government's governance principles to examine the likely trade-offs to the Nunatsiavut Government should they pursue certification. Together, this allowed a recommendation to be made whether pursuing certification would be wise based on the likelihood of certification and the potential trade-offs it may bring.

2.1. Scoping Nunatsiavut's Fisheries

Purpose – To identify which fisheries in Nunatsiavut are appropriate for use in this research project.

Before conducting the Rapid Assessment and trade-off analysis, each major commercial species fished (currently and historically) by Labrador Inuit was assessed based on its potential to be used in the later stages of this research. Species to include in this research were determined using a decision framework based on each species' current social and economic importance as well as the amount of information available for each fishery (Figure 5). Fisheries that did not meet the defined criteria were excluded from the analysis. The fisheries identified as potential species at the outset were northern shrimp, snow crab, Greenland halibut, Arctic char, Atlantic salmon, Atlantic cod, and Iceland scallop. Using the decision framework, each species was first assessed based on if it 1) was commercially active or had evidence it could sustain commercial harvesting and, 2) had some form of an official management plan that defines the goals of the fishery specific to Nunatsiavut. These steps allowed for the removal of fisheries that currently have little potential for promoting the development of the fishing sector as well as fisheries where the data would be insufficient to assess with the Rapid Assessment Tool.

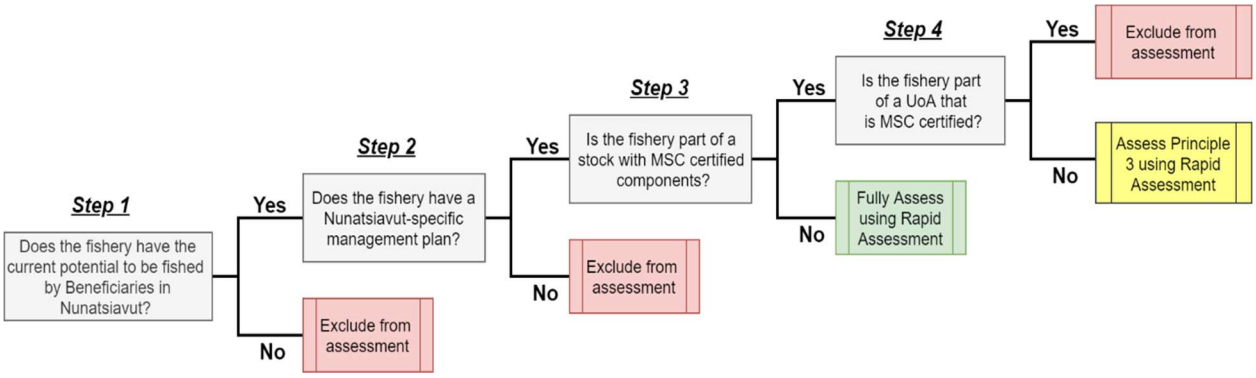

Figure 5. *Decision framework used to assess the suitability of each species for this research project.*

The fisheries that made it past steps 1 and 2 were then assessed based on the extent to which they are covered under fisheries already certified by the MSC. This was done by determining if each fishery is 3) currently part of a stock that has a component of the stock that are MSC certified, and 4) if the fishery is currently part of a certified unit of assessment (UoA). Any species already part of a certified UoA could be excluded from the sustainability assessment as they were determined to be sustainably managed already. For species that are part of a certified stock, but not a certified UoA, the outcome of MSC Principles 1 and 2 were assumed to be already sustainable. This assumption was made as for a fishery to become certified, the health of the entire stock and the ecosystem impacts of fishing on the stock must be taken into consideration (MSC, 2014). Thus, as long as the same gear type is being used, the stock health and ecosystem impact of a fishery already on a stock with certified components could be assumed to be sustainable for Principles 1 and 2. Principle 3 is still required to be assessed by the Rapid Assessment Tool, given potentially different management systems between fisheries. For the species that are not currently part of a stock that has certified components, all three Principles were assessed with the Rapid Assessment Tool.

2.2 Sustainability Assessment

Purpose – To assess the sustainability of each fishery against the MSC fisheries standard.

Section two assessed the sustainability of each fishery, as identified in the first section, to determine its potential of becoming certified should it enter an MSC full assessment. The OSMI Rapid Assessment Tool was chosen as the framework for this assessment as it allows for a direct

comparison to the fisheries standard used in an MSC assessment. Assessing the sustainability of the stock was considered to be a necessary step before conducting the trade-off analysis because the cost of MSC certification can vary greatly depending on the extent to which a fishery meets the sustainability standards before certification. This allowed for the costs associated with getting ready for certification to be considered in the next section.

OSMI Rapid Assessment Tool

The OSMI Rapid Assessment Tool was followed, in accordance with the guidance document, to assess the sustainability of each identified fishery, providing insight into how well each fishery likely holds up to the MSC fisheries standard (OSMI, n.d.). The Rapid Assessment Tool was developed to obtain a relatively quick, but accurate, estimate of the sustainability of a UoA before committing to an MSC pre-assessment, providing a fast and cost-effective route for small-scale fisheries to initially be assessed (OSMI, n.d.). Although this methodology scores a UoA using the same Principles and performance indicators as an MSC full assessment, it is designed to be able to be conducted in data-limited fisheries using mainly publicly-available information. Even though the goal of a Rapid Assessment Tool is to streamline and improve the process for fisheries looking to enter a Fishery Improvement Project (FIP), the results also highlight the major sustainability deficiencies in a fishery. It can then be estimated by using this information how a UoA would likely score if it were to be assessed by an MSC assessment.

For each fishery being assessed using the Rapid Assessment Tool, the first step was to collect basic information about the fishery in question. This information included identifying the target species, fishery location, gear type, catch quantity, vessel characteristics, number of vessels and management authorities. Together, this information defined the UoA for the assessment. For each fishery assessed, it was assumed that the Nunatsiavut Government would form the client group (given the propensity for them to hold commercial communal licences), and thus, the UoA was limited to the fishing allocations held by the Nunatsiavut Government. As required, each UoA was assessed against the MSC Sustainability Principles: stock status, environmental impacts, and management system. Using the Rapid Assessment Tool, each Principle was broken down into performance indicators, which were individually scored for each fishery based on how well they fit the scoring criteria (Figure 6).

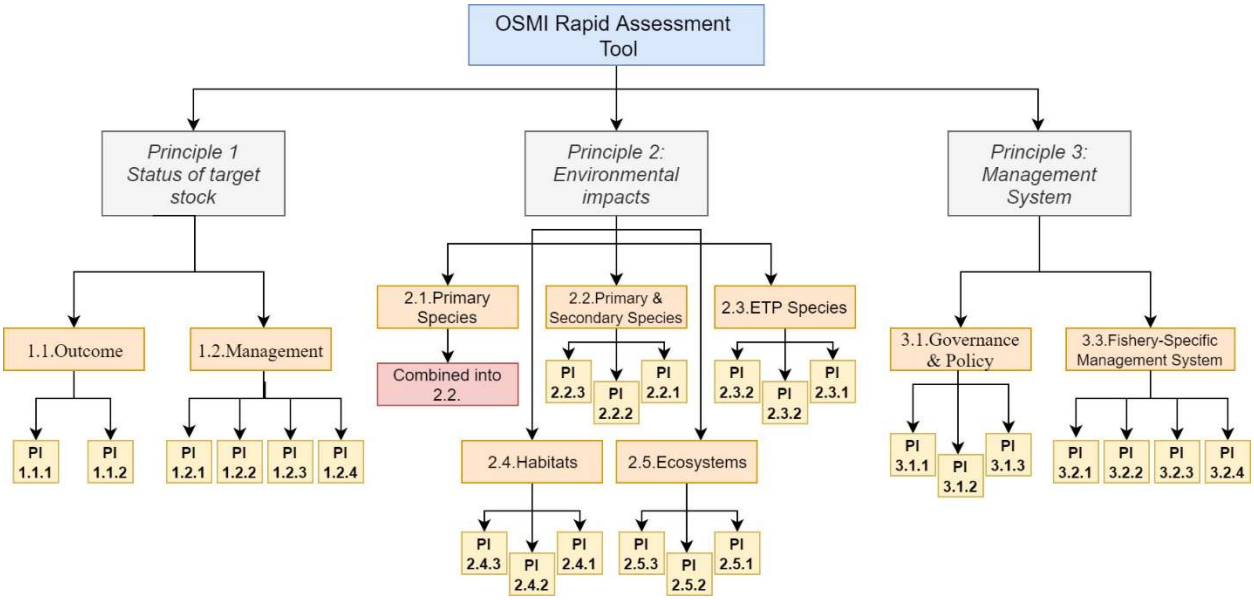

Figure 6. *Scoring breakdown of the Rapid Assessment Tool.*

Scoring

Each performance indicator was scored using three scoring categories based on the UoA's likelihood of being sustainable. The three categories are red (high risk), equating to an MSC indicator score of <60; yellow (medium risk), equating to an MSC indicator score of 60-79; and green (low risk), equating to an MSC indicator score of 80 or above. For a UoA to achieve a score of green on a performance indicator, it must have met all the minimum requirements outlined under that performance indicator. If the UoA did not meet these standards but met the minimum requirements under the medium risk category, it was scored yellow. If the minimum requirements were not met, the performance indicator scored red. An overview of the results of the UoA scores for each fishery is provided in Chapter 3 and the complete assessments in Appendix A.

Data-limited pathway

The Rapid Assessment Tool also allowed for the use of different scoring pathways depending on the amount of information available on the UoA. When scientific data were too limited to assess specific performance indicators, the data-limited pathway was used. This pathway uses the risk-based framework, evaluating the risk to sustainability using available information. In this assessment, UoAs that have developed reference points and biomass estimates were assessed using the non-data-limited pathway. However, when there was a lack of such indices being

estimated within the past ten years, the data-limited pathway was used. When there was not enough data to accurately determine if the fishery met a specific requirement, the performance indicator was regarded as data deficient and received the default score of red.

Sources of information

In conducting the Rapid Assessment for each UoA, multiple sources of information were considered in scoring each performance indicator. These sources included documents and reports from the federal, provincial and Nunatsiavut governments, peer-reviewed journal articles, Northwest Atlantic Fisheries Organization (NAFO) science documents, radio interviews, and personal communication with representatives from the Nunatsiavut Government, DFO, and MSC. As outlined in the Rapid Assessment Tool methodology, all the information used for the assessment was obtained from publicly available sources (whether available online, in print, or by request) to ensure that the results can be externally validated.

2.3 Trade-off Analysis

Purpose – To assess what the potential positive and negative implications MSC certification could bring in terms of how well they align with the Fundamental Principles of the Nunatsiavut Government.

For the trade-off analysis, this study compared the potential negative implications associated with preparing for, achieving and maintaining MSC certification against the positive implications that MSC certification may bring to the Nunatsiavut Government. In order to focus the implications of certification on the Nunatsiavut Government's governance objectives, the Fundamental Principles (5) of the Nunatsiavut Government were chosen as a framework for assessing the positive and negative implications of becoming MSC certified. These governance principles are democracy and equality, preservation of our culture and language, pursuit of a healthy society, pursuit of a sustainable economy and, preservation of the lands, waters, animals, and plants of our ancestral territory. The rationale was that decisions to seek MSC certification for Nunatsiavut's fisheries could be tied to the extent to which certification would support these governing principles.

Given the limited amount of information available on the fisheries in question, the trade-off analysis was dependant on using existing literature to understand the implications that MSC

certification has had on other studied fisheries. This required the assumption that if Nunatsiavut's fisheries were to become MSC certified, they would see similar implications as other similar fisheries that have become certified.

Steps of the Trade-off Analysis

In order to understand the implications that MSC certification could have on the Nunatsiavut Government pursuing the Fundamental Principles, the trade-off analysis was broken into four steps.

Step 1: Identification of the implications of MSC certification

This study used a scoping literature review to identify the positive and negative implications associated with MSC certification. This review was performed by searching the Novanet Database for literature on MSC using a combination of the keywords, "Marine Stewardship Council," "ecolabel," "costs," "benefits," "analysis," and "case study" while filtering for peer-reviewed journal articles published after 2016. The relevant articles were then used as a means to identify further related literature by looking at the sources that each article cited that referenced any potential implications of MSC certification. The same procedure was then used for these articles. This was continued until no additional articles were identified. Ideally, by doing the literature search this way, the most recent articles would be uncovered by the initial search, with the less recent publications included in their literature cited. Each article was then examined for mention of the positive and negative implications of MSC certification, and where applicable, the fishery it was reported from. For clarity, the implications identified were sorted into one of four broad themes (financial, governmental relations, social, and environmental) based on what area they had the most substantial impact. Although this did not return an exhaustive list of the implications of MSC certification, it is representative of a diverse range of the most commonly reported implications in the literature. The literature used to identify the implications of certification included case studies, qualitative and quantitative interviews, meta-analyses, market studies, conceptual articles, and technical papers. The literature review resulted in the identification of 25 implications of MSC certification.

Step 2: Identification of implication inclusion criteria

After identifying the positive and negative implications of MSC certification from the literature, this study assessed each implication using inclusion criteria as to only include implications

relevant to the fisheries in Nunatsiavut. Given that certification implications are highly context-specific, this approach looked to include implications based on the similarities of the fisheries the implication was reported in to Nunatsiavut's fisheries. The first inclusion criterion was if the implication was present in a small-scale fishery. The second inclusion criterion was if the implication was present in a fishery from a developing country. The third inclusion criterion was whether the implication was seen in similar markets as the products coming from Nunatsiavut. This criterion was only applied to market-based implications as it was not relevant for many other implications. The final criterion was if there was any supporting evidence that the implication is probable in Nunatsiavut. This criterion was reserved for cases where there was no strong evidence from the first three criteria that the implication would be likely in Nunatsiavut and was used to justify such an implication's inclusion or exclusion. In total, these criteria led to the removal of two positive implications, leaving a total of 23 potential implications.

Step 3: Elaboration of governance principles

Given the risk of misinterpretation of the Nunatsiavut Government's five Fundamental Principles, the Labrador Inuit Constitution (2005) was examined to elaborate on the specific goals and sub-principles behind each principle. Since the governance principles were developed based on the contents of the Labrador Inuit Constitution, these goals and sub-principles were able to be used to elaborate on how the identified implications of MSC certification could impact the five governance principles.

Step 4: Relation to the governance principles

In the fourth step, the implications of certification that were identified were sorted based on which governance principle they would most support or conflict with, using the elaboration of the principles from step 3 as guidance. Although there were situations where an implication would fit under more than one governance principle, it was only placed under the principle where it would have the most substantial impact. Once the implications were sorted, they were broken down into the specific ways that they could support or impede the principle under which they were placed. The specific impacts were determined based on readings and interpretations of the social, cultural, political, environmental, and economic situation in Nunatsiavut as well as the shortcomings identified in the Rapid Assessment.

In the case of Nunatsiavut, economic viability is only one of the goals of the fishing sector, with others being social well-being, pursuit of self-governance, and cultural preservation, to name a few. Hence, the importance of the non-monetary implications of certification carries considerable importance to those involved in the fisheries. As a researcher that is not an Inuk and is not living in Nunatsiavut, it was important to not use the research position as a place of judgement in the relative importance of the different costs and benefits that may come from certification. As such, an attempt has been made to assess the implications of certification as objectively as possible using the information that was available. However, the actual weight of the costs and benefits and the priorities of the fishing industry are decisions and perspectives that must be made by the Nunatsiavut Government and the people of Nunatsiavut alone.

Chapter 3: Results

3.1 Scoping Nunatsiavut's Fisheries

For the identification of fisheries suitable for this assessment, all major species that are currently or have historically been commercially important in Northern Labrador were considered. The fisheries identified included, Atlantic cod, Atlantic salmon, Arctic char, Iceland scallop, northern shrimp, snow crab, and Greenland halibut. These seven species were assessed for their suitability in this research using the decision framework (Figure 5). An overview of the results of the decision framework can be seen in Table 1.

***Table 1**. Results of the decision framework showing the extent to which each of the seven species identified will be assessed by the Rapid Assessment Tool.*

Species	Results from Decision Tree				
	Step 1	*Step 2*	*Step 3*	*Step 4*	*Decision for Section 2*
Atlantic cod	Exclude				**Excluded**
Atlantic salmon	Exclude				**Excluded**
Arctic char	Include	Include	Full RA required		**Principles 1,2 & 3**
Iceland scallop	Include	Exclude			**Excluded**
Northern shrimp	Include	Include	Full RA not required	Already certified	**Excluded**
Snow crab	Include	Include	Full RA not required	Partial RA required	**Principle 3**
Turbot	Include	Include	Full RA not required	Partial RA required	**Principle 3**

Of the potentially suitable fisheries, the first step of the decision framework excluded Atlantic cod and Atlantic salmon as there is little potential for them to be commercially harvested in Nunatsiavut. In NAFO areas 2GH and 2J3KL, Atlantic cod is currently under moratorium with the exception of a small "stewardship" fishery in and 2J3KL (DFO, 2019e). Given the entry requirements, low TAC, monitoring requirements and low weekly trip limits, it is unlikely that fishing for cod could currently be profitable in Nunatsiavut. Similarly, Atlantic salmon has been under moratorium in Labrador since 1992, with only subsistence and recreational fishing permitted (DFO, 2019i). Although Iceland scallops are not consistently being fished, surveys have shown commercially viable quantities in the area around Nain, and the Co-op has continued to offer to buy these species from fishers should they be fished (Barker, 2019). Even though

there has been little interest from harvesters amid concerns the cost of fishing is too high, they have the potential to be harvested. The remaining four species are all currently commercially harvested in Nunatsiavut. The second step of the decision framework excluded Iceland scallops due to the lack of a Nunatsiavut-specific management plan. As well, there is very limited data available for Iceland scallops on management or impacts on the ecosystem of the fishery in Nunatsiavut, making it difficult to use the Rapid Assessment Tool to assess sustainability. For the remaining fisheries, DFO management plans were available in the form of Nunatsiavut-specific licence conditions, a conservation harvest plan (CHP), or both.

For steps 3 and 4, only Arctic char is not currently covered in some way by an MSC assessment and required to be fully assessed by the Rapid Assessment Tool. The snow crab fishery in Nunatsiavut, though not directly part of a certified UoA, is part of a stock that is MSC certified (SAI Global, 2018). In the snow crab certification report, the UoA is defined as snow crab caught up to 2J south, however, it explicitly states that the snow crab fished under the Nunatsiavut Governments commercial communal licence in 2J north and 2H is excluded from the certification (SAI Global, 2018). Although Greenland halibut is not currently certified in Atlantic Canada, the 0AB 2+3KLMNO Greenland Halibut bottom trawl and gillnet fishery is currently in the final stages of assessment for MSC certification. The public certification report has been released, and all UoAs have met the minimum requirements for certification (Lloyd's Register, 2019). Thus, if there are no objections raised, certification will likely be achieved. Based on the defined UoAs in the public certification report, the Nunatsiavut Government's allocations in 2+3KLMNO are not included and are, therefore, not part of the certification. Hence, for both snow crab and Greenland halibut, the Nunatsiavut Governments allocations are not certified but are part of the same stock as a certified UoA. For these species, the Rapid Assessment Tool was used to assess Principle 3 only. The reason for this is that despite being part of the same stock as a certified UoA, Nunatsiavut's fisheries may be managed by DFO and the Nunatsiavut Government using different management strategies. Northern shrimp was the only species that is part of a UoA that is currently MSC certified (Acoura Marine, 2016). As a result, it is assumed that the fishery would be sustainable for all MSC Principles and was not required to be assessed by the Rapid Assessment. Thus, based on this decision framework, Arctic char was selected to be fully assessed by the Rapid Assessment Tool, and Greenland halibut and snow crab were selected to be assessed for Principle 3 only.

3.2 Sustainability Assessment

This study used the OSMI Rapid Assessment Tool to examine the sustainability of the Arctic char, snow crab, and Greenland halibut fisheries in Nunatsiavut. All three Principles were assessed for Arctic char, while only Principle 3 was assessed for snow crab and Greenland halibut. For the latter species, scores for Principles 1 and 2 were assumed based on the results in the certification reports for the other UoAs on the stock that have pursued MSC certification. Each UoA was limited to the Nunatsiavut Government's allocations and commercial communal licences.

Overall, the snow crab and Greenland halibut UoAs scored very similarly, while the Arctic char UoA scored much lower, keeping in mind that for a UoA to become certified, all performance indicators must score at least yellow or higher (Figure 7). Including the inferred scores for Principles 1 and 2 for the snow crab and Greenland halibut UoAs, they respectively scored green for 19 and 20 performance indicators out of a total of 25. The remainder were scored yellow, with no indicator scoring red. In Arctic char, however, six indicators scored green, nine scored yellow, and the remaining ten scored red. The following sections provide an overview of the performance strengths and weaknesses for each UoA as determined by the Rapid Assessment Tool. The complete assessment performed for each species is located in Appendix A.

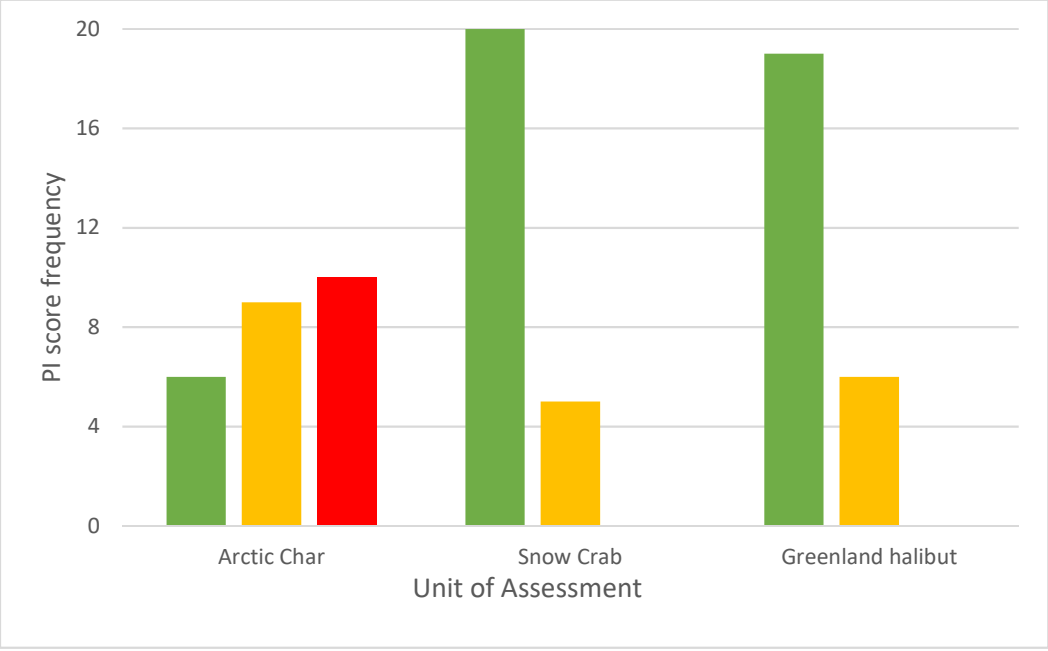

Figure 7*. Frequency of performance indicator scores for each unit of Assessment. Both snow crab and Greenland halibut scored red on zero performance indicators.*

Arctic Char Sustainability

Even though the commercial Arctic char fishery in Nunatsiavut is thought to be composed of three stock complexes (Nain Bay, Okak Bay, and Voisey Bay), each managed by DFO with their own TAC, for this assessment they were generally treated as one in this assessment. The main reason for this was that the resolution of the data available was generally not specific enough to any stock complex, and for many indicators would be expected to be the same. Where there would be an expected difference in scores, it was identified. However, in an MSC full assessment, each stock complex would be required to be scored separately (MSC, 2014). Overall, the Arctic char Rapid Assessment revealed that the weakest component of the UoA was Principle 1 (stock health), and the strongest Principle 2 (ecosystem impacts) (Figure 8).

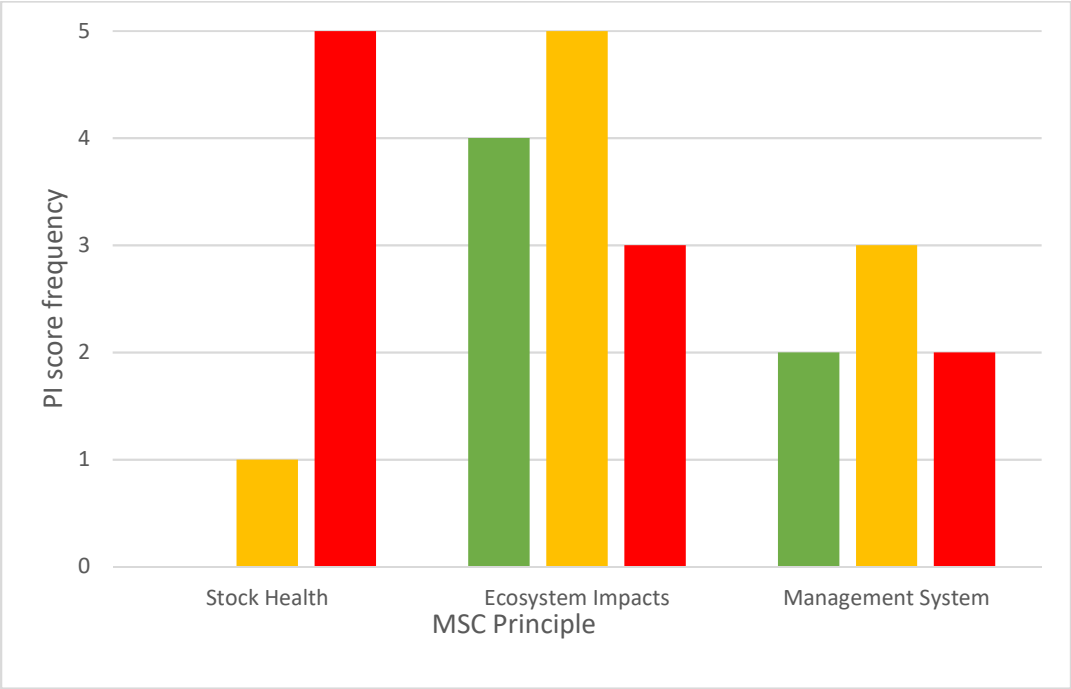

Figure 8. *Frequency of performance indicator scores for each MSC Principle for the Arctic char UoA.*

Under Principle 1, five out of six performance indicators scored red, with one scoring yellow and none scoring green. In contrast, under Principle 2, four performance indicators scored green, five yellow, and three red. Principle 2 scored slightly better than Principle 3 (management), which scored green for two performance indicators, yellow for three, and red for two. As well, under Principle 2, two performance indicators were considered data deficient, resulting in a score of red. This section provides an overview of the justifications used for the UoA in the Rapid Assessment. A summary of the results for each performance indicator is displayed in Table 2.

***Table 2**. Performance indicator scores for the Arctic char UoA.*

Principle	Component	Performance Indicator (PI)		Score
One: Status of Target Stock	Outcome	*1.1.1*	Stock status	Yellow
		1.1.2	Stock rebuilding	Red
	Management	*1.2.1*	Harvest strategy	Red
		1.2.2	Harvest control rules (HCRs)	Red
		1.2.3	Information & monitoring	Red
		1.2.4	Assessment of stock status	Red
Two: Environmental Impacts	Primary & Secondary Species	*2.2.3*	Information/Monitoring	Yellow
		2.2.1	Outcome	Green
		2.2.2	Management strategy	Green
	ETP species	*2.3.3*	Information/Monitoring	Red (DD)
		2.3.1	Outcome	Red (DD)
		2.3.2	Management strategy	Red
	Habitats	*2.4.3*	Information/Monitoring	Yellow
		2.4.1	Outcome	Green
		2.4.2	Management strategy	Yellow
	Ecosystem	*2.5.3*	Information/Monitoring	Yellow
		2.5.1	Outcome	Green
		2.5.2	Management strategy	Yellow
Three: Management System	Governance and Policy	*3.1.1*	Legal &/or customary framework	Green
		3.1.2	Consultation, roles & responsibilities	Yellow
		3.1.3	Long term objectives	Green
	Fishery-Specific Management System	*3.2.1*	Fishery-specific objectives	Red
		3.2.2	Decision making processes	Red
		3.2.3	Compliance & enforcement	Yellow
		3.2.4	Monitoring & management performance evaluation	Yellow

Principle 1: Stock health

1.1. Stock outcome

Despite five out of six performance indicators under the first Principle scoring red, the performance indicator on the current health of the stock scored yellow. In the absence of a formal stock assessment for Arctic char in Northern Labrador since 2001, the indicator was

required to be scored using the Productivity-Susceptibility Analysis (PSA), along with other available information regarding the health of the stock. The PSA resulted in a score of 2.48, which indicates that the stock has a low vulnerability (PSA score < 2.64) to overfishing by the UoA (Monterey Bay Aquarium, 2016). Other evidence from the UoA supported this finding, such as Arctic char populations showing a stable age-length distribution and decreased pressure on the stock (Dempson, 2008). However, subsistence harvesters fishing in Nain, among others, have recently become concerned over the health of the Nain Bay stock (OK Society, 2018a). As a result, without having a formal stock assessment, no definite conclusion could be drawn on the health of the stock. As well, in Nain Bay, the subsistence and recreational harvest of char is unmonitored, and the information regarding this source of removals could not be added to the assessment. The subsistence fishery in Nain Bay could be quite significant, though, with 8,000 char estimated to have been harvested in 2010 (Cohen et al., 2010). For MSC full assessment, this information would need to be considered. However, in both Okak and Voisey Bay, no commercial harvesting is currently occurring, and subsistence removals are limited to ice fishing in the winter months, suggesting these stock complexes are under less fishing pressure.

The second performance indicator assessed the effectiveness of stock rebuilding measures. The Nunatsiavut Government has intentionally under-harvested the stock, given the uncertainty around its health (Snook et al., 2018). However, since there is no formal stock rebuilding strategy in place, this indicator was scored red.

1.2. Stock management

All four performance indicators under stock management scored red as a result of the heavy focus of these indicators on the UoA having a robust harvest strategy in place. Under this section, the UoA was assessed based on the effectiveness of harvest control rules (HCRs), information and monitoring, stock assessments, and the extent that these components work together to keep fishing mortality below reference points. In the UoA, the primary documents outlining the management strategy for the fishery are the "Arctic Char Management Plan for Northern Labrador document" and the "Commercial Communal Licence Conditions for Arctic Char in Northern Labrador" (DFO, 2019a, n.d.). These documents make no mention of HCRs, which are defined as "pre-agreed rules and management actions that will be taken in response to changes in indicators of stock status with respect to reference points" (OSMI, n.d., p. 10). Even if

HCRs were in place, without a stock assessment, there would be no way of knowing when reference points are reached.

In terms of information and monitoring in the UoA, the only information on removals of the commercial fishery is collected by the Co-op at the point of landing (Whalen et al., 2015). As well, information collected on the stock structure and productivity has been sparse over the last 20 years (Dempson, 2008). This data void is in contrast to the wealth of information collected on the stock before the 2000s, which now provides a baseline to compare current stock information against, should it become available. However, the current level of information on the fishery is lacking in supporting a precautionary harvest strategy as defined by standards like the MSC's. Thus, in the absence of HCRs, stock assessments and up-to-date stock information, the overall harvest strategy was not determined to be effective relative to the requirements within an MSC assessment. As a result, all four stock management performance indicators were scored red.

Principle 2: Ecosystem impacts

Whereas an MSC full assessment considers the effect of the UoA on primary species (2.1) and secondary species (2.2) separately, the Rapid Assessment Tool assesses them together under the primary and secondary species section (2.2). Hence the reason why there is no section 2.1 in this assessment. Sections 2.2-2.5 each have three performance indicators, one assessing the information/monitoring, one the outcome, and one the management strategy associated with the given section (Table 2).

2.2. Primary and secondary species

Under primary and secondary species, the UoA scored yellow for the first performance indicator and green for the following two. In the Arctic char UoA, Atlantic salmon is the only other species frequently caught in the fishery. Since salmon is required to be discarded when caught and logbooks are not required, there is no monitoring of the number of salmon caught by the UoA. However, the management plan includes a "salmon bycatch protocol," which comes into effect if the number of salmon caught in any one location exceeds 5% the number of char (DFO, n.d.). The salmon bycatch protocol requires a fisher to move away from the berth where salmon were caught for the day, and if the issue continues over three days, the area is shut down to fishing for two weeks. Thus, the likely catch of salmon in the UoA is minimal. Personal communication with Todd Broomfield (2019), Director of Renewable Resources for the

Nunatsiavut Government, suggests that catches are very low. Despite local knowledge, in the absence of any formal method for collecting bycatch information that MSC assessment processes prioritizes, the information/monitoring performance indicator scored yellow.

In terms of the health outcome of the stock, the Atlantic salmon stock in Northern Labrador is not considered at risk under the *Species at Risk Act* (2002) or by COSEWIC. As well, the most recent stock assessment of Atlantic salmon in Northern Labrador place biomass estimates above both the upper and lower reference points, suggesting the stock is doing well (DFO, 2018e). The outcome of the Northern Labrador stock is therefore highly likely to be above biologically based limits and was scored green.

The UoA also scored green for the management of Atlantic salmon as a result of the salmon bycatch protocol and other management measures such as minimum mesh size, maximum gear length, low TAC, and short fishing season. Together, this strategy is highly likely to prevent the fishery from seriously impacting the health of the Northern Labrador Atlantic salmon stock.

2.3. Endangered, threatened, or protected (ETP) species

This group of performance indicators received the lowest scores of all the sections under Principle 2. All three indicators scored red, with two of them being scored as data deficient. However, the UoA scored poorly because of the lack of information available about the impacts on endangered, threatened, or protected (ETP) species, not necessarily the magnitude of its impact. Off the coast of Nunatsiavut, multiple species of ETP mammals and seabirds are found that are listed under the *Species at Risk Act* (2002). These include the low Arctic population of Atlantic Walrus, hooded seals, Barrows goldeneyes, harlequin ducks, and ivory gulls. However, given the close distance of the Arctic char fishery to shore, it is unlikely to frequently encounter any of these species. The Arctic char fisheries in the Northwest Territories and Greenland support this claim as they report minimal bycatch of seabirds in char gillnets (Bakken & Falk, 1998; Bentzen & Robards, 2014). However, without any documented understanding of the UoAs interactions with ETP species, the information/management and outcome of ETP species was considered data deficient and scored red by default. Similarly, the management of ETP species is scored red as there is no review of the potential effectiveness of the measures in the fishery at protecting ETP species (as the interactions are not known). Even though these performance

indicators scored red, likely, the UoA interacts with few ETP species and is not impacting their recovery.

2.4. Habitats

The UoA scored yellow for two and green for one of the habitat-specific performance indicators. In general, there is a lack of documented information regarding habitats encountered by the fishery. Off the coast of Labrador, there are some area-based closures to protect vulnerable habitats, though no closures occur within the UoA. In the fishery, though, only short, midwater gillnets are allowed, with which there is minimal contact with the seafloor. Thus, like other fisheries using this gear, it can be assumed that habitat impacts are minimal (Acoura Marine, 2017). This claim is supported by Chuenpagdee et al. (2003), who found that midwater gillnets have very low impacts on the physical and biological habitat of an area. As a result, even though the commonly encountered habitats and the fishery's impacts on habitats are only broadly understood, it is highly unlikely to reduce their structure to a point where there would be serious harm.

In terms of habitat management, despite there not being any specific habitat-based management measures, the general fishery measures in place are expected to be effective at protecting habitats from serious harm based on the similarity to the British Columbia salmon UoA (Acoura Marine, 2017). As well, the Nunatsiavut Government and Oceana Canada, are currently working on the Imappivut Expedition project to survey the physical and biological habitats in Nain Bay (Oceana, 2019). Although these findings are not yet available, this research is expected to help improve the understanding of the key habitats in the region, and any effects the fishery may have on them. With no examination of the effectiveness of the UoAs management measures, though, this indicator was scored yellow.

2.5. Ecosystem

The three ecosystem-based performance indicators scored yellow, green, and yellow, respectively. This section is like the previous section but is focused more on the understanding and management of the key elements of the ecosystem in the UoA. The information/monitoring indicator could be scored yellow because of the collection of scientific studies, surveys, local and traditional ecological knowledge, and expert knowledge on the ecology and oceanography around Nain. This information helped DFO classify the coasts around Nain as an ecologically

and biologically significant area (Wells et al., 2017). As well, some information on the diets of Arctic char stocks throughout Northern Labrador has been collected and shows that age, stock, and year can influence the diet of Arctic char (Dempson et al., 2002). However, climate change is expected to cause ecosystem shifts in the area, and without continued data collection, these changes may go undocumented (Allard & Lemay, 2012).

Like habitat outcome, the ecosystem outcome indicator was scored green as it is highly unlikely that the UoA will cause any serious or irreversible damages to the key ecosystem functions. However, as the current management system does not explicitly consider the UoAs impact on the function of the ecosystem, the management indicator was scored yellow.

Principle 3: Management system

In this section, the UoA score green for the performance indicators linked to legal/customary framework and long-term objectives, and yellow for the consultation, roles, and responsibilities indicator. At the national level, there is a robust framework guiding the management of fisheries in Canada in accordance with the precautionary approach. At the highest level, the *Fisheries Act* (1985), *Oceans Act* (1996), and *Species at Risk Act* (2002) make up the overarching fisheries management framework and define the legal context for fisheries management in Canada. The *Fisheries Act* is the most relevant, which grants the Minister of Fisheries and Oceans authority over Canada's coastal and inland fisheries. Multiple enabling regulations have been enacted to support the *Fisheries Act* to allow the Minister to specify management measures to ensure the conservation of fish and habitats. For the Arctic char UoA, the most relevant are the:

- Aboriginal Communal Fishing Licences Regulations;
- Atlantic Fishery Regulations, 1985;
- Fishery (General) Regulations;
- Marine Mammal Regulations; and
- Newfoundland and Labrador Fishery Regulations

These regulations also allow for the enforcement of violations of the various Acts and keep the process equal across all fisheries by clearly defining violations and sanctions.

The co-management arrangement between DFO and the Nunatsiavut Government is outlined in Section 13 of the Labrador Inuit Land Claims Agreement (2005). This arrangement defines the

Nunatsiavut Government's roles and responsibilities in managing Nunatsiavut's subsistence fisheries and assigns the Torngat Joint Fisheries Board as the primary body for communicating with the Minister of Fisheries on matters relating to the conservation of commercially harvested species and habitats within the LISA. The primary responsibility of the TJFB is to advise the Minister of Fisheries on issues of conservation through recommendations and to carry out any research necessary to support these recommendations. As well, for species listed under Schedule 13-B (such as Arctic char), the Minister is required to appoint 70% of any new fishing licences within and adjacent to the LISA to the Nunatsiavut Government. Similarly, the Minister is required to appoint 60% of new licences within the LISA to the Nunatsiavut Government for species listed under Schedule 13-C (such as snow crab and Greenland halibut). Along with the other provisions in the LILCA, the rights of Labrador Inuit are considered to be respected under federal legislation.

Outlined in the *Fisheries Act* (1985) are the long-term national objectives for fisheries in Canada. In addition to ensuring the conservation and sustainable harvest of fish stocks, the *Fisheries Act* was recently amended to include: recognition that decision-making should be guided by principles of sustainability, precaution, and ecosystem management; a commitment to protect all fish habitats; and provisions for protecting biodiversity in the long-term, for restoring degraded fish habitats, and for rebuilding fish stocks (DFO, 2019h). These amendments are in line with the long-term objective of the Nunatsiavut Government to ensure sustainable use of fishery resources for the benefit of Labrador Inuit (LIC, 2005). Supporting the national objectives of conservation and precaution are various policy frameworks such as the "Sustainable Fisheries Framework" (DFO, 2018f), "Atlantic Fisheries Policy Review" (DFO, 2008), and "Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas" (DFO, 2013b). As well, the "Integrated Aboriginal Policy Framework" is enacted to provide support to Indigenous groups wanting to take a greater role in fisheries management (DFO, 2019g). Overall, the national level legal framework and long-term objectives are supportive of an inclusive fisheries management process that can promote sustainable management of Canada's fisheries.

However, the UoA scored yellow for the consultation, roles, and responsibilities indicator due to the lack of clarity around support for the Nunatsiavut Government and TJFB to perform its responsibilities under the LILCA (Snook et al., 2019). This issue was brought up at the TJFB

Fisheries Workshop meeting in 2015, where the Nunatsiavut Government reported they could not continue the subsistence Arctic char logbook program as funding from DFO was not available (Whalen et al., 2015). Despite recognizing the value of having this information, without funding, the Nunatsiavut Government could not afford to collect this information. Given how important this information is for the proper management of the stock, not all aspects of the management process are considered to explicitly defined, and thus, scored yellow.

3.2. Fishery-specific management system

Under the fishery-specific management section, the UoA scored red for the fishery-specific objectives and decision-making process performance indicators and yellow for both compliance and enforcement and management system performance evaluation indicators.

Even though the Arctic char management plan identifies three main management goals, there are no short or long-term objectives, no timeframe, and little evidence of the precautionary approach associated with them. The management plan is also static, and the specific measures in the plan are not given much attention by DFO (Whalen et al., 2015). Instead, the Nunatsiavut Government has been using its authority to impose quota limits on the designates under its commercial communal licence to under harvest the stock given the uncertainty around stock health (Snook et al., 2018).

Within the fishery, consultation with stakeholders is done primarily at the TJFB Fisheries Workshops, though not specific to char, which allows the TJFB to gather information to bring forward to DFO (OK Society, 2018b). However, there is no evidence that this information is being used by DFO to guide the management strategy for the fishery or if a defined decision-making process even exists for the fishery. As a result, the first two performance indicators were scored red.

Given the small number of fishers, small TAC, and remote location of the UoA, there are no extensive compliance and enforcement mechanisms used in the fishery to ensure compliance with the management plan. Instead, compliance relies on implementing control measures through the licence conditions issued to a Beneficiary when they are designated under the Nunatsiavut Government's licence (DFO, 2019a). These measures include vessel registration and gear marking, allowing violations to be tracked to an individual. As well, there is a federal

Conservation Officer stationed in Nain who surveys for compliance in the fishery. Overall though, there is evidence that non-compliance is not an issue in the UoA (personal comm. Todd Broomfield, 2019). Given the nature of the fishery, these measures are likely sufficient for generating compliance, but it cannot be said without a doubt, resulting in a score of yellow.

Snow Crab Sustainability

Only Principle 3 was assessed by the Rapid Assessment for the snow crab UoA. For the other two Principles, the likely results for the performance indicators under Principles 1 and 2 were assumed from the results of the "1st Re-assessment Public Certification Report for Newfoundland & Labrador snow crab" (SAI Global, 2018). In total, two performance indicators in each Principle 1 and 2 were determined to be yellow with the rest green (Figure 9). For Principle 3, all indicators scored green except for compliance and enforcement. These results differed from the certified UoA which scored green for all Principle 3 indicators (SAI Global, 2018).

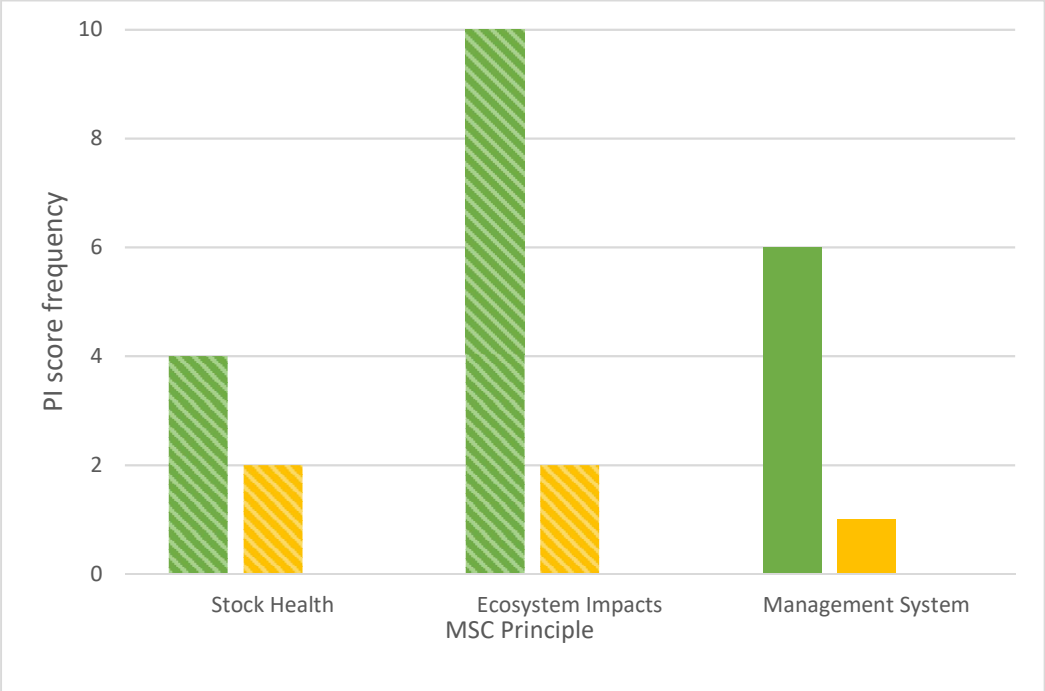

Figure 9. *Frequency of performance indicator scores for the snow crab UoA. The shaded bars represent performance indicator scores inferred from the MSC full assessment of the certified UoA (SAI Global, 2018).*

Principle 3: Management system

3.1. Governance and policy

All the performance indicators were scored green under section 3.1 based on the same justifications as the Arctic char UoA (Table 3). However, since there is not the issue of data

collection in the subsistence fishery for this UoA, the performance indicator for consultation, roles, and responsibilities was scored green instead of yellow.

***Table 3**. Principle 3 performance indicator scores for the snow crab UoA.*

Principle	Component	Performance Indicator (PI)		Score
Three	Governance and policy	*3.1.1*	Legal &/or customary framework	Green
		3.1.2	Consultation, roles & responsibilities	Green
		3.1.3	Long term objectives	Green
	Fishery-specific management system	*3.2.1*	Fishery-specific objectives	Green
		3.2.2	Decision making processes	Green
		3.2.3	Compliance & enforcement	Yellow
		3.2.4	Monitoring & management performance evaluation	Green

3.2. Fishery specific management system

Overall, the fishery-specific management system for snow crab was determined to be effective with the UoA scoring green on all performance indicators except compliance and enforcement, which scored yellow (discussed below) (Table 3). Unlike the Arctic char fishery, the Newfoundland and Labrador snow crab fishery has an Integrated Fisheries Management Plan (IFMP) outlining the overall management strategy for ensuring the sustainability of the fishery (DFO, 2019j). In the IFMP, the short and long-term objectives of the fishery are defined, including measurable management actions to reach these objectives. The key long-term objectives are conservation and sustainable harvest, benefit to stakeholders, and co-management of resources. Even though biological reference points are not used in the fishery, the UoA is still considered adequately precautionary from an MSC standpoint because of alternate measures used to support the precautionary approach. These alternate measures include using a multi-indicator approach to determine appropriate harvest levels and requiring juvenile and female crabs to be released alive to keep their mortality to a minimum (DFO, 2017).

To consult with stakeholders, DFO holds annual Advisory Meetings in each of the 18 crab fishing areas to discuss the most recent science and gather industry feedback on the previous fishing season and recommendations on how management should be changed (DFO, 2019j). The Nunatsiavut Government is involved in the Advisory Committee meeting for snow crab area 1,

allowing them to bring the comments and concerns heard by their members to DFO (OK Society, 2018b). As well, the TJFB's recommendations to the Minister of Fisheries provide another way to ensure DFO hears the concerns in Nunatsiavut. The TJFB is also in partnership with DFO to conduct a Post-Season Trap Survey for snow crab in NAFO division 2H and 2J north, ensuring that the TJFB has up to date scientific information on their portion of the stock (TJFB, 2017c). DFO generally makes decisions at the NL-wide level after reviewing what was heard at the Advisory Committee meetings and taking into account the most up-to-date scientific advice. This process is repeated annually and is well understood in the fishery. The Nunatsiavut Government also has additional decision-making capabilities to ensure their portion of the stock is managed sustainably. Their commitment to sustainability is evident from the voluntary holdback of 15% of their snow crab quota from 2014-2016 among concerns over the stock health (TJFB, 2017c). Overall, the TJFB considers the co-management of the snow crab fishery a "co-management success story" between the Nunatsiavut Government and DFO (TJFB, 2017c).

The reason for the yellow score for the compliance and enforcement performance indicator, when the certified UoA scored green, is because monitoring and surveillance mechanisms, though adequate across the whole fishery, are not being implemented in Nunatsiavut. In the snow crab IFMP, the main methods of monitoring the fishery are through dockside monitoring of catches, at-sea observed trips, and aerial surveillance (DFO, 2019j). Given that no dockside monitoring or at-sea observer companies exist in Nunatsiavut, these measures cannot be performed. In their absence, it is difficult to say with certainty that the main compliance issues in the fishery are not occurring in Nunatsiavut.

Greenland Halibut Sustainability

Like snow crab, the performance indicators under Principles 1 and 2 were assumed from the results of the "MSC Sustainable Fisheries Certification Canada 0AB 2+3KLMNO Greenland Halibut: Public Comment Draft" (Lloyd's Register, 2019). In this assessment, two performance indicators in Principle 1 and three in Principle 2 were determined to be yellow with the rest green (Figure 10). For Principle 3, all performance indicators scored green except for compliance and enforcement, differing from the MSC assessed UoA which scored green for all Principle 3 indicators (Lloyd's Register, 2019).

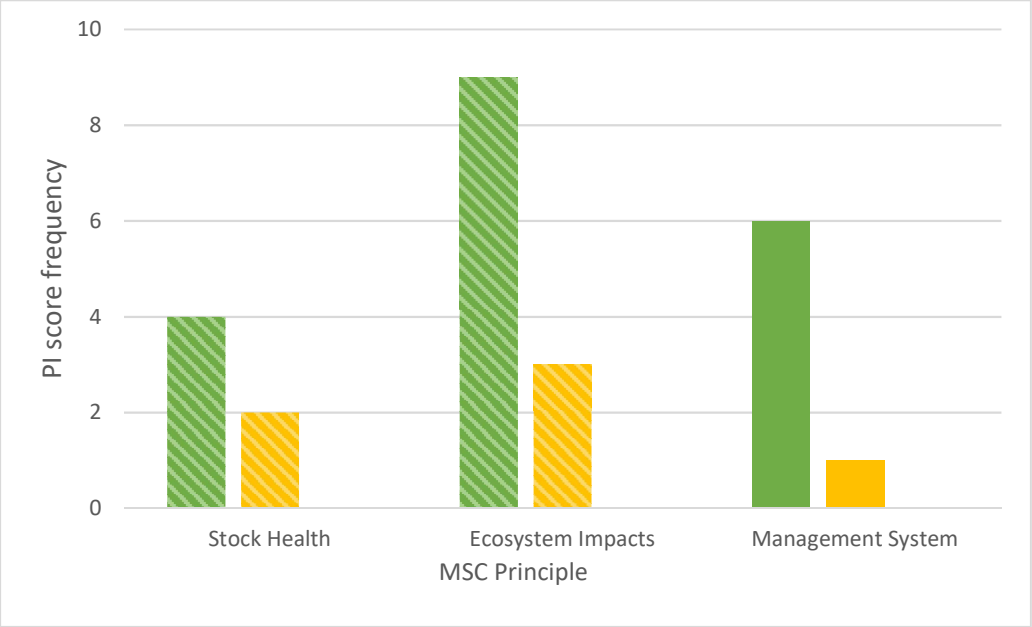

Figure 10. *Frequency of performance indicator scores for the Greenland halibut UoA. The shaded bars represent performance indicator scores inferred from the certified UoA (Lloyd's Register, 2019).*

Principle 3: Management system

3.1. Governance and policy

The governance and policy performance indicators for the Greenland halibut UoA were all scored green using the same justification as the snow crab UoA (Table 4). Since the stock is transboundary, the international fisheries management organizations involved must also be assessed. For the 2+3LMNO stock of Greenland halibut, this includes the regional fisheries management organization NAFO. NAFO's mandate is to provide scientific advice on the stock and set the regional TAC (NAFO, 2018). Since the management system of NAFO was already assessed in the Public comment draft for the Canada 0AB 2+3KLMNO Greenland halibut, it is not required to be re-evaluated for the UoA in this study (Lloyd's Register, 2019).

Table 4*. Principle 3 performance indicator scores for the Greenland halibut UoA.*

Principle	Component	Performance Indicator (PI)		Score
Three	Governance and policy	*3.1.1*	Legal &/or customary framework	Green
		3.1.2	Consultation, roles & responsibilities	Green
		3.1.3	Long term objectives	Green
	Fishery-specific management system	*3.2.1*	Fishery-specific objectives	Green
		3.2.2	Decision making processes	Green
		3.2.3	Compliance & enforcement	Yellow
		3.2.4	Monitoring & management performance evaluation	Green

3.2. Fishery specific management system

For the Greenland halibut UoA, the fishery-specific performance indicators scored identically to the snow crab UoA (Table 4). Included in the 2+3KLMNO groundfish IFMP are the management objectives for Greenland halibut. Although this IFMP is not specific for Greenland halibut, it includes the two long-term objectives "ensure conservation and sustainable harvest" and "benefit to stakeholders" (DFO, 2019e). These long-term objectives also include measurable management strategies for achieving them. For Greenland halibut, the NAFO Rebuilding Program is also in place, which requires extra measures to be taken to promote the recovery of the Greenland halibut stock. The "Nunatsiavut Government Greenland halibut conservation harvest plan (CHP)" issued by DFO is the specific management plan for Nunatsiavut's Greenland halibut fishery. This CHP outlines the specific management measures that are applied to designates fishing under the Nunatsiavut Government's groundfish licences (DFO, 2016chp). It also allows for a Nunatsiavut-specific management plan to be used promote conservation of the portion of the stock in the Zone.

In the UoA, decision-making for the stock occurs at two levels. The TAC is decided precautionarily by NAFO using harvest control rules defined under the Management Strategy Evaluation process. For all other aspects, decision-making authority remains with DFO. Management system decisions are made after consultation with relevant stakeholders and a review of the stock information available from the annual Science Regional Advisory Process and the NAFO Scientific Council (DFO, 2019e). The main consultative body is the Groundfish Advisory Council (GAC), which allows members to provided advice to DFO about the previous fishing season and raise any issues regarding the current management strategy (DFO, 2019e). The GAC has members from the harvesting and processing sectors, the province of Newfoundland and Labrador, Indigenous oOrganizations, and environmental non-governmental organizations (DFO, 2019e). The membership includes the Nunatsiavut Government, allowing them to bring forward what was heard from the annual workshops in Nunatsiavut (Whalen et al., 2015). The TJFB is also able to participate in the decision-making process through recommendations to the Minister. The GAC meets annually, and DFO uses the information heard and the scientific advice in monitoring and evaluating the current management system. The GAC can also form ad hoc working groups if further information is needed to make a decision

(DFO, 2019e). The information collected through these groups is brought back to the GAC and discussed with DFO.

This UoA scored yellow for the compliance and enforcement performance indicator on the same basis as the snow crab UoA. In the Nunatsiavut-specific CHP, designates are required to have their catch dockside monitored and may be requested to take an at-sea monitor. However, these services are unavailable in Nunatsiavut. The only monitoring is done by the Co-op when fish are landed at their Makkovik fish plant. Thus, the lack of these monitoring and surveillance tools in the UoA makes it challenging to determine with certainty whether compliance and enforcement measures are effective.

3.3 Trade-off Analysis

Step 1. Identification of the Implications of MSC Certification

Using a scoping literature review, the potential implications of MSC certification were identified. In total, 16 positive implications (Table 5) and nine negative implications (Table 6) were identified. These implications fell into four broad themes, financial implications, implications for governmental relations, social implications, and environmental implications. Some of the identified implications were able to fit into more than one category but were only placed in the one that was most relevant. Although some implications of certification were mentioned more frequently than others, all implications were included in this step regardless of frequency.

Financial implications

Financial implications make up the first broad theme of implications of certification that were identified in the literature. Financial implications were almost always mentioned by certified fisheries when discussing costs and benefits likely because they are tangible and can often be quantified. In total, five potential positive implications and three potential negative implications of certification were identified.

Negative financial implications

One of the primary considerations of fisheries looking to pursue MSC certification is the economic resources required to undertake a pre-assessment, full assessment, and annual audits. Entering the certification process is a time and resource-intensive process and, for many small-scale fisheries, these costs alone are enough to prevent seeking certification (Lajus et al., 2018).

***Table 5**. The potential implications of MSC certification identified in the literature review that resulted in a positive impact on a fishery.*

Implication	Elaboration	Example fishery	Supporting Sources
Financial			
Market access	Maintenance of existing markets; Greater access to existing markets; Access to new markets	- SA hake - Mozambique shrimp - Alaskan Salmon - Patagonian scallop	- Carlson & Palmer, 2016 - Pérez-Ramírez et al., 2016 - ISU, 2012 - Lallemand et al., 2016 - UNEP, 2009 - Butterworth, 2016
Market stability	Greater ability to withstand internal and external changes in product volume	- KDSFF Flounder - US Pollock	- Wakamatsu, 2014 - Roheim & Zhang, 2018
Differentiation from aquaculture	Market separation from farmed products	- Salmon - European turbot	- Roheim et al., 2012 - Bronnmann & Hoffmann, 2018
Price Premium	Higher price received at the retail level; Higher price received dockside level	- US Pollock - Haddock - Pacific cod - Alaskan Salmon	- Blomquist et al., 2015 - Sogn-Grundvåg et al., 2013 - Roheim et al., 2011 - Stemle et al., 2016
Export tariff reduction	Avoidance of tariffs due to sustainability	- Australian rock lobster	- Matthew, 2011
Government Relations			
Fishery access security	Maintenance of current allocations; Greater allocations granted in the future	- SA Hake - Ben Tre clams	- Ponte, 2008b - Pomeroy, 2013
Greater governmental support	Funding for fisheries development projects	- Mexican Lobster	- Pérez-Ramírez et al., 2012a
Greater participation in management	Creation of new management institutions; Improved relations between existing institutions; Greater access to information	- Waterhen Lake walleye - Mexican lobster - Multiple Argentinian fisheries	- Wakamatsu & Wakamatsu, 2017 - Phillips et al., 2008 - Gutierrez et al., 2016 - Pérez-Ramírez et al., 2012c
Improved interjurisdictional relations	Greater coordination between countries with shared fish stocks	- Baltic Sea codfish	- Lajus et al., 2018

Social			
Creation of jobs	Ability to supporting more fisher, processors, and indirectly related jobs	- SA Hake	- Butterworth, 2016
Improved reputation and prestige	Sustainable fishery management recognized at the international, national, and local level	- Alaskan Pollock - Patagonian toothfish - Mexican lobster	- UNEP, 2009 - Pérez-Ramírez et al., 2012c
Indirect food security	Greater capacity to import food	- Brazil lobster	- Kurien, 2005
Environmental			
Improved health of fish stock and ecosystem	Resulting from certification required changes	- Across multiple fisheries	- Martinet et al., 2012 - Gutiérrez et al., 2012 - Selden et al., 2016
Reduced IUU fishing	Resulting from improved monitoring, enforcement and traceability	- Patagonian Toothfish	- UNEP, 2009
Identification of management shortcomings	Allows management measures to focus on the most needed areas	- Multiple Argentinian fisheries - SA hake	- Pérez-Ramírez et al., 2012a - Pérez-Ramírez et al., 2016 - Butterworth, 2016
Clear path for improvement	Through the clear identification of management measures that need to be improved	- Bahamian spiny lobster	- Thomas Travaille et al., 2019

***Table 6**. The implications of MSC certification identified in the literature review that resulted in a negative impact on a fishery.*

Implication	Elaboration	Example fishery	Supporting Sources
Financial			
Direct economic costs	Cost of an MSC pre-assessment; Cost of a full MSC assessment; Cost of annual audits; Costs associated with logo use	- Cost evident in all fisheries	- UNEP, 2009
Indirect economic costs	Preparation for certification; Meeting certification conditions	- Cost evident in all fisheries	- Roheim et al., 2011 - Lajus et al., 2018
Economic uncertainty	Uncertainty of future MSC requirements; Uncertainty in maintaining funding	- AAFA Albacore Tuna Fishery - Cornish sardine fishery	- Bellchambers et al., 2016a - Sampson et al., 2015 - ISU, 2012
Social			
Extensive Human Capacity	Capacity to prepare for certification; Capacity to maintain certification	- Multiple small-scale fisheries	- Carlson & Palmer, 2016
Increased price locally	Higher prices of MSC product to locals following certification	- Speculated	- UNEP, 2009 - Standing, 2009 - Gardiner & Viswanathan, 2004 - Kurien, 2005
Less available for domestic consumption	Lower availability of MSC products to locals following certification	- Speculated	- UNEP, 2009 - Gardiner & Viswanathan, 2004 - Kurien, 2005
Environmental			
Greater pressure on stock	Increased pressure to supply sustainable fish	- SA hake	- Butterworth, 2016
False sense of security	Assumption that fish stocks are sustainable because they are certified	- SA hake - NZ hoki	- Ponte, 2008a - Ponte 2008b
Set management path	Concern that process is becoming to focused on "Western management" styles	- SA hake	- Butterworth, 2016

The first and most straightforward likely implication of MSC certification identified was the direct economic investment required for assessments, which can be broken down into multiple components. The initial direct cost for a fishery entering certification is the MSC pre-assessment. Although not required, a pre-assessment is highly recommended, costing from a few thousand to a few tens of thousands of USD (Washington & Ababouch, 2011). After the pre-assessment, a fishery will likely enter into MSC full assessment, for which direct costs (auditor site visits, salaries, etc.) can vary greatly depending on the context of the fishery. Although assessment costs are not made public, which makes it hard to estimate an average cost, one study reported that the costs are likely to be around USD 20,000 for a small community-based fishery and USD 300,000 for the largest fisheries (Howe, 2008). However, the size of a fishery is not the only factor that determines the assessment cost. This is evident from the provincially-funded Lake Waterhen walleye and northern pike fishery in Manitoba, which is reported to have cost CAD 80,000 for the certification of a harvest of only 40t (Forbes, 2015). After successful certification, a fishery must also undergo yearly surveillance audits, which are estimated to cost 15-20% of the initial certification assessment (Jaffry et al., 2016), with costs as high as 40% seen in the South African Hake fishery (Standing, 2009). Additional direct costs were also identified for the use of the MSC logo, including a small annual fee, and for consumer-facing organizations, a 0.5% royalty on the sale of all MSC products (assuming net sales of < USD 13,000,000) (MSC, 2019a). This cost has been enough to discourage the use of the logo by the Baja California red rock lobster fishery in Mexico (Bellchambers et al., 2016b).

Despite the potentially high costs directly associated with certification, the implications associated with the indirect costs of certification are reported to be far greater (Goyert et al., 2010; Lajus et al., 2018; Wakamatsu & Wakamatsu, 2017). A large indirect cost identified was the resources required to prepare the required documents and keep in contact with the assessment team during the process (Bellchambers et al., 2016b). This cost was reported to be magnified when there is a lack of knowledge of the certification process by the management agencies, resulting from inefficiencies during the assessment (Bellchambers et al., 2016a). Additionally, in many cases, the direct certification costs are seen to be only a fraction of the costs required to meet the conditions of certification (Roheim et al., 2011). For the Maine lobster fishery, annual costs required for audits and addressing conditions were estimated to be between USD 525,000 and 1.3 million per year (Goyert et al., 2010), with similar costs estimated for the South African

(SA) hake and Australian rock lobster fisheries (Bellchambers et al., 2016b; Standing, 2009). The added uncertainty placed on a fishery after becoming MSC certified was also identified as a negative implication of certification. Uncertain costs have been seen to result from changes in the MSC fisheries standard, such as in the case of the American Albacore Fishing Associations, where changes to the standard resulted in the condition that the UoA must develop limit reference points (Bellchambers et al., 2016a). The high indirect costs were also seen to make a fishery dependant on continued funding to ensure certification can be maintained, posing the risk that funding will not be enough to cover future certification costs (Sampson et al., 2015).

Positive financial implications

Despite these costs, there were also many positive economic implications reported by fisheries following certification, mostly arising from being able to differentiate certified from non-certified sources. The most-reported implications identified were related to improvements in market presence resulting in access to new markets, continued or greater access to existing markets, differentiation from farmed products, and market stability. Of the MSC certified fisheries in developing countries examined by Carlson and Palmer (2016), 57% reported market access as a benefit of certification. As well, in the Mozambique shrimp and South African Hake fisheries, MSC certification was considered a crucial tool for entering the EU market (ISU, 2012; Lallemand et al., 2016). Pérez-Ramírez et al. (2016) also found that for many certified Argentinian fisheries, MSC certification has been beneficial for maintaining access to European markets. Likewise, certification of the Alaskan wild salmon fishery is reported to have increased market share in EU markets (UNEP, 2009). Even in certified fisheries that did not see benefits to market access directly, some reported market stability as a positive implication of certification. This implication is seen in the Japanese flounder fishery, which has reported fewer impacts from endogenous market shocks following certification (Wakamatsu, 2014). A similar benefit was observed in the US pollock fishery, which reports becoming less sensitive to changes in both the volume of certified and uncertified products entering the market (Roheim & Zhang, 2018). An additional positive implication identified was the differentiation of MSC labelled products from farmed products. This preference was observed for consumers in the US and Germany who display a clear preference for wild-caught and ecolabeled salmon and flatfish over the farmed equivalents (Bronnmann & Hoffmann, 2018; Roheim et al., 2012).

Another financial benefit identified in some fisheries was the presence of a price premium on certified fish, either at the retail level or dockside level. However, these benefits are generally localized to specific markets and it unclear how stable these premiums are over time At the retail level, Blomquist et al. (2015) determined there was a 10% price premium for MSC-labelled cod in Sweden, while Sogn-Grundvåg et al. (2013) and Roheim et al. (2011) observed a 10% and 14.2% premium for certified haddock and Alaskan pollock, respectively, in the UK. At the dockside level, Stemle et al. (2016) noticed that dockside prices for MSC certified salmon have risen more than uncertified salmon in the Northwest Pacific; however, only for certain species. Other studies have found no price premium benefits to fishers (Blomquist et al., 2015). One other unique implication of MSC certification identified was the apparent use of certification by the Australian rock lobster fishery to reduce export tariffs on their product (Mathew, 2011).

Implications on government relations

The second broad theme that emerged in identifying the implications of MSC certification concerned the impacts on the relationships between governments and stakeholders. Under this theme, three positive implications and no negative implications were reported from certified fisheries. The first implication of MSC certification identified was security in access to fishing rights. This implication was evident in the Ben Tre clam and SA hake fisheries, who report that certification allowed for the long-term maintenance of, or increased in, access to fishing rights (Pomeroy, 2013; Ponte, 2008b). In the case of the SA hake fishery, their increased access was not necessarily favourable over the entire fishery, as greater access to the certified UoA restricted the small-scale longline vessels access to the fishery (Ponte, 2008a). This example highlights the complexity in trying to understand the full range of implications of MSC certification. Another positive implication identified was an increase in governmental support following certification. Governmental support was a clear benefit in the Mexican red rock lobster fishery, which received $20 million for infrastructure improvements in fishing communities after certification, far outweighing the costs to get certified (Pérez-Ramírez et al., 2012a). Some certified fisheries were also found to report increased participation in management as a favourable implication resulting from certification. This was realized in multiple ways, such as through the creation of new fisheries management institutions (Wakamatsu & Wakamatsu, 2017), improved positions of existing fishing associations (Phillips et al., 2008), greater access for stakeholders to information, and more interest from the government in management (Pérez-Ramírez et al., 2012c). In the case

of the Baltic sea codfish fishery, one implication of MSC certification was also identified to be the strengthening the inter-jurisdictional management relationship between Russia and Norway (Lajus et al., 2018).

Social Implications

The social implications of MSC make up the third broad theme of implications that emerged from the literature review. Overall, the literature review identified three positive implications and three negative implications related to the social well-being of the fishery and the surrounding community. The first positive implication identified was the potential for a fishery to support more jobs following certification. This implication was seen to be significant in some cases, such as the SA hake fishery, which estimates certification is directly responsible for maintaining thousands of jobs (Butterworth, 2016). The second social benefit identified was the improved reputation and prestige that having a certified fishery has brought. This implication was noted in many certified fisheries from the large-scale Alaskan pollock fishery to the small-scale Mexican red rock lobster fishery (Pérez-Ramírez et al., 2012c; UNEP, 2009). The final positive implication from certification identified was the indirect reduction of food security certification can bring. This reduction is possible when the export value is of a high-value product is improved, as in Brazilian lobster, allowing a greater import of other foods (Kurien, 2005).

The first negative social implication identified was the large amount of human capacity required before, during and after the initial MSC certification assessment. Ensuring such capacity has been reported in many small-scale fisheries to be a burden as the person-hours spent on certification were not able to be focused elsewhere, and the opportunity cost of such certification-directed labour can be substantial (Carlson & Palmer, 2016; Wang & Chang, 2017). An additional negative social implication was the potential for there to be decreased availability for local use as a result of higher demand for exports (UNEP, 2009). This implication is closely tied to the additional implication that there may be a potential increase in the price of a product to the local community after it becomes certified (UNEP, 2009). Although these implications were not identified directly in a specific fishery, there is evidence they are considered valid concerns for small-scale fisheries in developing countries (Gardiner and Viswanathan, 2004; Kurien, 2005).

Environmental implications

The final implications of certification fell under the theme of environmental implications. In total, the literature review identified four positive and three negative implications. The first positive implication identified was the improvement of stock and environmental health resulting from certification. Martin et al. (2012) have demonstrated that from pre-assessment to post-certification, many fisheries increased their performance indicator scores, bringing observable improvements to the health of the stock and environment. On average, there is evidence that certified fisheries are also more likely to meet literature-derived metrics of ecosystem-based sustainability (Selden et al., 2016), and are 3-5x less likely to be subject to harmful fishing (Gutiérrez et al., 2012). The second environmental benefit identified was a reduction in illegal, unreported, and unregulated (IUU) fishing. This implication was evident in the Patagonian toothfish fishery, where better monitoring and traceability as part of certification efforts helped significantly reduce illegal products from entering the market (UNEP, 2009). An additional positive implication identified was the understanding of the shortcomings of the current management system identified through the certification process. Many Argentinian fisheries and the SA hake fishery have reported benefits from this implication, especially in terms of being able to better focus resources and management actions (Pérez-Ramírez et al., 2012a; Standing, 2009). The last identified favourable implication was the clear management direction certification provides for a fishery to become sustainable. In the Bahamian spiny lobster fishery, guidance throughout the certification process was reported to be crucial for transforming the unsustainable fishery to one that is sustainably managed (Thomas Travaille et al., 2019).

The first negative implication of certification identified was an increase in pressure on the target stock. This implication is reported in the SA hake fishery, where improved science from certification was used to argue for an increased TAC (Butterworth, 2016). This increase in pressure follows the second negative implication that becoming certified can cause a false sense of security in a fishery. This implication was also observed in the SA hake fishery, which despite being certified sustainable, reported historically low catches years after certification (Ponte, 2008a), and similarly, from the collapse of the New Zealand hoki stock despite having seemingly sustainable management (Ponte, 2008b). The final implication identified was that the MSC process is becoming prescriptive in its requirements, creating a set path for the management if a fishery wants to become certified. Some local scientists and stakeholders in the SA hake fishery

have reported that these requirements are becoming too "North America-like" which do not always align with the local context and have caused frustration in the fishery (Butterworth, 2016).

Step 2. Relevant Implications for Nunatsiavut's Fisheries

This step assessed the implications identified in step 1 using inclusion criteria to determine their relevance in Nunatsiavut. After the inclusion criteria were applied, 23 of the 25 implications were considered relevant in the context of Nunatsiavut's fisheries (Table 7). In total, the criteria excluded two benefits, export tariff reductions and improved inter-jurisdictional relations. Export tariff reduction was determined to be excluded, despite being relevant to European markets, because of its uniqueness and lack of understanding of how this benefit would relate to other fisheries. Improved inter-jurisdictional relations was excluded as it has not been observed in a small-scale or developing country fishery. Following the exclusion of these benefits, 14 potential positive implications and nine negative implications of MSC certification remained. Of these positive implications, 11 were reported in small-scale fisheries, 11 in developing countries, and 10 implications in both small-scale and developing countries. For the identified negative implications, four were identified in small-scale fisheries, seven in developing countries, and four across both.

Based on the inclusion criteria, two positive implications that were not present in either developing or small-scale fisheries were still included. These implications are differentiation from aquaculture and the creation of a price premium. The benefit of differentiating from aquaculture was chosen to be included because the majority of Arctic char in Canada is currently farmed (DFO, 2019c), and thus, differentiating wild-caught using ecolabeling could, in practice, potentially result in benefits. Similarly, although no price premium was identified for products certified by small-scale fisheries or from a developing country, it was included because another salmonid species, Pacific salmon, has seen a price premium (Stemle et al., 2016). The negative implications of increasing product prices to locals and decreased availability for consumption were also included, despite not being directly observed from a fishery. Exceptions were made for these implications because of the importance of Arctic char in Nunatsiavut for cultural practices and subsistence. Given the high cost of importing food in Nunatsiavut, these implications could have a potential disproportionately large impact, are were important to consider.

Table 7. *Results of the inclusion criteria used to determine which potential implications of certification would be most likely relevant in Nunatsiavut. N/R is used in instances where the criteria is not relevant.*

Implication of MSC Certification	Criterion 1: Small-Scale Fishery	Criterion 2: Developing Country Fishery	Criterion 3: Market Similarity	Criterion 4: Additional Evidence	Decision
Positive Implications					
Market access	Yes - Patagonian scallop (UNEP, 2009)	Yes – Patagonian scallop (UNEP, 2009)	Yes – US/European (Lallemand et al., 2016, ISU, 2012)	N/R	**Include**
Market stability	Yes - KDSFF Flounder (Wakamatsu, 2014)	Yes – Ashtamudi short neck clam (ISU, 2012)	Yes – US/European (Roheim & Zhang, 2018)	N/R	**Include**
Differentiation from aquaculture	None	None	Yes – US/European (Roheim et al., 2012; Bronnmann & Hoffmann, 2018)	Majority of Arctic char in Canada is farmed (DFO, 2019c)	**Include**
Price Premium	None	None	Yes – US/European (Stemle et al., 2016; Blomquist et al., 2015)	Similar species (Pacific salmon) has seen a price premium (Stemle et al., 2016)	**Include**
Export tariff reduction	None	None	Yes – European (Matthew, 2011)	None	**Exclude**
Fishery access security	Yes – Vietnam Ben Tre clam (UNEP, 2009)	Yes – SA hake (Ponte, 2008b)	N/R	N/R	**Include**
Greater governmental support	Yes – Mexican red rock lobster (Pérez-Ramírez et al., 2012c)	Yes - Mexican red rock lobster (Pérez-Ramírez et al., 2012c)	N/R	N/R	**Include**
Greater participation in management	Yes – Waterhen Lake walleye and pike (Wakamatsu & Wakamatsu, 2017)	Yes –Mexican red rock lobster (Phillips et al., 2008)	N/R	N/R	**Include**
Improved interjurisdictional relations	None	None	None	None	**Exclude**
Creation of jobs	None	Yes- SA Hake (Butterworth, 2016)	N/R	N/R	**Include**
Improved reputation and prestige	Yes - Mexican red rock lobster (Pérez-Ramírez et al., 2012lob)	Yes - Mexican red rock lobster (Pérez-Ramírez et al., 2012lob)	N/R	N/R	**Include**
Indirect food security	Yes- Brazilian lobster (Kurien, 2005)	Yes- Brazilian lobster (Kurien, 2005)	N/R	N/R	**Include**
Improved health of fish stock and ecosystem	Yes – Multiple small-scale fisheries (Martin et al., 2012)	Yes – Many developing country fisheries (Martin et al., 2012)	N/R	N/R	**Include**

Reduced IUU fishing	Yes- Patagonian toothfish (UNEP, 2009)	None	N/R	N/R	**Include**
Identification of management shortcomings	Yes – Multiple Argentinian fisheries (Pérez-Ramírez et al., 2012a)	Yes – Multiple Argentinian fisheries (Pérez-Ramírez et al., 2012a)	N/R	N/R	**Include**
Clear path for improvement	Yes- Bahamian lobster (Thomas Travaille et al., 2019)	Yes- Bahamian lobster (Thomas Travaille et al., 2019)	N/R	N/R	**Include**
Negative Implications					
Direct economic costs	Yes – present for all fisheries	Yes – evident for all fisheries	N/R	N/R	**Include**
Indirect economic costs	Yes – (Wakamatsu & Wakamatsu, 2017)	Yes- SA hake (Ponte, 2008a)	N/R	N/R	**Include**
Economic uncertainty	Yes - AAFA Albacore Tuna Fishery (Bellchambers et al., 2016a)	Yes – SA hake (Butterworth, 2016)	N/R	N/R	**Include**
Extensive Human capacity	Yes - Taiwanese small-scale fisheries (Wang & Chang, 2017)	Yes - Multiple developing country fisheries (Carlson and Palmer, 2016))	N/R	N/R	**Include**
Increased price to locals	Presumed effect on small-scale (Gardiner & Viswanathan, 2004; Kurien, 2005)	Presumed effect on developing countries (Gardiner & Viswanathan, 2004; Kurien, 2005)	N/R	Possible if demand increases for char	**Include**
Less available for domestic consumption	Presumed effect on small-scale (Gardiner & Viswanathan, 2004; Kurien, 2005)	Presumed effect on developing countries (Gardiner & Viswanathan, 2004; Kurien, 2005)	N/R	Possible if demand increases for char	**Include**
Greater pressure on stock	None	Yes - SA hake (Butterworth, 2016)	N/R	N/R	**Include**
False sense of security	None	Yes - SA hake (Ponte, 2008a)	N/R	N/R	**Include**
Set management path	None	Yes – SA Hake (Butterworth, 2016)	N/R	N/R	**Include**

Step 3. Elaboration of the Nunatsiavut Government's Fundamental Principles

After assessing negative and positive implications MSC certification may have on a given fishery, the next step involved assessing the extent to which these might be considered positive or negative in the context of Nunatsiavut. This was done by drawing on the spirit and intent of the five Fundamental Principles of the Nunatsiavut Government. These Principles are embodied in the Labrador Inuit Constitution (2005) and are elaborated on in Table 7.

Step 4. Implications of Certification on the Fundamental Principles

Step 4 sorted the relevant potential implications of MSC certification identified in step 2 into the five Fundamental Principles of the Nunatsiavut Government based on the areas they would likely have the most substantial impact. Each implication was also broken into the potential impact it would have on each governance principle, given the specific context of Nunatsiavut (Figure 10). In this section, the results of the trade-off analysis are described for each of the governance principles using support from the sections of the Labrador Inuit Constitution (hereinafter known as "the Constitution") outlined in step 3.

Democracy and equality

Positive implications

The implications identified that were considered to align with the governance principle democracy and equality were greater participation in management, providing a clear path for improvement, and fishery access security. Having greater participation in management supports Sections 1.13(b) and (q) of the Constitution as it may strengthen the ability to self govern and promote the participation of Labrador Inuit in decision making. Specifically, in Nunatsiavut, this implication could improve the authority of the TJFB in co-managing and potentially lead to an increased ability to self-govern, as seen by fishing associations in the Mexican red rock lobster fishery (Pérez-Ramírez et al., 2012c). Greater participation may also lead to a higher degree of communication between the Nunatsiavut Government and DFO, potentially increasing the amount of interest taken in fisheries by the federal government (Whalen et al., 2015). Identifying aspects of a fishery that require attention to become sustainable is also an implication of the certification process. This implication aligns with Section 1.13(x) that new ideas and innovations must be developed to meet the needs of Labrador Inuit, as being able to focus management efforts can help maximize efficiency and provide greater benefits to communities in Nunatsiavut.

Table 8. *Elaboration of the Fundamental Principles using the Labrador Inuit Constitution (2005). Bolded numbers represent sections from the Constitution.*

Fundamental Principle
Democracy and equality
• **1.13(b)** The need to protect and advance Labrador Inuit aboriginal and treaty rights, including rights to language, culture, land and resources, and rights of self-government; • **1.13(x)** The recognition that the Inuit of Labrador have experienced change, new ideas and new technologies which we have integrated into our culture and way of life and, therefore, Labrador Inuit political, social cultural and economic institutions must maintain and develop policies and ideas that address innovation and the adaptation of new ideas and technologies in ways that are appropriate to Labrador Inuit needs, values and aspirations;
Preservation of the lands, waters, animals, and plants of our ancestral territory
• **1.13(e)** Acknowledgement that the Labrador Inuit have a special responsibility to use and enjoy Nunatsiavut and its renewable and non-renewable resources with care and respect, without greed or waste and as stewards for future generations; • **2.4.20** Every Labrador Inuk has the right to… have the environment protected for the benefit of present and future generations through reasonable Inuit laws and other measures that: **(a)** Prevent pollution and ecological degradation; **(b)** Promote conservation;
Pursuit of a sustainable economy
• **1.13(s)** The belief that the freedoms and aspirations of the Labrador Inuit and the ability of Labrador Inuit political, social cultural and economic institutions to advance those freedoms and aspirations will be enhanced and expanded through Labrador Inuit self-sufficiency and fiscal independence; • **2.4.20** Every Labrador Inuk has the right to… have the environment protected for the benefit of present and future generations through reasonable Inuit laws and other measures that: **(c)** Secure ecologically sustainable development and use of renewable and non-renewable resources while promoting justifiable economic and social development of Labrador Inuit
Preservation of our culture and language
• **1.13(d)** The need to maintain and strengthen the relationship of the Inuit of Labrador to the land, sea, waters, resources, plants, animals, birds and fish of our ancestral territory, Nunatsiavut • **1.13(h)** Recognition that the ancestral language of the Inuit of Labrador is Inuttut, that it is the right of every Labrador Inuk to use Inuttut in personal and community life and in official transactions and business and that every Labrador Inuk has a responsibility to teach Inuttut and Inuit culture and customs to Inuit children and provide them with guidance and a sense of belonging within Labrador Inuit culture and society;

- **1.13(r)** The conviction that Labrador Inuit political, social, cultural and economic institutions exist to consider and provide for Labrador Inuit culture, Labrador Inuit distinctiveness and the aspirations of Labrador Inuit by making policies and laws that meet Labrador Inuit needs, reflect Labrador Inuit culture, customs, traditions, observances, practices and beliefs, and strengthen the relationship between Labrador Inuit and Nunatsiavut;

Pursuit of a healthy society

- **2.2.1** When interpreting the Labrador Inuit Charter of Rights and Responsibilities an institution of Labrador Inuit government, court, tribunal or other forum must consider:
  (c) The desire of the Inuit of Labrador to encourage the realization of the human potential of each Labrador Inuk and the recognition that each Labrador Inuk has responsibilities to Labrador Inuit society and to all other Labrador Inuit.
- **2.4.23** Every Labrador Inuk has the right to have access to water, food, health care and, if they are unable to support themselves and their dependents, appropriate social services… to share food and shelter with those Labrador Inuit who are in need

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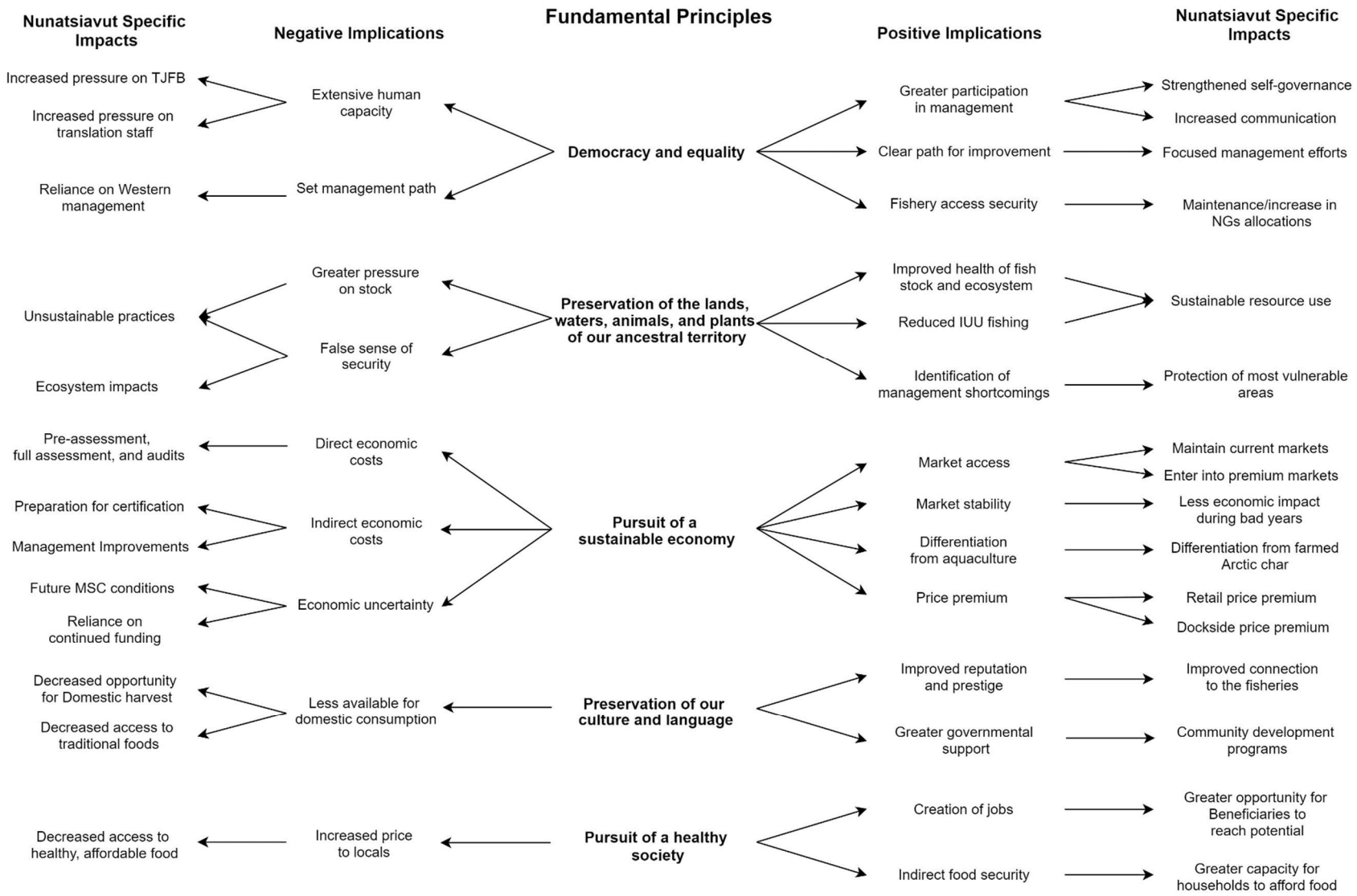

Figure 11. *The potential implications of certification and their potential impacts on the Nunatsiavut Government's Fundamental Principles.*

The implications around fishery access security also align with Section 1.13(b) as it directly relates to protecting/advancing Labrador Inuit rights to natural resources through increasing their ability to use and benefit from ocean resources (Bennett et al., 2018). This is important for Greenland halibut, where the Nunatsiavut Government's allocations are not reflective of the intent of the LILCA (TJFB, 2107d). Together, these three implications were seen to most align with the principle of democracy and equality.

Negative implications

The implications of certification that were considered to be contrary to democracy and equality are the extensive human capacity required for certification and the set management improvements required by the MSC fisheries standard. The vast amount of human capacity required for MSC certification is expected to have the opposite effect on Section 1.13(x), as described above. MSC certification would require a disproportionate amount of staff for preparing and maintaining certification, representing an opportunity cost in terms of lost capacity in other areas resources are required (like health care, education, housing, etc.). The resources required to translate the certification documents into Inuktitut would also amplify this impact. Thus, by focusing too much effort in one area, certification might not appropriately address the needs of the Labrador Inuit. As well, in some fisheries, the MSC process is seen as becoming prescriptive and imposing "Western management" onto a fishery, limiting the ability to self-determine how to manage a fishery. This implication contradicts the need to protect the self-governance of the Labrador Inuit in section 1.13(b). Hence, there are potential implications of certification that support and contradict the governance principle democracy and equality.

Preservation of resources

Positive implications

The positive implications of certification that were identified as supporting the second governance principle, preservation of resources, are improved health of the fish stock and ecosystem, reduced IUU fishing, and the identification of management shortcomings. All three implications align with Sections 1.13(e) and 2.4.20(a,b), which acknowledge what Labrador Inuit identify as their responsibility to use natural resources with care and respect, and their right to have the environment protected from ecological degradation. The identification of management shortcomings is likely to bring ecological benefits in Nunatsiavut by allowing management

actions to focus on areas where there is the most substantial need for attention. As well, reducing unreported and unmonitored catches, especially in the subsistence Arctic char fishery, may help reduce management uncertainty (Whalen et al., 2015). Finally, improved monitoring and reporting may provide much-needed information required for sustainably managing a fishery, ensuring the fisheries are available for generations to come.

Negative implications

MSC certification was determined to have the opposite impact on sustainable resource use in the case of creating additional pressure on the stock and promoting a false sense of security. Although higher pressure may not be harmful if it is within the limits of the stock, when combined with a false sense of security, these implications contradict Sections 1.13(e) and 2.4.20(a-b) to use resources without greed and to ensure they are available for generations to come. In Nunatsiavut, this could potentially lead to unsustainable fishing practices or ecosystem impacts in the Arctic char fishery arising from oversights caused by the belief the fishery is sustainable. Though this implication is unlikely given the precautionary nature and strong commitment to the sustainability within the Nunatsiavut Government, these implications are essential to consider for ensuring a holistic understanding of the range of impacts certification could bring.

Sustainable economy

Positive implications

The potential implications of certification on market access, market stability, differentiation from aquaculture, and generating price premiums were determined to best align with the third governance principle, pursuit of a sustainable economy. These potential economic implications are thought to align with Sections 1.13(s) of the Constitution that Labrador Inuit freedoms and aspirations will be advanced through fiscal independence, and Section 2.4.20(c) that Labrador Inuit have the right to secure ecologically sustainable development and use of renewable resources. The market implications likely in Nunatsiavut are the maintenance of current markets for snow crab and Greenland halibut and greater/new market access for Arctic char. For snow crab and Greenland halibut, both of their potential markets have shown a demand for ecocertified seafood (Roheim et al., 2011; Blomquist et al., 2015). Given the recent increase in the volume of MSC certified snow crab and Greenland halibut coming from Canada, ensuring markets are

maintained could be critical. As well, for Arctic char, certification may allow for differentiation from aquaculture and entrance into new markets, such as high-end restaurants, which has been the case for some small scale-certified fisheries (Lopuch, 2008). Currently, Arctic char products from aquaculture sell for a dollar a kilogram less, making it difficult for wild-caught Arctic char compete in the same markets, providing additional ways certification can benefit the fishery (Boutete, 2016). Moreover, the implications of market stabilizing could help mitigate impacts from bad fishing years, which are known to occur from exogenous factors, aiding in achieving sustainable development and fiscal independence. Price premiums at the market level or dockside level, though not guaranteed, could also contribute to maximizing economic returns and providing the best price to fishers. A price premium may be most likely for Arctic char, where the Co-op is both the fish buyer and retail seller of the finished product, reducing the number of steps for a premium to be lost in the value chain.

Negative implications

On the other side, the goal of financial independence may be threatened by the direct and indirect costs that come with certification and from increased economic uncertainty. The direct costs of certification are dependent on the finances required to achieve and maintain certification. These costs include pre-assessment, full assessment, yearly audits, and recertification every five years. As well, the use of the MSC logo would increase the required investment. Although these costs can vary significantly, Nunatsiavut's remote location and the data-poor nature of the Arctic char fishery would likely result in higher than average costs for a fishery of its size (Standing, 2009). Also, the indirect investments required to prepare a fishery for certification and meet performance conditions would likely be even more substantial. The Rapid Assessment for the Arctic char UoA resulted in ten red-scoring performance indicators, which would have to be improved before certification. As well, the UoA scored yellow on nine indicators that would each be required to be addressed by certification conditions. Even though it is unclear how much of the required changes would need to be funded by the Nunatsiavut Government compared to the Department of Fisheries and Oceans, the direct and indirect costs of certification would likely require the Nunatsiavut Government to seek external aid. This reliance would conflict with the goal of achieving self-reliance and financial independence. Covering the costs to maintain certification, whether from external or internal funds, may also create uncertainty that the required finances will be available in the future. Amplifying this implication is the potential for

changes to the MSC fisheries standard, which may result in additional requirements. In any case, pursuing MSC certification in Nunatsiavut will require a substantial investment into the fisheries, hindering the pursuit of a sustainable economy.

Preservation of culture

Positive implications

The implications that aligned with the fourth governance principle, preservation of culture, are improved reputation and prestige and increased governmental support. Both implications support Section 1.13(d) of the Constitution, recognizing the need to strengthen the relationship of Labrador Inuit to the land and sea, and Section 13.13(r) recognizing that all institutions should strive to reflect the culture and distinctiveness of Labrador Inuit. In Nunatsiavut, the most beneficial implication resulting from improved reputation and prestige would likely be the improved sense of connectedness to and pride in the fishery. Many certified fisheries have noticed improved worker self-esteem and pride in the fishery following certification, leading to a greater connection and sense of value by those in the industry and community (Carlson & Palmer, 2016). Especially for culturally relevant fisheries such as Arctic char, certification could strengthen the relationship of commercial and subsistence harvesters to the resource. Improved governmental support was also determined to support the preservation of culture based on the ability of the Mexican red rock lobster fishery to use government grants to strengthen the legitimacy of their fishery (Bellchambers et al., 2016b). This legitimacy promoted a sense of responsibility and pride in the fishery by members of the industry and the surrounding community alike. The Arctic char fishery is similar to this example in that it is co-managed with community-based objectives, and the community is strongly linked to the fishing industry.

Negative implications

The implication that potentially contradicts the benefits of certification on preservation and culture is the potential for MSC certification to limit the amount of fish available for domestic consumption. Specifically for Arctic char, where there is a large number of people that are connected to their traditional ways through fishing, reductions in the amount available for subsistence harvesting would be expected to create a disconnect between Labrador Inuit and their traditional practices. As well, Arctic char is also a traditional food source, and having less available for domestic consumption would be expected to decrease the dependence and

connectedness of Labrador Inuit lifestyle on land and sea. This implication could be especially concerning if certification or efforts to meet certification standards reduced the amount of Arctic char being provided for the Community Freezer programs, which for many, is a connection to traditional ways (Goldhar et al., 2012). Thus, it can be expected that a decrease in the availability of Arctic char from certification would disregard the uniqueness of the Labrador Inuit and weaken their relationship to the land and sea.

Healthy society

Positive implications

The positive implications of certification that were determined to most closely aligned with the fifth governance principle, pursuit of a healthy society, are the potential for certification to lead to the creation of jobs and indirect food security. The creation of additional jobs as a result of MSC certification aligns with Section 2.2.1(c) of the Constitution, which recognizes the desire of the Inuit of Labrador to encourage the realization of the human potential of each Labrador Inuk. In Nunatsiavut, unemployment rates are high in part because of the lack of stable employment (Coombs et al., 2011d). Hence, this benefit was considered to support promoting a healthy society as the creation of additional jobs would help more individuals reach their potential and contribute to society. Given the underutilization of Arctic char, there is the potential to support additional Beneficiaries. Additionally, the implication of indirect food security through the increased potential to afford food domestically was determined to align with Section 2.4.23, which states that every Labrador Inuk has the right to have access to food. However, given the high cost of importing food in Nunatsiavut, a substantial increase would be needed to have see a significant impact.

Negative implications

The negative implication identified that contradicted the benefits of certification on the pursuit of a healthy society is the potential increase in price for fish to the local community coming from certification. This implication contradicts Section 2.4.23 that every Labrador Inuk has the right to have access to food. Increasing the price of fish harvested in Nunatsiavut would make it less available to those who are food insecure. An increase in price is mainly a concern for Arctic char since a substantial amount is sold within the community or bought by the Nunatsiavut Government for the Community Freezer programs. In Nunatsiavut, mental well-being is also

linked to traditional species, such as Arctic char, furthering the potential for negative impacts should char become less affordable (Snook et al., 2018). Thus, MSC certification may both help and hinder progress towards a healthy society, especially concerning Arctic char.

Chapter 4: Discussion

This study was performed to assess the sustainability of Nunatsiavut's commercial fisheries against principles and criteria common to the MSC sustainability standard and to determine the potential that MSC certification of Nunatsiavut's fisheries has for promoting the development of the fishing sector in the face of many challenges. The Rapid Assessment Tool was used to identify the 'certifiability' of the Arctic char, snow crab, and Greenland halibut fisheries and their strengths and weaknesses concerning the MSC fisheries standard. The snow crab and Greenland halibut Units of Assessment (UoA) both display robust management measures and decision-making processes, indicating they are likely to meet the certification standard. However, the Arctic char fishery showed mixed sustainability results. Even though the ecosystem impacts of the char UoA were determined to be minimal, the UoA lacks many crucial aspects of a well-defined and precautionary management strategy. Thus, multiple fishery management issues would need to be addressed before the UoA could become certified. The results of the Rapid Assessments were incorporated into the trade-off analysis, which used a scoping literature review to identify the implications of MSC certification that might be possible or likely in the context of Nunatsiavut. The trade-off analysis then examined how these implications would align with or hinder the Nunatsiavut Government's governance principles. From the analysis, positive and negative implications were identified for each governance principle. Overall, the potential implications of certification that were determined to have the most significant impacts on the governance principles were democracy and equality and pursuit of a sustainable economy. Democracy and equality aligned well with the potential implications of improved access to fishing resources and government relations but would be hindered by the capacity required for certification and the dependence on Western management required for certification. Similarly, a sustainable economy could be supported through potential market benefits and the creation of jobs, though it would likely be impeded by the direct and indirect costs of certification.

This section will discuss these results in terms of what the Nunatsiavut Government could expect if they were to proceed with MSC certification as well as recommend potential next steps for consideration for each species. This section will also use the case of Nunatsiavut's fisheries to explore what MSC certification means for small-scale, co-managed fisheries looking to pursue

certification and potential impacts of MSC certification on the Inuit way of life. The majority of the discussion is focused on Arctic char as it is the species that was determined to have the highest potential to be influenced by the implications of MSC certification, for better or worse.

4.1. Potential for Achieving MSC Certification

Arctic Char

Arctic char is not only the most culturally and socially important fishery in Nunatsiavut, but it also has the highest potential to be developed further commercially and in other ways (TJFB, 2011). Because of its importance, any development initiative must be given proper consideration before implementation. At the TJFB's Arctic char workshop in 2011, many ideas were brought forward on how to progress the fishery, including setting up a weir fishery, developing the recreational tourism fishery, and focusing on accessing better markets (TJFB, 2011). Although not directly mentioned, pursuing MSC certification for the fishery is another potential method to develop the fishery. However, for this to be a viable option, it must align with the Nunatsiavut Government's decision-making principles and have the support of the community. This research project examined two main questions that must be considered before pursuing MSC certification, the ability of the fishery to achieve certification and the implications that certification could bring.

The readiness of the Arctic char UoA to become certified can be inferred by investigating the sustainability strengths and weaknesses identified in the Rapid Assessment. These results also provide insight into the improvements that would be required for the UoA to achieve certification.

Sustainability weaknesses

The Rapid Assessment provided evidence that the Arctic char UoA is not currently ready for MSC full assessment. The Arctic char UoA scored red for 40% of the performance indicators, all of which would need to be improved to at least a score of yellow before the fishery could become certifiable. Although the results of the Rapid Assessment used in this study may differ from the results of an MSC full-assessment, the assessment provided evidence that the management strategy and fishery-specific information is the major weaknesses in the fishery.

Management strategy

Many of the indicators that scored red and yellow were the direct result of the UoA not having a well-defined management strategy in place. In total, five out of ten red-scoring indicators resulted from the management strategy. The current strategy is lacking any mention of stock rebuilding, stock/harvest monitoring, ETP species, or a decision-making process (DFO, n.d). Even though the management plan does broadly include a harvest strategy and fishery-specific objectives, the MSC Fisheries Standard does not consider such a strategy be effective at ensuring the precautionary management of the stock. As well, three of the nine yellow-scoring performance indicators were related to the management plan. Neither ecosystem or habitat management is mentioned in the current management strategy, and both compliance and enforcement and performance evaluation strategies are only briefly mentioned. Together, these indicators suggest that developing a precautionary and integrated management strategy would be essential for pursuing certification.

However, creating an MSC certifiable management strategy for the fishery would not come quickly. The ideal situation would be to create an Integrated Fisheries Management Plan for the UoA, as was done for the Cambridge Bay commercial Arctic char fishery in Nunavut. Partially because of the well-defined management strategy in the IFMP, the 50t of Arctic char harvested annually in Cambridge Bay was certified as "Best Choice" by the Monterey Bay Aquarium Seafood Watch certification (Schiller, 2016) and is considered "Sustainable" by Ocean Wise (Ocean Wise, 2016). Whereas the Northern Labrador Arctic char management plan is only two pages long, the Cambridge Bay Arctic char IFMP integrates all the components of an effective management plan into one document (DFO, 2014). The Nunatsiavut Government would not be able to design an integrated management strategy alone, though, as it is the responsibility of DFO to design and implement new management measures and strategies[1]. Hence, the objectives, roles, responsibilities, and overall strategy would need to be co-developed by the Nunatsiavut Government, TJFB, and DFO, likely with input from the key fisheries players like the Co-op. In order to improve the performance indicator scores, this integrated management strategy would

[1] Of note here is that the Nunatsiavut Government and DFO did work together to develop a Canadian Scientific Advice Secretariat (CSAS) publication on Arctic Char in northern Labrador. However this has not been published yet (as of 19 November, 2019). The contents of this document could be instrumental in improving the science and management of Arctic char.

also need to be shown to operate effectively, requiring regular review of the management system. To implement such a strategy would require substantial human capacity and financial resources from both the Nunatsiavut Government and DFO, which are likely not readily available (Whalen et al., 2015). Nevertheless, such a strategy would be required for improving performance indicator scores before considering certification.

Fishery-specific information

Another shortcoming of the UoA is the general lack of information about the fishery. Insufficient data resulted in the UoA scoring red for the stock assessment and stock information performance indicators, and in the case of ETP species information/monitoring and outcome indicators, being scored data-deficient. Despite not having a stock assessment since 2001, the productivity-susceptibility analysis (PSA) and other available information were used to estimate the likely health of the stock. However, it is still very unclear what the health of the stock is, especially around Nain Bay. Similarly, even though the habitat and ecosystem information/monitoring indicator for the UoA scored yellow, it was based on evidence from the British Columbia Pacific salmon UoA, which uses similar fishing methods as the Arctic char fishery (Acoura Marine, 2017). For MSC full assessments, though, quantitative information for these indicators would need to be evident within the UoA. As well, the lack of information about the subsistence harvest of Arctic char is a barrier to becoming certified. This is apparent from the Kamchatka salmon fishery, where missing this information created a significant barrier for becoming certified (MRAG Americas, 2019). Having this information, especially in Nain Bay, where the commercial and domestic fisheries heavily overlap, is also essential for managing the fishery sustainably (TJFB, 2011).

Not having the necessary information to inform management is recognized as an ongoing issue in the fishery (OK Society, 2018a; TJFB, 2011). However, the resources required to collect the essential information is currently a limiting factor for both DFO and the TJFB (Whalen et al., 2015). With that in mind, the following actions will likely be required for improving information/monitoring in the UoA before certification can be pursued. For the UoA to be certified, each major stock complex needs a stock assessment, and ideally, to have a multi-year stock assessment plan developed. Alongside the stock assessment, information and monitoring will be needed to support the harvest strategy. Using the Cambridge Bay Arctic char fishery as a

model for what this would entail, data will need to be collected on the biological characteristics of the stock and intermixing between stock complexes (DFO, 2014). In terms of monitoring, measures such as implementing logbooks in the commercial fishery would effectively capture information about bycatch, discards and the catch per unit effort. The information collected by the Torngat Fish Producers Co-op on characteristics of the Arctic char landed would also be useful to incorporate into the management strategy (Whalen et al., 2015). Since logbooks have not been successful for monitoring the Arctic char subsistence fishery, the Nunatsiavut Government could use a combination of methods such as fish tagging and the Creel Survey methodology to estimate removals as was done in Nunavut (Kristofferson & Berkes, 2005). Multiple other community-based methods have been discussed for monitoring the subsistence fishery, though they have not consistently been used (Cohen et al., 2010)

One hopeful prospect in meeting the information/monitoring requirements is the availability of detailed catch reports and biological assessments from the 1970s-1990s. Having this information acts as a baseline for understanding the nature of the stock and can aid in setting appropriate reference points and TACs in the fishery (Dempson, 2008). As well, partnerships with NGO's such as with Oceana Canada and Oceans North, show the potential for science-related collaboration. Overall, a considerable data collection will be required before certification. However, much of this information is needed for effective management of the stock and any progress towards obtaining information will have benefits, whether related to certification or not.

Sustainability strengths

Despite the weaknesses of the fishery management system, there are aspects of the UoA that performed well. The notable aspects are the high level, long-term objectives and the intrinsically low impact of the Arctic char UoA.

Long-term objectives

The UoA scored green for the legal framework and the long-term objectives performance indicators under Principle 3. These scores suggest that the high-level fishery management framework and objectives of the Federal and Nunatsiavut Government level are capable of supporting a sustainable fishery. It is part of DFO's core mandate to ensure fisheries in Canada are managed sustainably and to respect the rights of Indigenous groups (DFO, 2019d). As well, the governance principles guiding the Nunatsiavut Government recognize the importance of

preserving the land and sea and using natural resources sustainably (LIC, 2005). Although these high-level objectives are only a small portion of an MSC assessment, they are necessary for developing a management strategy that meets the MSC fisheries standard. Thus, the high-level, long-term goals for the fishery are considered a strength, even though the capacity to implement such a management strategy is lacking.

Inherently low impacts

The UoA also scored green for the secondary species, habitat, and environment outcome performance indicators and was determined to have a low vulnerability to overfishing. These outcomes highlight the low intrinsic impact of the UoA on the stock and surrounding environment. Specifically, the short fishing season, low TACs, restricted number of fishers, and restrictions on gear are useful measures for keeping the pressure on a stock low. By enacting the salmon bycatch protocol and requiring a minimum mesh size of 4.5", the UoA is also able to keep salmon and juvenile char bycatch to a minimum. As well, by using mid-water gillnets placed close to shore, the fishery can avoid damaging interactions with bottom habitats and is not likely to overlap with ETP species. Local knowledge even suggests that lost gear is also less of an issue in the fishery because the challenge of obtaining/repairing gillnets in Nain provides extra incentive for fishers to properly tend their gear (personal comm. Todd Broomfield, 2019). Hence, even with the minimal management strategy that is in place, the potential for the UoA to impact the stock or ecosystem is low. However, the MSC fisheries standard is based heavily on documented effectiveness of formal management strategies, which leaves little potential for data-poor or informally managed fisheries to become certified, even if they are harvested sustainably. Instead, this aspect of the UoA suggests that the number of new measures required to mitigate impacts on the environment may be few, but will require objective ways to ensure the impact of the UoA is kept minimal.

Conclusion of the Rapid Assessment

The results of the Rapid Assessment suggest the Arctic char UoA is not currently ready to pursue a full assessment process for MSC certification. Overall, the fishery can be considered a low-impact and data-poor fishery, but without addressing the multiple issues regarding information/monitoring and the management strategy, it would likely not be able to meet the minimum criteria to become certified. The aspects that need improvement will require time and

resources from the Nunatsiavut Government and DFO, as well as a commitment over the long-term to make the Arctic char fishery a priority. Nonetheless, such a commitment would not only help prepare the fishery for certification, but it would also potentially set in motion processes to ensure adequate information is available to manage the fishery.

Snow Crab

Overall, the results of the Rapid Assessment for the snow crab UoA were positive. The UoA only scored yellow for one performance indicator in Principle 3 and two indicators for each Principle 1 and 2. The first MSC re-assessment of the NL-wide fishery in 2018 has already demonstrated that the entire stock is being managed sustainably, with only a few major areas in need of improvement (SAI Global, 2018). There is no reason to expect the sustainability would be different for the Nunatsiavut Government's quota in the northern tip of the stock. Therefore, the UoA in Nunatsiavut would also be expected to receive the same certification conditions as the certified UoA, in additional to the condition expected based on the yellow score for compliance and enforcement performance indicator.

Compliance and enforcement

With no dockside monitoring or at-sea observer companies in Nunatsiavut to monitor for compliance, if the UoA were to seek certification, the compliance and enforcement strategy for the fishery would likely be inadequate. This would likely lead to a condition requiring the UoA to develop monitoring and surveillance measures that are effective at promoting compliance in the fishery. These measures would not need to be the same as the NL-wide fishery, as long as they can be shown to be effective in the context of the UoA. In Nunatsiavut, the TJFB may be able to take responsibility for overseeing the implementation of compliance measures as agreed in the LILCA. Section 13.11.5(a) of the LILCA (2005) states that, upon request, the TJFB may perform "functions related to fisheries management measures such as monitoring catch and quotas, exercising co-operative enforcement responsibilities and assisting in the resolution of fishing gear conflicts." This agreement gives the TJFB the authority to design a compliance strategy that is appropriate for the UoA without having to rely on independent monitoring companies. The compliance strategy could also rely on government-funded Indigenous-focused programs to build capacity for compliance and enforcement measures, such as the "Indigenous Guardians Pilot Program" or the "Aboriginal Fishery Guardian Program" (DFO, 2019f; National

Indigenous Fisheries Institute, 2017). Hence, the TJFB would able to develop and enact a Nunatsiavut-specific strategy for dealing with this condition without relying on third-party companies used elsewhere on the stock.

Fishery-wide conditions

If the UoA in Nunatsiavut were to pursue certification independently, it would likely be required to ensure the four conditions placed on the NL-wide snow crab fishery are being met. None of these would directly affect the UoA in question, however. The first two conditions require the implementation of well-defined HCRs in the fishery, and the development of limit and target reference points for the stock (SAI Global, 2018). Both are fishery-wide measures that will need to be addressed by DFO and the Advisory Committee. The last two conditions require evidence that the fishery-wide effect on North Atlantic right whales is below national/international limits, and that a strategy is in place to keep interactions to a minimum. Since North Atlantic right whales are not found in Northern Labrador (NOAA, 2019), this issue will not require any direct changes for the UoA. Thus, the conditions placed on the NL-wide UoA would not require any additional measures to be taken by the Nunatsiavut-specific UoA.

Conclusion of the Rapid Assessment

Hence, an examination of the results of the Rapid Assessment suggests that if the snow crab UoA were to pursue certification, it would most likely achieve a conditional pass. Of the likely conditions to be placed on the fishery, only one would require direct attention from the Nunatsiavut Government. Therefore, whether it would be advisable to pursue MSC certification or not will be based on the Nunatsiavut Government's determination of likely trade-offs required for pursuing certification.

Greenland Halibut

The Rapid Assessment for the Greenland halibut UoA also resulted in encouraging scores. The UoA scored yellow for one performance indicator under Principle 3 and five more across Principles 1 and 2. The MSC Public Comment Draft Report for 2+3KLMNO Greenland halibut fishery (Lloyd's Register, 2019), provides evidence that the fishery is sustainable with only a few areas in need of major improvements. Since the Nunatsiavut Government's quota is part of the same stock and is fished using the same gear as the soon-to-be certified UoA, it would likely

receive the same certification conditions. Like snow crab, an additional condition is expected for compliance and enforcement in the Nunatsiavut UoA.

Compliance and enforcement

A large part of the DFO fishery surveillance strategy for the 2+3KLMNO fishery is based upon dockside monitored catches and at-sea observed fishing trips. As mentioned for the snow crab UoA, these services are not available in Nunatsiavut, and would likely result in a condition requiring the UoA to implement effective surveillance measures. Fortunately, however, this condition would not have to be dealt with separately from the condition for the snow crab UoA. Both fisheries are in Makkovik, and whereas snow crab is harvested primarily in July, the Greenland halibut fishery does not open up until August (TJFB, 2017d). Therefore, one program could effectively monitor both fisheries, given they only overlap for a short period. Having one program meet the requirements for both fisheries would potentially be able to reduce the cost of meeting this condition should both fisheries seek certification.

Fishery-wide conditions

The certification report outlines four conditions given to the 2+3KLMNO Greenland halibut UoA, which would be likely required by the Nunatsiavut-specific UoA. However, none of the conditions would have a direct impact on the fishery in Nunatsiavut. The first condition is to formally define the rules regulating the exploitation rate (Lloyd's Register, 2019). NAFO oversees setting the TAC, and therefore this condition would not affect the UoA. The following two conditions require a fishery-wide review to be completed every five years to ensure the effectiveness and practicality for the measures to reduce the mortality of both primary/secondary species and incidentally caught ETP species. This review would need to be discussed at the GAC meetings, which the Nunatsiavut Government would be present for, regardless if their allocation is certified. The last condition requires objective evidence that the management strategy is working to protect commonly encountered habitats. This strategy would also need to be implemented across the region-wide fishery, meaning the Nunatsiavut fishery would be impacted the same regardless of certification status. Thus, the conditions placed on the 2+3KLMNO-wide UoA would not lead to additional actions required for the Nunatsiavut-specific UoA.

Conclusion of the Rapid Assessment

The results of the Rapid Assessment are very similar to snow crab, suggesting the UoA would be likely to receive a conditional pass if it were to pursue MSC certification. As well, given the similar UoA-specific condition between the Greenland halibut and snow crab UoA, there is the potential for collaboration should both fisheries pursue certification. Therefore, whether it would be advisable to pursue MSC certification will be based on the Nunatsiavut Government's evaluation of likely trade-offs required for pursuing certification.

4.2. Key Considerations for MSC Certification in Nunatsiavut

The second important factor to consider when pursuing MSC certification is what the likely costs and benefits of certification will be. For a fishery with the goal of maximizing economic returns, this could be assessed by comparing the monetary costs of certification against the likely returns. For Nunatsiavut's fisheries, though, the goal is not necessarily to maximize profit. Hence, this study chose to compare the potential implications of certification with the Nunatsiavut Government's governance principles to determine how these implications could align or contradict with each principle. The results of the trade-off analysis show that each governance principle could both benefit and suffer from certification. However, specific implications stood out as being likely to have disproportionately large impacts. These implications are considered to have the most substantial effect on contributing to or hindering the Nunatsiavut Government's governance principles. As such, these implications are the focus for determining the extent of the trade-offs for each principle and whether certification may present benefits to Labrador Inuit.

Primary Implications for Arctic Char

Even though the Arctic char fishery is not ready to pursue MSC certification, the results from the trade-off analysis can help to determine if preparing the fishery for formal MSC assessment would be in alignment with the Nunatsiavut Government's governance principles. For Arctic char, many implications of certification are expected to have a high potential to positively or negatively impact the fishery. The notable likely positive implications are improved participation in management, market access, and job creation. The notable likely negative implications are the human capacity required, set management path, potential redirection of catch away from Nunatsiavut markets (impacting food security), and the direct and indirect economic costs. Although each likely implication is shown to align or contradict a single governance principle,

there are circumstances where there will be spill-over implications on other principles as well as cumulative effects arising from the interaction of multiple implications. Some actions and interactions may also help mitigate the adverse impacts of the fishery on the governance principles, which will be discussed.

Resource requirements

The financial resources and human capacity required for certification would be a significant drain on the already stretched Nunatsiavut Government. Consequently, the human capacity required before, during, and after certification would necessitate bringing on multiple people focused just on certification. In acquiring this capacity, the opportunity cost is reduced capacity to perform other vital functions or pursue other potential initiatives. In this way, the capacity required for certification could contradict the first governance principle, democracy and equality, by creating an imbalance in capacity in favour of the Arctic char fishery. Likewise, the associated direct and indirect costs that would be required for certification would take away from other potential areas of investment (healthcare, infrastructure, etc.) and development. Hence, this burden may severely hinder the governance principles of a sustainable economy and democracy and equality. Given the number of improvements required to become certified, however, it is highly unlikely that the Nunatsiavut Government would even be able to consider becoming certified without external aid. Perceptions of such external assistance could further erode principles of self-determination and democracy.

Yet, there are many options available for small-scale fisheries looking to improve fishing practices, which could significantly reduce the resources required by the Nunatsiavut Government in preparing the fishery for certification. One option is partnering with an NGO to enter a fisheries improvement project (FIP). FIPs are designed to address the sustainability issues in fisheries where the capacity to make the improvements within the fishery is lacking, and are closely linked with MSC certification (Thomas Travaille et al., 2019). However, with FIPs comes a dependence on the continued support of the NGO that cannot be guaranteed (Sampson et al., 2015). A potentially better solution could be to seek aid from federal grant programs for promoting sustainable fisheries. There are multiple programs available that could support the Nunatsiavut Government in making improvements to the fishery and in pursuing ecocertification. From the Department of Fisheries and Oceans, the Atlantic Fisheries Fund is

one such option with the goal to aid in transition fisheries towards producing value-added, sustainably-sourced products through innovation, infrastructure, and science partnership projects (DFO, 2018b). The Canadian Fish and Seafood Opportunities Fund is another program that focuses on supporting industry collaboration and cooperation to improve cross-cutting market access issues and create branding opportunities (DFO, 2019b). As well, given the impacts that climate change is predicted to bring for Arctic char, there is also the potential to take advantage of programs such as climate change research funded community monitoring initiatives (Allard & Lamay, 2012). Preparing the Arctic char fishery for certification would fall under all these programs. Hence, governmental aid would be able to reduce the pressure of certification on the Nunatsiavut Government, but at the same time, it would go against the goal of financial independence. Nonetheless, the benefits such grants could bring to the fishery could be better weighed against the costs and could provide a realistic way for the Arctic char fishery to improve management shortcomings.

Implications for self-determination

An essential component of the Nunatsiavut Government's governance principles is to strengthen Labrador Inuit's right to self-determination and self-governance (Snook et al., 2018). Certification of the Arctic char fishery is expected to align with this goal by increasing communication with the federal government and allowing the Nunatsiavut Government to steer the process towards a certified sustainable fishery. However, some requirements of the MSC fisheries standard will necessitate management measures that may further limit the Nunatsiavut Government's control over managing the fishery. Even though the conditions of certification do not tell a fishery how to meet the requirements, some performance indicators are leaning towards requiring "Western-style management" to meet the requirements. Examples of these set management requirements can be seen from the conditions placed on fisheries in Canada that are MSC certified. In the snow crab fishery, for example, scientifically based target and lower reference points are required to be determined despite having alternative precautionary measures (SAI Global, 2018). As well, in the BC salmon fishery, despite ETP species not being recorded as catches in the UoA, it received a condition that it must show continued evidence that the fishery is not hinder the recovery of ETP species (Acoura Marine, 2017). For this condition to be met, there must be "objective" evidence that interactions are not frequently occurring. These conditions are very dependant on Western science to fulfill the requirements and require the

continuous monitoring of impacts that in the fishery may subjectively be known not to be an issue. In this way, the set management measures may make the Nunatsiavut Government increasingly dependant on often-quantitatively documented scientific evidence and reduce the ability to determine what measures will be best for managing the fishery.

Although the MSC fisheries standard does allow for traditional management systems to be considered in an assessment, there is little room for traditional and local knowledge to be incorporated into the scoring for Principles 1 and 2 (MSC, 2014). Incorporating these alternative forms of knowledge into fisheries management is an essential component for recognizing the distinctness of the North Labrador Inuit (Pardy et al., 2011). By reducing the importance of these alternative ways of knowing, certification may continue to promote Western scientific knowledge as the authoritative voice in fisheries management. Hence, getting the Arctic char fishery certified will provide little room for including traditional and local knowledge into the assessment. The resulting lack of a balance between the different ways of knowing does not likely align with the governance principle democracy and equality, especially for a fishery that is managed by Labrador Inuit, for Labrador Inuit (Snook et al., 2018).

Implications on governmental relations

The implication of certification on participation in management is also important to consider in determining how well certifying Arctic char would align with the Nunatsiavut Government's governance principles. In Canada, MSC certification has the potential to improve communication between the fishing industry and the Department of Fisheries and Oceans, often resulting in the fishery receiving more attention. This implication could be especially crucial for Arctic char, which has not been a Department priority for many years (Whalen et al., 2015). The reason certification improves communication comes as a result of DFO's role in supporting the ecocertification of Canadian fisheries and the need for DFO to be involved in certification assessment processes (Foley, 2013). Concerning MSC certification, DFO has agreed to undertake actions that are within its core mandate to address conditions of certification and maintain certification and has created positions within the Department specifically for dealing with ecolabelling (personal comm. Laura Hussey-Bondt, 2019). DFO's core mandate includes collecting scientific information and developing best management practices to promote sustainable fisheries. Hence, to prevent a fishery from losing certification, the needs of a fishery

to remain certified are often given attention by DFO. However, this only applies if a fishery is certified or in the certification process. Because the Arctic char fishery cannot become certified without first having a commitment from DFO to work on the management shortcomings that are preventing certification, some other way to prioritize the fishery will be needed.

Even though the fishery is not ready for MSC full assessment, a pre-assessment would be a possible way to improve DFOs involvement in the fishery. A pre-assessment would still require participation with DFO, and as the process is still a moderate commitment, it demonstrates the Nunatsiavut Government's commitment to ensuring a sustainably managed fishery. Moreover, a pre-assessment would require DFO and the Nunatsiavut Government to compile all the information that is available for the fishery and provide an up-to-date picture of the current state of the UoA[2]. Although it cannot be presumed that a pre-assessment will lead to a commitment by DFO to prioritize the needs of the Arctic char fishery, it would highlight the areas of the fishery that are the most in need of attention. As a result, a pre-assessment would allow the Nunatsiavut Government and DFO to draw greater attention and resources towards addressing the needs of the fishery and address the issues that are currently within their capacity. In this way, just starting the certification process would likely improve communication and involvement of both governments in management, thus promoting equality for the fishery. Some of the funding mechanisms mentioned above could also be pursued in support of undertaking pre-assessment.

Market-based implications

If the Arctic char fishery becomes certified, there is the potential for market-based implications to align with the Nunatsiavut Government's governance principles. One major issue identified in the fishery is the trouble the Co-op has had taking advantage of the markets for Arctic char (TJFB, 2011). This issue has been made worse by having to compete in the same market as farmed Arctic char, which outcompetes wild-caught char in both volume and price (Boutete, 2016; DFO, 2019c). Recent investments into the fishery have been targeted at ensuring product consistency, allowing the Co-op to create a high-quality product (TJFB, 2011). However, all the Arctic char produced is currently sold in Nunatsiavut or out of Happy Valley-Goose Bay, NL. With MSC certification and a high-quality product, though, Nunatsiavut harvested Arctic char would likely be able to compete in markets supplying high-end restaurants (Lopuch, 2008).

[2] Again, this may be something that the Nunatsiavut Government-DFO joint CSAS report can partially fulfill.

These markets could make a good fit for the fishery, given that the small volume of char harvested and seasonally limited production may be less of an issue for restaurants that change their menu throughout the year. Targeting high-end restaurants would also reduce competition with farmed fish, given the preference for consumers towards wild-caught seafood (Bronnmann & Asche, 2017). Hence, certification may allow for Arctic char to sell for a better price, which would support the governance principle pursuit of a sustainable economy. As well, there is also the potential for spill-over effects should the markets increase the profitability of char fishing.

Better market access may also require trade-offs, however, especially in the case of potentially reduced availability of Arctic char for subsistence purposes. Given the recognition of the Arctic char fishery as a social fishery, it is likely that the subsistence fishery will be adequately considered in any fishery development decision, though, this trade-off may reduce the benefits of accessing new markets (TJFB, 2011). However, there is the potential for targeting high-end markets to ensure there is char available for local consumption because of the different grades of char. Char that is bruised or discoloured would not be suitable for high-end markets and could be sold within the community or bought for the Community Freezer programs (TJFB, 2011). Through synergies like this, greater market access from certification can support the pursuit of a sustainable economy while also preserving the traditional practices and availability and price of char. Whether targeting high-end restaurants would be ideal in Nunatsiavut is dependant on other factors that must also be considered. One such factor is whether the Co-op wants to target this market. Recently, the Co-op invested in new packaging and a smoking machine to maximize sales at their Happy Valley-Goose Bay store (Whalen et al., 2015). Given this investment, they may not be looking for expanding their market if it requires producing a new product or the market is not to their benefit. As well, factors such as the cost of transportation and product requirements would need to be examined before it can be determined with enough certainty what benefits high-end markets could bring.

Implications on Job Creation

It is not likely that certification would be able to create more jobs in the Arctic char fishery directly. However, if the market access benefits are strong enough to increase the economic rent obtainable in the fishery, there is the potential it will become profitable to commercially harvest char farther from Nain Bay. Despite having the allocations to harvest 31t of Arctic char in Okak

Bay and 14t in Voisey Bay, it has not been practical for fishers to travel to these locations, though the benefits if they could, would be considerable (TJFB, 2011). Since the Arctic char fishery is a low-cost fishery to enter (requiring small vessels and minimal gear), many additional jobs harvesting char could be created in addition to the employment required for processing. Additional employment would allow a greater distribution of income throughout the communities, which is a social determinant of health (Mikkonen & Raphael 2010). As well, there would be likely cultural impacts similar to what is described for the Nunavut Arctic char fishery, where the char fishery is seen to enhance the cultural identity of the people (TJFB, 2011). Thus, if certification was able to promote the creation of jobs, it could significantly support the preservation of culture and pursuit of a healthy society. These implications are largely dependant on certification being able to increase the profitability of the fishery, however, which is not guaranteed to come with certification.

Recommendations for Arctic Char

Two recommendations are made for the Arctic char fishery regarding MSC certification:

1. Do not pursue MSC full Assessment

Based on the findings of this study, it is not recommended for the Nunatsiavut Government to pursue MSC certification of the Arctic char fishery. The number of management improvements that would need to be made to prepare the fishery for certification would require a substantial investment from both the Nunatsiavut Government and DFO. From the trade-off analysis, it is clear that pursuing certification would require continued investments and human capacity and would require set management actions to be taken. These implications may not align with the Nunatsiavut Government's goal for a sustainable economy, equality, or self-determination. These negative implications may be mitigated by potential positive implications of certification, including access to high-end markets and job creation, which could have impacts that align with multiple of the governing principles. However, there is a large amount of uncertainty regarding these positive implications, and without a guarantee that certification will deliver these benefits, the risk to a sustainable economy and democracy and equality is too high.

2. Consider pursuing an MSC pre-assessment

It is recommended that the Nunatsiavut Government consider pursuing a pre-assessment for the Arctic char fishery. Having a pre-assessment conducted will not only provide the Nunatsiavut Government with a greater understanding of the needs of the fishery but will also require collaboration with DFO. Together, this may help to draw greater management attention and resources to the Arctic char fishery and lead to greater cooperation in addressing the lack of information available for management. Since a pre-assessment is a much smaller commitment, the potential benefits of improving the relationship with DFO and increasing the information on the fishery align this decision with the Nunatsiavut Government's governance principles. Much of the discussion above regarding trade-offs emphasizes the need for explicit objectives for the Arctic char fishery. What does the Nunatsiavut Government want to achieve from the fishery? What are the priorities for Labrador Inuit, for economic development, for sustainability, etc.? If these are articulated, evaluating trade-offs becomes easier.

Primary Implications for Snow Crab and Greenland Halibut

Both snow crab and Greenland halibut fisheries in Nunatsiavut are likely to achieve a conditional pass if they were to pursue MSC certification. However, whether the decision to get certified would align with the Nunatsiavut Government's governance principles requires interpreting the results from the trade-off analysis and requires direct consideration by NG. This section examines the positive and negative implications that were identified as potentially most aligning with or contradicting the governance principles. Snow crab and Greenland halibut are examined together as the primary implications of certification for both fisheries are similar. Whereas Arctic char is strictly a Nunatsiavut-based fishery, the snow crab and Greenland halibut fisheries are part of a much larger, industrially fished stock. As well, neither fishery has a subsistence component. As a result, the anticipated implications of certification are not expected to have as drastic impacts on the Nunatsiavut Government's governance principles. However, there are still multiple implications to consider in determining whether pursuing certification would be in the best interest of the Nunatsiavut Government.

Resource Requirements

The resources required are likely the only significant negative implication of certification for snow crab and Greenland halibut. These species are not fished for subsistence or widely consumed domestically. As well, since DFO manages the region-wide fishery under a fishery-

wide management framework, certification would not require additional measures that may go against the ability to self-govern. Hence, the most significant implication of certification is the impact that the required resources and capacity would have on the pursuit of a sustainable economy and democracy and equality. Even though the indirect certification costs associated with improving the fishery for certification would be less than for Arctic char, pursuing certification would still require considerable assets. The direct certification costs and the indirect resources associated with communicating with the assessment team and implementing surveillance measures alone would require substantial investments. As noted earlier, there are potential ways to mitigate the resource requirements, but in any case, certification would require additional human capacity. In the case of snow crab and Greenland halibut, there would be two options to enter the certification process (personal comm. Jay Leuger, 2019). One way is to apply for certification as a UoA separate from the current UoA that is already certified. This method would be less costly than a regular assessment as a large portion of the required materials for assessment have already been collected. The second option is to wait for the certified UoA to enter re-assessment and then join the client group, effectively becoming part of the UoA. A potential issue with this is that while MSC policies encourage certificate sharing amongst all fisheries/stakeholders who extract portions from the UoA, there is no requirement for the client group to accept additional members and this could prevent the Nunatsiavut Government from becoming certified this way (Foley & McCay, 2013). Both options would effectively reduce the cost of certification for snow crab and Greenland halibut. However, to determine if certification is in the best interest of the Nunatsiavut Government, the positive implications of certification on the governance principles would at least need to outweigh the resources and human capacity required.

Implications on fishery access

The most impactful potential implication that certification may have in promoting the Nunatsiavut Government's guiding principles is on securing fishery access. For snow crab, the Nunatsiavut Government is currently satisfied with the share of the quota. For Greenland halibut, however, the TJFB has repeatedly requested that the Minister of Fisheries increase their allocations from ~200t to 650t to allow for an equitable share of the resource (TJFB, 2017d). MSC certification has helped improve fishery access in many other fisheries that have become certified, including the SA hake fishery and the Vietnam Ben Tre clam fishery (Pomeroy, 2013;

Ponte, 2008b). Although it is not guaranteed that certification would impact the Minister of Fisheries decision to allocate more quota, it may provide an edge to the TJFB when making recommendations if they are internationally recognized to be sustainable. Currently, the TJFB is recommending to the Minister that a compromise be reached where the Nunatsiavut Government is granted additional quota, and in exchange, the 75/25 season split in the Greenland halibut fishery can be removed. This split is has caused frustration in the industry (TJFB, 2017d), and with the added help of certification may aid in influencing the Minister's decision. Securing fishing access is considered crucial for the well-being and sustainability of coastal communities (Bennet et al., 2018), and thus would align with multiple governing principles. Additional allocations could also help make the fishery more economically viable, reducing the dependence on shrimp royalties to keep the fishery going. Hence, for Greenland halibut, the potential for certification to bring greater access to the resource likely supports multiple governing principles.

Implications on marginalization

The remaining potential implications of certification that are considered important for the snow crab and Greenland halibut fisheries were not directly looked at by the trade-off analysis. Whereas the trade-off analysis identified the implications of certification on fisheries that have been certified, the following implications are the result of a fishery not becoming certified. These implications are most prominent when a fishery occurs on the same stock that has certified components. Since snow crab and Greenland halibut are on stocks with certified components or components in assessment, the negative implications of not becoming certified that could be prevented through certification provide additional support for the Nunatsiavut Government's governance principles.

One potential implication of snow crab and Greenland halibut not being certified is that the Nunatsiavut Government may be indirectly left out of decision making. When a fishery is certified with a conditional pass, the conditions require an action plan to be developed by the client group that outlines the steps that will be taken to achieve this plan (MSC, 2014). Using the case of MSC certified northern shrimp in NL, Foley (2013) illustrated how meeting the conditions of certification, despite it being the responsibility of the client group, depended heavily on support from DFO. In this way, the client group was able to pressure DFO into supporting measures outlined in their action plan, essentially blurring the line between the

private and public sources of fishery management. Similarly, the client groups for the certified components of the snow crab and Greenland halibut fisheries are required to create their own action plans for meeting the conditions of certification. Since the Nunatsiavut Government is not part of the UoA, they will not necessarily be included in developing this plan, despite being on the same stock. As long as this plan is within the mandate of DFO, however, it will likely be supported. Hence, the decisions made for the stock may be determined before the Nunatsiavut Government even has a chance to provide input.

Another concern is the potential for MSC certification to support the privatization of a stock by excluding others from being part of the client group (Foley & McCay, 2014). This exclusion may have consequences for small, community-based fisheries on the same stock, such as Nunatsiavut's snow crab and Greenland halibut fisheries. In being excluded from the client group, excluded fisheries are not able to benefit from MSC certification, but are still being held to the stricter rules required to meet the MSC standards. Thus, exclusion may inadvertently increase the cost of the fishery through the additional measures required despite not being certification. There may also be adverse effects on such fisheries if they are competing for similar markets as certified products on the same stock (Foley & McCay, 2014). Hence, by being on a stock that has components certified, the snow crab and Greenland halibut fisheries in Nunatsiavut are potentially being marginalized, despite also fishing sustainably. This implication could be dealt with by becoming certified, and in this way, certification would promote democracy and equality for Nunatsiavut's snow crab and Greenland halibut fisheries.

Recommendations for Snow Crab

Two recommendations are made for the snow crab fishery:

1. Do not pursue MSC full Assessment at present

Although the snow crab fishery is likely certifiable, it is not recommended that the Nunatsiavut Government currently pursue their own MSC certification. The potential benefits of certification likely do not justify the costs and capacity required. Markets and fishery access are not currently a primary issue for the snow crab fishery, and there is minimal potential to develop the fishery, meaning that certification likely does little to support the governance principles. Thus, the resources and capacity required for certification could be better used elsewhere.

2. If MSC certification becomes favourable, join the existing client group

If something triggers the need for certification, it is recommended that the Nunatsiavut Government attempt to join the client group for the certified UoA when it enters re-assessment. This would remove the need for a pre-assessment and lower the cost of certification.

Recommendations for Greenland Halibut

Similar to snow crab, two recommendations are made for Greenland halibut:

1. Do not pursue MSC full Assessment at present

It is not recommended that the Nunatsiavut Government pursue certification for the Greenland halibut fishery. However, it is recommended that the fishery is monitored for any effects resulting from the newly certified component on the stock. There is some potential in the fishery for MSC certification to improve access to the fishery; although, without this being guaranteed, the costs and capacity associated with certification would likely outweigh the other benefits. Thus, the decision to become certified would not likely align with the Nunatsiavut Government's governance principles.

2. If MSC certification becomes favourable, join the existing client group

There is the potential that the current markets for Greenland halibut could be impacted by the increase in certified product entering the market or that the fishery becomes increasingly marginalized. If these effects are noticed, it may be worth reconsidering certification. In this case, it is recommended to try to join the certified client group when the UoA is up for re-assessment.

4.3. Context Specificity of MSC certification

Using the case of Nunatsiavut, this study provides insight into the importance of context in determining the implications MSC certification can have, even between two seemingly similar fisheries. In this study, it became clear that understanding the fishery-specific context of a UoA was not sufficient for determining the implications of certification. Fishery-specific information was insufficient because the political, social, environmental, and economic context at the local, national, and international level all play a role in MSC certification. The importance of context is apparent in comparing the fisheries in Nunatsiavut to the small-scale Baja California red rock

lobster fishery in Mexico, which benefited from substantial fishery empowerment following certification. Pérez-Ramírez et al. (2012c) attributed these benefits to the fishery being co-managed, having community-based objectives, and strong organization, all of which are shared by the fisheries in Nunatsiavut. In the lobster fishery, certification ensured industry representatives were adequately included in decision-making and provided access to government funds for ensuring the social, economic, and environmental sustainability of the fishery. However, similar benefits were not considered to be likely for any fishery in Nunatsiavut because of differences in national governance. In Mexico, MSC certification aligned with the government's new commitment to seafood sustainability, prompting the government to take notice of the lobster fishery and support it (Pérez-Ramírez et al., 2012lob). In Canada, the same national commitment to sustainability exists, but many fisheries are already certified, which causes the benefits of certification to diminish (Pérez-Ramírez et al., 2012dev). In this way, should the fisheries in Nunatsiavut become certified, they would be just another certified Canadian fishery, whereas rock lobster was the first fishery to become certified in Mexico. Hence, the benefits of certification in two similar fisheries may be completely different.

As well, similar fisheries within the same country can be affected very differently by certification. Even though Nunatsiavut's fisheries are mostly small-scale, their accessibility to MSC certification is much lower than other small-scale fisheries in Atlantic Canada. Generally, MSC certification in Atlantic Canada is funded by groups of seafood processors, not harvesters. In the NL northern shrimp fishery, fish processors used MSC certification to incentivize harvesters to land their product at their fish plants shifting the balance away from processors that were not part of the client group (Foley, 2012). In this case, it made sense for small-scale fishers to be included in the certification as their inclusion increased the supply of certified products. This is similar to the certified snow crab, haddock and Atlantic halibut fisheries in Atlantic Canada, which include small-scale harvesters under the certification (MSC, 2019b). However, for the small-scale fisheries in Nunatsiavut, it would have to be decided who the client group actually is. Would it be the Nunatsiavut Government, as assumed throughout this study, or would the Torngat Co-op make more sense, and then how are actual fish harvesters engaged or not in the certification process? Hence, even two small-scale fisheries on the same stock may be impacted differently. Thus, it is not enough to look at the benefits coming from another fishery,

even if they appear very similar, and anticipate the implications to be the same. Even after certification, it may be hard to determine the actual implications it brings (UNEP, 2009).

4.4. The Inuit Way of Life and Market-Based Tools

With the addition of more centralized populations, greater food insecurity, and climate change, Canada's northern regions are expected to face increased pressures that will continue to threaten the Inuit way of life. For many Inuit communities, fishing activities are a source of food, wealth, and social well-being, making it particularly important that these activities are being managed to ensure Inuit have the freedom to maintain their traditional lifestyle (Snook et al., 2018). Despite this importance, the Co-management Boards set up in the Arctic and sub-Arctic are lacking capacity and influence to manage their fisheries, with one Board representative contending the "North is always served last" (Snook et al., 2019, p. 14). Using the case of Nunatsiavut, this section will discuss the potential for MSC certification to promote the Inuit way of life.

Implications of MSC Certification on the Inuit Way of Life

This study has shown that there is the potential for MSC certification to bring advantages and disadvantages to the Inuit communities in Nunatsiavut. The most likely way certification could promote the Inuit way of life is through the benefits that might result from its commercial fisheries gaining an improved ability to compete in national and global markets. According to the National Aboriginal Economic Development Board (2014), the development of Inuit fisheries can accumulate benefits to communities and businesses, but the ability of Inuit fisheries to compete on markets is currently an issue. As seen in Nunatsiavut, greater market access can potentially allow for the fishing sector to expand, creating jobs and connection to traditional practices. In the face of climate change, certification may also ensure information is available to detect potential climate effects early and manage the stock accordingly. Thus, certification can assist in developing and protecting resources that are crucial to the Inuit way of life. However, MSC certification requires a heavy focus on Western management and objective evidence, which may not be appropriate or embraced for managing Inuit co-managed fisheries. As a result, with certification, there would be fewer opportunities to include traditional and local knowledge into fisheries management and less flexibility in management. Given the already low capacity of the co-management boards, the most significant barrier preventing MSC certification from supporting the Inuit way of life may be the resources required for certification. Even with

external support, pooling resources together to become certified would likely come with an unjustifiable opportunity cost to other essential programs.

Shockingly, even uncertified Inuit fisheries are impacted by MSC certification. In managing Canadian fisheries, the Department of Fisheries and Oceans has the mandate to ensure that fisheries are managed sustainably. However, DFO cannot address the needs of all fisheries and must prioritize where efforts are focused (DFO, 2018d). MSC certification becomes an issue when certified fisheries increase pressure on DFO to address the sustainability needs required for them to remain certified. In this way, MSC certification in Canada has required DFO to spend resources on the needs of privately certified fisheries, taking away from requirements of other publicly managed fisheries (Foley, 2013). The Arctic char fishery is an example of a fishery that has received little attention, even though it is a top priority of DFO to improve the relationship with Indigenous peoples and to support the desire for greater Indigenous participation in the commercial fisheries (DFO, 2019d). Pressure from MSC-certified fisheries will likely continue to take priority over the needs of the North, partially because of the lobbying power of large-scale, certified fisheries, but also because of the negative reputation that DFO may face if they do not ensure certification is maintained. The pressure DFO faces can be seen by the recent withdrawal of certification by the Pacific salmon fishery due to not meeting the conditions of certification. The withdrawal has led to criticism of DFO for "failing the fishery" as they are the manager of the fishery and ultimately responsible (Landreville, 2019). This is despite the fact that the fishery was given 22 conditions on which to improve (Acoura Marine, 2017). Hence, MSC certified fisheries will likely necessitate continued support from DFO, tapping resources that could be used in other priority areas. In doing so, MSC certification may be inadvertently hindering the proper management of Inuit fisheries, which are tightly connected to their way of life.

4.5. Study Limitations

While this study was able to estimate the potential for Nunatsiavut's fisheries to become certified and the potential trade-offs of certification, limitations may have influenced the results of the Rapid Assessment analyses and the trade-off analysis. The most significant limitation for the Rapid Assessment was the availability of data, especially for Arctic char. Despite being designed for data-poor fisheries, the assessment still required a large amount of data that was not readily

available online. As a result, specific indicators had to be scored based on the best evidence available information, such as stock health, but may not reflect the actual situation. Ideally, members of the Nunatsiavut Government, the Co-op, fish harvesters, community members, and DFO would have also been consulted to gather information firsthand and confirm any assumptions that had to be made based on the available data. Despite these shortcomings, the assessments act as a good starting point for investigating the sustainability of the fisheries further.

As well, the trade-off analysis was limited by the availability of data. The multiple and changing implications of certification over time are poorly represented in the literature, compared to the number of fisheries that are certified, making it difficult to understand the implications of MSC certification fully. This effect is amplified for small-scale and developing country fisheries, which make up only a subset of the total number of fisheries certified. As well, this analysis only identified the potential implications of certification and did not provide much information on the magnitude or likelihood of implications. As a result, the trade-offs for each governing principle were mainly based on potential effects certification could have, making it hard to determine for sure whether certification would be beneficial or detrimental overall. Even though the likelihood and magnitude of an implication had to be estimated based on the available information, considering each implication is essential, nonetheless, for ensuring the costs and benefits of certification are fully examined. Furthermore, it is important to note that these trade-offs were identified and interpreted by one outside scientist. Assessment and reflection on the governance principles and certification should at least include, and more properly be led by, Northern Labrador Inuit.

4.6 Conclusion

This research project examined the potential for MSC certification to address the issues being faced in Nunatsiavut by looking at both the potential of the Arctic char, snow crab, and Greenland halibut fisheries to become certified and the extent to which certification could align with the Fundamental Principles of the Nunatsiavut Government. Although the Rapid Assessment of the snow crab and Greenland halibut fisheries suggest that they meet the MSC fisheries standards, this study concluded that the resource implications of certification would have a greater impact on the Nunatsiavut Government's governance principles than the potential

benefits certification may have on securing access to resources and markets. Given this information, it is not recommended either species pursue certification at this time. For Arctic char, the Rapid Assessment suggests that the fishery has a low impact on the environment but is missing components of a precautionary management strategy and information/monitoring to meet the MSC standards. Even though the fishery may substantially benefit from better market access and its subsequent effects, these implications come with high uncertainty, and would not likely justify the resources and capacity to prepare for and maintain certification. However, it is apparent from this study that there is a shortage of information required for what MSC standards imply constitutes proper management of the Arctic char fishery. Unlike the other species in Nunatsiavut, the Arctic char fishery is exclusively harvested by Labrador Inuit and promotes social well-being through commercial and subsistence activities (Snook et al., 2018). Thus, even though a full assessment is not recommended, undergoing an MSC pre-assessment is one alternative measure that could be potentially taken to address the needs of the fishery. Such an assessment has the potential to highlight the areas in most need of management and help increase the visibility of the Arctic char fishery to DFO. Since it could be funded through government programs and comes with no commitments, the negative impacts would be minimal, though, it may not result in any market benefits either.

With everything taken into consideration, it is apparent that obtaining the information and capacity required throughout all stages of certification remains a barrier for small-scale fisheries looking to pursue certification. It then becomes a question of whether certification standards should continue to be modified to accommodate small and data-poor fisheries better, or whether an entirely different approach to promoting sustainable practices should be envisioned. For the Arctic char fishery, it appears the latter is the case. As beneficial as certification may be, the real need of the fishery is information and documentation, as the motivation to ensure sustainable practices is already present. Although certification requires this information, it is not the only way for it to be collected. This is in line with Jaquette & Pauly's (2008) assertion that the limited resources available for fisheries conservation should go towards efforts that have the best chance to promote sustainable fisheries. Given the context of the Arctic char fishery, market-based tools are likely not the solution. However, efforts focused on addressing the primary needs of these fisheries and enhancing their capacity to self-manage would be much more likely to balance the environmental, social, and economic aspirations of Labrador Inuit. Efforts such as this may be

most important in fisheries where it is the capacity, and not the incentive, that is preventing the adoption of sustainable practices. Hence, even though MSC certification may be able to bring benefits to Nunatsiavut's fisheries, it is clear that context-specific initiatives will be required to best support the Inuit way of life.

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Appendix A: Detailed Rapid Assessments

Arctic Char Rapid Assessment

Basic Fishery Information

Target species:

- Arctic Char (*Salvelinus alpinus*)
    - Also known as Arctic charr

Fishery location:

- Cape Rogue to Cape Chidley
    - Stock complexes in Okak, Nain and Voisey Bay

Gear type:

- Mid-water gillnets

Catch quantity:

- TAC of 32t in Nain Bay, 31t in Okak Bay, 14t in Voisey Bay; <25t landed annually

Vessel type and size:

- <35'

Number of registered vessels:

- Up to 50 designates under the Nunatsiavut Governments Commercial Communal Licence

Management authority:

- Snow crab is listed as a species under Schedule 13-B in the LILCA (2005). This means snow crab is a species that is co-management between the Nunatsiavut Government and DFO.

Principle 1 – Stock Status

Since the Arctic char that can be fished under the communal licence span over three defined stock complexes, each complex was taken into consideration during the assessment. Where there was data for one stock complex and not another, it was assumed that they would be similar unless there was evidence to suggest otherwise. Where there was data suggesting they would be scored differently, it was noted, though the overall score for the overall stock was taken to be the lowest of the three.

1.1. Outcome

1.1.1. Stock Status Outcome – ***Score*** ***Yellow***

Although up until 2001, there were regular assessments of Arctic Char stock status and fishing effort in Northern Labrador, in the past 15 years, there has not been a stock assessment conducted by the Federal, Provincial, or Nunatsiavut Government. As such, there are no formal stock estimates or reference points for the UoA. In the lack of a recent stock assessment, the Stock Status Outcome was required to be assessed using the data-limited pathway (OSMI, n.d).

This pathway utilizes a Productivity-Susceptibility Analysis (PSA), available stock information, and stakeholder perceptions of the stock health to estimate the likely score of this indicator.

Productivity-Susceptibility Analysis (PSA)

The PSA methodology was taken from the Monterey Bay Aquarium Seafood Watch standard for fisheries, version F3.1 (Monterey Bay Aquarium, 2016). The productivity section of the PSA was conducted using mostly information that was collected in 1985 on the biology of Arctic char in the Fraser River, which flows into Nain Bay. Although the biological characteristics for char are known to vary depending on the location and river, the differences between the three bays are known to be small and should not different to the point that they would score differently for stock productivity (Dempson, 2008). However, for the susceptibility portion of the analysis, each bay may differ. The PSA methodology scores productivity and susceptibility attributes from 1 (lowest vulnerability) to 3 (highest vulnerability). The final PSA score is calculated by the MSC risk-based framework spreadsheet using the scores from seven productivity attributes and four susceptibility attributes.

Productivity Analysis attributes scoring

1. *Age at sexual maturity* – **Score 2** (5-15 years) - The age at sexual maturity for Arctic char in the Fraser river was found to vary quite a bit with 50% of males reaching sexual maturity at 5.2 years, 50% of females reaching maturity at 6.9 years, and 75% of females at age 8 (Dempson & Green, 1985). By age 12, 100% of females have reached maturity. This places the Arctic char stock safely within the 5-15 age category, resulting in a score of 2.

2. *Average maximum age* – **Score 2** (10-25 years) – The average maximum age that was recorded in the Fraser River was 18 years of age. This places the stock in the 10-25 maximum age category resulting in a score of 2 (Dempson & Green, 1985).

3. *Fecundity* – **Score 2** (100-20,000 eggs/year) – In the Fraser River, sampled Arctic char had a fecundity between 2316 and 9245 eggs/year with the average being 4665 + 434 eggs laid per female (Dempson & Green, 1985). This estimate is within 100-20,000 eggs/year category, resulting in a score of 2.

4. *Average maximum size* – **Score 1** (<100cm) – In the Fraser river, the largest sampled Arctic char had a fork length of 82cm (Dempson & Green, 1985). This length is well under 100cm, scoring this attribute as 1.

5. *Average size at maturity* – **Score 1** (<40cm) – According to the biological assessment, the average length at maturity for Arctic char in the Fraser river is was 38.1cm (Dempson & Green, 1985). This is close to, but still under the 40cm lower limit for this attribute to be scored as 1.

6. *Reproductive strategy* – **Score 2** (Demersal) – Similar to other salmonid species, Arctic char are demersal egg layers, depositing their eggs in gravel in streambeds prior to fertilization (Dempson & Green, 1985). This resulted in a score of 2.

7. *Tropic Level* – **Score 3** (<3.25) – Though the exact trophic level of Arctic char in the region has not been scientifically determined, the diet has been investigated. Using this information, the trophic level (TL) could be estimated based on the method outlined by Trites (2001). Based on an assessment by Dempson et al. (2002) the main diet by weight for char in the waters around Nain is capelin and sand lance, both planktivorous fish. Since both prey species feed on zooplankton, their trophic level is approximately 3 (Trites, 2001). The remainder of the diet of Artic char came from zooplankton (trophic level 2) (Dempson et al*.,* 2002). Therefore, it is safe to assume that the trophic level of Arctic char around Nain would be greater than 3.5, which is what it would be if their diet was split between planktivorous fish and zooplankton (0.5*2TL + 0.5*3TL + 1tl = 3.5TL). This is greater than 3.25 and thus the trophic level of Arctic char is above 3.25, resulting in a score of 3.

Susceptibility attributes scoring

For the susceptibility score, all pressures on the stock must be considered (including the subsistence and recreational removals)

1. *Area overlap (availability)* – **Score 3 –** This attribute is difficult to assess given the lack of information on the locations of fishing effort and the spatial extent of the stock. However, due to the small range that arctic char travel from their home river, and location of fishing gear at berths that Arctic char are known to pass through, the overlap between char and fishing gear is likely high (Moore et al., 2014). This is especially true given that the fishing season overlaps with the time char migrate back into fresh water (Moore et al., 2014)

2. *Encounterability* – **Score 3** – For the target species of a fishery, the automatic score for encounterability is three. Thus, Arctic char commercial fishery is scored as 3.

3. *Selectivity of Gear* – **Score 1** (Total score = (1+1)/2) – This attribute is scored based on the average scores of the two sub-attributes.
    - (a) *Individuals < size at maturity are rarely caught* – **Score 1** – The gillnet mesh size is required to be a minimum of 114mm (4.5”) in the region, which has been demonstrated to effectively eliminate the catch of immature char. Sampling for Arctic char in Nain in 1974 using commercial gillnets resulted in the catch of char with and average length of 53.7cm with the minimum size caught 47.4cm (Coady & Best, 1976). Of all the fish caught, only 5 were under the age of 8, suggesting it is highly selective for older individuals. Since Arctic char have such a variable age and length when they become reproductive, it is possible there are still some larger/older females that are caught in the fishery, though the average immature char would not be caught.

    - (b) *Individuals < size at maturity can avoid gear* – **Score 1** – Similar to above, the minimum mesh size appears to be enough to allow immature char to pass through the mesh without being captured. Although no studies could be found on the selectivity of gillnets with a mesh size of 114mm on char, there were relevant

studies on other salmonid species. For Atlantic salmon in Newfoundland, the smallest salmon caught using 114mm gillnets was 47.0cm and for Lake Trout in Lake Superior, the smallest caught was 43.8mm (Reddin, 1986; Hansen et al., 1997). Given that the mean length of Arctic char becoming sexually mature in Nain Bay is 38.1cm, it is likely individuals greater than size at maturity can avoid the gillnets.

4. *Post-capture mortality* – **Score 3** – For species that are landed in the fishery, the automatic score for post-capture mortality is three. Thus, the commercial Arctic char fishery scored 3.

Productivity-Susceptibility Analysis Score

Using the individual attribute score calculated above, the PSA resulted in a score of **2.48**. This is well below the high vulnerability threshold of < 3.18, and slightly below the medium vulnerability range of ≥ 2.64 and ≤ 3.18. Hence, based on the PSA, the Artic char stocks assessed have a low vulnerability to overfishing. However, the PSA only provides an indication of the likely stock status and should be supported from other available information in the fishery, and does not include the domestic or recreational removals due to lack of data (OSMI, n.d.).

Other Indicators of Stock Health

Reduction in fishing pressure

Other indicators suggesting that the stock is not depleted comes from the changes in landings of Arctic char in Nain Bay. By 1974. The stock was showing signs of being overfished, resulting in significantly reduced effort from the previous 20 years (Dempson, 2008). However, an average of 48t per year was still harvested between the years 1974-1993. Over the next 12 years, the pressure on the stock was reduced by an additional 70-75%. Catches have remained lower since then, with the last 12-year average being only 21t per year across all stocks in Nain. Even with the subsistence harvest considered, the amount of char taken yearly is likely lower than was taken prior to 1993. In both Voisey Bay and Okak Bay, the Arctic char stock complex has not been commercially fished since 2002, and only a limited subsistence harvest occurs in these areas during the winter months (Dempson, 2008).

Stable Age and Length Distribution of Catch

Upon analysis of the length and age of Arctic char caught between 1977 and 2001, Dempson (2008), found that catches were dominated by ages 7-10 years of age and a length between 48-52cm. These results are similar to what was reported by Andrew and Lear (1956) over 20 years prior. Thus, the age and length of the catch have remained relatively stable over at least 50 years, which is a sign of stock health (OSMI, n.d.). Although it is reported that this is in part due to the selectivity of gillnets, Johnson (1989) found a similar trend in an unselective Arctic char weir fishery in NWT, with age and length distributions only showing changes once the stock collapsed. This provides evidence that the stock is not collapsed.

Environmental Effects

Despite lower pressures on the stocks, without a proper stock assessment, it is hard to determine the health of the stock. In part, this is because environmental conditions influence stocks of Arctic char. In the Nain area, Powers et al. (2000) observed that changes in sea-surface temperatures and precipitation had a strong influence on the mean weight of Arctic char. Environmental patterns have also been known to affect the distribution and abundance of the main prey of Arctic char, which likely also affects the stock health even in the absence of fishing pressure (Dempson, 2008).

Stakeholder Concern

Despite the reduction of fishing pressure, there is currently concern from both commercial and subsistence Arctic char harvesters about the number of char in Nain Bay. In his news report, Baker (2019) expressed that the catches of char are thought to be getting lower each year. The reason people think this is because there is too much pressure between the commercial fishers who target only Nain Bay and the concentration of subsistence harvest in the same area. In 2018, concern amongst beneficiaries was enough to call a public meeting to discuss the state of the Arctic char in Nain Bay (OK Society, 2018a). At this meeting, concern was expressed over the declining catches, and the consensus was that more science is needed to assess why catches are decreasing. Since there is limited subsistence harvesting in the Voisey Bay and Okak Bay stock complexes, there is no stakeholder concern for these areas.

The score for Voisey and Okak – Green – Given that these stocks scored low vulnerability on the PSA and that the stock age and length has remained constant and there has been little fishing in this area for 17 years, the Voisey Bay and Okak Bay stock complexed scored green.

The score for Nain Bay – Yellow – Even though the stock scored low vulnerability on the PSA, there is some evidence to suggest that the stock is declining, giving the Nain Bay Arctic char stock complex a score of yellow.

*1.1.2. Stock Rebuilding Outcome – **Score Red***

The stock rebuilding outcome is only required if the stock complex did not score green on PI 1.1.1. Since both Voisey Bay and Okak Bay scored a low risk, they would not be required to score this PI. However, given the concerns in Nain Bay, this indicator must be scored.

This indicator is based entirely on the fishery having a stock rebuilding plan in place. Since there is such a substantial deficiency of scientific information concerning the health of the Arctic char stock complex, a recovery plan has not been developed. As a result, this performance indicator is automatically scored red.

1.2. Management

This set of performance indicators will be the same for each stock complex as it is based on the Harvest Strategy in place for the Arctic char fishery across Northern Labrador. Although the

fishery is co-managed between the Nunatsiavut Government and DFO, the creation and implementation of the Harvest Strategy are under the authority of DFO with the TJFB able to recommend to the Minister management measures they believe appropriate. The current management measures are listed in Table 9. Enforcement activities are conducted by a conservation officer stationed in Nain (personal comm. Todd Broomfield, 2019). There is no catch monitoring by dockside monitor or at-sea observer, nor are logbooks required in the fishery (DFO, 2019a). All char harvested are processed at the Co-op's Nain fish plant, which keeps sale receipts of what is caught and by whom (Whalen et al., 2015). Given the small number of fishers, this is likely a reasonable estimate of what is being landed, though it gives no information on bycatch.

***Table 9**. Table 9. Overview of the Management measures in place for the Northern Labrador Arctic char fishery (DFO, n.d.)*

Management measure	*Details*
Restricted Access	- NG Commercial Communal licence - 50 designates maximum
Total Allowable Catch	- Voisey Bay -14t - Nain Bay - 32t - Okak Bay - 31t
Gear Restrictions	• 200 fathoms allowed per designate • 50 fathoms maximum at any one berth • Minimum mesh size of 4 ½" (114mm) • Marked with the name and designation number of the designate
Vessel Restrictions	• Vessels must be under 35'
Salmon bycatch Protocol	• Area closures if encounters with Salmon reach the 5% threshold in the area

1.2.1. Harvest Strategy – **Score Red**

Unlike many DFO managed fisheries, the target and lower reference points have not been identified for the Arctic char stock complexes in Northern Labrador. As well, there is currently no Integrated Fisheries Management Plan available for the fishery, which are the main documents DFO uses to provide a planning framework and management strategy for the sustainable harvest of the species (DFO, 2010). Given the absence of an IFMP, the harvest strategy for Arctic char is defined by the DFO-implemented "Arctic Char Management Plan for

Northern Labrador document" (DFO, n.d.), "Commercial Communal Licence Conditions for Arctic Char in Northern Labrador" (DFO, 2019a), and the Nunatsiavut Government. The Management Plan is the primary management framework that identifies the key objectives of the fishery. The key objectives are to conserve and protect Arctic char, maximize benefits to residents of Northern Labrador, and eliminate bycatch of Atlantic salmon (DFO, n.d.). However, except for Atlantic salmon bycatch, there are no pre-defined harvest control rules which will be taken in response to changes in the status of the Arctic char stocks. Instead, this management plan focuses on using fixed management measures to limit the pressure of the fishery on the stock.

Under this management plan, it is specified that no new licences may be distributed for the fishery, with the only licence being the commercial communal licence held by the Nunatsiavut Government. With this licence, up to 50 beneficiaries can be designated to fish under this licence, each of which is subject to the licence conditions attached to the commercial communal licence and any additional conditions imposed by the Nunatsiavut Government. This is the primary method used to control access into the fishery and effectively restricts the fishery to Beneficiaries chosen to be part of the fishery by the Nunatsiavut Government. This ability gives the Nunatsiavut Government control over who may fish commercially for Arctic char in Northern Labrador. To be considered for access, one must, be a Beneficiary of the Labrador Inuit Land Claim Agreement, hold or has established a plan with the Director of Renewable Resources to pursue a Professional Fish Harvester Level II Certification, have participated full-time in the commercial fishery for no less than three years, and holds a Northern Labrador Core status (Nunatsiavut Government, 2019). Although up to 50 Beneficiaries may be designated, in the last five years, many less have been designated. Hence, this management method has been successful in preventing overcapacity in the fishery. In the management plan, there are no obvious pre-season decisions such as stock-recruitment targets, exploitation limits, or enforcement objectives as are set up in other similar fisheries (Acoura Marine Marine, 2017).

In-season management decisions are very similar across the three stock complexes and remain static from year to year (Whalen et al., 2015). Given that there is no current stock assessment, and no reference points for the stock, there is no evidence that management measures are based on scientific information. Although there are management measures in place to limit pressure on the stock (Table 9), the measures are not responsive to the state of the stock health and fail to meet the requirements for an effective harvest strategy.

At the end of the season, there is a post-season review, though there is no information about what this review entails. Since there are no catch monitoring requirements (e.g., logbooks, dockside monitoring, etc.), the only information about what is caught comes from purchase slips from the fish plant that buys the fish that is landed. Given the uncertainty in stock abundance and the multitude of factors that may be affecting the landings of Arctic char each year, the information available for the post-season assessment is likely insufficient to assess the effectiveness of the harvest strategy on protecting the stock.

Thus, even though a harvest strategy exists, multiple necessary components for effective monitoring, assessments, and harvest control rules are lacking. This indicator is scored red.

1.2.2. Harvest Control Rules – **Score Red**

Although well-defined management measures are being used in the Arctic char fishery, they are not responsive to the changes in stock status. This contradicts the Fisheries Decision-Making Framework that commits DFO to manage all key stocks using the precautionary approach (DFO, 2009). Under this framework, all fisheries should have defined reference points placing the stock in either the healthy, cautious, or critical zone (DFO, 2009). As the stock status moves into the caution zone, fishing pressure is to be reduced to levels that are expected to bring the stock back into the healthy zone. Once a stock is in the critical zone, fishing pressure is to be reduced to zero. In the case of Arctic char in Northern Labrador, however, the absence of any reference points and stock assessments makes it difficult to adjust the management measures precautionarily. As a result, the Nunatsiavut Government has been intentionally under harvesting to deal with the uncertainty in stock health (Whalen et al., 2015). In this way, fishing effort may be reduced by the Nunatsiavut Government without the need for DFO intervention. However, with the lack of information on stock status, the Nunatsiavut Government does not have enough information to ensure the stock is managed precautionarily.

Thus, the harvest control rules are "unlikely to result in sustainable fishing practices, where exploitation is reduced in response to evidence of stock depletion," given the uncertainty around fishing pressure (OSMI, n.d). As a result, this indicator is scored red.

1.2.3. Information and Monitoring– **Score Red**

This performance indicator assesses the information that is collected to support the harvest strategy. As noted in PI 1.2.1., there are no reference points and limited available information on stock structure available to base HCRs on. The last stock assessment was in 2001, and most information about the life-history and stock characteristics are available from research before this assessment. Monitoring of fish removals, though documented through purchase slips from the Co-op, is also insufficient to support the harvest strategy as this only records how much is landed. As well, there is ambiguity over whether the information provided to DFO by the Co-op is being assessed (Whalen et al.,2015).

Since the Nunatsiavut Government assigns designated each year, the fleet composition is known for the commercial char fishery, though the number of fishers and removals from the subsistence and recreational fishery are mostly unknown, though subsistence removals alone were estimated to be 8,000 char in the year 2011 (Cohen et al., 2010). The Nunatsiavut Government has tried implemented logbooks for the subsistence fishery to track catches, although troubles getting funding for this project have prevented it was continuously being collected (Whalen et al., 2015). As a result, the extent of the pressure on all three stocks from subsistence removals is not well understood. Hence, the lack of information collected about stock structure, stock productivity, and fishery removals is insufficient to support a precautionary harvest strategy, and thus, this indicator is scored red.

1.2.4. Assessment of Stock Status – **Score Red**

This performance indicator assesses the timeliness and relevance of stock assessments (whether scientific or traditionally assessed) for the fishery. In scoring this indicator, if there has not been a recent stock assessment, the UoA automatically scored red. As per the guidelines by the Monterey Bay Aquarium (2016), a recent stock assessment is defined as an assessment less than five years old or less than ten years old if the stock biomass was above the upper reference point. Since the last assessment was conducted over 15 years ago (DFO, 2001), this indicator is scored red.

Principle 2 – Ecosystem Impacts

The second Principle assessed is the impacts of the fishery on the ecosystem. For this Principle, information on the catch of all species in the fishery are required, as well as the impacts of the fishing gear on the environment. In the Rapid Assessment Tool, other species that are caught in the fishery are either labeled primary or secondary based on whether that species has management objectives or not. Differing from MSC, in this methodology, both primary and secondary species are scored by the same performance indicators (2.2.), instead of being assessed separately.

This Principle needs to take into account all species caught in a fishery, although in this UoA, there are very few species of bycatch.

2.2. Primary and secondary species

2.2.3. Other Species Information – **Score Yellow**

This indicator is scored based on the available information on the other species caught by the fishery in the UoA. Since the only recording of catch data is purchase slips from the fish processing plant and the only species landed is Arctic char, there is minimal information regarding bycatch in the fishery. In the circumstance where the other species catch data is unknown, indicators 2.2.1, 2.2.2 and 2.2.3 are to be scored red. However, in the fishery, it is known that salmon is the only significant bycatch species, and because of the management measures in place, the maximum that can be caught is 5% before the salmon bycatch protocol comes into effect (DFO, n.d.). As a result, even though the exact amount of salmon caught is not known, it can be assumed it is 5% or lower, which allows this indicator to be scored. Personal communication with Todd Broomfield also suggests that salmon bycatch being quite rare. Since it is not known exactly the amount of salmon caught, this performance indicator was scored assuming it constituted a main species (5% or more of the total catch). Although no quantitative data could be found on the impact of the UoA on Atlantic salmon, qualitative data is available to estimate the impact on Atlantic salmon stocks. As a result, this performance indicator is scored yellow.

2.2.1. Other Species Outcome – **Score Green**

In each stock complex, the main bycatch species is considered to be Atlantic salmon. It is a primary species as both limit and upper stock reference limits have been estimated based on egg

deposition levels in salmon spawning rivers. Although many rivers in Newfoundland and Labrador show concern over stock health, the Northern Labrador stock is not currently at risk. This is supported by the biennial stock assessments of 14 spawning rivers in Newfoundland and Labrador. Although the English River (near Hopedale) was the only Northern Labrador river is assessed, in 2017, the survey found that egg depositions levels were above the upper stock reference point, and have been above the limit reference point for the seventh year in a row (DFO, 2018e). This assessment suggests that the Northern Labrador stock of Atlantic salmon is highly likely above the biologically based limits. Since Atlantic salmon is the only main species caught, this indicator scores green.

2.2.2. Other Species Management – **Score Green**

One of the main objectives of the management plan for Northern Labrador Arctic char is to eliminate the bycatch of Atlantic salmon in the Arctic char fishery (DFO, n.d.). The management plan provides details of the measures in place to ensure that salmon bycatch remains very low, including limiting fishing to only areas where salmon bycatch can be minimized. Under the management plan, if the number of salmon caught while commercially fishing for char is >5% the number of char, the salmon bycatch protocol comes into effect, which requires a fisher to move berths. Also, if the number of salmon caught in an area over a few days is >5%, the area may also be closed to commercial char fishing for two weeks. Given the low volume of Arctic char harvested in a year, it is reasonable to suspect that by limiting salmon bycatch to <5%, the health of the salmon stock is not being threatened. As well, given that char gillnets are placed near the mouths of rivers and that salmon only return to freshwater only to spawn, there is very little chance of catching a salmon that has not reached maturity. Together, these measures make it likely that the strategy will be effective at reducing the threat to Atlantic salmon populations. This conclusion is backed up by reports from Nunatsiavut that salmon bycatch is not a concern. Hence, there is evidence that the strategy is being implemented successfully, and given the continued salmon stock health, that the fishery is not threatening the stock. As a result, this indicator is scored green.

2.3. ETP species

This section examines the impact of the UoA on endangered, threatened, or protected (ETP) species. These are species that are recognized by national legislation, international agreements the jurisdiction the fishery is in are part of (e.g., CITES), or other internationally binding agreements (including the IUCN Redlist). In Canada, ETP species are listed under the Species at Risk Act (2002). Once a species is listed, it becomes legally binding to protect that species. The species at Risk Act appoints the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as the body responsible for identifying and assessing the status of species in Canada. COSEWIC reports the conservation status of species to the government and public, ranging from special concern to endangered. However, regardless of COSEWIC's determination, a species is only identified as ETP in Canada if it is included under the Species at Risk Act.

2.3.3. ETP Species Information – **Score Red (Data deficient)**

Atlantic salmon are the only major bycatch of the Arctic char fishery. Although certain populations of Atlantic salmon do fall under the endangered, threatened, or protected category in Atlantic Canada, the Northern Labrador population does not meet the criteria. This population is listed as "not at risk" by COSEWIC and is not listed as an ETP species under the Species at Risk Act (2002). Atlantic salmon are also listed on the IUCN Redlist as least concern and are not recognized as a species of concern by any binding international agreements. Hence, the Atlantic salmon population in the UoA does not meet any of the criteria required to be classified as an ETP species. However, there is very limited information regarding other species of fish being caught in the UoA.

The lack of logbooks and species at risk reports required in the Arctic char fishery is found to hinder the ability to estimate the impact of the UoA on ETP species. Although the bycatch of the fishery is very low, there are several species of both ETP marine mammal and seabirds in the area being fished. Most notably, the Low Arctic population of Atlantic Walrus and hooded seals are listed as vulnerable on the IUCN Redlist, and several species of at-risk whales are also present in the Northern Labrador Sea. However, bycatch of marine mammals is reported to be highly unlikely given the short distance from shore that the gillnets are set (personal comm. Todd Broomfield, 2019). As well, under the licence conditions for the fishery, all interactions with marine mammals must be reported to DFO. In addition to mammals, seabirds are the other major species identified that may be caught in the char fishery. However, there is no available data to determine the species or extent that seabirds are captured. In similar fisheries in Greenland, seabird bycatch was found to be low as the gillnets are set close to shore, away from many seabirds (Bentzen & Robards, 2014). In the Arctic char gillnet fishery in Northwest Territories, it is expected that the main species that will interact with gillnets are black guillemots and eiders as they frequent close to shore (Bakken & Falk, 1998). Both species are also found in Labrador, though they are not listed as ETP species. There are multiple species of seabird found in Labrador that are listed as ETP (including Barrows goldeneye, harlequin duck, and ivory gull), though there is no evidence of interaction in the fishery.

Hence, even though there is evidence from reports within the fishery and from similar fisheries that catch of ETP species are sufficiently low as not to impede their recovery, more information is needed to be confident of the direct effects of the fishery on these ETP species. Since the exact species that are encountered in the fishery is not know, if there are interactions of any ETP species in the fishery, it is unknown. As a result, the information available is inadequate to determine the effects of the fishery on ETP species. Thus, this performance indicator is data deficient and automatically scored red.

2.3.1. ETP Species Outcome – **Score Red (Data Deficient)**

Since the score for indicator 2.3.3 was red, the ETP Species Outcome is not scored. Instead, it is data deficient as there is a lack of information to determine the impact of the UoA on the recovery of ETP species.

2.3.2. ETP Management – **Score Red**

This performance indicator looks both at the national/international requirements in place for protecting ETP species and the management measures that are in place to protect ETP species in the UoA. However, since very little information on the impact of the fishery on ETP species is available, there are few measures in place for the fishery. As well, unlike other fishery management plans in Canada, there is no specific objective to ensure that the fishery does not hinder the recovery of ETP species (Acoura Marine, 2017). Despite not having this as an objective, the management plan restricts the minimum mesh size, the length of gillnets, and the total amount of gear that can be used in the fishery. These measures are similar to measures that are expected to reduce ETP impacts in the British Columbia salmon fishery (Acoura Marine, 2017). In the fishery, marine mammal interactions reporting requirements are included in the licence conditions, which requires the recording of all lethal and non-lethal interactions with marine mammals, supplying some information regarding marine mammal interactions. However, seabird interactions are not known. Together, these measures may be sufficient not to hinder the recovery of ETP species. However, in the absence of any management plan or strategy that is directly targeted at protecting ETP species (including a review of its potential effectiveness), this indicator has to be scored red.

2.4. - Habitats

This set of performance indicators assess the outcome, management, and information regarding the UoAs impacts on commonly encountered habitats. Commonly encountered habitats are habitats that regularly come into contact with fishing gear within the UoA. In the case of the commercial Arctic char fishery, the only gear type used is midwater gillnets.

2.4.3. Habitats Information – **Score Yellow**

In the Arctic char fishery, habitat impacts are thought to be minimal as they are conducted using midwater gillnets. As in the Pacific salmon fishery, there are not considered to be any "commonly encountered habitats" as defined by MSC as the gear is designed to operate strictly in the water column and not make contact with the bottom (Acoura Marine, 2017). Given the low interactions with the bottom and broad understanding of the areas where char are being fished, the habitat information meets the minimum requirements for to be scored yellow. The gear can safely be assumed to have minimal direct impacts on the environment. As well, in the waters off Labrador, vulnerable marine ecosystems (VME) have been identified, and marine protected areas and other effective area-based closures (OEABCs) have been implemented. Given the relatively small size of the UoA, there are no VMEs or closures within its boundaries. Although there is only broad information available on the types and distribution of habitat where char is fished, it is reported that habitat around Voisey Bay is not unique in the context of Northern Labrador (Voisey Bay Environmental Assessment Panel, 1999). As well, the Imappivut Expedition project led by the NGO Oceana Canada in partnership with the Nunatsiavut Government is working on identifying the crucial habitats in the area around Nain Bay (Oceana, 2019). Though the results of the survey are not yet available, this research will lead to a more detailed understanding of the

habitat in the UoA. However, since this information is not currently available and has not been continuously collected until this point, the indicator is scored as yellow.

2.4.1. Habitats Outcome - **Score Green**

This performance indicator assesses the impact that the UoA is likely to have on the structure and function of the habitat. Although there is little information on the direct and indirect impacts of the Arctic char fishery on frequently encountered habitats, information based on fisheries using similar gear supports the claim that there is a minimal impact (Acoura Marine, 2017). As well, a review of fishing gears by Chuenpagdee et al. (2003) determined that midwater gillnets have a very low impact on the physical and biological habitat. Given that the midwater nets are not designed to contact the bottom, there is little potential for harm with the best use of the gear. However, sometimes gear is lost, and this impact has to be taken into consideration, too, as discarded gear can impact habitats. In Nunatsiavut, however, there are few reported cases of lost gear (personal comm. Todd Broomfield, 2019). This is thought to be a result of the limit on the length of gillnets, the small number of fishers, and the high cost of replacing a net in Nunatsiavut, leading to extra care being taken by fishermen. Together, this information suggests that it is highly unlikely that the impacts of the UoA on habitats would cause irreversible harm. As a result, this performance indicator is scored green.

2.4.2. Habitats Management – **Score Yellow**

Although a partial strategy is not currently in place in the UoA (required to score green), there are measures in place for the UoA that are expected to ensure that the fishery is highly unlikely to reduce the structure and function of the commonly encountered habitats. Based on comparison from other fisheries using similar gear, the restriction of gear to only midwater gillnets is estimated to have minimal impacts on both the physical and biological habitat (Chuenpagdee et al., 2003). Measures restricting the length and amount of gear used are likely to help reduce the impact further. Like the Pacific salmon fishery, the opening of the Arctic char season is restricted to three months in the summer, which is also thought to reduce the impact of the UoA on the habitat (Acoura Marine, 2017). As well, the number of fishers able to enter the fishery is limited, which prevents overcapacity. Together these measures provide confidence that the fishery is being managed to avoid causing irreversible harm to the UoA. However, these measures cannot be considered a partial strategy as there is little information regarding how the measures in the fishery are working to achieve an outcome and awareness of how they need to change if they stop being effective (MSC, 2014). Similarly, there is a lack of quantitative evidence to suggest that the measures are being implemented effectively. As a result, the indicator receives a score of yellow.

2.5. Environment

This set of performance indicators is not meant to repeat the evaluation of 2.4., but instead, focus on the main impacts and understanding of the key ecosystem elements the of UoA. The MSC describes key ecosystem function as "the features of an ecosystem considered as being most crucial to giving the ecosystem its characteristic nature and dynamics, and are considered relative to the scale and intensity of the UoA" (MSC, 2014, p. 162). They are features most crucial to

maintaining the integrity of its structure and functions and the key determinants of the ecosystem's resilience and productivity" (MSC, 2014, p. 162).

2.5.3. Ecosystem Information – **Score Yellow**

This performance indicator considers whether there is adequate information to understand the key ecosystem elements and the impacts of the fishery on them. It is knowns that the bays around Nain, including the area fished by the UoA, are ecologically diverse. The Nain area is considered one of the top ten special marine area priority sites by Canadian Parks and Wilderness Society and was identified as an ecologically and biologically significant area (EBSA) by DFO (DFO, 2013a). As well, just offshore from Nain, the Nain bank and the Hopedale Saddle were also identified as EBSAs based on the diversity of corals and sponge beds, seabird colonies, and forage grounds for planktivorous fish (Wells et al., 2017). Important features of the Nain Area include spawning rivers for salmon and char, important nursery grounds for char, a spawning beach for capelin, and the presence of seabird colonies. This information has been collected from a variety of sources, including scientific studies, surveys, local and traditional ecological knowledge and expert knowledge (Wells et al., 2017). Some information is also available about the dynamics and community structure of zooplankton in the Northern Labrador Sea, which are a vital food source for both Arctic char and their primary prey, planktivorous fish (Huntley et al., 1983). The diets of Arctic char stocks throughout Northern Labrador have also been examined and show how their diet changes based on age, stock and year (Dempson et al., 2002). Changes in climatic conditions in the broader area have also been linked to changes in the diet of char (Dempson et al., 2008). However, more information is required to understand how these changes will affect the ecosystem in the future.

The Nain Area is also known to be an essential breeding ground for ringed seals due to the many islands that protect from compaction of landfast ice (Wells et al., 2017). As well, using community-based knowledge, many aggregations of groundfish, pelagic fish, shellfish, marine mammals and aquatic plants have been identified within the boundaries of the UoA. Included in this was the identification of the largest sand delta in Northern Labrador, which is an important foraging ground for colonies of waterfowl (Wells et al., 2017). Thus, the ecological information in the Nain Area is adequate to identify many key ecological elements, and given the nature of the fishery, the main impacts of the UoA can be inferred from existing information (Chuenpagdee et al., 2003). However, these impacts have not been investigated in detail, and adequate information is not being collected to assess the impacts of changing climate features on the ecosystem. As a result, this performance indicator is scored yellow.

2.5.1. Ecosystem Outcome – **Score Green**

This performance indicator evaluates the probability that the UoA will disrupt key ecosystem functions to the point of serious harm. As previously mentioned, the UoA is highly likely to have little effect on both the biological and physical characteristics of an ecosystem, with the primary concern of the fishery being on the population of Arctic char themselves. Since char has not been defined to be a "key" element of the ecosystem, it is highly unlikely that the fishery as-is will cause irreversible harm to the structure or function of the ecosystem. This contrasts with other

salmonids, such as Pacific salmon, which play a crucial role in providing resources to upstream habitats upon death after spawning (Acoura Marine, 2017). As a result, this indicator is scored green.

2.5.2. Ecosystem Management – **Score Yellow**

This performance indicator looks specifically at whether management explicitly considers the fishery's impact on the function of the ecosystem. In the UoA, measures exist which limit the potential impacts of the UoA on the ecosystem, including the gear and catch restrictions and the salmon protocol. However, these measures have not been assessed for their effectiveness. It is likely, based on similar fisheries, that these measures will ensure that ecosystem function is maintained, but these measures do not qualify as a partial strategy. As well, much of the information on the ecosystem is outdated. Hence, recent information is needed to be confident that the effects of the UoA on the ecosystem are not being magnified by changing climatic factors. As a result, this indicator is scored yellow.

Principle 3 – Management

Principle 3 assesses the effectiveness of the UoAs management system, looking for evidence of the precautionary approach, structured ways of dealing with uncertainty, and decision-making frameworks for dealing with data-deficiencies. As well, the management system must be appropriate for planning and implementing measures required for maintaining sustainability in Principles 1 and 2. An effective management system must also integrate relevant laws and standards at the local, national and international levels. There are seven performance indicators under Principle 3. Performance indicators under 3.1. are focused on the high-level context of the fishery management system, while those under 3.2. are focused on fishery-specific management.

The Arctic char fishery in Nunatsiavut is unique compared to other fisheries in Canada. Not only is it co-managed between the Nunatsiavut Government and DFO, but the fishery is also highly localized, with access granted exclusively to the Labrador Inuit. Asa result, the management system will likely be less dependant on national and international agreements and rely more on context-specific management initiatives to be effective.

3.1. Governance and Policy

3.1.1. Legal/Customary Framework – **Score Green**

This performance indicator looks at the broad system of relevant rules that govern and regulates decision making, agreements, laws, etc., in managing fisheries. This overarching framework is often at the national level and should define management responsibilities. Within Canada, there is a robust legal framework for managing fisheries at the national level.

National

The main legal instruments for managing fisheries are the *Fisheries act* (1985), the *Oceans Act* (1996), and the *Species at Risk Act* (2002). These Acts define the legal context for fisheries management in Canada and outline the broad requirements for all commercial fisheries about how fisheries are to be managed. The *Fisheries Act* is the most relevant legislature regarding the

management of commercial fisheries in Canada. It is also under the *Fisheries Act* that the Minister of Fisheries and Oceans exercises their executive authority over Canada's coastal and inland fisheries.

Under the *Fisheries Act*, the following regulations are the most relevant for the management of the Arctic char UoA:

- Aboriginal Communal Fishing Licences Regulations;
- Atlantic Fishery Regulations, 1985;
- Fishery (General) Regulations;
- Marine Mammal Regulations; and,
- Newfoundland and Labrador Fishery Regulations

In these regulations, provisions are provided that give the Minister the ability to specify, through Aboriginal commercial communal licence conditions, measures to ensure the proper management and conservation of fish and habitats. Specific to the UoA, this includes setting the number of designates that can fish, the TAC for species, the method of fishing and other gear restrictions, the time and location of the fishery, and the level of reporting required in the fishery. As well, Fishery (General) regulations allow for DFO to appoint Fishery Officers to enforce the sanctions and penalties defined in the *Fisheries Act* and regulations. The sanctions and penalties imposed on an entity are transparently laid out in the relevant Acts, and under the *Federal Court Act* (1985), entities have a mechanism to challenge charges against them before an independent Justice of Court. Recent amendments to the *Fisheries Act* also give the "ability to address *Fisheries Act* offences outside of courts using alternative measures agreements," providing the opportunity for alternative forms of justice (DFO, 2019h).

Canada is also a signatory to binding international agreements, including the United Nations Convention on the Law of the Sea and Convention on Biological Diversity. Given that Arctic char stock in Nunatsiavut is highly localized, international cooperation is not essential for the effective management of the stock.

Labrador Inuit Land Claims Agreement

Under this performance indicator, a management system must also have a mechanism to observe the legal rights of the people dependant on fishing for food or livelihood. In Nunatsiavut, this is achieved through the legally binding Labrador Inuit Land Claims Agreement (2005), which defines the authorities and responsibilities of the Nunatsiavut Government in managing fish resources within the LISA. As defined in the LILCA, Labrador Inuit have the right to harvest species that do not have quotas (including char) in the LISA to the extent required for food, social, and ceremonial purposes any time of the year. For species with domestic quotas (such as Atlantic salmon), they may also be harvested at any time of the year and be traded, exchanged or bartered to other aboriginal individuals within the set limits. As well, the LILCA gives the Nunatsiavut Government the authority to select designates to fish under the commercial communal licence for Arctic char and to apply additional regulations on the designates. Since the Nunatsiavut Government is the only licence holder for the fishery, they have additional powers

for managing the stock. The LILCA also requires the Minister to issue 70% of any new Arctic char licences created in the Zone to be issued to the Nunatsiavut Government. Additionally, he LILCA includes a provision allowing the TJFB to perform functions relating to catch monitoring, enforcement and conflict resolution within the fishery at the request of the Minister or Nunatsiavut Government.

Together, the legal framework that is in place in federal legislation and under the LILCA is adequate for effectively delivering management outcomes consistent with Principles 1 and 2. They include defined management roles and responsibilities, provide a transparent mechanism for the resolution of legal disputes, and observe the legal rights of the Labrador Inuit. As a result, this performance indicator is scored green.

3.1.2. Consultation, Roles and Responsibilities – **Score Yellow**

This performance indicator considers whether the organizations involved in the management process have been identified, whether their roles and responsibilities in management are defined and understood, and the degree to which consultation with affected parties is used to inform the management system. For Arctic char in Nunatsiavut, the main organizations involved in management are the Nunatsiavut Government and DFO. Together, they co-manage the fishery as defined in Section 13 of the Labrador Inuit Land Claims Agreement (2005). In the LILCA, the roles and responsibilities of the Nunatsiavut Government in co-managing fisheries are laid out, with flexibilities offered in the roles if required. The agreement includes assigning the Torngat Joint Fisheries Board as the primary body responsible for making recommendations and communicating with the Minister of Fisheries and Oceans on issues relating to the fishing sector and conservation of fish and their habitats. However, the ultimate decision-making authority remains with the Minister of Fisheries.

Unlike other fisheries in Canada, there is no Integrated Fisheries Management Plan or advisory committee specific to the management of Arctic char in Nunatsiavut. In general, IFMPs are the primary tool used to define roles and responsibilities specific to a fishery, and advisory committees are the primary method of consultation with relevant parties. Instead, for the UoA, the primary mechanism for consultation with relevant stakeholders appears to be the annual TJFB meetings. Although these meetings are not specific to char, their purpose is "to provide an overview of the past fishing season, discuss management approaches and options for moving forward in the fishery, and provide an opportunity for stakeholders to express opinions and concerns" (Whalen et al., 2015, p. 1). At these meetings, there are representatives from the Nunatsiavut, Federal, and Provincial Governments, academic institutions, NGOs, fish processors, and harvesters. These meetings provide the opportunity for stakeholders to discuss anything they feel is relevant for managing the fishery, which the TJFB can discuss at their quarterly meetings and with DFO (OK Society, 2018b).

Overall, the management system appears to include consultation with affected parties, though it does not regularly seek and consider this information in management. This is evident in the UoA, as it is noted that the Arctic char management plan "has not been looked at much in the previous years" (Whalen et al., 2015, p.15). As well, functions, roles and responsibilities are generally

understood as defined in the LILCA, though issues such as funding for these roles are not explicitly laid out (Whalen et al., 2015). The lack of clarity around funding has created issues in the TJFB and Nunatsiavut Government in performing their responsibilities in the fishery, such as collecting information on subsistence removals. As a result, this performance indicator scores yellow.

3.1.3. Long-term Objectives – **Score Green**

This performance indicator focuses on the high-level government policies that focus on setting long-term objectives beyond the fishery being assessed. In Canada, multiple government legislation and policies guide the long-term management of fisheries and fish habitat in Canadian waters. Nation-wide, the *Fisheries Act*, *Oceans Act* and *Species at Risk Act* contain provisions to ensure the conservation and sustainable harvest of fish stocks and the conservation of marine ecosystems. In 2019 the *Fisheries Act* was amended, which strengthened the commitment to long-term management by adding additional provisions to strengthen the use of the precautionary approach in fisheries management. The amendments include recognition that decision-making should be guided by principles of sustainability, precaution, and ecosystem management; commitments to protect all fish habitats; and provisions for protecting biodiversity for the long-term, restoring degraded fish habitats, and rebuilding fish stocks (DFO, 2019h). Creating long-term objectives are also supported by policy frameworks such as those under the "Sustainable Fisheries Framework" (DFO, 2018f), "Atlantic Fisheries Policy Review" (DFO, 2008), and "Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas" (DFO, 2013b), which all promote using the precautionary approach to manage fish stocks and habitat sustainably. Additionally, the "Fishery Decision-Making Framework" (DFO, 2009), requires incorporating the precautionary approach into decision-making for all key fish stocks in Canada. At the Nunatsiavut Government level, sustainable use of natural resources is a guiding principle of the Labrador Inuit Constitution (2005), which aims to ensure resources are available for generations to come. Together, at the national and regional level, there is clear legislation and policies to support the sustainable management of a fishery that is consistent with MSC Principles 1 and 2. As a result, this indicator is scored green.

3.2. Fishery specific management system

3.2.1. Fishery-specific Objectives – **Score Red**

The fishery-specific objectives focus on the management objectives within the UoA that provide direction for management measures and regulations within the fishery. For Arctic char in Nunatsiavut, these objectives are defined in the "Arctic Char Management Plan for Northern Labrador" (DFO, n.d.). In this management plan, there are three main objectives listed, allowing this performance indicator should be scored. The fishery-specific objectives are to:

- Conserve and protect Arctic char stocks;
- Manage the Arctic char resource for the maximum benefit of residents in Northern Labrador and;
- Eliminate by-catch of Atlantic salmon

However, these objectives lack any specific short or long-term goals, have no timeframe, are not accompanied by any mention of actions to achieve them or method to measure progress towards meeting them. For many other fisheries, the IFMP includes these aspects of the management plan. However, there has not yet been an IFMP developed for the Arctic Char fishery in Northern Labrador. Although the amount of fish harvested has been intentionally kept under the TAC by the Nunatsiavut Government over concern of the stock health (Snook et al., 2018), the management plan itself does not incorporate the precautionary approach into the management of the UoA. In the absence of specific management objectives consistent with the precautionary approach, this indicator cannot meet the minimum requirements to score yellow, and thus is scored red.

3.2.2. Decision-making Processes – **Score Red**

This performance indicator assesses how decisions regarding the UoA are made and the extent that they lead to fishery-specific measures and strategies. The Rapid Assessment Tool defines decision-making processes as the rules for voting on decisions and public comment periods in the UoA. For the Arctic char fishery, this is hard to score as a result of the lack of information regarding how decisions have been made, or even what decisions have been made regarding the fishery. At the TJFB annual Fisheries Workshop in 2015, it was noted that since char has been harvested well under the TAC, the management plan has not been a priority for DFO (Whalen et al., 2015). This suggests that little has changed in how the fishery is managed. The authority to make the decisions that would result in measures and strategies to achieve sustainability objectives remains primarily with DFO. Although, the TJFB does meet with DFO multiple times a year, bringing forward the information heard from those involved in the fishery (OK Society, 2018b). Overall though, it is recognized by the TJFB and DFO that there needs to be greater communication between the two for properly managing Arctic char (Whalen et al., 2015). One area the Nunatsiavut Government has the authority to make decisions autonomously is in determining who can be a designated under their commercial communal licence, which is laid out in a transparent process based on a Beneficiary's ability to participate in the fishery (Nunatsiavut Government, 2018).

In the UoA, conducting an up to date stock assessment and monitoring of the catch in the subsistence fishery are recognized as essential components for managing the fishery. However, due to the limited resources, these activities have not been maintained (Whalen et al., 2015). Given the growing concerns over the state of the resource despite under harvesting, it appears that the decision-making process, whether transparent or not, is not responding to concerning issues in the fishery. However, there are no reports of the fishery repeatedly violating laws or regulations necessary for the sustainability of the fishery, which is a requirement of this indicator. Given that the decision-making currently appears "unlikely to result in measures and strategies to achieve the fishery-specific sustainability objectives" or to quickly "respond to serious issues identified in relevant research, monitoring, evaluation and consultation," this indicator is scored red (OSMI, n.d.).

3.2.3. Compliance and Enforcement – **Score Yellow**

This indicator assesses the compliance and enforcement measures related to the monitoring, control and surveillance mechanisms that are used to support fisheries management. These measures may include using licensing, logbooks, vessel registration, dockside or at-sea monitoring, vessel monitoring system, boarding and inspection, etc. Given the remote location and the small number of active fishers in the Arctic char fishery, many of these measures are not in place. Under the LILCA (2005), the Nunatsiavut Government has the power to determine who may harvest Arctic char under the commercial communal licence. Each year, a Beneficiary must apply to become a designate and is selected based on the designation criteria (Nunatsiavut Government, 2018). Once designated, the beneficiary is required to fish under the DFO issued licence conditions for the Northern Labrador Arctic Char Commercial Communal Licence (DFO, 2019a). Under these conditions, the designate must register their vessel to the licence and use only that vessel while fishing (unless authorized to change). As well, all gear must be marked with a matching vessel number, allowing the gear to be traced back to the individual designate. Under the *Fisheries Act*, sanctions for non-compliance are well defined. In terms of enforcement, there is a Conservation Officer stationed in Nain who patrols for violations in the fishery, though few violations are reported in the fishery (personal comm. Todd Broomfield, 2019). Together, given the limited number of harvesters in the UoA, there is a reasonable expectation that these measures are effective at promoting compliance in the fishery. However, since it cannot be demonstrated without a doubt that these measures are effective, this indicator is scored yellow.

3.2.4. Monitoring and Management Performance Evaluation – **Score Yellow**

This performance indicator is scored based on the evaluation and review of the overall management system and its components. For this assessment, the "key" parts of a management system are monitoring and evaluation of stock status, management of ecosystem impacts, and performance of the compliance and enforcement system. It is mentioned in the Arctic char management plan, a "thorough review of the commercial Arctic Char fishery will be conducted by DFO following at the end of each char fishing season, to determine if management objectives have been met" (DFO, n.d., p.2). Although this constitutes a review of the management system, it is unsure whether it is used to make changes to the management system if required. No additional information could be found regarding these reviews, nor could any evidence that management measures have been changed as a result of the review. Within Nunatsiavut, the Arctic char fishery is discussed at the TJFBs annual Fisheries Workshops with stakeholders able to bring forward information about the previous fishing season and their concerns. Using this information, the TJFB makes recommendations to the Minister of Fisheries. An example of how this information has been used comes from the 2018 workshop where Arctic char stock health in the Nain area was a big concern for stakeholders, which prompted the TJFB to try and get a char counting fence for the area (OK Society, 2018a). Hence, there are internal review measures that are in place for the parts of management strategy, but it is unclear how they are being used at the federal level to improve management efficacy. As a result, this indicator is scored yellow.

Snow Crab Rapid Assessment

Basic Fishery Information

Target species:

- Snow Crab (*Cheonoecetes opilio*)
    - Also known as queen crab

Fishery location:

- Crab fishing Area 1 (2HJ north of 54˚40' to 56˚00')

Gear type:

- Crab traps

Catch quantity:

- 310t (2019)
    - 273t allocated to Nunatsiavut Government
    - 37t allocated to Torngat Fish Producers Co-op

Vessel type and size:

- <90' (though the vessels are generally <65')

Number of registered vessels:

- Up to 8 designates (as required in the commercial communal licence)

Management authority:

- Snow crab is listed as a species under Schedule 13-C in the LILCA (2005). This means snow crab is a species that is co-management between the Nunatsiavut Government and DFO.

Principle 3 – Management

3.1. Governance and Policy

Given that some of the performance indicators in Principle 3 focus on legislation and policy at the national level, the justification for scoring is based on features already outlined in the Rapid Assessment for Arctic char. These aspects will be noted but not be re-explained in detail.

3.1.1. Legal/Customary Framework – **Score Green**

For the legal and customary framework, all the national Acts and regulations used as justification in the Arctic char UoA apply to the snow crab fishery in Nunatsiavut. The main difference is that snow crab is listed as a species under Schedule 13-C in the LILCA (2005), whereas Arctic char is under Schedule-B. Under Section 13.12 of the LILCA, this requires the Minister of Fisheries to issue 60%/20% of the new commercial licences for snow crab within/adjacent to the Zone to the Nunatsiavut Government, which is slightly lower than a Schedule-C species. However, the snow crab fishery is still co-managed between DFO and the Nunatsiavut Government, and the TJFB is still in charge of making recommendations to the Minister about the conservation and management of the fishery (TJFB, 2017c).

3.*1.2. Consultation, Roles and Responsibilities* – **Score Green**

Like the Arctic char fishery, the management roles and responsibilities of DFO and the Nunatsiavut Government regarding snow crab are outlined in Section 13 of the LILCA (2015). For the NL-wide fishery, the roles and responsibilities for the management system are defined in the Newfoundland and Labrador snow crab IFMP under sub-section 1.6. "governance," as well as in section 7 "management measures for the duration of the plan" (DFO, 2019j). One objective for the fishery is to "clearly define roles and responsibilities for both the fishing industry and DFO" with the goal of improving the co-management of the resource. Together, these measures provide evidence that the functions, roles and responsibilities in the fishery are clearly understood and that DFO is committed to clarifying any areas where it is not clear.

In addition to the consultation required under the LILCA (2005), DFO holds Advisory Committee meetings for each crab fishing area every March. Invitations to these meetings are to fish harvester committees, Fish Food and Allied Workers Union, the Association of Seafood Producers, the provincial government, and the Nunatsiavut Government (DFO, 2019j). These meetings review the latest information regarding the stock and the main priorities for the fishery. Harvesters have a chance to share their opinion on the state of the resource and management measures they believe would be appropriate. As well, representatives of each group can voice the concerns of their members at these meetings. DFO also ensures that the meeting minutes from these meetings are made available upon request. The information collected from these meetings is then used alongside science advice to inform the annual regional advisory process for snow crab. This process is used to prepare the stock advice concerning the fishery for the upcoming fishing season (DFO, 2019j). Also, ongoing management issues are discussed between DFO and the TJFB throughout the year (OK Society, 2018b). Thus, the consultation process contains mechanisms to integrate relevant information heard from stakeholders and provides opportunities for all stakeholders to voice their opinions. As well, since the issue regarding the uncertainty of funding responsibilities in the Arctic char UoA are not apparent in this UoA, this indicator was scored green.

3.1.3. Long-term Objectives – **Score Green**

The long-term objectives at the national level are the same for the snow crab and Arctic char UoAs. One additional national policy that is more applicable to the snow crab fishery than Arctic char is the "Integrated Aboriginal Policy Framework" (DFO, 2019j). Whereas the Nunatsiavut Government has exclusive access to the Arctic char fishery, their allocation of snow crab is only a proportion of the total TAC. The Integrated Aboriginal Policy Framework sets out the long-term objective of "fostering a respectful and mutually beneficial relationship with Aboriginal groups who are seeking a greater share of the fisheries resource, on contributing to the growth and well-being of their communities, and on providing them with a greater role in integrated aquatic resource and oceans management" (DFO, 2019j). Together, the Integrated Aboriginal Policy Framework and the other policy frameworks outlined in the Arctic char UoA set out sufficient long-term goals to score green for this indicator.

3.2. Fishery specific management system

3.2.1. Fishery-specific Objectives – **Score Green**

For the Newfoundland and Labrador snow crab fishery, short- and long-term objectives are clearly defined under Section 5 of the IFMP. These objectives include being sustainable, fair, and equitable, promoting good fishing practices, withholding new access, respecting Aboriginal rights, and fulfilling obligations of Land Claim Agreements (DFO, 2019j). The last of these objectives are specific to Nunatsiavut, displaying a long-term commitment to upholding the obligations set out in the LILCA. As well, specific and measurable strategies to meet the objectives of conservation and sustainable harvest, provide benefit to stakeholders, and improve the co-management of resources are defined in table 7 of the IFMP. There is also evidence of the use of the precautionary approach in the commitment to use "a multi-indicator approach… to address protection of stock reproductive capacity and efficiency in resource extraction" (DFO, 2019j).

For the snow crab UoA, the Nunatsiavut Government has also displayed a commitment to managing the stock precautionarily. In 2014, the TJFB recommended to the Minister of Fisheries that the TAC for snow crab in 2HJN be reduced by 15% over concerns from their science initiatives and harvesters (TJFB, 2017c). Although the Minister did not accept this proposal, the Nunatsiavut Government voluntarily held back 15% of their snow crab quota and did not allocate any of their 100t of exploratory quota. This reduction was continued for three seasons until the stock health improved. This holdback demonstrates the Nunatsiavut Government's commitment to the long-term sustainability of the resource, and their willingness to use their authority to ensure precautionary management. Hence, the fishery-specific objectives at the Nunatsiavut and regional level meet the criteria to be scored green.

3.2.2. Decision-making Processes – **Score Green**

In the NL-wide snow crab fishery, there are established decision-making processes in place that have been successful in achieving the fishery-specific objectives. Decision-making in the fishery is based on scientific advice and discussions with stakeholders at the region-wide Advisory Committee meetings. At these meetings, the management measures being used are reviewed, and their effectiveness examined with industry members. This information is combined with the information from the most recent stock assessments and used to formulate any changes to the current management strategy. In this way, the decision-making process is transparent and well-understood by the industry and can continuously adapt. As well, this process is timely enough to respond to serious issues that come up in the fishery. Not all issues that come up are addressed through this process, though, as the Minister of Fisheries did not reduce the TAC despite the TJFBs recommendation (TJFB, 2014). However, within the UoA, additional decisions can be made based on consultations within Nunatsiavut to deal with area-specific issues that arise. Overall though, the TJFB has expressed that the snow crab fishery represents a "co-management success story with the Department of Fisheries and Oceans and the Nunatsiavut Government" (TJFB, 2017c).
Even though the NL-wide fishery does not have defined reference points and HCRs for applying the precautionary approach, the UoA is considered precautionary. This is demonstrated by the

actions of the Nunatsiavut Government to voluntarily withhold quota and the fishery-specific management system. In the fishery, only the largest males are able to be retained, with females and juveniles discarded back in a manner that causes the least harm (DFO, 2017). As a result, the fishery has very low mortality of reproductive females and juveniles, which is considered adequately precautionary. Thus, the decision-making process for the UoA meets the minimum requirements for this performance indicator and is scored green.

3.2.3. Compliance and Enforcement – **Score Yellow**

The compliance and enforcement for this UoA scored lower than the NL-wide snow crab UoA, which scored 85 (green) on the MSC full assessment (SAI Global, 2018). Over the entire fishery, there are comprehensive monitoring, control and surveillance systems in place that are effective at ensuring compliance with the management strategy (DFO, 2019j). The specific measure that are taken in the fishery including setting a TAC, a fishing season, gear requirements, individual quotas, trap limits, the soft-shell crab protocol, logbooks, dock-side monitoring of catches, at-sea observer coverage, vessel monitoring system, and aerial surveillance (DFO, 2019j). However, it is also noted that there are current compliance issues, including unmonitored landings. Under the commercial communal snow crab licence conditions issued to the Nunatsiavut Government, a Beneficiary fishing for snow crab under this licence is responsible for having all landings dockside monitored and is subject to randomized at-sea observer coverage (DFO, 2018a). However, neither of these services are available in Nunatsiavut, and thus, catches are not officially monitored when offloading, and no fishing trips are observed in Nunatsiavut. As well, there is likely no air surveillance of fishing grounds in the region either. Given the small number of designates, this is not a significant issue for the stock overall but is a concern for the UoA specifically. Although there are no apparent signs of non-compliance by the designates, without these monitoring tools, there is not enough evidence to demonstrate that all fishers comply with the outlined measures. Thus, even though most elements under this performance indicator are efficient, as they would be similar to the NL-wide fishery, the lack of these monitoring and surveillance tools results in a score of yellow.

3.2.4. Monitoring and Management Performance Evaluation – **Score Green**

Given that the monitoring and management strategy is implemented across the entire fishery, the performance evaluation of the monitoring and management strategy is conducted mainly by DFO. This review includes assessing if fishery-specific objectives are being met and ensuring that all major issues are being addressed. Performance evaluation is done through the Advisory Committee meetings, where the past season and the science conducted by DFO and the industry are reviewed (DFO, 2019j). As evident by the score of 80 achieved by the certified snow crab UoA, the fishery-wide performance evaluation meets the minimum criteria to be considered sustainable. However, there are additional aspects to be considered in the Nunatsiavut snow crab UoA that ensure that the performance evaluation is adequate for their portion of the stock. Every year the TJFB holds the annual Fishery Workshop, where members from all areas of the fishery can come and discuss the successes and challenges of the previous year. Although not specific to snow crab, it is one of the main species of focus at the meetings (Whalen et al., 2015). The TJFB then brings this input to the Advisory Committee meeting with DFO and uses this information to

help inform recommendations to the Minister of Fisheries (Ok Society, 2018b). This provides two ways for the Nunatsiavut specific issues to be fed into the region-wide review process. As well, since 2013, the TJFB has collaborated with DFO to "develop and implement the TJFB-DFO Collaborative Post-Season Trap Survey for snow crab in NAFO Division 2H and 2J North" (TJFB, 2017c). This collaboration provides the TJFB and DFO with area-specific, scientific data to evaluate how successful current management measures are in the area. Together, having both consultation and resource information coming directly from Nunatsiavut make it likely the UoA is being taken into consideration in evaluating the key parts of the management system. As a result, this indicator scores green.

Greenland Halibut Rapid Assessment

Basic Fishery Information

Target species:

- Greenland halibut (*Reinhardtius hippoglossoides*)
    - Also known as turbot

Fishery location:

- In or Adjacent to the Zone (subject to closed areas)

Gear type:

- Gillnets and longline

Catch quantity:

- Up to 3.38% of the total Canadian Allocation for NAFO Zones 2+3K & 3LMNO

Vessel type and size:

- <65’

Number of registered vessels:

- Multiple registered vessels under NG Enterprise 50001229, or
- NG can request authorization from DFO for eligible fixed gear licence holders to harvest the NG GHL allocation

Management authority:

- Greenland halibut is listed as a species under Schedule 13-C in the LILCA (2005). This means snow crab is a species that is co-management between the Nunatsiavut Government and DFO.
- Regional TAC determination by Northwest Atlantic Fisheries Organization (NAFO)

Principle 3 – Management

3.1. Governance and Policy

3.1.1. Legal/Customary Framework – **Score Green**

The legal/customary framework for the Greenland halibut fishery in Nunatsiavut is the same as snow crab, but with additional components due to the transboundary nature of the stock. Greenland halibut is listed as a species under Schedule 13-C and is co-managed by DFO and the Nunatsiavut Government. However, the Greenland halibut fishery in Nunatsiavut targets fish in the NAFO subarea 2 + divisions 3KLMNO stock, which extends beyond Canada’s exclusive economic zone. As such, the management of this stock requires cooperation between Canada and the Northwest Atlantic Fisheries Organization (NAFO). However, in terms of assessing the international legal/customary framework, the UoA being assessed here will not differ from the Greenland halibut fishery in NAFO subarea 2 + divisions 3KLMNO UoA that is currently pursuing MSC certification. Given that the UoA currently being assessed received a score of 100 for this performance indicator, it is safe to assume that the UoA identified here would score green (Lloyd’s Register, 2019).

3.1.2. Consultation, Roles and Responsibilities – **Score Green**

As outlined for the snow crab UoA, DFO is the institution that is primarily responsible for managing fisheries in Canada, and the TJFB is the primary body responsible for communicating with the federal government on issues relating to Nunatsiavut's commercial fisheries. Though there is room for interpretation, the *Fisheries Act* (1985) and the LILCA (2005) define the primary roles and responsibilities for the management of species in the LISA. Consultation for Greenland halibut, being part of the Newfoundland and Labrador groundfish fishery, is done primarily through the 2+3KLMNO Groundfish Advisory Committee (GAC), of which the Nunatsiavut Government is involved. This Advisory Committee focuses on all groundfish in Newfoundland and Labrador, providing a forum for representatives in the industry to discuss issues related to the management strategy and conservation of species (DFO, 2019e). The Committee meets at least once a year and provides the opportunity for members to inform DFO about the past fishing season and make recommendations about the current management strategy. The GACs membership includes representatives from DFO, the harvesting and processing sectors, province of Newfoundland and Labrador, Indigenous organizations, and environmental non-governmental organizations (eNGOs) (DFO, 2019e). As well, non-members can attend meetings, and future seats may be added if determined necessary. Hence, the organizations and individuals involved in the management and their roles and responsibilities are identified, including a consultation process that considers information from all interested parties. The process used by NAFO was also determined to meet these criteria (Lloyd's Register, 2019). As a result, this performance indicator is scored green.

3.1.3. Long-term Objectives – **Score Green**

The long-term objectives of the federal and Nunatsiavut Governments do not differ between Greenland halibut and the other species assessed. As well, NAFO's long-term objectives were also considered to be appropriate (Lloyd's Register, 2019). Therefore, this indicator was scored green

3.2. Fishery specific management system

3.2.1. Fishery-specific Objectives – **Score Green**

For this UoA, explicit short- and long-term objectives are defined in the 2+3KLMNO groundfish IFMP (DFO, 2019e). The overall objectives are stock conservation and sustainable harvest, ecosystem health and sustainability, stewardship, and stock-specific objectives. One of the stock-specific objectives is the NAFO Rebuilding Program, which is directly related to the 2+3KLMNO Greenland halibut stock. This program is in response to the current concern over the health of the stock and calls for the TAC to be adjusted annually, according to precautionary HCRs (NAFO, 2018). In Section 10 of the IFMP, measurable objectives are defined for the long-term objectives, which are to ensure conservation and sustainable harvest and benefit to stakeholders (DFO, 2019e). These measures provide strategies that are to be employed to meet these objectives. As well, the fishery management plan includes a conservation harvest plan (CHP) specific to the Nunatsiavut Governments allocations. The CHP outlines the management measures that are applied to designates fishing under the Nunatsiavut Government's groundfish licences (DFO, 2016). Overall, the UoAs combination of short and long-term objectives and

strategies that are consistent with the precautionary approach allow this indicator to be scored green.

3.2.2. Decision-making Processes – **Score Green**

NAFO sets the official TAC for the 2+3KLMNO stock using the Management Strategy Evaluation framework (NAFO, 2018). This framework determines the TAC based on precautionary HCRs that are informed by scientific surveys performed throughout the season. For other matters in the fishery, DFO remains the primary decision-making authority, with the GAC being the main body for gathering information from the relevant parties to help make decisions. The GAC is guided by the principles of transparency, accountability and inclusive representation, aiming to provide information to everyone on an equal basis and ensure that the broad range of interests at the meeting are heard and taken into consideration. Scientific information used in the decision making for the stock comes from the annual science regional advisory process as well as from NAFO Scientific Council (DFO, 2019e). Together, the advice from GAC and the scientific information are used by DFO to make decisions regarding the fishery. Similar to snow crab and Arctic char, the LILCA (2005) allows the TJFB to make recommendations to the Minister of Fisheries for Greenland halibut conservation. As well, the TJFB annual Fisheries Workshops provide the opportunity for stakeholders in Nunatsiavut to express concern about the fishery. Overall, the decision-making system met the criteria for this indicator to be scored green.

3.2.3. Compliance and Enforcement – **Score Yellow**

Similar to snow crab, compliance and enforcement is where this UoA and the UoA undergoing a full assessment differ. In both cases, the sanction framework for violations of the *Fisheries Act* (1985) are the same. As well, fishery wide, there are few violations reported by DFO. DFO reports that the priority compliance concerns in the fishery are quota overruns, high grading, unmonitored fish landings and fishing during closures. In Nunatsiavut, quota overruns and fishing during closures are improbable given that the Co-op is the only buyer of fish and is busy processing snow crab before the Greenland halibut season. However, as mentioned for the snow crab UoA, there is a lack of dockside monitoring and at-sea observer companies in Nunatsiavut, despite both services being a requirement for harvesters under the Nunatsiavut Greenland halibut CHP (DFO, 2016chp). There is a conservation officer present who enforces violations, though alone, this is insufficient to say without a doubt that designates are complying with the fishery regulations. For this indicator to be scored green, there needs to be evidence that the monitoring, control, and surveillance efforts in place are effectively enforcing relevant management measures, even if it is unlikely that there is a large amount of non-compliance. Since compliance cannot be said for sure, this performance indicator scores yellow despite the effectiveness of monitoring, control, and surveillance in the overall fishery (Lloyd's Register, 2019).

3.2.4. Monitoring and Management Performance Evaluation – **Score Green**

There are mechanisms within the UoA for ensuring the regular and effective evaluation of the management system. DFO evaluates the management system annually through a post-season review using feedback heard from the GAC meetings and science advice (DFO, 2019e).

Decisions to change the management measures decided based on this review and how well the current system is meeting the objectives in the IFMP. As well, the GAC has the authority to create working groups to review fishery specific issues that are raised as a concern by GAC members to aid in the management system evaluation (DFO, 2019e). The findings from the working groups are reported back to the GAC as a whole and used in the decision-making process. Concerns specific to Nunatsiavut are included in the process in the same way as in snow crab through the TJFB annual Fisheries Workshop, meetings with the Advisory Committee, and subsequent recommendations to the Minister of Fisheries. Although there is no TJFB led science for Greenland halibut in the LISA, information is available to the TJFB from DFO and NAFO. Hence, the evaluation of the performance of management measures met the criteria to scored green.