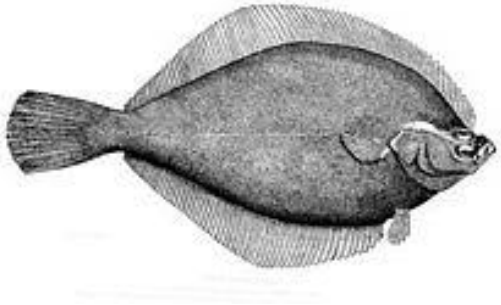
Lloyd's Register
6 Redheughs Rigg
South Gyle
Edinburgh, EH12 9DQ
United Kingdom

T +44 (0)13 1335 6600
E fisheries-ca@lr.org
www.lr.org

OCI Grand Bank Yellowtail Flounder Trawl



Public Comment Draft Report

June 2020

Conformity Assessment Body (CAB)	**Lloyd's Register**
Assessment team	Paul Knapman, Robin Cook, Rob Blyth-Skyrme
Fishery client	**Ocean Choice International (OCI)**
Assessment Type	Second Reassessment

Assessment Data Sheet

CAB details		**Lloyd's Register**
	Address	6 Redheughs Rigg Edinburgh EH12 9DQ
	Phone/Fax	T +44 (0)131 335 6616
	Email	Fisheries-ca@lr.org
	Contact name(s)	Deirdre Duggan
Client details		**Ocean Choice International**
	Address	1315 Topsail Road PO Box 8274 Station A St John's, NL A1B 3N4, Canada
	Phone/Fax	(902) 497-4586
	Email	sdevitt@atlanticgroundfish.ca
	Contact name(s)	Steve Devitt
Assessment Team	Paul Knapman	Team Lead & P3 expert
	Robin Cook	P1 expert
	Rob Blyth-Skyrme	P2 expert

Table of Contents

List of Tables

List of Figures

Glossary

ASPIC	A Stock Production Model Incorporating Covariates
B_{ISR}	An intermediate stock reference point or security margin.
B_{LIM}	Limit biomass (usually associated with spawning stock biomass – SSB). In the case of yellowtail flounder, B represents total biomass rather than SSB
B_{MSY}	Spawning stock biomass (SSB) that results from fishing at F_{MSY}. In the case of yellowtail flounder, B represents total biomass rather than SSB
B_{TARGET}	Target biomass reference point (equivalent to B_{MSY})
C&P	Conservation and Protection Branch (of DFO)
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CPUE	Catch per unit effort
DFO	Fisheries and Oceans Canada / Department of Fisheries and Oceans
DMP	Dockside monitoring programme
EA	Enterprise Allocation
EBSA	Ecologically and biologically significant area
EEZ	Exclusive economic zone
ENGO	Environmental non-governmental organisation
EPP	Ecosystem production potential
ETP	Endangered, threatened or protected (species)
F	Instantaneous rate of fishing mortality
F_{BUF}	Buffer fishing mortality
F_{LIM}	Limit fishing mortality
F_{MSY}	Fishing mortality associated with MSY
FPP	Fisheries production potential
GAC	Groundfish Advisory Committee
ICNAF	International Commission for the Northwest Atlantic Fisheries
IFMP	Integrated fisheries management plan
L_{50}	Length at 50% maturity
LIM	Limit (in relation to reference points)
LOMA	Large ocean management area
LRP	Limit reference point
L_T	Total length
LTRT	Leatherback Turtle Recovery Team
MCS	Monitoring, control and surveillance
MPA	Marine protected area
MSC	Marine Stewardship Council
MSY	Maximum sustainable yield
NAFO	Northwest Atlantic Fisheries Organization
NAO	North Atlantic Oscillation
NM	Nautical mile
NRA	NAFO Regulatory Area: the area within the NAFO Convention Area but outside of Coastal State EEZs
PA	Precautionary Approach
RAP	Regional advisory process
RDG	Regional Director General (DFO)
RV	Research vessel
SAR	Scientific Advisory Report
SCC	Supreme Court of Canada
SFF	Sustainable fisheries framework
SSB	Spawning stock biomass
t	tonnes
TAC	Total allowable catch
TRP	Target reference point
VME	Vulnerable marine ecosystem
VMS	Vessel monitoring system
YTFF	OCI Grand Bank Yellowtail Flounder Trawl Fishery

1 Executive summary

This report is the Public Comment Draft Report (PCDR) which provides details of the MSC assessment process for the Ocean Choice International (OCI) Grand Bank Yellowtail Flounder Trawl Fishery (YTFF). The process began with publication of the Announcement Comment Draft Report (ACDR) on 13th December 2019 and was concluded (to be determined at a later date).

A review of information presented by the client has been scored by the assessment team and through the publication of the ACDR and the site visit that followed 13-15th January 2020 in St John's Canada, these scores have been reviewed by the assessment team and amended as appropriate.

Following this, this report has been through peer and client review. The assessment team have reviewed all comments and revised scores appropriately.

Stakeholders are once again encouraged to review the PCDR and scoring (and responses to previous input where relevant) presented in this assessment and use the Stakeholder Input Form to provide evidence to the team of where changes to scoring are still necessary.

The **Eligibility Date** for this assessment is the date of recertification.

The assessment team for this fishery assessment comprised of Paul Knapman (Team Leader and Principle 3 specialist), Robin Cook (Principle 1 specialist) and Rob Blyth-Skyrme (Principle 2 specialist).

Client fishery strengths

For Principle 1, the stock is well above the point where recruitment would be impaired with a high degree of certainty, and there is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years.

For Principle 2, key strengths include the client fleet actively avoiding areas where bycatch of Divisions 3LNO American plaice and Divisions 3NO cod is high. Both stocks are under moratorium because of being below their B_{LIM}, but OCI has worked to improve the yellowtail flounder catching efficiency of the fleet, thus remaining under the bycatch limits imposed. The use of 150-155 mm cod end mesh helps to ensure that bycatch is minimised.

For Principle 3, key strengths include a comprehensive national and regional legal and policy framework for managing fisheries and ecosystems. The fishery is well regulated and has a comprehensive monitoring, control and surveillance system.

Client fishery weaknesses

The YTFF catches very small quantities of out-of-scope species (which are required to be considered as main secondary species – SA3.7.1.2, MSC 2018a), and ETP wolffish species. The client has undertaken various efforts over recent years to minimise mortality of these unwanted species, but there has not been a regular review as required for secondary species and ETP species; this is reflected in the introduction of conditions of certification on Performance Indicator (PI) 2.2.2 and PI 2.3.2 (see below).

The management system does not have an occasional external review; this is reflected in the introduction of a condition on PI 3.2.4 (see below).

Determination

On completion of the review of information, the site visit and scoring, review by the client and peer reviewers, the assessment team consider that the fishery meets the MSC Standard as no PI is scored below 60 nor are any MSC Principle level scores less than 80. **It should be noted that at this stage this does not represent the final determination by the Conformity Assessment Body (CAB) – Lloyd's Register (LR).**

Conditions & Recommendations

Three PIs which contribute to the overall assessment score scored less than the unconditional pass mark, and therefore trigger binding conditions to be placed on the fishery, which must be addressed in a specified timeframe (within the 5-year lifespan of the certificate). Full explanation of the conditions is provided in Section 6.5 of the report, but in brief, the areas covered by these conditions are:

Condition number	Condition	Performance Indicator (PI)	Related to previous condition?
1	By the fourth annual audit the client shall provide evidence that there is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species and they are implemented as appropriate.	2.2.2	**No**
2	By the fourth annual audit the client shall provide evidence that there is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	2.3.2	**No**
3	By the third annual audit the client shall provide evidence that the YTFF management system is subject to regular internal and occasional external review.	3.2.4	**No**

For interested readers, the report also provides background to the target species and fishery, the wider impacts of the fishery and the management regime, supported by full details of the assessment team, a full list of references used and details of the stakeholder consultation process.

There were no reports or evidence provided during the recertification process to suggest that destructive practices or unilateral exemptions have been introduced within the fishery.

Lloyd's Register (LR) confirm that this fishery is within scope.

2 Report details

2.1 Authorship and peer review details

All team members listed below have completed all requisite training and signed all relevant forms for assessment team membership on this fishery.

Assessment team leader: Paul Knapman

Primarily responsible for assessment under Principle 3

Paul is an independent consultant based in Halifax, Nova Scotia, Canada. Paul began his career in fisheries nearly 30 years ago as a fisheries officer in the UK, responsible for the enforcement of UK and EU fisheries regulations. He then worked with the UK government's nature conservation advisors (1993-2001), as their Fisheries Programme Manager, responsible for establishing and developing an extensive programme of work with fisheries managers, scientists, the fishing industry and ENGOs, researching the effects of fishing and integrating nature conservation requirements into national and European fisheries policy and legislation.

Between 2001-2004 he was Head of the largest inshore fisheries management organisation in England, with responsibility for managing an extensive area of inshore fisheries on the North Sea coast. The organisations responsibilities and roles included: stock assessments; setting and ensuring compliance with allowable catches; developing and applying regional fisheries regulations; the development and implementation of fisheries management plans; acting as the lead authority for the largest marine protected area in England.

In 2004, Paul moved to Canada and established his own consultancy providing analysis, advisory and developmental work on fisheries management policy in Canada and Europe. He helped draft the management plan for one of Canada's first marine protected areas, undertook an extensive review on IUU fishing in the Baltic Sea and was appointed as rapporteur to the European Commission's Baltic Sea Regional Advisory Council.

In 2008, Paul joined Moody Marine as their Americas Regional Manager, with responsibility for managing and developing their regional MSC business. He became General Manager of the business in 2012. Paul has been involved as a lead assessor, team member and technical advisor/reviewer for more than 50 different fisheries in the MSC programme. He returned to fisheries consultancy in 2015.

Paul has passed MSC training and has no Conflict of Interest in relation to this fishery. A full CV is available upon request.

Expert team member: Robin Cook

Primarily responsible for assessment under Principle 1

Robin Cook studied zoology at Durham University followed by a PhD in population dynamics from Oxford University. He worked for many years at the Marine Laboratory, Aberdeen and was Director there from 2002-2011. He worked mainly in the field of demersal fish stock assessments and assessment methodology. During the 1990s he was chair of the ICES North Sea demersal assessment working group and served on the ICES Advisory Committee on Fishery Management (ACFM) and the EU Scientific, Economic and Technical Committee on Fisheries (STECF). Currently he is a Senior Research Fellow at Strathclyde University, Glasgow, focusing on bio-economic modelling of grey seal predation on demersal fish and the assessment of data-poor stocks. He has published over 80 scientific papers.

Robin has passed MSC training and has no Conflict of Interest in relation to this fishery. A full CV is available upon request.

Expert team member: Rob Blyth-Skyrme

Primarily responsible for assessment under Principle 2

Rob started his professional career in marine aquaculture in 1996, before switching to a focus on the science, management and policy of wild fisheries. Following his PhD, which considered biological and socio-economic aspects of an inshore shellfish fishery and resulted in peer-reviewed publications on issues including habitat and ecosystem interactions, he worked as the Senior Environment Officer and then Deputy Chief Fishery Officer at the Eastern Sea Fisheries Joint Committee, the largest regional fisheries management organization in England. In these roles he was responsible for, amongst other things, advising the Committee on ETP species, habitat and ecosystem considerations. Rob then became Natural England's senior advisor to the UK Government on marine fisheries and environmental issues, leading a team dealing with fisheries policy, science and nationally significant fisheries casework. Since 2008, Rob has run Ichthys Marine Ecological Consulting Ltd., which provides marine fisheries and environmental advice to a variety of governmental and industry clients. Rob has also undertaken all facets of MSC work as a Team Leader, expert team member and peer reviewer, across a wide variety of fisheries, including those for demersal species.

Rob has passed MSC training and has no Conflict of Interest in relation to this fishery. Rob has completed the MSC RBF training in the past 3 years. A full CV is available upon request.

2.2 Peer Reviewers

Peer reviewers used for this report were Don Bowen and Neil Campbell. A summary CV for each is available in the **Assessment downloads** section of the fishery's entry on the MSC website.

Don Bowen

Dr William Don Bowen is a Ph.D. graduate of the University of British Columbia, Vancouver, British Columbia, Canada. He retired from the Department of Fisheries and Oceans in May 2016 after 37 years with the Department. Prior to his retirement, he was a research scientist at the Bedford Institute of Oceanography, Department of Fisheries and Oceans (DFO) and an Adjunct Professor of Biology at Dalhousie University, Halifax, Nova Scotia for 31 years. He is currently an Emeritus Research Scientist at the Bedford Institute of Oceanography and continues his adjunct position at Dalhousie University. He has conducted research mainly on the ecology and population dynamics of North Atlantic seals. His professional interests also include mammalian life histories, population assessment, ecological interactions with fisheries, conservation, and ecosystem change. From 1985 to 1989, he managed fish and marine mammal stock assessments and ecological research on the Scotian Shelf for the DFO. He has published 240 scientific papers, including 170 journal articles and book chapters, and has edited two books. He has served on the USA recovery team of the Hawaiian monk seal, and as chair of the UK Special Committee on Seals. He has broad national (Natural Science and Engineering Research Council, DFO) and international (US National Academy, US National Science Foundation, US Center for Independent Experts, US National Marine Fisheries Service, UK Natural Environment Research Council, North Pacific Research Board) experience as a science advisor and served as member of the Board and Editor of Marine Mammal Science for five years. For nine years he chaired the National Marine Mammal Peer Review Committee of DFO, the body responsible for providing science advice to the Minister of Fisheries. He has considerable experience as an MSC assessor (Alaska pollock, Pacific cod, Flatfishes) in the Bering Sea and Gulf of Alaska and has been an MSC peer reviewer of Cornish Hake, US West Coast groundfish trawl fisheries, Icelandic Blue Whiting, Orange Roughy, and West Greenland Halibut.

Neil Campbell

Dr Neil Campbell, having worked in the field for twenty years, has considerable experience across a wide range of fisheries science and management areas. He has worked on age- and length-based assessment of shellfish during his time as a population modeller with the Scottish government; assessment of data-poor deep water stocks, and the assessment of widely dispersed, transboundary demersal and pelagic stocks. He is also familiar with the assessment of impacts of fisheries on vulnerable marine ecosystems, through his work with NAFO's ecosystem assessment group, and with the FAO VME database. His work also encompasses the science-compliance boundary, analysing vessel monitoring data to investigate behavioural changes brought about by changes in regulation, developing discard mitigation measures, and the use of CCTV systems as enforcement and research tools.

Dr Campbell's work with the MSC has been similarly diverse, acting as a peer-reviewer for fish and shellfish assessments, as a stakeholder, representing NAFO's scientific council and presenting the most recent advice and stock status to assessors during a field visit, and as a consultant, working on the creation of a global database of stock status.

2.3 RBF Training

RBF was not used for this fishery assessment.

2.4 Version details

Table 1: Fisheries program documents versions.

Document	Version number
MSC Fisheries Certification Process	**Version 2.1**
MSC Fisheries Standard	**Version 2.01***
MSC General Certification Requirements	**Version 2.4.1**

MSC Reporting Template	**Version 1.0**

*Default assessment tree

3 Unit of Assessment and Certification and results overview

3.1 Unit of Assessment and Unit of Certification

The Unit of Assessment is described in Table 2, below, and defines the full scope of what is being assessed.

Table 2: Unit of Assessment (UoA)

UoA 1	Description
Species	Yellowtail flounder (*Limanada ferruginea*)
Stock	NAFO Divisions 3LNO yellowtail flounder
Geographical area	The OCI Grand Bank Yellowtail Flounder Trawl Fishery (YTFF) operates on the Grand Bank, in Northwest Atlantic Fisheries Organisation (NAFO) Divisions 3L, 3N and 3O. The fishery occurs both within the Canadian 200 nautical mile exclusive economic zone (EEZ) and in waters on the Grand Bank that extend beyond the Canadian EEZ.
Harvest method / gear	Low headline, rockhopper trawl, with a footrope length of 30 m, and cod end mesh of 150 - 155 mm.
Client group	Ocean Choice International (OCI). OCI holds the majority of the Canadian allocation for the 3LNO yellowtail flounder stock.
Other eligible fishers	OCI has also acknowledged that other participants in this fishery may have an interest in gaining access to the MSC Certificate upon successful completion of this assessment. OCI have publicly confirmed that they will negotiate a reasonable certificate sharing arrangement with other interested quota holders.

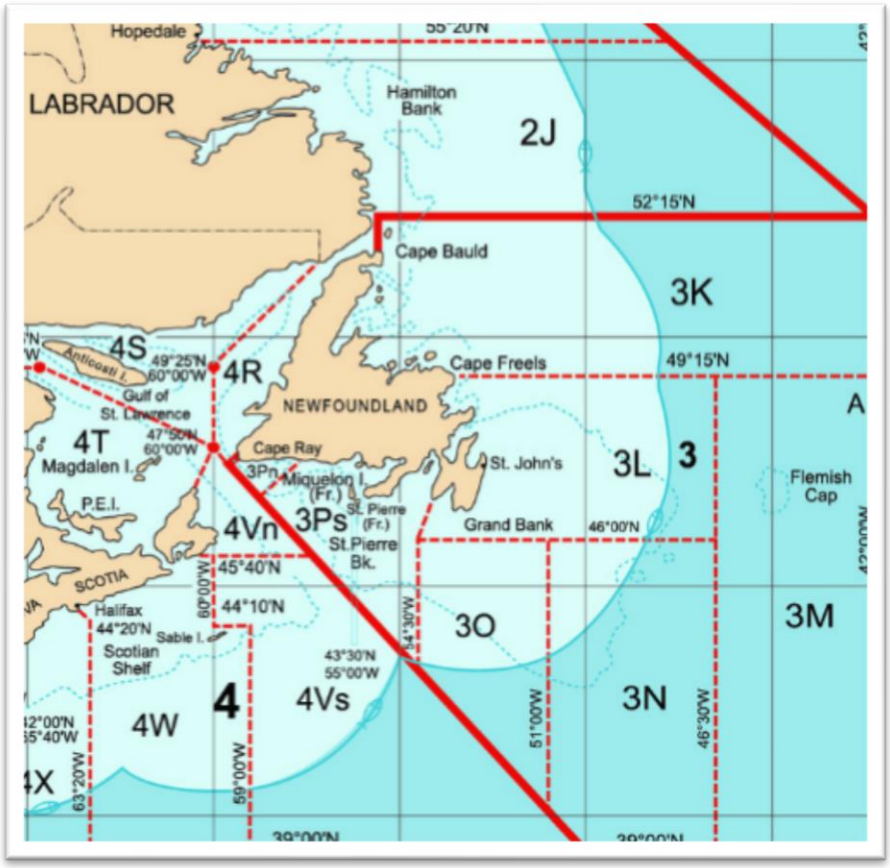


Figure 1: **Part of the NAFO Convention Area, including Divisions 3L, 3N, 3O (the Grand Bank). The light blue shading distinguishes the Canadian EEZ. The darker blue shading indicates part of the NAFO Regulatory Area (NRA). Source: NAFO Website: http://www.nafo.int/about/frames/area.html.**

3.1.1 Unit of Certification

Table 3: **Unit(s) of Certification (UoC)**

UoC 1	Description
Species	Yellowtail flounder (*Limanada ferruginea*)
Stock	NAFO Divisions 3LNO yellowtail flounder
Geographical area	The OCI Grand Bank Yellowtail Flounder Trawl Fishery (YTFF) operates on the Grand Bank, in Northwest Atlantic Fisheries Organisation (NAFO) Divisions 3L, 3N and 3O. The fishery occurs both within the Canadian 200 nautical mile exclusive economic zone (EEZ) and in waters on the Grand Bank that extend beyond the Canadian EEZ.
Harvest method / gear	Low headline, rockhopper trawl, with a footrope length of 30 m, and cod end mesh of 150 - 155 mm.
Client group	Ocean Choice International (OCI). OCI holds the majority of the Canadian allocation for the 3LNO yellowtail flounder stock.
Other eligible fishers	OCI has also acknowledged that other participants in this fishery may have an interest in gaining access to the MSC Certificate upon successful completion of this assessment. OCI have publicly confirmed that they will negotiate a reasonable certificate sharing arrangement with other interested quota holders.

3.1.2 Fishery background

The following information is taken from:

- The Yellowtail Flounder Integrated Fishery Management Plan (IFMP) (DFO 2014 accessed Sept 2019) https://www.dfo-mpo.gc.ca/fisheries-peches/ifmp-gmp/groundfish-poisson-fond/yellowtail-limande-div3LNO-eng.html;
- The Groundfish Newfoundland and Labrador Region NAFO Subarea 2 + Divisions 3KLMNO IFMP (DFO, 2019) https://www.dfo-mpo.gc.ca/fisheries-peches/ifmp-gmp/groundfish-poisson-fond/2019/groundfish-poisson-fond-2_3klmno-eng.htm;
- The Assessment of the Yellowtail Flounder in NAFO Divisions 3LNO (NAFO, 2018) https://www.nafo.int/Portals/0/PDFs/sc/2018/scr18-038.pdf;
- MSC Public Certification Report (PCR) (Intertek 2015) https://fisheries.msc.org/en/fisheries/oci-grand-bank-yellowtail-flounder-trawl/@@assessments; and,
- MSC annual audit reports https://fisheries.msc.org/en/fisheries/oci-grand-bank-yellowtail-flounder-trawl/@@assessments

A mixed trawl fishery for groundfish including yellowtail flounder began in the early-1960s in NAFO Divisions 3L, 3N and 3O (Figure 1), following drastic declines in the 3LNO haddock stock and fishery. For much of the period up to 1994, 3LNO yellowtail flounder was exploited with 3NO cod (*Gadus morhua*) and 3LNO American plaice (*Hippoglossoides platessoides*). Effort by Canada was mainly during summer over a large portion of the Grand Bank.

Catches of yellowtail flounder in Divisions 3LNO increased from very low amounts in the early 1960's to peak at 39,000 t in 1972 (Table 4) Catches gradually declined thereafter and from 1976 to 1993, were in the range of 10,000 – 18,000 t with the exception of 1985 and 1986 when catches were about 30,000 t.

The International Commission for the Northwest Atlantic fisheries (ICNAF) first established quota management of 3LNO yellowtail flounder in 1973 when a quota of 50,000 t was set (Table 4). This was rapidly lowered to only 9,000 t in 1976. After extension of jurisdiction by Canada in 1977, overall management of the stock including establishment of TACs and allocations to Contracting Parties was taken over by the Northwest Atlantic Fisheries Organization (NAFO). Quotas were gradually increased again after 1976 to reach 23,000 t in 1982. Thereafter the quotas declined to 15,000 t during 1985 – 1988 then to 5,000 t in 1989 and 1990. The TACs were increased to 7,000 t for 1991 – 1993.

A moratorium was declared on directed fishing in 1994, although NAFO's Scientific Council had recommended a quota of 7,000 t. The moratorium was put in place because of concerns that TACs had been exceeded during 1985 – 1993, and due to the poor status of the 3LNO American plaice and 3NO cod that were taken as part of the traditional mixed fishery. During the moratorium from 1994 until 1997, catches remained low but the bycatch was more than 600 t in 1997 (Table 4). In 1998 the fishery was reopened with a quota of 4,000 t. Annual quotas have gradually increased since and were set at 17,000 t beginning in 2009 and extending through 2017.

Table 4: Nominal catches and TACs (t) of 3LNO yellowtail flounder by country. Source: NAFO 2018

	Catch by Country						
Year	Canada	France	USSR/Rus.	S. Korea[a]	Other[b]	Total	TAC
1960	7	-	-	-	-	7	
1961	100	-	-	-	-	100	
1962	67	-	-	-	-	67	
1963	138	-	380	-	-	518	
1964	126	-	21	-	-	147	
1965	3,075	-	55	-	-	3,130	
1966	4,185	-	2,834	-	7	7,026	
1967	2,122	-	6,736	-	20	8,878	
1968	4,180	14	9,146	-	-	13,340	
1969	10,494	1	5,207	-	6	15,708	
1970	22,814	17	3,426	-	169	26,426	
1971	24,206	49	13,087	-	-	37,342	
1972	26,939	358	11,929	-	33	39,259	
1973	28,492	368	3,545	-	410	32,815	50,000
1974	17,053	60	6,952	-	248	24,313	40,000
1975	18,458	15	4,076	-	345	22,894	35,000
1976	7,910	31	57	-	59	8,057	9,000
1977	11,295	245	97	-	1	11,638	12,000
1978	15,091	375	-	-	-	15,466	15,000
1979	18,116	202	-	-	33	18,351	18,000
1980	12,011	366	-	-	-	12,377	18,000
1981	14,122	558	-	-	-	14,680	21,000

	Catch by Country						
Year	Canada	France	USSR/Rus.	S. Korea[a]	Other[b]	Total	TAC
1982	11,479	110	-	1,073	657	13,319	23,000
1983	9,085	165	-	1,223	-	10,473	19,000
1984	12,437	89	-	2,373	1,836[b]	16,735	17,000
1985	13,440	-	-	4,278	11,245[b]	28,963	15,000
1986	14,168	77	-	2,049	13,882[b]	30,176	15,000
1987	13,420	51	-	125	2,718	16,314	15,000
1988	10,607	-	-	1,383	4,166[b]	16,158	15,000
1989	5,009	139	-	3,508	1,551	10,207	5,000
1990	4,966	-	-	5,903	3,117	13,986	5,000
1991	6,589	-	-	4,156	5,458	16,203	7,000
1992	6,814	-	-	3,825	123	10,762	7,000
1993	6,747	-	-	-	6,868	13,615	7,000
1994	-	-	-	-	2,069	2,069	7,000[d]
1995	2	-	-	-	65	67	0[d]
1996	-	-	-	-	232	232	0[d]
1997	1	-	-	-	657	658	0[d]
1998	3,739	-	-	-	647	4,386	4,000
1999	5,746	-	96	-	1,052[b]	6,894	6,000
2000	9,463	-	212	-	1,486	11,161	10,000
2001	12,238	-	148	-	1,759	14,145	13,000
2002	9,959	-	103	-	636	10,698	13,000
2003	12,708	-	184	-	914[e]	13,806	14,500
2004	12,575	-	158	-	621	13,354	14,500
2005	13,140	299	8	-	486	13,933	15,000
2006	177	-	1	-	752	930	15,000
2007	3,673	-	76	-	874	4,623	15,500
2008	10,217	384	143	-	659	11,403	15,500
2009	5,416	87	3	-	662	6,168	17,000
2010	8,070	580	101	-	628	9,379	17,000
2011	3,947	338	82	-	863	5,230	17,000
2012	1,796	-	84	-	1,253	3,133	17,000
2013[c]	7,921	-	172	-	2,421	10,514	17,000
2014[c]	6,802	6	85	-	1,112	8,005	17,000
2015	5,582	349	84	-	672	6,687	17,000
2016	6,327	322	81	-	2,597	9,327	17,000
2017	6,508	280	85	-	2,329	9,202	17,000

[a] South Korean catches ceased after 1992, [b] includes catches estimated from Canadian surveillance reports, [c] provisional, [d] no directed fishery permitted, [e] Includes catches averaged from a range of estimates

Up until 1975, Canada and the USSR accounted for the majority of landings, but Canada took virtually all of the catch during 1976 – 1981. Factory freezer trawlers began fishing the tail of the Grand Bank (the NAFO Regulatory Area (NRA) outside Canada's 200-mile Exclusive Economic Zone (EEZ) in 3NO) in 1982. In 1985 and 1986 as well as for 1989 – 1993, catches by non-Canadian fleets combined exceeded those of Canada, although Canada was allocated most of the quota (Table 4). During 1985, 1986 and 1989 – 1993 catches exceeded the TACs by a factor of 2. These included catches by the EU and countries that were not Contracting Parties of NAFO (S. Korea acceded to the NAFO Convention in 1993).

Since the reopening of the fishery, Canada has accounted for the majority of the total catch in most years (Table 4) Canada caught 12,575 t and 13,137 t in 2004 and 2005 respectively but in 2006 the Canadian catch was only 177 t due to corporate restructuring and labour disputes. The nominal catch in that year was only 930 t, well below the TAC of 15,500 t. In 2007, catches by the Canadian fleet increased somewhat, but catch was still low at 3,672 t again as a result of ongoing restructuring. The Canadian catch increased to 10,217 t in 2008, but subsequently declined because of another labour dispute, and because of significant marketing issues that were not resolved until late 2012 (Table 5).

The current Canadian fishery allocation accounts for 97.5% of the overall quota. With the TAC being stable at 17,000 t since 2017, this equates to an allocation of 16,575 t. The client (OCI) holds 83.44% of the NAFO set quota. In the past, 1,000 t of the quota was transferred to the USA in turn for access to US quota, more recently approximately 450 t is transferred. Five other Canadian companies hold the remainder of the Canadian allocation (1,391 t) in various portions. At present, the fishery for 3LNO yellowtail flounder within Canadian waters is conducted solely by the client.

Table 5: Canadian catches (tons) of yellowtail flounder by division from 1998 to 2017, including reported catches from other gears. Source: NAFO 2018

Year	3L	3N	30	3LNO	Other Gears
1998	0	2969	742	3710	29
1999	0	5636	107	5743	3
2000	1409	7733	278	9420	43
2001	183	8709	3216	12108	130
2002	22	7707	2035	9764	195
2003	28	8186	4482	12696	1
2004	2760	7205	2609	12575	3
2005	284	10572	2283	13137	1
2006	0	176	0	176	1
2007	5	2053	1615	3672	1
2008	985	6976	2249	10210	6
2009	224	3228	1958	5410	3
2010	113	5584	2372	8069	2
2011	24	1887	2036	3947	1
2012	199	1171	424	1794	0
2013	82	6034	1804	7920	0
2014	2	5827	973	6802	0
2015	2	3148	2425	5572	0
2016	24	5622	681	6327	0
2017	0	5180	1082	6262	0

Source: Data are from Canadian ZIF statistics and may be slightly different from STATLANT data used in Table 4

Since the re-opening of the fishery, seasonal restrictions have been imposed on occasion. In 1998 it was recommended that the fishery should only occur after peak spawning was completed in June – July. As a result, the actual reopening date was set at August 1. In 1999 the fishery was closed during the spawning period from June 15 – July 31 but there have been no regulated restrictions since then. Nonetheless, OCI has closed the fishery during mid-June to early August, plus or minus one to two weeks. This is done due to product quality issues associated with fish spawning.

3.1.3 Fleet and gear description

Four vessels currently operate in the fishery – see Table 6. The Fukuyoshi-Maru 68 and Katsheshuk II are relatively new vessels to the fleet, joining in 2016 in the most recent MSC certification period. Fukuyoshi Maru 68 was added as part of a joint collaborative arrangement and the Katsheshuk II was re-purposed for the fishery, having previously been used for offshore shrimp fishing.

Table 6: Client vessels operating in the yellowtail fishery

Vessel Name	Registration
Aqviq	8714566
Fukuyoshi-Maru 68	8708189
Katsheshuk II	9127174
Ocean Breaker	8519552

OCI provided support to the crew of the Fukuyoshi-Maru 68 to assist their entry to the fishery and, while the vessel generally fishes in the same region as the existing OCI vessels targeting yellowtail flounder, it is limited to waters outside the Canadian 200 nm EEZ.

All of the vessels use bottom otter trawl. All vessels use the Golden Top trawl with a mesh size of 165 mm inside mesh for the trawl and 150– 155 mm for the cod end and a headline height of 2.75 m. In 2013, the OCI vessels converted to ‘flying doors’ and elevated sweeps, which are designed to lift the as much of the gear off the seabed as possible when towing. Fishing sensors (Scanmar, Marport) monitor the door configuration, catch, temperature and headline so as to ensure that the trawl is fishing properly, thereby helping to maintain optimum fishing efficiency.

Vessel trips last approximately 30 days.

In late 2018, OCI announced the construction of a new vessel, M/V Calvert, that will join its fleet and will be equipped to operate in the yellowtail flounder fishery, as well as other fisheries that OCI have access to. The vessel has been

designed in Norway and built in Turkey and is expected to be delivered in early 2020 (igure 2). The vessel's factory is being designed and built in Newfoundland & Labrador.

Figure 2: OCI's new vessel, "M/V Calvert", launched in 2020 (Source: Provided by OCI, 2020).

3.2 Assessment results overview

3.2.1 Determination, formal conclusion and agreement

To be drafted at Final Draft Report

3.2.2 Principle level scores

Table 7: Principle level scores

Principle	UoA 1
Principle 1 – Target species	90.0
Principle 2 – Ecosystem impacts	90.7
Principle 3 – Management system	91.0

3.2.3 Summary of conditions

Table 8: Summary of conditions

Condition number	Condition	Performance Indicator (PI)	Related to previous condition?
1	By the fourth annual audit the client shall provide evidence that there is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species and they are implemented as appropriate.	2.2.2	**No**
2	By the fourth annual audit the client shall provide evidence that there is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	2.3.2	**No**
3	By the third annual audit the client shall provide evidence that the YTFF management system is subject to regular internal and occasional external review.	3.2.4	**No**

3.2.4 Recommendations

No recommendations were made by the assessment team.

4 Evaluation results

4.1 Eligibility date

The Eligibility Date for this assessment is the date of recertification.

4.2 Traceability within the fishery

Traceability of product from the sea to the consumer is important so as to ensure that the MSC standard is maintained. There are several aspects to traceability that the MSC require to be evaluated at assessment: traceability within the fishery; at-sea processing; at the point of landing; and subsequently, the eligibility of product to enter the chain of custody. These requirements are assessed here.

Existing fisheries management requirements include the clear identification of species, quantity, fishing method and area of capture by all vessels landing fish from the fishery. Catches are reported in logbooks and on landing tickets. On board observers also monitor, cross check and verify their reports with the vessels' logbooks. All landings are required to be overseen by an independent dockside monitor, and the weights of all fishery products are verified at that time. Random landing and processing plant inspections by enforcement officers are also conducted to ensure that administrative details associated with species, area and capture and quantity are in order.

Cross referencing of satellite monitoring data from the vessel's Vessel Monitoring System (VMS) with logbooks, observer and aerial and at-sea surveillance reports also ensures that fish is reported from the correct area of capture.

Given the monitoring associated with the fishery (VMS + observers + 100% of the landings are monitored by independent dockside monitors) and, the fact that no other Canadian vessels are engaged in fishing for yellowtail flounder means the risk of non-certified yellowtail flounder being sold as MSC certified is considered to be very low.

All traceability and segregation systems as appropriate for products are already in place for this fishery as part of the existing certification.

Table 9: Traceability within the fishery

Factor	Description
Will the fishery use gears that are not part of the Unit of Certification (UoC)? No If Yes, please describe: - If this may occur on the same trip, on the same vessels, or during the same season; - How any risks are mitigated.	All the vessels use the same type of fishing gear, i.e. Golden Top trawl with a mesh size of 165 mm inside mesh for the trawl and 150 – 155 mm for the cod end and a headline height of 2.75 m. This gear is considered to be the most effective way to catch yellowtail flounder. The at-sea monitoring and tracking systems described above ensure that the potential for non-certified gears to be used within the fishery to be negligible.
Will vessels in the UoC also fish outside the UoC geographic area? No If Yes, please describe: - If this may occur on the same trip; - How any risks are mitigated.	All vessels are equipped with VMS and observers are frequently deployed on the vessels (e.g. 67% and 57% for all trips in 2017 and 2018, respectively). There is extensive record keeping to verify fishing position. All landings are subject to dockside monitoring. These checks will confirm the area of capture and ensure only fish from within the UoA are eligible to qualify for certification. Therefore, the risk to compromising traceability is considered to be low.
Do the fishery client members ever handle certified and non-certified products during any of the activities covered by the fishery certificate? This refers to both at-sea activities and on-land activities. No - Transport - Storage - Processing - Landing - Auction If Yes, please describe how any risks are mitigated.	All yellowtail flounder landings are overseen by independent dockside monitors. Landing cannot take place without dockside monitors being present. All fishery products are observed being offloaded, and the declared weights are verified. Any landed yellowtail flounder is transported to bonded warehouse for storage or direct to processing facilities. All companies have existing CoC certification. There is no auction facility for the yellowtail flounder fishery. No risks in the CoC process are identified.

Factor	Description
Does transhipment occur within the fishery? No If Yes, please describe: - If transhipment takes place at-sea, in port, or both; - If the transhipment vessel may handle product from outside the UoC; - How any risks are mitigated.	Transhipment is not allowed in the fishery. Therefore, there is no risk to compromising traceability.
Are there any other risks of mixing or substitution between certified and non-certified fish? No If Yes, please describe how any risks are mitigated.	No risks of mixing or substituting certified and non-certified fish were identified.

4.3 Eligibility to enter further chains of custody

The fishery assessment covers all yellowtail flounder (*Limanada ferruginea*), landed from OCI vessels operating in the UoA until the point of landing. Therefore, the scope of certification ends at the point of landing. Downstream certification of the product requires the appropriate chain of custody certification.

The regular ports of landing are made in Newfoundland: Bay Roberts, Harbour Grace and Marystown, but, in instances where necessary (for example due to bad weather or mechanical issues), at other ports where appropriate recording and dockside monitoring of landings can be accommodated (i.e., landings are required to be subject to dockside monitoring).

The fishery certificate is applicable to all OCI vessels that are legally licenced to fish for yellowtail flounder in NAFO Divisions 3 LNO. Any yellowtail flounder landed by OCI vessels operating within the UoA is considered to be within scope and MSC certified. The client vessels are shown in Table 6.

Beyond the point of landing, any company taking ownership of yellowtail flounder product originating from the fishery and wishing to identify it as MSC certified will need to hold a valid chain of custody certificate.

In order for subsequent links in the distribution chain to be able to use the MSC logo, companies and/or individuals must enter into a separate chain of custody certification, and be able to track product to the client group companies and member companies.

4.4 Eligibility of Inseparable or Practicably Inseparable (IPI) stock(s) to enter further chains of custody

There are no IPI stocks in the fishery.

5 Scoring

5.1 Summary of Performance Indicator level scores

Principle	Component	Performance Indicator (PI)		Score Range
One	Outcome	1.1.1	Stock Status	90
		1.1.2	Stock Rebuilding	n/a
	Management	1.2.1	Harvest Strategy	95
		1.2.2	Harvest control rules & tools	90
		1.2.3	Information / Monitoring	90
		1.2.4	Assessment of stock status	85
Two	Primary Species	2.1.1	Outcome	95
		2.1.2	Management strategy	95
		2.1.3	Information / Monitoring	100
	Secondary Species	2.2.1	Outcome	85
		2.2.2	Management strategy	75
		2.2.3	Information / Monitoring	85
	ETP Species	2.3.1	Outcome	90
		2.3.2	Management strategy	75
		2.3.3	Information / Monitoring	100
	Habitats	2.4.1	Outcome	100
		2.4.2	Management strategy	95
		2.4.3	Information / Monitoring	95
	Ecosystems	2.5.1	Outcome	100
		2.5.2	Management strategy	85
		2.5.3	Information / Monitoring	85
Three	Governance and policy	3.1.1	Legal & / or customary framework	100
		3.1.2	Consultation, roles & responsibilities	95
		3.1.3	Long term objectives	100
	Fishery specific management system	3.2.1	Fishery-specific objectives	80
		3.2.2	Decision-making processes	85
		3.2.3	Compliance & enforcement	95
		3.2.4	Monitoring and management performance evaluation	75

5.2 Principle 1

5.2.1 Principle 1 Background

Yellowtail flounder (*Limanda ferruginea*) only occur in the western North Atlantic ranging from southern Labrador to Chesapeake Bay (W. B. Scott and Scott 1988).

The largest population of yellowtail flounder in Canadian waters is on the Grand Bank in NAFO Divisions 3LNO (Figure 1). In this stock area, the largest proportion is found mainly in the eastern area in depths of 40 – 70 m (Walsh 1992). Commercial concentrations of this species are also found on the Scotian Shelf and Georges Bank, as well as off Cape Cod (Walsh and Burnett, 2001).

Yellowtail flounder is an offshore species that lives on gravely sand, sand-shell hash or rock-sandy sediments. They are found less frequently on rocky bottoms (Simpson and Walsh 2004). They have been found in depths down to 364 m but on the Grand Bank are primarily found in depths of about 35 - 95 m. Simpson and Walsh (2004) concluded that the contraction of range at low abundance of yellowtail flounder in 3LNO represents selection of preferred habitats of temperature and bottom type.

Analysis of Canadian research survey data from 1990 – 2005 (Colbourne and Walsh 2006) found that the most significant aggregations of yellowtail flounder on the Grand Bank were south of the 0°C isotherm in warmer water and within the 100 m isobath. It was also shown that a strong association exists between bottom temperatures and mean catch rates in depths less than 100 m, suggesting a possible increase in catchability with warmer temperatures. Yellowtail flounder exhibit both seasonal and diel variations in distribution by both depth and temperature (Walsh and Morgan 2004).

The diet of yellowtail flounder comprises mainly amphipods and polychaete worms (Scott and Scott 1988) but they also eat smaller quantities of other crustaceans such as shrimp, cumaceans and isopods. Later research showed that their diet has been dominated by sand launce (*Ammodytes americanus*), (DFO 2012b). Feeding takes place primarily during daylight.

Spawning occurs during May to July in Canadian waters, but can extend into September. Peak spawning on the Grand Bank is mid- to late-June (Pitt 1970). Spawning occurs near the bottom where eggs are deposited and fertilized. They then float to the surface layers where they drift during development. Walsh *et al*., (2001) concluded that the main nursery area for yellowtail flounder is the southern portion of the Southeast Shoal together with an area immediately to the west. This area is outside of the Canadian EEZ but within the NAFO Regulatory Area (NRA). Walsh *et al*., (2001) considered that the physical bounds of the yellowtail flounder nursery area could be defined with some certainty (Figure 3).

Pitt (1971) determined that female yellowtail flounder produce large numbers (350,000 to 4,570,000) of small eggs. More recent work by Rideout and Morgan (2007) found that fecundity has decreased significantly since earlier studies. They estimated that use of the older fecundity estimates with the assumption of fecundity being constant over time and total length could result significant in errors in estimated reproductive potential.

There are detectable effects of growth, mortality and temperature on maturation, (Walsh and Morgan,1999). They estimated length at 50% maturity (L50) for males as approximately 27 cm and 34 cm for females. More recent analyses have estimated current L50 to be 21 cm for males and 30 cm for females,

Age determinations from recaptures of fish tagged during the early 1990's revealed that the traditional age determination technique was underestimating the ages (Dwyer, Walsh, and Campana 2003). Based on the use of thin sections coupled with validations utilizing bomb radiocarbon assay techniques, females were aged up to 25 years and males to 21 years (Dwyer, Walsh, and Campana 2003).

Work by Walsh and Colbourne (2007) suggested that in addition to fishing pressures, biomass and surplus productivity of yellowtail flounder in Div. 3LNO also vary in response to environmental conditions. Biomass but not surplus production was influenced by the negative phase of the North Atlantic Oscillation (NAO) that is associated with warmer bottom temperatures on the Grand Bank. Regional scale warmer temperatures were found to enhance both biomass and surplus production.

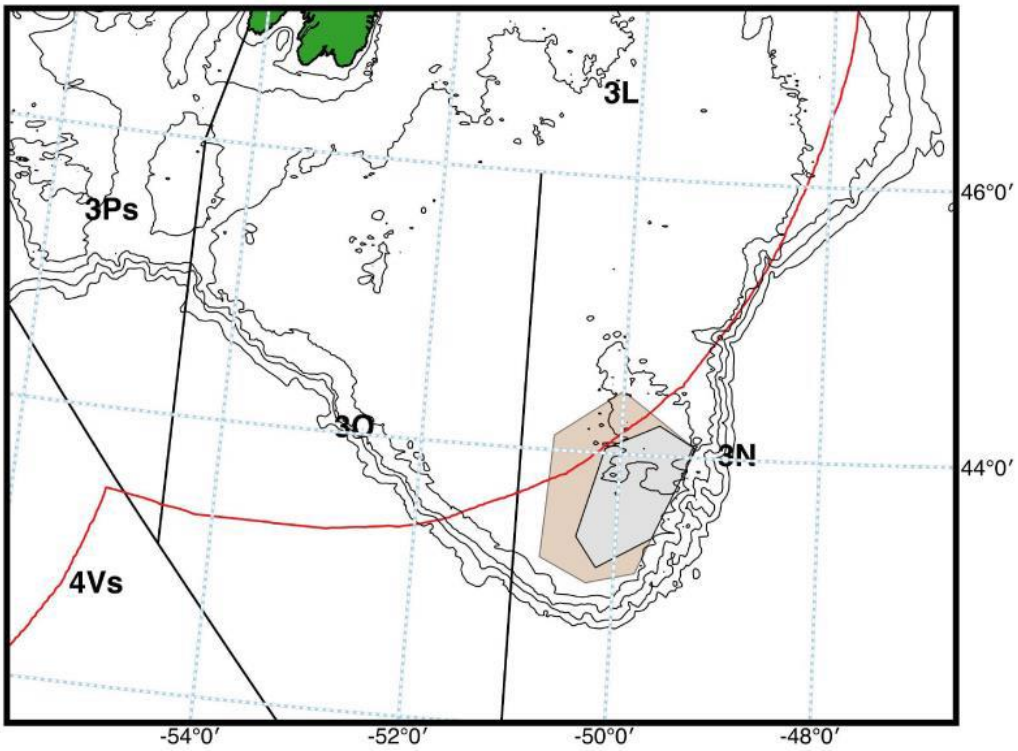


Figure 3: Boundaries of areas that would encompass >60% (grey) and >80% (brown) of juvenile yellowtail flounder on the southern Grand Bank based on aggregated Voronoi polygons. Source: adapted from Walsh *et al*., 2001.

Stock structure

The management unit of the stock is NAFO Divisions 3LNO (Figure 1). Work by Cadrin and Silva (2005) indicated good separation of 3LNO yellowtail flounder from those in other areas under Canadian jurisdiction based on morphometrics. This supports the separation of the 3LNO yellowtail flounder as a separate management unit. The stock is mainly concentrated on the southern Grand Bank and is recruited from the Southeast Shoal area nursery ground, where the juvenile and adult components overlap in their distribution (NAFO 2010d). The stock is considered trans-boundary in that it is found both inside and outside Canada's 200-mile EEZ.

Fishery data and information

When the Canadian yellowtail flounder fishery re-opened in 1998, its nature changed dramatically from being a mixed fishery prior to the closure to one directed specifically at yellowtail flounder due to the fact that both 3LNO American plaice and 3NO cod were still under moratoria. This same situation still exists in 2019 (NAFO website: https://www.nafo.int/Science/Science-Advice/Species)

After the re-opening, yellowtail flounder catches by all countries increased from 4,400 t to a high of 14,145 t in 2001. These catches exceeded the TACs from 1998-2001 by about 10%, but since 2002 catches have been below the TACs (Table 4). When the fishery re-opened, fishing in 3L was initially prohibited due to continued low biomass in the area, but this prohibition was lifted in 2000 (Walsh *et al*., 2000).

Stock assessment

Assessments of the status of 3LNO yellowtail flounder stock have been carried out beginning in the 1970's, first by ICNAF then by the Scientific Council of NAFO since 1979. Currently, a designated expert prepares initial assessments, and these are peer reviewed during the June meetings of the Scientific Council. Formalized external peer reviews of the assessments done by the Scientific Council are not carried out at present but, in recent years, external reviewers have participated in the June Scientific Council meetings and provided feedback on the assessments (Dawn Maddock Parsons, pers. comm.).

For many years, assessments were done on an annual basis but, beginning in 2002, full assessments have been carried out every second year and advice provided for two years. In 2008, the NAFO Fisheries Commission requested a full assessment for 2009 so that the full assessments of 3LNO yellowtail flounder and 3LNO American plaice (also assessed every second year) would occur during the same years into the future (NAFO 2010b). In years when full assessments are not conducted, status updates are provided. Over time, different approaches have been applied in the assessment of yellowtail flounder in 3LNO.

In various years, analytical age-based approaches were attempted but the results were generally unsatisfactory such that these methods have not been attempted since the early 1980s. The problems encountered with these age-based analytical assessments were a consequence of the ageing difficulties. General examinations of trends in commercial catch rate data and research survey data were used to evaluate relative stock status for many years in the absence of a satisfactory analytical assessment approach (e.g., Walsh *et al*., 1997, 1998, 1999). Relative cohort strengths from research survey data were examined in some years (e.g., Walsh *et al*., 2000, 2001).

In 1999, preliminary work was carried out to investigate the utility of using an analytical age aggregated non-equilibrium production model incorporating commercial catches and research survey biomass estimates, using A Stock-Production Model Incorporating Covariates (ASPIC - Prager, 1994,1995, 2005) to determine reference points associated with the Precautionary Approach (Amaratunga 1999). Based on this initial work, Scientific Council recommended that the ASPIC results should be used as the basis for setting some reference points. At that time, B_{MSY} was estimated at 19,000 t and F_{LIM} (defined as F_{MSY}) was estimated to be 0.18. F_{BUF}, as defined as the tenth percentile of F_{MSY} was therefore 0.13. Scientific Council concluded that B_{LIM} and B_{BUF} could not be determined. Although the results of the ASPIC analyses were presented during the annual assessment meeting of Scientific Council in 1999, the results pertaining to stock biomass were not used for the provision of stock status advice. Instead, Scientific Council applied the $F_{BUF} = 0.13$ (an exploitation rate of 11%) to the age 7+ biomass index from the 1998 Canadian spring and fall research surveys to arrive at a recommended TAC (NAFO 2010d).

In 2000, the Scientific Council began basing its recommendations for 3LNO yellowtail flounder TACs on projections using ASPIC. This practise has continued through 2015 (e.g., Brodie *et al*., 2004; Maddock Parsons *et al*., 2008, 2013). However, more recently sensitivity tests on the ASPIC assessment suggested it was insensitive to the recent decline in the survey time series (Maddock Parsons et al 2018). New assessments using a Schaefer production model in a Bayesian framework (Meyer and Millar, 1999) were found to be more robust and formed the basis for advice by NAFO in 2018 (Figure 4). The model gave similar results to the former ASPIC assessment and reflected recent trends in the surveys.

Stock status

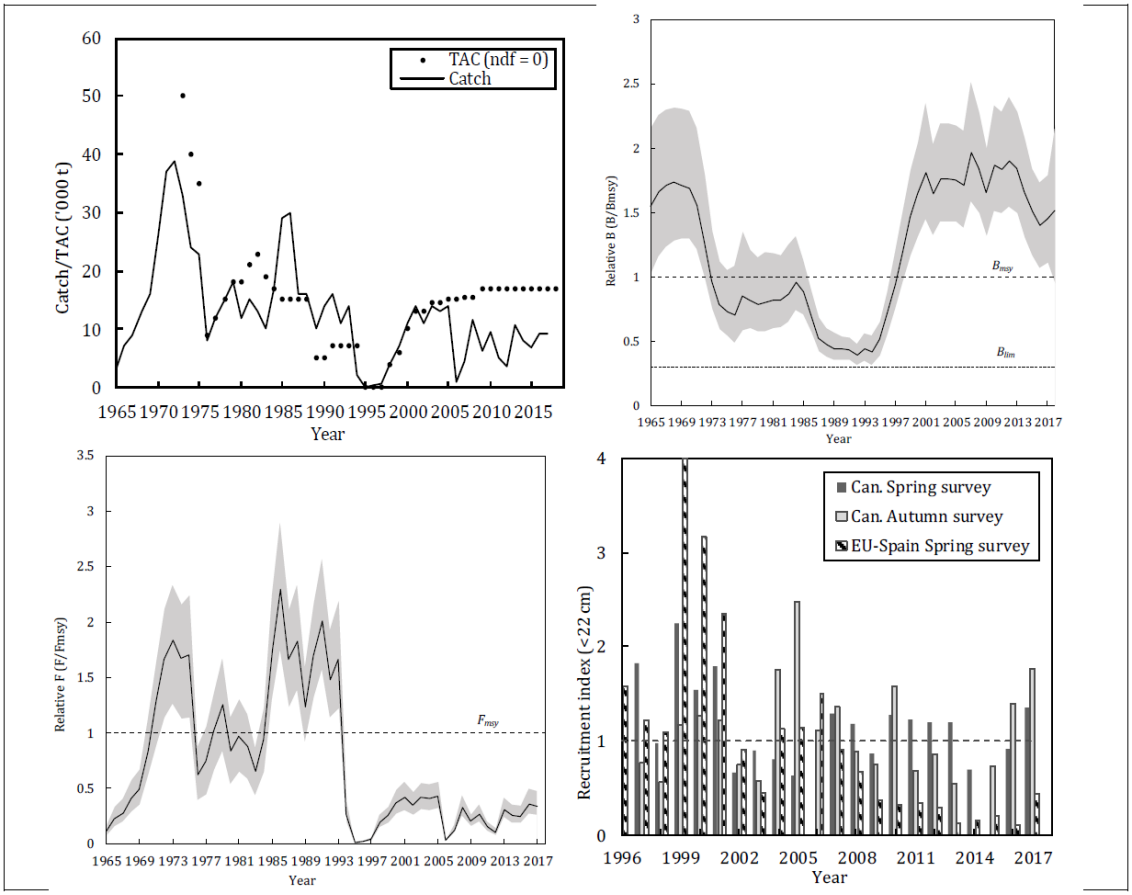


Figure 4: Relative biomass (B/B_{MSY}) and fishing mortality (F/F_{MSY}) from the 2018 assessment of 3LNO yellowtail flounder compared to B_{MSY} and F_{MSY}. Source: NAFO 2018.

The stock showed a long-term decline from the mid-1960s to 1994 when a fishing moratorium was imposed. At its lowest in 1994, the stock was less than 50% of B_{MSY} (Maddock Parsons *et al*., 2018). After imposition of the moratorium in 1994, the stock biomass increased rapidly due to protection of the relatively strong year-classes of the early to mid-1990s and the 4 or more years of reduced fishing mortality (Maddock Parsons *et al*., 2018).

Fishing mortality is estimated to be less than 50% of F_{MSY} and has fluctuated without trend since 2000. Stock biomass estimates have been well above B_{MSY} since 2000 although there is some indication of a recent decline. Indices of SSB derived from surveys suggest a recent decline (Figure 5).

Figure 5: Index of female spawning stock biomass ('000t) for Div. 3LNO yellowtail flounder as calculated from Canadian spring research vessel surveys from 1984-2017 (the surveys in 2006 and 2015 were not considered representative). Source: Maddock Parsons et al, 2018.

Recent catches have been well below the TAC. The stock is considered to be in the safe zone as defined in the NAFO Precautionary Approach Framework.

Harvest strategy

Harvest controls are in place via quota and allocation management by Fisheries Commission of NAFO (e.g., https://www.nafo.int/Portals/0/PDFs/COM/2018/QuotaTable2018.pdf). Since re-opening the directed fishery in 1998, the Fisheries Commission has set quotas at or below the levels recommended by Scientific Council (initially 2/3 F_{MSY} but 85% F_{MSY} in more recent years (Maddock Parsons *et al*., 2013) representing a strategy aimed at achieving management objectives reflected in the target and limit reference points.

Within Canada, there is an Integrated Fisheries Management Plan (IFMP) in place (DFO 2019) for groundfish within 2+3KLMNO, that includes the YTFF. There is also a yellowtail flounder IFMP (not updated since 2013) that includes Harvest Control Rules (HCR) that are consistent with the NAFO Precautionary Approach Framework and the Scientific Council recommended reference points. At the site visit the client representatives and DFO confirmed that the 2+3KLMNO groundfish IFMP is being updated and will include an annex specifically for the yellowtail fishery which will describe the same HCR. DFO also confirmed that the HCR has not been reviewed by NAFO but if the stock were to go below BMSY NAFO would follow the Precautionary Approach Framework recommended by Scientific Council (NAFO 2004a). Prosecution of the fishery is well monitored with minimum observer coverage of 25% (100% when fishing in the NRA); observer coverage has been close to 50% or higher since the fishery has been MSC certified (DFO C&P data). The YTFF is also subject to 100% dockside monitoring, daily hails, fishery officer inspections of all vessels that have fished in the NRA, logbook requirements and VMS monitoring.

The Fisheries Commission of NAFO formulates an annual Request for Advice to the Scientific Council regarding the status of stocks under its jurisdiction (e.g., see NAFO, 2018). Advice for 3LNO yellowtail flounder is provided to Fisheries Commission for three-year periods. For example, based on the 2018 assessment, advice was provided for 2019 to 2021 (NAFO 2018).

Scientific Council did not provide specific quota advice in the early 2000s but instead recommended that catches should not exceed those associated with the recommended target of 2/3 F_{MSY} (Atkinson *et al*., 2010a). In 2008 and 2009, Scientific Council recommended any TAC option up to a catch corresponding to 85% F_{MSY} (Atkinson *et al*., 2010a). In 2011 Scientific Council recommended "*F options of up to 85% F_{MSY} are considered to have a low risk of exceeding F_{LIM} (=F_{MSY}) in 2012 and 2013, and are projected to maintain this stock well above B_{MSY}*" (NAFO 2012).

In 2013 the Council recommended "*Fishing mortality up to 85% F_{MSY} corresponding to a catch of 26,000 t in 2014 and 23,500 t in 2015 has low risk (<5%) of exceeding F_{LIM}, and is projected to maintain the stock well above B_{MSY}*" (NAFO 2013a) For 2014 and 2015, Fisheries Commission set the quotas to be 17,000 t in each year (NAFO 2013d; NAFO 2014d). These quotas are 35% and 26% below the maxima suggested by Scientific Council for 2014 and 2015 respectively (NAFO 2013a).

In 2018 the Council recommended that "*At a fishing mortality of 85% Fmsy, catches of 24,900 t, 22,500 t, and 21,100 t in 2019 to 2021, respectively, have less than a 30% risk of exceeding Flim. At these yields the stock is projected to have an 82% probability of remaining above Bmsy.*"

In recent years, TACs have not been taken and suggest that the harvest strategy is achieving its objectives with regard to reference points.

Harvest control rules

Under the Precautionary Approach Framework adopted by NAFO in 1994 (NAFO 2004a), the limit reference point for fishing mortality (F_{LIM}) should be no higher than F_{MSY} (currently estimated to be 0.21 for yellowtail flounder). For 3LNO yellowtail flounder, F_{LIM} is equal to F_{MSY} and B_{LIM} is 30% B_{MSY} following the recommendation of the Limit Reference Point Study Group (NAFO 2004c). Although B usually refers to SSB, for yellowtail flounder, it refers to total biomass rather than SSB because the assessment model estimates total biomass rather than SSB.

The Limit Reference Point Study Group considered the biomass giving 30% of MSY would be a reasonable proxy for B_{LIM} in the absence of SSB information, although its properties are not fully known, including whether it represents a point below which there is "serious harm" (NAFO 2004c).

Currently, although the Fisheries Commission has adopted the Precautionary Framework recommended by Scientific Council and agreed to manage 3LNO yellowtail flounder based on the Precautionary Approach (PA) (NAFO 2004a), no explicit management plan or management objectives have been defined by the Fisheries Commission, nor are there specific Harvest Control Rules. Instead, General Convention objectives (GC Doc. 08/3, see NAFO, 2009) are applied (NAFO 2014c).

The Canadian IFMP (DFO 2012a) also describes Harvest Control Rules that are specifically applicable to the Canadian fishery for yellowtail flounder. They reflect NAFO Scientific Council advice for this stock and have in part formed the basis of Canadian positions and subsequent NAFO decisions related to establishment of the TAC. They are compliant with the NAFO Precautionary Approach Framework that guides the setting of TACs within that decision-making forum. Specifically, the IFMP states:

***Reference Points*:** Rather than using specific estimates in a given year, ratio values derived from the production model are considered to be more stable over time.

(a) Limit reference point for SSB (B_{LIM}): 30% of B_{MSY}

(b) Limit reference point for fishing mortality (F_{LIM}): Relative F (F/F_{MSY}) of 1 (about 0.25 in recent assessments)

(c) B_{MSY}: Relative Biomass (B/B_{MSY}) of 1 (about 1.8 in recent assessments)

Objectives: To maintain the Relative Biomass at or above 1 and to keep Relative Fishing Mortality at less than 1.

***Harvest Control Rules*:**

(a) When Relative Biomass is below B_{LIM}:

i. No directed fishing

ii. By-catch should be restricted to unavoidable by-catch in fisheries directing for other species

(b) When Relative Biomass is between B_{LIM} and B_{MSY}

i. Fishing mortality of < 2/3 F_{MSY}

(c) When Relative Biomass is above B_{MSY}:

i. Fishing mortality should have a low1 risk of exceeding F_{MSY}

Other fisheries affecting the target stock

Prior to the moratorium on directed fishing in 1994, Canadian catches of 3LNO yellowtail flounder were taken as part of a mixed fishery that included American plaice and cod. Since the re-opening in 1998, the Canadian fishery has been directed at yellowtail flounder since the 3NO cod and 3LNO American plaice fisheries remain under moratoria.

Catches of yellowtail flounder have been reported as bycatches in fisheries directing for skates and Greenland halibut in the NAFO Regulatory Area of Divisions 3NO by European Union vessels through most of the 2000s. These catches have been less than 1,000 t in most years. In 2016 and 2017 Japanese catches amounted to 1,984 t and 1,683 t

respectively. However, in 2018 all non-Canadian catches amounted to 1,098 tonnes according to STATLANT data (https://www.nafo.int/Data/STATLANT) compared to the Canadian catch for the same year of 7,135 t.

5.2.2 Total Allowable Catch (TAC) and catch data

Table 10: Total Allowable Catch (TAC) and catch data

TAC	**Year**	**2018**	**Amount**	**17,000 mt**
UoA share of TAC	**Year**	**2018**	Amount	**16,575 mt**
UoA share of total TAC	**Year**	**2018**	Amount	**16,575 mt**
Total green weight catch by UoC	**Year (most recent)**	**2018**	Amount	**7,588 mt**
Total green weight catch by UoC	**Year (second most recent)**	**2017**	Amount	**6,508 mt**

5.2.3 Principle 1 Performance Indicator scores and rationales

PI 1.1.1 – Stock status

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
a	Stock status relative to recruitment impairment			
	Guide post	It is **likely** that the stock is above the point where recruitment would be impaired (PRI).	It is **highly likely** that the stock is above the PRI.	There is a **high degree of certainty** that the stock is above the PRI.
	Met?	**Yes**	**Yes**	**No**

Rationale

The stock assessment does not explicitly estimate recruitment, but an index of fish less than 22 cm derived from surveys is used as a recruitment proxy. It shows that recruitment was high during the period of low stock size in the 1990s and has been somewhat lower during recent years when the stock has been above B_{MSY} (Figure 6). This indicates that recruitment was not impaired even at the lowest observed stock sizes so SG60 is met.

Given that the current biomass is well above Bmsy SG80 is met (Figure 4).

There is however some uncertainty as to whether total biomass as estimated in the stock assessment model is an adequate proxy for SSB since it includes non-mature fish. An index of SSB suggests a recent decline (Figure 7), hence SG100 is not met.

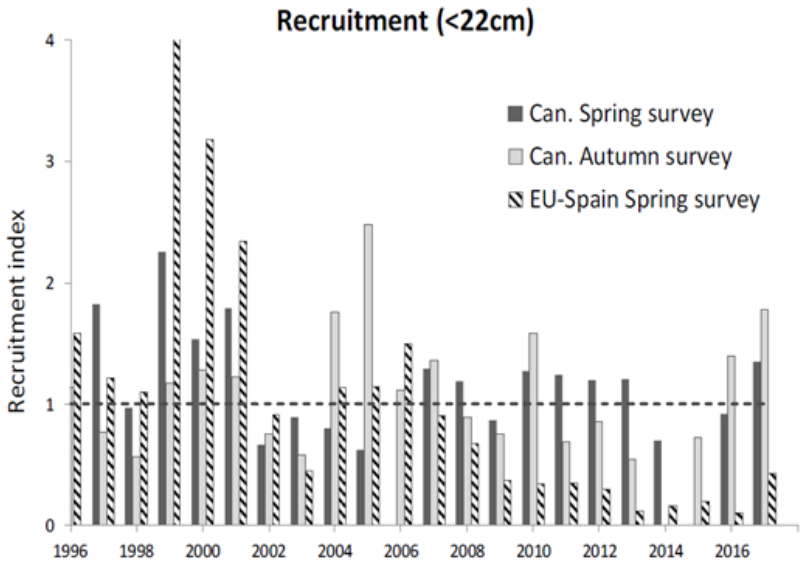


Figure 6: Indices of recruitment for yellowtail flounder from the 2018 assessment (NAFO, 2018).

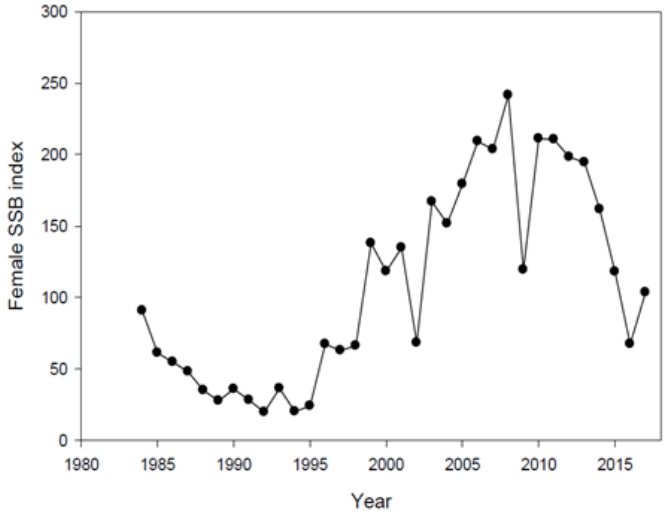


Figure 7: Index of female spawning stock biomass ('000t) for Div. 3LNO yellowtail flounder as calculated from Canadian spring research vessel surveys from 1984-2017 (the surveys in 2006 and 2015 were not considered representative). Source: Maddock Parsons et al, 2018)

b	Stock status in relation to achievement of Maximum Sustainable Yield (MSY)		
	Guide post	The stock is at or fluctuating around a level consistent with MSY.	There is **a high degree of certainty** that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
	Met?	**Yes**	**Yes**

Rationale

The most recent stock assessment shows the current biomass to be well above B_{MSY} despite a recent decline. The lower bound of this estimate is at the B_{MSY} level, hence the SG 80 is met. The biomass has been fluctuating around 1.7 times BMSY since the late 1990s (Figure 4 above Maddock Parsons et al 2018), hence SG100 is met.

References

Maddock Parsons, D., M. J. Morgan and R. Rogers. 2018. Assessment of Yellowtail Flounder in NAFO Divisions 3LNO using a new Stock Production Model in a Bayesian Framework. NAFO SCR Doc. 18/038

Stock status relative to reference points

	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to PRI (SIa)	B_{LIM}=30%B_{MSY}	Absolute biomass is not used as a reference point as B_{MSY} is re-estimated at each assessment. A relative value is used i.e., 0.3*B_{MSY}	B/B_{LIM}=5.0
Reference point used in scoring stock relative to MSY (SIb)	BMSY as estimated from a stock production model. Biomass is total biomass including juveniles	Absolute biomass is not used as a reference point as B_{MSY} is re-estimated at each assessment.	B/B_{MSY}=1.5

Overall Performance Indicator score	**90**
Condition number (if relevant)	**NA**

PI 1.2.1 – Harvest strategy

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Harvest strategy design			
	Guide post	The harvest strategy is **expected** to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy **work together** towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is **designed** to achieve stock management objectives reflected in PI 1.1.1 SG80.
	Met?	**Yes**	**Yes**	**Yes**

Rationale

The following evidence indicates SG 60 is met: The harvest strategy is to fish the stock so that the biomass is at or above B_{MSY} and in line with the NAFO Precautionary Approach. The strategy is implemented mainly through the application of TACs and these are set corresponding to a fishing mortality rate no higher than F_{MSY}. Fishing at this level would be expected to maintain the stock at B_{MSY}. Current advice is to set TACs at 85% F_{MSY}.

The following evidence indicates SG 80 is met: Canada is allocated the largest share of the TAC (97.5%) and its Integrated Fishery Management Plan is key to the management of the stock. The plan requires F to be reduced when biomass falls below B_{MSY} and set to zero when B_{LIM} is reached. Hence the strategy is responsive to the state of the stock. The Plan is consistent with NAFO Precautionary Approach and the resulting TACs work towards achieving the MSY objectives.

The following evidence indicates SG 100 is met: The harvest strategy is designed to meet objectives by ensuring TACs correspond to fishing below F_{MSY}. Current advice from NAFO is for TACs to be set as 85% F_{MSY} (NAFO 2018).

b	Harvest strategy evaluation			
	Guide post	The harvest strategy is **likely** to work based on prior experience or plausible argument.	The harvest strategy may not have been fully **tested** but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been **fully evaluated** and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	**Yes**	**Yes**	**No**

Rationale

The following evidence indicates SG 60 is met: See below.

The following evidence indicates SG 80 is met: The stock assessment shows that the biomass increased following a period of closure and when the fishery re-opened fishing mortality remained well below F_{MSY} while the biomass continued to increase. The biomass has remained well above B_{MSY} for the last 20 years while fishing mortality has remained well below F_{MSY}. (Maddock Parsons et al, 2018)

The following evidence indicates SG 100 is not met: The stock assessment shows that the stock biomass increased following a period of closure and when the fishery re-opened fishing mortality remained well below F_{MSY} while the biomass continued to increase. The biomass has remained well above BMSY for the last 20 years while fishing mortality has remained well below F_{MSY}. However, the strategy has not been fully evaluated because the use of total biomass as a proxy for SSB has not been investigated and so SG100 is not met.

c	Harvest strategy monitoring

	Guide post	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	**Yes**		

Rationale

The following evidence indicates SG 60 is met: NAFO Scientific Council monitors status of the stock through triennial assessments. Fisheries Commission of NAFO monitors compliance and reviews quota management on an annual basis. For Canadian vessels there is a requirement for a minimum observer coverage of 25% when fishing within the EEZ (subject to annual review) – at the site visit the client confirmed that observer coverage has been between 57-67% for all trips between 2017 and 2019. According to observer records around 40% of the total catch has been observed since the fishery was first MSC certified. A NAFO observer has to be carried at all times if fishing in the NAFO Regulatory Area (NRA). 100% dockside monitoring, daily hails, fishery officer inspections of all vessels that have fished in the NRA, logbook requirements and VMS monitoring by DFO is also required when operating in the EEZ and NRA. These activities work together to help determine whether the harvest strategy is working.

d	Harvest strategy review			
	Guide post			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			**Yes**

Rationale

The following evidence indicates SG 100 is met: NAFO Scientific Council monitors status of the stock through triennial assessments. Updated advice is provided to Fisheries Commission based on these assessments. Fisheries Commission of NAFO reviews quota management on an annual basis. It also reviews the Conservation and Enforcement Rules annually and makes changes and improvements as may be deemed necessary. The Commission has committed to managing the yellowtail flounder stock based on the Precautionary Approach (NAFO 2004). The management of fisheries on various stocks including yellowtail flounder within the Canadian EEZ is reviewed annually and adjustments made as may be necessary. The Canadian IFMP is considered a 'living document' and may be changed at any time if improvements are considered necessary

e	Shark finning			
	Guide post	It is **likely** that shark finning is not taking place.	It is **highly likely** that shark finning is not taking place.	There is a **high degree of certainty** that shark finning is not taking place.
	Met?	**NA**	**NA**	**NA**

Rationale

Not applicable to this fishery.

f	Review of alternative measures			
	Guide post	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	**NA**	**NA**	**NA**

Rationale

The following evidence indicates this is not relevant to the fishery: NAFO has a standing working group that considers issues of bycatch and discards (e.g. NAFO 2019). Discards of the target species are negligible. In 2018 it is estimated there were 13t of discards from a total catch of 30,000t, hence this SG is not scored.

References

Maddock Parsons, D., M. J. Morgan and R. Rogers. 2018. Assessment of Yellowtail Flounder in NAFO Divisions 3LNO using a new Stock Production Model in a Bayesian Framework. NAFO SCR Doc. 18/038

NAFO 2004. “Report of the Fisheries Commission, 26th Annual Meeting, September 13-17, 2004, Dartmouth, Nova Scotia, Canada.” NAFO FC Doc. 04/17. Serial No. N5067.

NAFO Advice June 2018 for 2019-2021. NAFO SC01

NAFO, 2019. Report of the NAFO Commission Ad Hoc Working Group on Bycatches, Discards and Selectivity (WG-BDS) in the NAFO Regulatory Area Meeting. Serial No. N6967NAFO COM Doc. 19-05.

Overall Performance Indicator score	**95**
Condition number (if relevant)	**NA**

PI 1.2.2 – Harvest control rules and tools

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue		SG 60	SG 80	SG 100
a	HCRs design and application			
	Guide post	**Generally understood** HCRs are in place **or available** that are **expected** to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	**Well defined** HCRs are **in place** that **ensure** that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock **fluctuating around** a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock **fluctuating at or above** a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, **most** of the time.
	Met?	Yes	Yes	Yes
Rationale				
b	HCRs robustness to uncertainty			
	Guide post		The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a **wide** range of uncertainties including the ecological role of the stock, and there is **evidence** that the HCRs are robust to the main uncertainties.
	Met?		**Yes**	**No**
Rationale				

The following evidence indicates SG 60 is met: NAFO advises TACs on the basis of the Precautionary Approach and advice has been to set the TAC at 85% of FMSY. This combined with the HCR operated by Canada (see below) where F is reduced as B_{LIM} is approached means that SG60 is met.

The following evidence indicates SG 80 and 100 is met: Within Canada, there is an IFMP in place (DFO 2019) for groundfish within 2+3KLMNO, that includes the YTFF. There is also a yellowtail flounder IFMP (not updated since 2013) that includes Harvest Control Rules (HCR) that are consistent with the NAFO Precautionary Approach Framework and the Scientific Council recommended reference points. At the site visit the client representatives and DFO confirmed that the 2+3KLMNO groundfish IFMP is being updated and will include an annex specifically for the yellowtail fishery which will describe the same HCR. These require fishing mortality to be ≤ ⅔ FMSY when relative biomass is between B_{LIM} and B_{MSY}, and for there to be no directed fishing and for bycatch to be restricted to unavoidable bycatch in fisheries directing for other species when relative biomass is below B_{LIM}. These ensure that exploitation is reduced as limit reference points are approached. Since Canada's allocation is 97.5% of the quota, imposition of these rules is significant for the whole stock.

The HCRs are consistent with the harvest strategy and will ensure that exploitation is reduced as limit reference points are approached, so meeting the SG80 level of performance. The performance of the fishery in recent years demonstrates the strategy is expected to maintain the stock at B_{MSY} and SG100 is met.

The following evidence indicates SG 80 is met: The Harvest Control Rules specified in the Canadian IFMP is based on the uncertainty in the estimate of biomass. This is done by setting B_{LIM} well below B_{MSY} to account for measurement error. In turn, assessments conducted by Scientific Council include, as part of the output, the 50% and 80% confidence intervals (e.g., Maddock Parsons et al., 2018) that allow consideration of the risks during development of advice to Fisheries Commission.

The following evidence indicates SG 100 is not met: Because the assessment model employed is not age-based, it cannot be considered that a wide range of uncertainties (e.g., such things as growth, natural mortality, age, SSB) has been taken into account, and so the fishery scores 80 for this SI.

c	HCRs evaluation			
	Guide post	There is **some evidence** that tools used **or available** to implement HCRs are appropriate and effective in controlling exploitation.	**Available evidence indicates** that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	**Evidence clearly shows** that the tools in use are effective in achieving the exploitation levels required under the HCRs.
	Met?	Yes	Yes	Yes

Rationale

The following evidence indicates SG 60 is met: Overall the estimated catches from the fishery are well below the TAC which provides some evidence that the tools to implement the HCR are effective.

The following evidence indicates SG 80 is met: See evidence below.

The following evidence indicates SG 100 is met: The tools in place in relation to the Canadian fishery such as a minimum observer coverage of 25% (100 % in the NRA), 100% dockside monitoring, daily hails, fishery officer inspections of all vessels that have fished in the NRA, logbook requirements and VMS monitoring that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules. Further, evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules. For the overall fishery, Scientific Council estimates of catch have been below the TAC showing that measures have been effective, and that the exploitation level is below F_{MSY} (see section 5.2.1).

References

Maddock Parsons, D., M. J. Morgan and R. Rogers. 2018. Assessment of Yellowtail Flounder in NAFO Divisions 3LNO using a new Stock Production Model in a Bayesian Framework. NAFO SCR Doc. 18/038

Overall Performance Indicator score	**90**
Condition number (if relevant)	**NA**

PI 1.2.3 – Information and monitoring

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Range of information			
	Guide post	**Some** relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	**Sufficient** relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy.	A **comprehensive range** of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	**Yes**	**Yes**	**Yes**

Rationale

The following evidence indicates SG 60 is met: See scoring rationale for SG100.

The following evidence indicates SG 80 is met: See scoring rationale for SG100.

The following evidence indicates SG 100 is met: Work by Cadrin and Silva (2005) provides information on stock structure. Stock productivity is estimated from tri-ennial stock assessments (e.g. Maddock Parsons 2018) which estimates productivity parameters using a Bayesian surplus production model. Most of the catch arises from a single Canadian otter-trawl fleet and catches by other fleets are reported to NAFO so removals by all major fleets are known. Abundance is monitored through a number of research vessels surveys including two Canadian surveys and an EU-Spanish survey. These provide information on distribution, growth, length weight relationships and maturity (Maddock Parsons et al, 2018a, 2018b). Environmental information is also available on an annual basis (e.g., DFO, 2014), and work is progressing regarding ecological issues (e.g., DFO, 2012; NAFO, 2013).

b	Monitoring			
	Guide post	Stock abundance and UoA removals are monitored and **at least one indicator** is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are **regularly monitored at a level of accuracy and coverage consistent with the harvest control rule**, and **one or more indicators** are available and monitored with sufficient frequency to support the harvest control rule.	**All information** required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent **uncertainties** in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	**Yes**	**Yes**	**No**

Rationale

The following evidence indicates SG 60 is met: See scoring rationale for SG80.

The following evidence indicates SG 80 is met: Most of the catch arises from a single Canadian otter-trawl fleet that is closely monitored - (minimum observer coverage of 25% - 100 % in the NRA, 100% dockside monitoring, daily hails, fishery officer inspections of all vessels that have fished in the NRA, logbook requirements and VMS monitoring). Catches by other fleets are reported to NAFO on an annual basis so removals by all major fleets are known. Abundance is monitored through a number of research vessels surveys including two annual Canadian surveys and an EU-Spanish survey. Data from surveys and the catches are used in a surplus production model to

provide estimates of biomass the exploitation rate that support the HCR. Uncertainties in the surveys are understood (e.g. Brodie 2005).

The following evidence indicates SG 100 is not met: The HCR has not been fully tested in simulation studies which means not all sources of uncertainty have been investigated.

c	Comprehensiveness of information			
	Guide post		There is good information on all other fishery removals from the stock.	
	Met?		**Yes**	

Rationale

The following evidence indicates SG 80 is met:

In fisheries by other countries for Greenland halibut and skate in the NRA of Div. 3NO, some sampling of yellowtail flounder is available (Maddock Parsons, 2018).

References

Brodie, W. MS 2005. A description of the autumn multispecies surveys in SA 2 + Div. 3KLMNO from 1995-2004. NAFO SCR Doc., No. 05/8, Serial No. N5083.

Cadrin, Steven X., and Vaughn M. Silva. 2005. “Morphometric Variation of Yellowtail Flounder.” ICES Journal of Marine Science: Journal Du Conseil 62 (4): 683–94.

DFO 2012. “Results and Recommendations from the Ecosystem Research Initiative – Newfoundland and Labrador’s Expanded Research on Ecosystem Relevant but Under- Surveyed Species.” DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/058.

DFO 2014. “Oceanographic Conditions in the Atlantic Zone in 2013.” DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2014/050.

Maddock Parsons, D., M. J. Morgan and R. Rogers. 2018a. Assessment of Yellowtail Flounder in NAFO Divisions 3LNO using a new Stock Production Model in a Bayesian Framework. NAFO SCR Doc. 18/038

Maddock Parsons, D., M. J. Morgan, R. Rideout and R. Rogers. 2018b. Divisions 3LNO Yellowtail Flounder (Limanda ferruginea) in the 2015-2017 Canadian Stratified Bottom Trawl Surveys. NAFO SCR Doc. 18/036

NAFO 2013. “Report of the 6th Meeting of the NAFO Scientific Council Working Group on Ecosystem Science and Assessment (WGESA) [Formerly WGEAFM].” NAFO SCS Doc. 13/24 Rev 2. Serial No. N6277.

Overall Performance Indicator score	**90**
Condition number (if relevant)	**NA**

PI 1.2.4 – Assessment of stock status

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration			
	Guide post		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?		**Yes**	**No**
Rationale				
b	Assessment approach			
	Guide post	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
	Met?	**Yes**	**Yes**	
Rationale				
c	Uncertainty in the assessment			
	Guide post	The assessment **identifies major sources** of uncertainty.	The assessment **takes uncertainty into account**.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a **probabilistic** way.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				

The following evidence indicates SG 80 is met:

The triennial assessments (e.g., Maddock Parsons et al., 2018) are appropriate for the stock and the Harvest Control Rules in that the outputs from the model used (Bayesian surplus production model) provide all necessary information related to stock status in terms of the reference points used in the HCR.

The following evidence indicates SG 100 is not met: Because the assessment is not age or size based, it cannot be considered to take into account the major features relevant to the biology of the species such as the age/size of maturity and growth rates. The biomass reference points are based on total biomass as opposed to SSB and do not therefore explicitly address the spawning potential of the stock.

The following evidence indicates SG 60 is met: See scoring rationale for SG80 below.

The following evidence indicates SG 80 is met: The assessments provide estimates of B_{MSY}, F_{MSY}, B/B_{MSY} and F/F_{MSY} (e.g., Maddock Parsons et al., 2018) which are all related to the reference points. MSY is an appropriate framework for the reference points as this is not an LTL species.

The following evidence indicates SG 60 is met: See scoring rationale for SG100.

The following evidence indicates SG 80 is met: See scoring rationale for SG100.

The following evidence indicates SG 100 is met: In addition to providing estimates as described in (b) above, assessments provide the confidence intervals around these values. The assessment model takes measurement error

and process error into account. Projections on which advice is based provide probabilities of exceeding reference points (e.g., Maddock Parsons et al., 2018, NAFO SC 01 – 14 June 2018).

d	Evaluation of assessment			
	Guide post			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			**No**

Rationale

The following evidence indicates SG 100 is not met: Various assessment approaches have been used in the past. ASPIC (Prager 1994) has been used for recent assessments but has now been replaced by a Bayesian surplus production model. This has been compared to ASPIC and gives similar results (Maddock Parsons et al, 2018). However, there have been no rigorous explorations of alternative assessment approaches although one other stochastic surplus production model (SPiCT, Pedersen and Berg, 2017) was explored. Hence SG100 is not met.

e	Peer review of assessment			
	Guide post		The assessment of stock status is subject to peer review.	The assessment has been **internally and externally** peer reviewed.
	Met?		**Yes**	**No**

Rationale

The following evidence indicates SG 80 is met: Triennial assessments are prepared by an expert designated by Scientific Council (Designated Expert) and are peer reviewed by the Standing Committee on Fisheries Science (STACFIS), a standing committee of Scientific Council. Agreement is reached by consensus regarding the assessment including any modifications, etc. to the initial document tabled; SG80 is met.

The following evidence indicates SG 100 is not met: While external reviewers have participated in Scientific Council meetings in recent years there is no systematic peer review outside of NAFO Scientific Council so SG100 is not met.

References

Maddock Parsons, D., M. J. Morgan and R. Rogers. 2018a. Assessment of Yellowtail Flounder in NAFO Divisions 3LNO using a new Stock Production Model in a Bayesian Framework. NAFO SCR Doc. 18/038

Pedersen, M. and C. Berg (2017). A stochastic surplus production model in continuous time. FISH and FISHERIES, 2017,18, 226–243.

Prager, M. H. (1994). A suite of extensions to a non-equilibrium surplus-production model. Fishery Bulletin 92: 374–389.

Overall Performance Indicator score	**85**
Condition number (if relevant)	**NA**

5.3 Principle 2

5.3.1 Principle 2 background

The Grand Bank is a submarine plateau of approximately 93,000 km^2, most of which is within the Canadian 200 NM EEZ off Newfoundland's south-east coast. The depth of water across most of the Bank is in the range 50-150 m, although the southern and south-eastern edges are deeply incised with submarine canyons, and in these areas the continental slope shelves rapidly to depths of 1000 m or more (DFO 2007a).

The cold Labrador Current sweeps down and across the Grand Bank, mixing with the warm, northerly directed Gulf Stream along the Bank's south-eastern edge. At 100 m depth, water in this region is rarely warmer than 2ºC (Drinkwater & Trites 1986). This mixing of cold and warm water causes the fog that occurs notoriously over the Grand Bank, but in the relatively shallow water it also provides for excellent growing conditions for phytoplankton, with peaks in production in May and October. Animals further up the food chain benefit from this planktonic production, and the Grand Bank is a spawning, nursery and feeding area for a number of important commercially exploited fish and shellfish species.

5.3.2 Primary and Secondary Species

Under the MSC Fisheries Standard v2.01 (MSC 2018a), primary species are defined as those species that are in scope but not target (P1) species, "where management tools and measures are in place, intended to achieve stock management objectives reflected in either limit or target reference points" (SA3.1.3, MSC 2018a). Secondary species are then defined by the MSC as species in the catch that do not meet the definition of 'primary' species or species that are out of scope of the program but where the definition of endangered, threatened or protected (ETP) species is not applicable (SA3.1.4, MSC 2018a).

For primary and secondary species, a 'main' designation is then given if: i) "the catch of a species by the UoA comprises 5% or more by weight of the total catch of all species by the UoA", or ii) "the species is classified as 'less resilient' and the catch of the species by the UoA comprises 2% or more by weight of the total catch of all species by the UoA" (SA3.4.2, MSC 2018a). However, Assessment Teams, "may still designate species as main, even though it falls under the designated weight thresholds of 5% or 2%, as long as a plausible argument is provided as to why the species should warrant that consideration" (GSA3.4.2, MSC 2018a).

Catch data for the fishery from the at-sea observer (ASO) programme for the five years from 2013/14 – 2017/18 were provided to the Assessment Team, as shown in Table 11. The data show that observers were present on 48% of the trips undertaken by vessels in the certified fishery over the period, while the catches observed represented 40.4% of the total yellowtail flounder catches (including discards) reported in logbooks over the period; this high level of observer coverage provides confidence that the independent data collected are representative of the fishery as a whole.

With respect to primary species in the YTFF, only American plaice meets the criterion for a main species by comprising 6.4% of the total catch over the 2013/14 – 2017/18 period. Thorny skate is also treated as a main primary species, however, because although made up just 1.6% of the catch on average, it made up 5.1% of the catch in the 2016/17 year. Also, skate (NS) made up an average of 0.9% over the period, and it is presumed that the majority of that group was made up of thorny skate as by far the most common individual species identified in the catch (i.e., the next most common species are round skate = 0.029%, and smooth skate = 0.007% – Table 11). Thorny skate is less resilient (NAFO SC 2018d), and so from a precautionary perspective it is appropriate to score it as a main primary species because the combined total of thorny skate + skate (NS) exceeds 2% of the total catch. Other primary species in the catch (Atlantic cod, Atlantic halibut, witch flounder and Greenland halibut) were taken in small quantities, only, and are scored as minor primary species.

Several 'out of scope' but not ETP species / groups were recorded in the catch (Table 11), and these are required to be treated as main secondary species (SA3.7.1.2, MSC 2018a). However, harp seal was the only species recorded more than once in the five-year period. Other secondary species in the YTFF include a wide variety of different species, but no fish or shellfish (i.e., MSC 'in-scope' species) comprised more than a very small proportion of the catch, with only sea cucumbers (NS) exceeding 0.2% of the total. 32 species were recorded in the catch at less than 200 kg annually over the entire five-year period covered by the observer data, and as a negligible component of the catch these are not considered further in this assessment.

It is noted that the observer data provided to the Assessment Team included an unidentified 'whale' in the 2013/14 year (Table 11). Following checking that was agreed at the site visit, it was confirmed by DFO that this 'whale' was a decomposed carcass. As such, this animal is not scored or referenced further in this assessment.

No bait is used in the YTFF, and so there is no consideration of bait in the assessment of the YTFF.

Table 11: Observer data showing catches for 2013/14 – 2017/18 from the OCI Yellowtail Flounder Fishery.

Rank	Species Name	2013/2014				2014/2015				2015/2016				2016/2017				2017/2018				2013-2018		
		Retained (t)	Discard (t)	Total catch (t)	% of total catch	Retained (t)	Discard (t)	Total catch (t)	% of total catch	Retained (t)	Discard (t)	Total catch (t)	% of total catch	Retained (t)	Discard (t)	Total catch (t)	% of total catch	Retained (t)	Discard (t)	Total catch (t)	% of total catch	Mean annual Observed total catch (t)	Catch as % of mean annual Observed total	Estimated total annual catch scaled to YTF Observer data
1	Yellowtail flounder (YTF)	4,571.74	5.33	4,577.08	86.19	1,533.12	0.29	1,533.41	86.90	2,945.71	3.33	2,949.04	89.90	1,969.96	8.51	1,978.47	80.19	3,455.12	2.24	3,457.36	92.15	2899.072	87.453	7178.6
2	American plaice	459.31	0.81	460.11	8.66	106.93	0.06	106.98	6.06	134.08	0.24	134.32	4.09	267.91	0.38	268.29	10.87	83.15	0.07	83.22	2.22	210.584	6.352	521.4
3	Thorny skate	0.00	40.79	40.79	0.77	0.06	9.50	9.56	0.54	0.55	63.80	64.34	1.96	1.13	125.68	126.81	5.14	0.02	19.06	19.08	0.51	52.116	1.572	129.0
4	Atlantic cod	93.42	0.07	93.49	1.76	39.49	0.00	39.49	2.24	33.89	0.02	33.91	1.03	34.89	0.09	34.98	1.42	22.52	0.00	22.52	0.60	44.878	1.354	111.1
5	Skate (NS)	0.05	45.65	45.70	0.86	0.00	11.46	11.46	0.65	0.02	39.38	39.40	1.20	0.00	0.84	0.84	0.03	0.00	48.38	48.38	1.29	29.156	0.880	72.2
6	Atlantic wolffish	0.02	9.79	9.81	0.18	33.70	14.09	47.79	2.71	0.15	11.18	11.33	0.35	0.00	10.34	10.34	0.42	0.00	55.17	55.17	1.47	26.888	0.811	66.6
7	Sea cucumber (NS)	0.00	4.85	4.85	0.09	0.00	0.05	0.05	0.00	0.00	13.09	13.09	0.40	0.02	20.24	20.26	0.82	0.10	27.59	27.69	0.74	13.188	0.398	32.7
8	Atlantic halibut	10.79	0.27	11.06	0.21	7.81	0.02	7.83	0.44	5.26	0.14	5.41	0.16	5.66	0.14	5.79	0.23	12.47	0.05	12.53	0.33	8.052	0.257	19.9
9	Witch flounder	19.18	0.02	19.21	0.36	1.86	0.00	1.86	0.11	12.45	0.00	12.45	0.38	6.61	0.00	6.61	0.27	0.13	0.00	0.13	0.00	8.524	0.243	21.1
10	Sculpins (Horned *Shorthorn, Longhorn, Grubby)	0.00	16.59	16.59	0.31	0.00	0.31	0.31	0.02	0.00	2.61	2.61	0.08	0.00	0.66	0.66	0.03	0.00	1.60	1.60	0.04	4.354	0.131	10.8
11	Sculpins (NS)	0.00	1.30	1.30	0.02	0.00	3.74	3.74	0.21	0.00	5.83	5.83	0.18	0.00	2.04	2.04	0.08	0.00	6.06	6.06	0.16	3.794	0.114	9.4
12	Sea raven	0.00	5.64	5.64	0.11	0.00	0.78	0.78	0.04	0.00	2.53	2.53	0.08	0.00	0.67	0.67	0.03	0.00	4.99	4.99	0.13	2.922	0.088	7.2
13	Sand lances (NS)	0.00	1.26	1.26	0.02	0.00	0.27	0.27	0.02	0.00	2.35	2.35	0.07	0.00	1.50	1.50	0.06	0.00	8.04	8.04	0.21	2.684	0.081	6.6
14	Toad crab (NS)	0.00	8.87	8.87	0.17	0.00	0.01	0.01	0.00	0.00	0.45	0.45	0.01	0.00	1.49	1.49	0.06	0.00	0.95	0.95	0.03	2.354	0.071	5.8
15	Haddock	6.36	0.01	6.37	0.12	0.24	0.00	0.24	0.01	0.18	0.00	0.18	0.01	0.01	0.00	0.01	0.00	0.08	0.00	0.08	0.00	1.376	0.042	3.4
16	Greenland halibut	4.29	0.01	4.31	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.00	0.68	0.03	0.00	0.00	0.00	0.00	0.998	0.030	2.5
17	Round skate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.80	4.80	0.19	0.00	0.00	0.00	0.00	0.960	0.029	2.4
18	Starfish (NS)	0.00	0.73	0.73	0.01	0.00	0.00	0.00	0.00	0.00	0.70	0.70	0.02	0.00	0.20	0.20	0.01	0.00	0.92	0.92	0.02	0.510	0.015	1.3
19	Porbeagle shark	0.00	0.18	0.18	0.00	0.00	0.00	0.00	0.00	0.00	1.03	1.03	0.03	0.00	0.03	0.03	0.00	0.00	0.99	0.99	0.03	0.446	0.013	1.1
20	Lancetfishes (NS)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.42	1.42	0.06	0.00	0.00	0.00	0.00	0.284	0.009	0.7
21	Invertebrate (NS)	0.00	1.23	1.23	0.02	0.00	0.00	0.00	0.00	0.00	0.14	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.274	0.008	0.7
22	Smooth skate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	1.20	1.20	0.03	0.244	0.007	0.6
23	Capelin	0.00	0.59	0.59	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.44	0.02	0.00	0.02	0.02	0.00	0.210	0.006	0.5
29	Whale (NS)	0.00	0.30	0.30	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.060	0.002	0.1
30	Harp seal	0.00	0.03	0.03	0.00	0.00	0.07	0.07	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.15	0.00	0.056	0.002	0.1
32	Northern wolffish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.25	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.050	0.002	0.1
35	Toothed whale (NS)	0.00	0.19	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.038	0.001	0.1
42	True seals (NS)	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.000	0.0
49	Grey seal	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.004	0.000	0.0
52	Spotted wolffish	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.002	0.000	0.0
32 other species / groups <200 kg annual (0.007%)		0.07	0.88	0.95	0.00	0.02	0.66	0.68	0.03	0.18	0.95	1.13	0.02	0.00	0.99	0.99	0.03	0.00	0.84	0.84	0.02	0.911	0.027	2.3
Grand Total (ASO data)		5,165.23	145.45	5,310.68	100.00	1,723.21	41.33	1,764.53	100.00	3,132.46	148.08	3,280.54	100.00	2,286.87	180.45	2,467.32	100.00	3,573.59	178.30	3,751.90	100.00	3315.01	100.000	8208.5
Total catch YTF (logbook, t)		7,685.804				6,273.32				7,417.007				6,730.308				7,786.392				7178.566		N/A
Observer coverage (% of YTF catch – calculated)		59.6%				24.4%				39.8%				29.4%				44.4%				40.4%		N/A
Observer coverage (% of trips – client data)		50%				25%				46%				63%				57%				48%		N/A

Key: Target (Principle 1) species; Main Primary species; Minor Primary species; Main secondary species; Minor secondary species; ETP species. 'Whale' = a decomposed carcass, so not scored.

Table 12: Logbook data (kg kept/landed and discarded) for non-target species taken in the YTFF (Source: client).

Species Name	2014			2015			2016			2017			2018			Annual mean total (kg, only reported years)
	Kept / Landed	Discard Dead	Discard Alive	Kept / Landed	Discard Dead	Discard Alive	Kept / Landed	Discard Dead	Discard Alive	Kept / Landed	Discard Dead	Discard Alive	Kept / Landed	Discard Dead	Discard Alive	
American plaice	636,976	0	0	357,634	15	0	718,450	170	0	187,587	64	0	332,113	2,734	0	447,149
Cod, Atlantic	156,424	0	0	106,045	0	0	107,769	0	0	49,223	161	0	65,043	626	0	97,058
Greysole/witch	8,465	0	0	49,077	0	0	15,969	0	0	10,000	0	0	12,871	23	0	19,281
Groundfish Heads				6	0	0	18	0	0							12
Haddock	6,475	0	0	1,455	0	0	1,582	331	0	1,038	0	0	662	0	0	2,309
Hake, white							143	0	0	28	0	0				86
Halibut	27,482	35	0	21,651	49	0	22,119	11	0	31,030	1	0	62,937	896	0	33,242
Monkfish (Am angler)				182	0	0	128	0	0				34	0	0	115
Redfish																37
Sculpin	0	2,240	0				37	0	0				0	40	0	1,140
Sea cucumber													0	55	1,57	55
Shark, mako										0	0	100	0	375	1,250	863
Shark, porbeagle/mackerel										0	1,460	0	0	0	140	800
Shark, unspecified										0	0	11,800	0	1,855	776	7,216
Skate	0	47,875	65	0	162,596	20	0	223,688	2,980	0	187,213	150	0	186,715	1,975	162,655
Tongues, sounds, cheeks							12	0	0							12
Turbot/Greenland halibut				10	0	0										10
Wolffish, Striped/ Atlantic	49,801	0	0	146	0											24,974

5.3.2.1 American plaice (Main primary species)

American plaice (*Hippoglossoides platessoides*) is managed as a 3LNO stock. The stock is distributed throughout Divisions 3LNO, but historically most of the biomass was found in Division 3L (NAFO SC 2018b). There is a conservation plan and rebuilding strategy in place for the stock that includes an HCR; the objective is to restore the stock to Bmsy. The stock remains low compared to historic levels and is presently at 34% of Blim. Recruitment has been low since the late 1980s, but Canadian surveys indicate a large number of pre-recruits in Division 3L in recent years. Current estimates of total fishing mortality are very low (Figure 8).

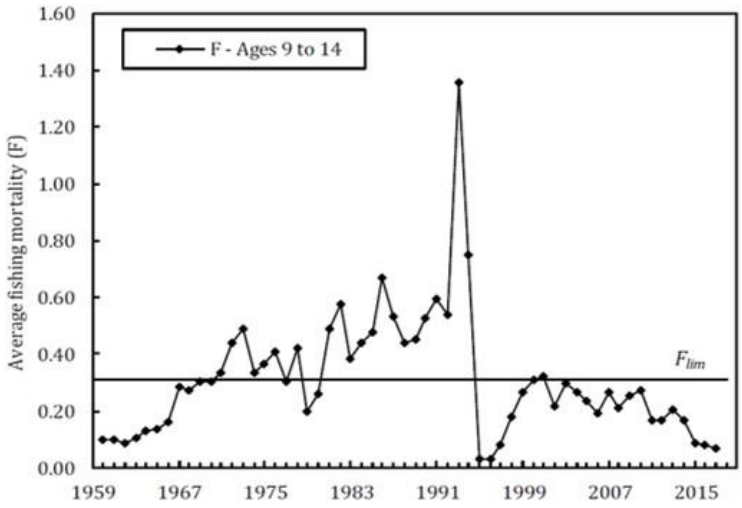


Figure 8: Average fishing mortality (F) for the 3LNO American plaice stock, 1959-2017. (Source: NAFO SC 2018b).

5.3.2.2 Thorny skate (Main primary species)

Thorny skate (*Amblyraja radiata*) is managed as a 3LNOPs stock. Total survey biomass has remained stable since 2007, and the probability that the current biomass is above Blim (defined from survey indices as Bloss (shown in Figure 9, below, as the solid line) is >95%. Recruitment in 2017 was above average. Fishing mortality is currently low, but the NAFO SC advised that catches do not increase for the 2019-2020 period because of the stock's low resilience to fishing mortality and higher historic biomass (NAFO SC 2018c).

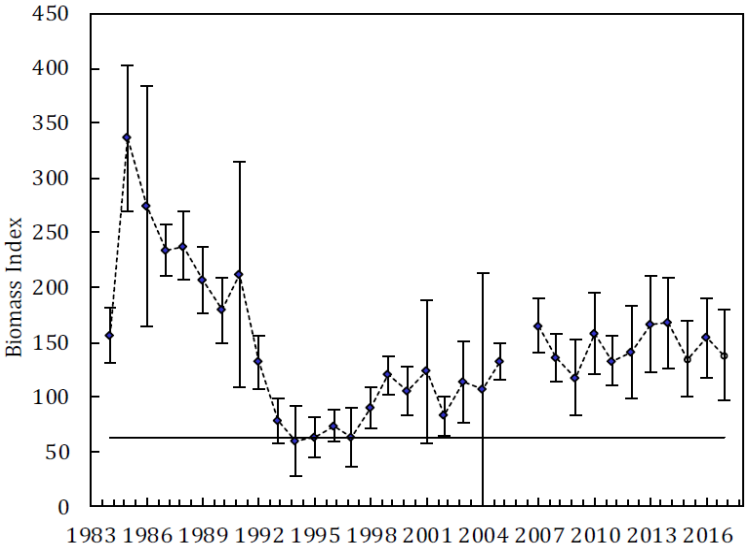


Figure 9: Biomass index for the Divisions 3LNOPs thorny skate stock. (Source: NAFO SC 2018a).

5.3.2.3 Atlantic cod (Minor primary species)

Atlantic cod (*Gadus morhua*) is managed as a 3NO stock, with fish occupying shallow parts of the bank, particularly the southeast shoal area (Division 3N) in summer and on the slopes of the bank in winter. The spawning biomass increased

noticeably between 2010 and 2015 but has subsequently declined and the 2018 estimate of 18,537 t represents only 31% of Blim (60,000 t). The 2006 year-class remains relatively strong and at age 12 in 2018 makes up more than half of the estimated SSB. Subsequent year classes are much weaker, suggesting that the medium-term prospects for the stock are not good (NAFO SC 2018e). Fishing mortality values over the past decade have been low and well below Flim (0.3) (Figure 10).

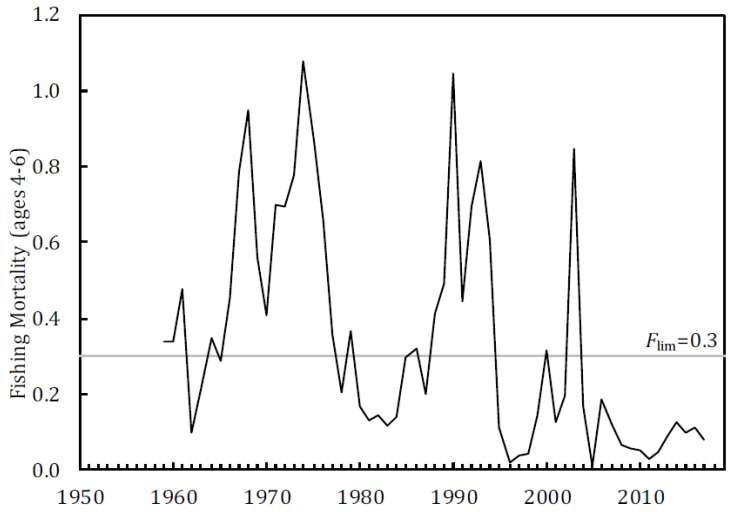


Figure 10: Fishing mortality (ages 4-6) for the 3NO Atlantic cod stock. (Source: NAFO SC 2018e).

5.3.2.4 Atlantic halibut (Minor primary species)

Atlantic halibut (*Hippolglossus hippoglossus*) is managed as a Scotian Shelf and southern Grand Banks stock in NAFO Divisions 3NOPs4VWX5Zc (DFO 2018a). Management is based on a F=0.14 harvest strategy with a cap on annual changes in TAC of 15%. The DFO Summer RV Survey (NAFO Divs. 4VWX) has been conducted every July since 1970 and is used to derive a biomass index for the 3NOPs4VWX5Zc Atlantic halibut stock, this is currently at the highest level in the time series (Figure 11).

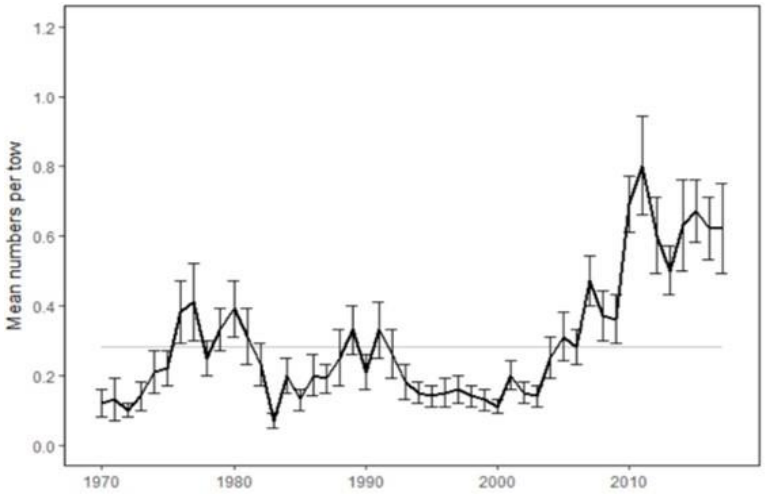


Figure 11: Plot of mean number of Atlantic halibut per tow in the DFO summer research vessel survey sets in 4VWX from 1970 to 2016. The grey horizontal line in the long-term (1970-2016) mean. Vertical bars indicate 95% confidence limits. Source: DFO 2018a.

5.3.2.5 Witch flounder (Minor primary species)

Witch flounder (*Glyptocephalus cynoglossus*) is managed as two separate stocks of potential relevance to the YTFF – a 2J3KL stock and a 3NO stock. However, while the 2J3KL witch flounder stock is widely distributed throughout the shelf area of Divisions 2J3KL in deeper channels around the fishing banks, it is found primarily in Division 3K (NAFO SC 2016a). As such, and because the YTFF occurs almost exclusively within 3NO, the 2J3KL stock is not assessed as an element.

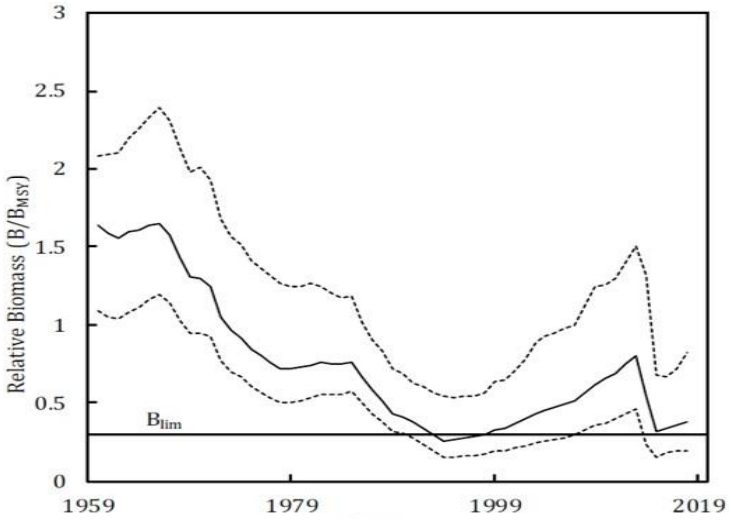


Figure 12: 3NO witch stock relative biomass 1959-2018, showing improvement from 1999-2013, then a decline. (Source: NAFO SC 2018a).

The 3NO witch stock occurs mainly in Division 3O along the southwestern slopes of the Grand Bank (NAFO SC 2018a). The stock increased between 1999 and 2013 but declined subsequently and is now at 37% Bmsy (Bmsy = 60 000 t). There is presently a 29% risk of the stock being below Blim (Figure 12) and a 4% risk of F being above Flim. Recruitment in 2017 surveys increased in the fall to a value just above the time series mean while those in the spring increased to a value approaching the time series mean. The 3NO witch fishery was reopened to directed fishing in 2015. Total estimated catch in the YTFF equates to approximately 20 t annually (based on scaled observer data for the fishery), which is very similar to the 19.3 t reported caught by the fishery in logbook data (Table 12); this catch equates to <4% of the total annual catch of witch flounder as reported to NAFO (approximately 600 t annually) for the 2014-2018 period (NAFO SC 2018a).

5.3.2.6 Greenland halibut (Minor primary species).

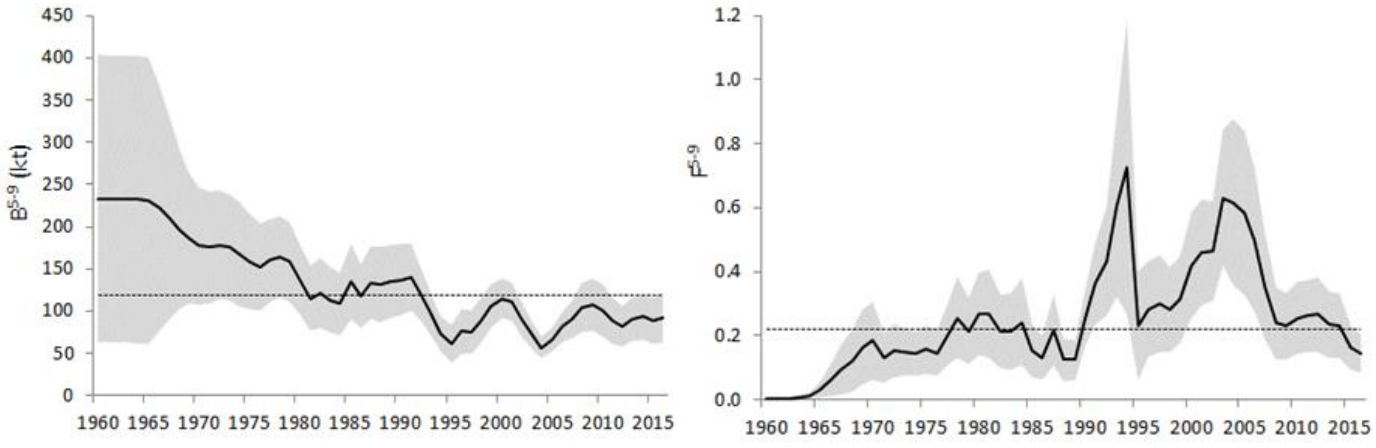


Figure 13: Exploitable biomass (B_{5-9} – left panel) and fishing mortality (F_{5-9} – right panel) for Greenland halibut over time, based on a statistical catch-at-age model. Dashed lines show Bmsy and Fmsy. (Source: NAFO SC 2017).

Greenland halibut (*Reinhardtius hippoglossoides*) is managed as a SA2 + Divisions 3KLMNO stock. Spawning biomass (10+) has declined since the beginning of the time series in the 1960s and is estimated to be below SSBmsy since the late 1990's (NAFO SC 2017). Exploitable biomass (B5-9) shows a similar trajectory and is estimated to be 91 510 t (62 410 – 120 610 t) in 2016, below B5-9msy but stable (Figure 13). Fishing mortality was above Fmsy from 1991 until 2014, but is estimated to have been below Fmsy in the last 2 years. In 2016 F was estimated to be 0.14 (0.08-0.20).

The catch of Greenland halibut in the YTFF is very low and represents a tiny proportion of the total catch of this species (Table 11).

5.3.2.7 Toothed whale (Main secondary species)

A single 'toothed whale (190 kg)' was recorded in the observer data in the 2013/14 year. No information is available on the species, but the weight suggests that the animal was from a smaller species. Candidate species include Atlantic white-sided dolphin (*Lagenorhynchus acutus*), Risso's dolphin (*Grampus griseus*), common bottlenose dolphin (*Tursiops truncatus*), short-beaked common dolphin (*Delphinus delphis*), striped dolphin (*Stenella coeruleoalba*) and white-beaked dolphin (*Lagenorhynchus albirostris*), none of which are considered to be at risk[1]. Other candidate species include Blainville's beaked whale (*Mesoplodon densirostris*), Cuvier's beaked whale (*Ziphius cavirostris*), long-finned pilot whale (*Globicephala melas*), northern bottlenose whale (*Hyperoodon ampullatus*), Sowerby's beaked whale (*Mesoplodon bidens*) and True's beaked whale (*Mesoplodon mirus*), all of which are at least several times heavier than 190 kg when adult.

It is impossible to be confident in the absence of a species identification, but it appears most likely that the animal was a dolphin, as they are relatively common in the region, around the right size at full size, and occur commonly in shelf waters. Long-finned pilot whales are also relatively common species in shelf regions, but females reach weights of 1.3 t and males can exceed 2 t. While the capture of a juvenile of a larger species cannot be ruled out, the other whale species are relatively rare and are found predominantly in much deeper water than is found on the Grand Bank.

The dolphin species identified as present in Atlantic Canadian waters are not considered to be at risk under the Species at Risk Act (SARA), have Least Concern (LC) status under the IUCN and have no status under the Convention on Migratory Species (CMS) or the Convention on International Trade in Endangered Species (CITES). As such, unless other information comes to light, the 'toothed whale' listed in the catch data is assumed to be a dolphin species and is therefore treated as a secondary main species.

5.3.2.8 Harp seal and true seal (Main secondary species)

Harp seal (*Pagophilus groenlandicus*) is not listed under SARA, is listed as 'Least Concern' under the IUCN, and has no status under the CMS or CITES. As such, it is treated here as a secondary main species.

Harp seals are restricted to the North Atlantic where they are separated into three separate populations, each of which uses a specific pupping site (DFO 2016a). The Northwest Atlantic stock, which is the largest, is located off eastern Canada and western Greenland. Overall, the Northwest Atlantic harp seal population is healthy and abundant with an estimated population of 7.4 million animals, almost six times what it was in the 1970s. There is some evidence to suggest that the population may be reaching levels close to its natural carrying capacity, which is the maximum number of individuals of a particular species that can be sustained by that species' ecosystem.

Very small numbers of harp seal were reported in observer data from the YTFF, with possibly only a single animal in each of 2013/14 (30 kg), 2014/15 (70 kg) and 2016/17 (30 kg), but possibly two animals in 2017/18 (150 kg) (Table 11). This reflects a negligible proportion of the population. Note that it is assumed that the 'true seal' identified in 2013/14 (50 kg) and 2015/16 (10 kg) are also assumed by the Assessment Team to be harp seals, and again likely representing a single animal in each of the two years.

5.3.2.9 Grey seal (Main secondary species)

Grey seal (*Halichoerus grypus*) is not listed under the Canadian Species at Risk Act (SARA), is listed as 'Least Concern' under the International Union for Conservation of Nature (IUCN), and has no status under the CMS or CITES. As such, it is treated here as a secondary main species.

Grey seals in the Northwest Atlantic form a single population, but all three Canadian herds (Sable Island, coastal Nova Scotia and Gulf of St. Lawrence) have increased in size over the last three decades, such that the Canadian population overall was estimated in 2014 (including pups) to number 505,000 animals (DFO 2018c). Grey seal was reported in the observer data only in 2013/14 (20 kg) (Table 11). Although grey seals wean at approximately 50 kg (DFO 2018c), the catch possibly represents a single juvenile. It is clear that this is essentially negligible and will not have impacted the overall Northwest Atlantic population adversely.

5.3.2.10 Secondary minor species

A large number of other secondary species occur in the catch, with sea cucumber (0.4%) being the most abundant (Table 11). For reasons of time and expense, no attempt has been made here to assess the impact of the fishery on

[1] https://wildlife-species.canada.ca/species-risk-registry/sar/index/default_e.cfm?stype=species&lng=e&index=1&common=dolphin&scientific=&population=&taxid=0&locid=15&desid=0&schid=0&desid2=0&

these species, which limits the potential score for secondary species to less than 100 (GSA3.4.1, MSC 2018) but does not prevent the certification of the fishery.

5.3.3 Endangered, Threatened and Protected (ETP) Species

5.3.3.1 Atlantic wolffish (ETP species)

Atlantic wolffish (*Anarhichas lupus*) is listed as Special Concern under the SARA and is therefore assessed as an ETP species. It is a requirement of SARA that a management plan must be prepared for species listed as Special Concern, rather than a recovery strategy as required for species listed at higher levels of conservation concern; general prohibitions under SARA that no person shall kill, harm, harass, capture or take an individual do not apply to species listed as Special Concern (DFO 2015). DFO (2018e) notes that this species occurs in the North Atlantic from the White Sea in the east to Canadian and US Atlantic waters in the west. In Canadian waters it occupies about 500,000 km^2 (DFO 2018h), and occurs from Baffin Island to the Bay of Fundy. It is the most abundant of the three wolffish species in the Northwest Atlantic Ocean and may be found from nearshore to depths of 900 m, although Albikovskaya (1982) reported that in the Newfoundland area it was most common between 100 m and 350 m where the water temperature ranged from -0.4° – 4° C.

Atlantic wolffish underwent steep declines in both abundance and area of occupancy over much of its range from the 1980s until the mid-1990s, including its historical stronghold in waters east and north of Newfoundland. Since then it has been increasing in area of occupancy (Figure 14) and abundance (Figure 15).

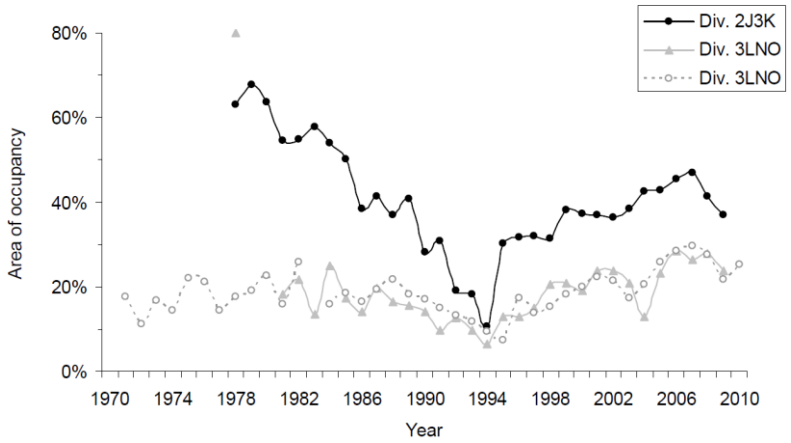


Figure 14: Area of occupancy for Atlantic wolffish in NAFO Divisions 2J3K and 3LNO in spring (1971-2010; open symbol) and fall (1978-2009; closed symbol). Source: Simpson *et al*. 2012

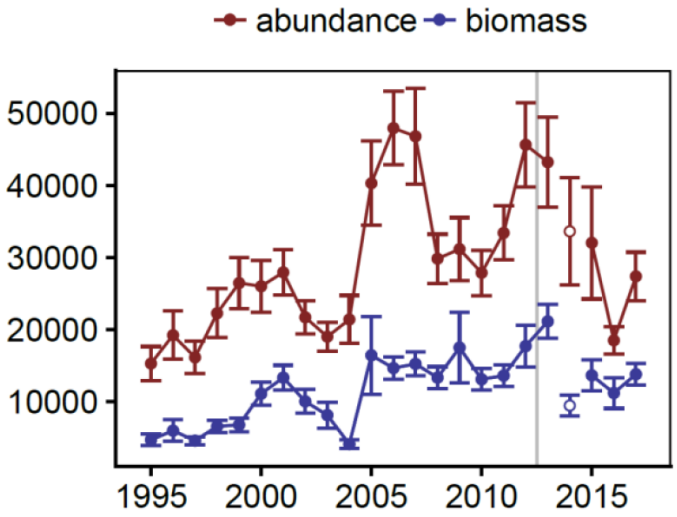


Figure 15: Research survey standardised indices of relative abundance and biomass for Atlantic wolffish in the Division 2J3KLNO fall survey. Source: Rideout & Ings 2018

DFO 2018g notes that of the three species of wolffish, the indices of relative abundance and distribution have varied the least over time for Atlantic Wolffish, especially on the Grand Banks (3LNO), but recent data, including for northeast Newfoundland and Labrador shelves (2J3K) show improvement since the 1990s low (Figure 14 and Figure 15).

There is not a requirement under SARA to return Atlantic wolffish to the water where caught, but nevertheless this is common practice in many fisheries and is the case in the YTFF for the last three years. Although it is likely that around 70 t of Atlantic wolffish are taken annually in the YTFF (Table 11), the Assessment Team notes that releasing live wolffish has good potential for success, because wolffish do not have swim bladders (thus do not suffer barotrauma in the way that fish with swim bladders do when retrieved from depth) and the majority of captured wolffish are reported to be very lively when first captured (DFO 2004). Post-capture survival was tested in the YTFF, where 92-100% of the Atlantic wolffish tested survived after tows of ≤2.5 hours and air exposure of ≤2 hours (Grant & Hiscock 2014).

5.3.3.2 Northern wolffish (ETP species)

Northern wolffish (*Anarhichas denticulatus*) is listed as Threatened under the SARA and is therefore assessed as an ETP species. DFO (2018g) notes that this species occurs in the North Atlantic from the Barents Sea in the east to Canadian waters in the west. It is only occasionally observed in Baffin Bay and the Davis Strait to the north, and in the waters of the Gulf of St. Lawrence and the Scotian Shelf to the south. DFO 2018h stated it occupies about 500,000 km^2 in Canadian waters but is most abundant in the deep waters of the continental shelf in the centre of its range, off northeastern Newfoundland and on the Labrador Shelf and to a lesser extent along the shelf edge of the Grand Bank. It may be found in depths of approximately 50 – 1,500 m, but Albikovskaya (1982) reported that in the Newfoundland area Northern wolffish occurred more frequently over a greater range of depth than the two other wolffish species, and mean catches generally increased with depth from 151 to 600 m at preferred temperatures from 1.6˚C to 4.0˚C.

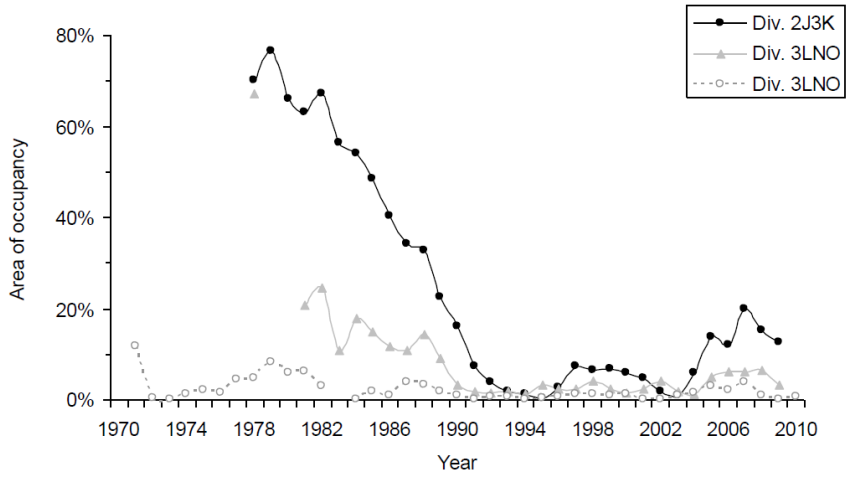


Figure 16: Area of occupancy for Northern wolffish in NAFO Divisions 2J3K and 3LNO in spring (1971-2010; open symbol) and fall (1978-2009; closed symbol). Source: Simpson *et al*. 2012

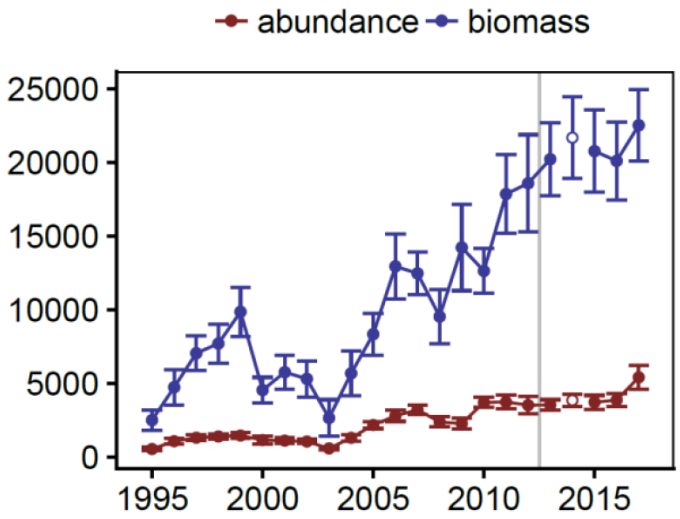


Figure 17: Research survey standardised indices of relative abundance and biomass for Northern wolffish in the Division 2J3KLNO fall survey. Source: Rideout & Ings 2018

Northern Wolffish showed the largest decline in area of occupancy of all three wolffish species (>99%), with its range decreasing steadily from 76% in 1977 to <1% in 2003, with trends then reversing so that the range extended to 20% in the most recent year for which data are reported (Figure 16), together with increases in abundance and biomass (Figure 17). These have been in parallel with recovery measures, including mandatory release of individuals taken as bycatch under SARA (Simpson *et al*. 2012). Catches of northern wolffish in the YTFF are negligible, with an estimated 100 kg taken annually (Table 11).

5.3.3.3 Spotted wolffish (ETP species)

Spotted wolffish (*Anarhichas minor*) is listed as Threatened under the SARA and is therefore assessed as an ETP species. DFO (2018f) notes that this species occurs in the North Atlantic from Norway in the east to Canadian waters in the west. In Canadian waters it occupies about 500,000 km^2 (DFO 2018h), and occurs from the far north to the Scotian Shelf and the Bay of Fundy; it is less common than Atlantic wolffish, and may be found in depths of approximately 50 – 1,000 m. Albikovskaya (1982) reported that in the Newfoundland area it was most common between 100 m and 300 m in water temperatures of -0.4^o C up to 6^o C.

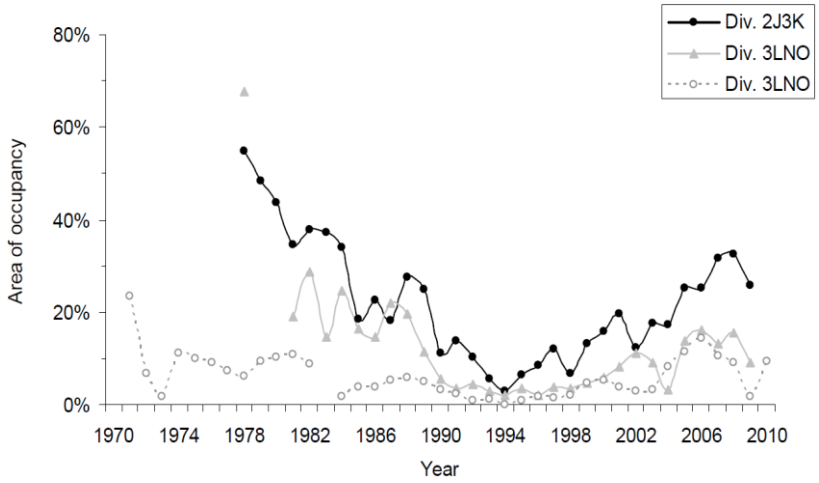


Figure 18: Area of occupancy for spotted wolffish in NAFO Divisions 2J3K and 3LNO in spring (1971-2010; open symbol) and fall (1978-2009; closed symbol). Source: Simpson *et al*. 2012

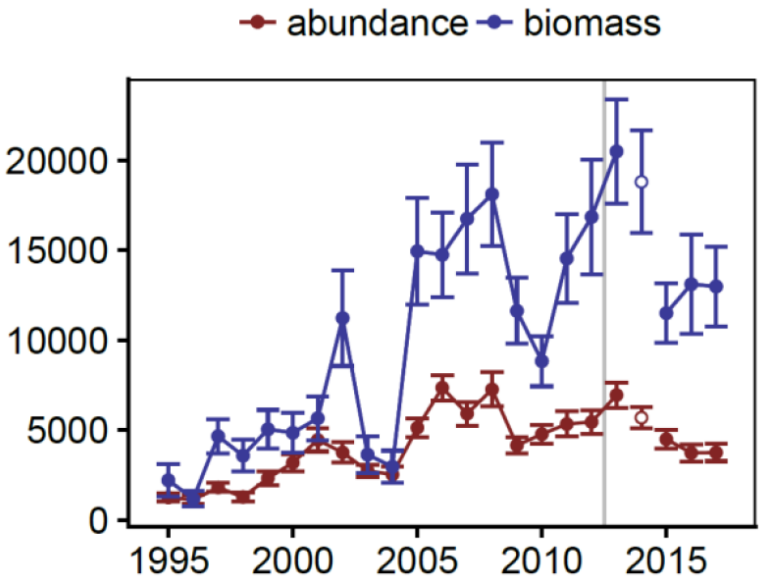


Figure 19: Research survey standardised indices of relative abundance and biomass for spotted wolffish in the Division 2J3KLNO fall survey. Source: Rideout & Ings 2018

DFO (2018f) notes that spotted wolffish underwent strong declines from the late 1970s until the mid-1990s, but since then there has been some recovery over most of its Canadian range. This is indicated by both increases in area of occupancy and abundance. These increases parallel a reduction in bottom fisheries that had a high incidental catch of this species, as well as introduction of recovery measures including mandatory release in 2004 (DFO 2004).

Indices of distribution (Figure 18) and relative abundance and biomass (Figure 19) for spotted wolffish in NAFO Divisions 3LNO have increased since the lows of the early 1990s. The amount of spotted wolffish caught in the YTFF is essentially negligible, with only 10 kg recorded in observer data for the entire 5-year period.

5.3.4 Habitats

The seabed of the Grand Bank is essentially made up of sediments draped over topography created during a rift phase of seafloor spreading (Mason et al.,1984 and Figure 20, below).

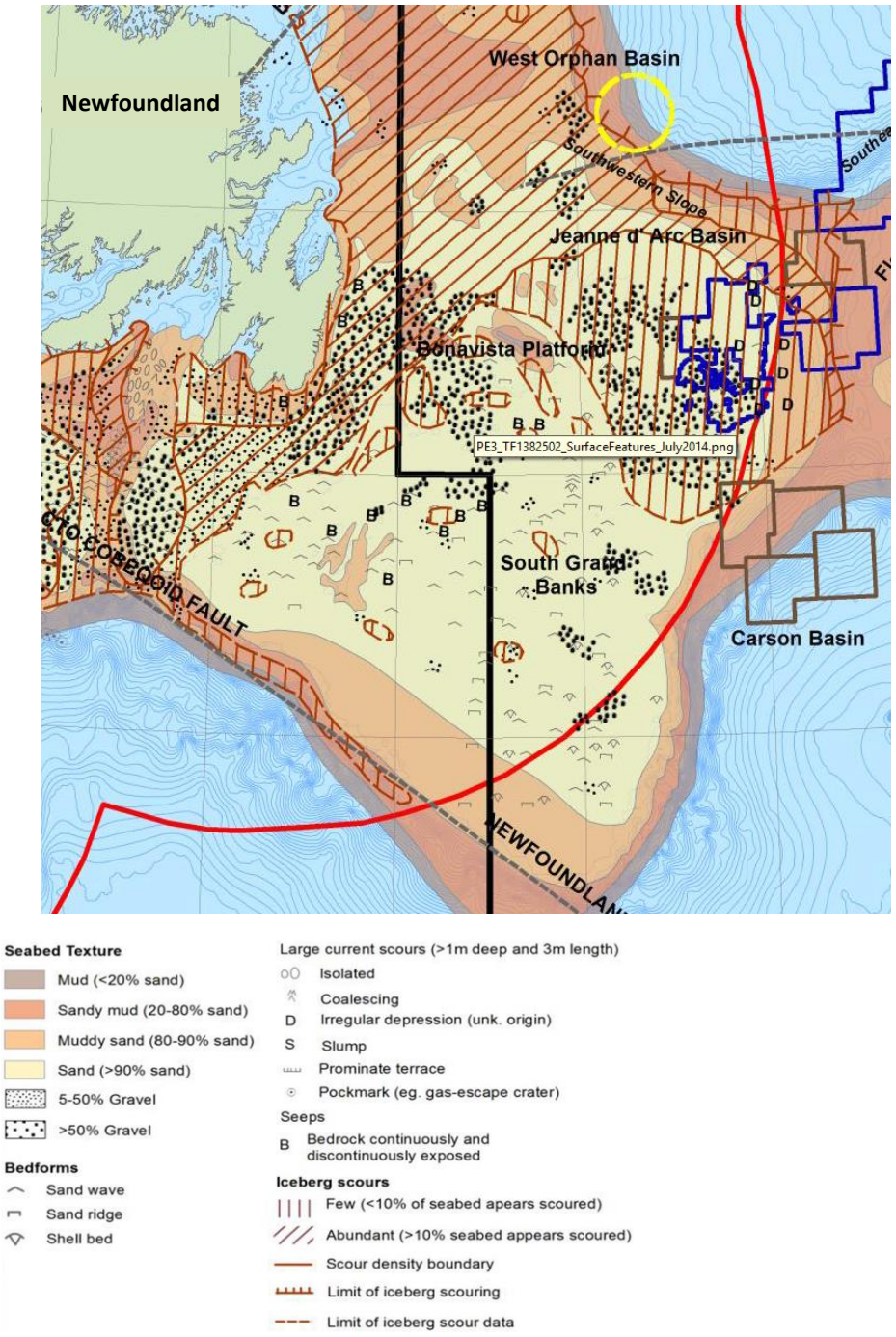


Figure 20: Geological characteristics of the Grand Bank. (Source: Adapted from C-NLOPB 2014).

The shallow seabed of the Grand Bank is a high-energy environment, with frequent winter storms and accompanying large waves. Modelling work has been conducted on the likelihood of seabed sediments in the Grand Bank area being mobilised by wind, wave and current stressors (Geological Survey of Canada, pers. comm., and see Figure 21, below). This supports the suggestion that some of the most mobile sediment areas (shaded blue) are found in the areas of the Grand Bank that are fished by the YTFF fleet.

Natural disturbance is also caused by icebergs, with an average of more than 540, ranging in size from small growlers to large icebergs of greater than 1Mt, making it into the Grand Banks area annually from 1997 – 2006 (McClintock et al. 2007). Some of these icebergs are large enough to contact the seabed, and plough marks of greater than 3 km length, and up to 80 m wide and 10 m deep have been observed (Barrie et al. 1992). The Geological Survey of Canada maintains a database of more than 5,000 ice scour features in the Grand Banks area.

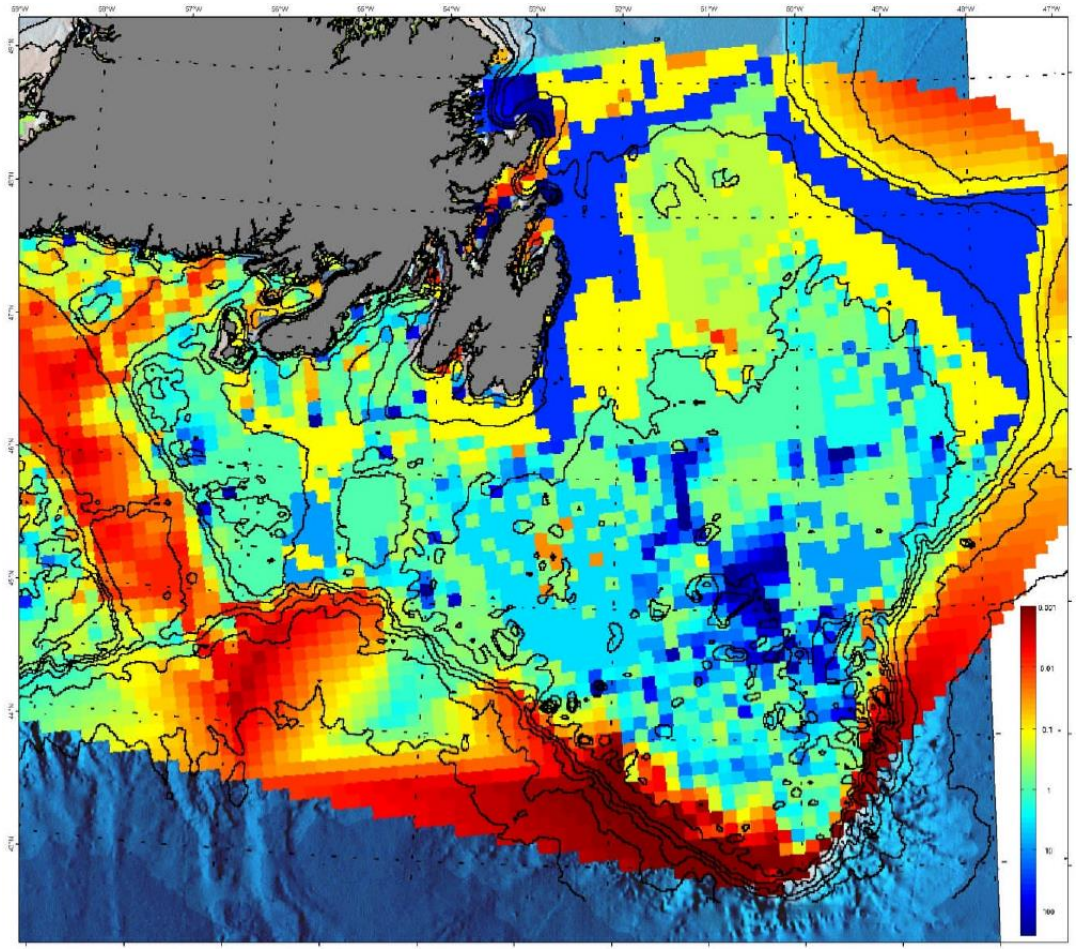


Figure 21: Predicted likelihood (%probability) of seabed stress sufficient to mobilise sediments in the area of the Grand Bank. NB: This analysis is based on past wind, wave and currents over a three-year period, the stress this has on the seabed, and the potential effect this has on the sediment grain size at any location, based on a 0.1° resolution (Geological Survey of Canada, pers. comm.). The predictive success of this model has not been determined to the assessment team's knowledge.

Fishing with towed bottom fishing gears, such as those used by the YTFF fleet, can result in significant and long-lasting impacts to benthic habitats and communities (Jennings & Kaiser 1998). In particular, chronic fishing disturbance can cause the removal of high-biomass species that are composed mostly of emergent seabed organisms that increase the topographic complexity of the seabed and have been shown to provide shelter for fish and other species (Kaiser et al. 2002). However, the nature, scale and recovery time of these impacts vary widely depending on a combination of factors including the frequency of use, the previous history of towed bottom gear use at a site, the benthic habitat and community composition, and the level of natural perturbation that the area is subject to (DFO 2006). In general, communities in areas with higher levels of natural perturbation (such as found in the shallow areas of the Grand Bank), are more resilient to towed gear use because of being adapted to regular disturbance (Hiddink et al. 2006).

A study of direct trawling impacts was conducted on the northern part of the Grand Bank, in an area of relatively stable sand in deeper water (c. 130 m) than is typically fished for yellowtail flounder Gordon Jr. et al. 2002). This study concluded that the rich macrobenthic community in this area had recovered fully within one year after intensive fishing, although immediate impacts were readily identifiable. These visible impacts included damage to biogenic structures such as tubes, burrows and mounds, the creation of trawl tracks and the destruction of epibenthic and shallow burrowing infauna. While considerable fishing activity has occurred across the south-eastern portion of the Grand Bank in NAFO area 3LNO historically, including by vessels targeting yellowtail flounder, the shallower and sandy-gravelly sediments and communities of this area are likely to recover more quickly from the impacts of trawling.

This is consistent with results obtained from meta-analyses of trawling studies conducted by Hiddink et al. (2017), which allowed for estimates of recovery times for the biomass and numbers of animals in the benthic biota to be derived, based on the typical substrate types fished by trawls under various levels of initial community depletion. Assuming that biota was reduced to 0.5 carrying capacity (K) by otter trawling, community biomass would be expected in approximately 3 years (5-95% uncertainty level = approximately 1-9 years). Even under very high levels of depletion, and assuming the extreme range of probability, recovery back to 0.95 K would be expected following fishing well within 20 years.

Sciberras et al. (2018) also conducted a meta-analysis, with data from 122 experimental gear impact studies employed in their study, including those that addressed impacts from otter trawling and beam trawling. As with the Hiddink et al. (2017) study, the majority of the studies included in this meta-analysis were from north-western Europe and northeastern United States, including those that addressed impacts from otter trawling and beam trawling. Community recovery to control conditions was faster for communities' subject to fishing by gears that penetrated less into the sediment (i.e. beam and otter trawling) than by gears that penetrated deeper in the sediment and killed a larger fraction of biota (i.e. dredging, raking and hydraulic dredge). However, recovery times in the studies included by Sciberras et al. (2018) were determined to be generally faster because the experimental manipulations generally involved disturbance of smaller areas of seabed.

For the previous reassessment of the YTFF (Blyth-Skyrme et al. 2015), the annual spatial footprint of the YTFF was calculated for the period 2000-2014 (Spatialanalysis 2015). For the 2000-2011 period, landings data were available linked to the start location of each fishing event / tow. For the 2012-2014 period, data on the precise location of each tow track were available. In order to undertake an analysis of the frequency of fishing in different locations, the Grand Bank was then divided into a 6-minute grid for the earlier data (such that each cell equated to approximately 25 sq. NM), and a 3 minute grid for the most recent data (such that each cell equated to approximately 6.25 sq. NM). Given that the area of the Grand Bank of less than 100 m depth was calculated as being 41,549 sq. NM, this meant the analysis of fishing effort was conducted on 1,641 6-minute grid cells for 2000-2011, and 6,564 3-minute grid cells for 2012-2014.

The annual footprint of the fishery was then estimated on the basis of effective swept width of the gears in use. This was estimated to average 115m for the period 2000 - 2011 based on information from fishing skippers, but was estimated to average 70 m for 2012, 58 m for 2013 and 48 m for 2014, based on data from the Trackwell Ltd. systems in use on each vessel (see https://vmsfisheries.com/vessel-monitoring-solutions/vessel-monitoring-system/ for more information on the vessel tracking and elogbook systems in use). The decrease in swept area in the recent period was because the Aqviq and Ocean Breaker vessels were equipped with 'flying doors' and modified sweeps after May 2013, in order to reduce bottom contact.

For the data analysis, the swept area in any cell was computed as the sum of either the swept areas, or the cell area itself if the swept area within the cell was greater than 100% of the area (as occurred in the cells accounting for the middle and top third of the catch in the 2000-2011 period. The data show that, for the three most recent years in the analysis, the average swept area was 415 NM^2, equating to 1.0% of the area <100 m, while the maximum swept area in the same period was 587 NM^2, in 2013 (Table 13).

Table 13: Grid-cell based analysis of average swept area and cell overlap, 2012-2014, with grid-cells binned by catch quantity (bottom, middle and top third of cells that contributed to catches). (Source: (Spatialanalysis 2015). NB. Analysis for 2012-2014 undertaken on a 3 Minute cell size on all habitats on the Grand bank at less than 100 m water depth. Swept area for each cell was computed as either the sum of the swept areas, or the cell area itself if the swept area exceeded 100% of the cell area.

	Cells in Bottom 3rd of Catch			Cells in Middle 3rd of Catch			Cells in Top 3rd of Catch			Total for Cells Fished			Total for All Cells		
	Cell Area (NM^2)	Swept Area (NM^2)	% Cell Area	Cell Area (NM^2)	Swept Area (NM^2)	% Cell Area	Cell Area (NM^2)	Swept Area (NM^2)	% Cell Area	Cell Area (NM^2)	Swept Area (NM^2)	% Cell Area	Cell Area (NM^2)	Swept Area (NM^2)	% Cell Area
2012	1,330	89	7	120	72	60	57	65	113	1,508	218	14.5	41,549	218	0.5
2013	3,734	248	7	352	192	55	147	177	120	4,232	587	13.9	41,549	587	1.4
2014	3,030	183	6	282	140	50	116	130	112	3,428	438	12.8	41,549	438	1.1
Average 2012-2014	2,698	173	6	251	135	54	107	124	116	3,056	415	13.6	41,549	415	1.0

The habitats of the shallow Grand Bank are estimated to be mainly sand (79.6%), with smaller amounts of muddy sand (17.6%) and then sandy mud (0.4%) (Spatialanalysis 2015). Based on attributing these sediment types to the different cells used in the effort analysis, and looking at hours fished by the YTFF in each year over the period 2012-2014, the YTFF was prosecuted for an annual average of 4,794 hours (range 1,990-6,567 hours), with 4,328 hours fished on sand, 455 hours fished on muddy sand, and 11 hours fished on sandy mud (Table 14). This equated to fishing occurring in 8.1% of the sand cells, 4.0% of the muddy sand cells and 4.3% of the sandy mud cells. Not all cells in which fishing occurred were fished in their entirety, and the average annual area fished was just 1.0% of the Grand Bank area of < 100 m depth.

Table 14: Hours fished by the YTFF in different seabed texture categories for 2012-2014. NB. Analysis for 2012-2014 undertaken on a 3 Minute cell size, on all habitats on the Grand Bank at less than 100 m water depth. Source: (Spatialanalysis 2015)

		Fished			Not Fished				Total	
		Cell Count		Effort	Cell Count		Area(NM2)		Cell Count	Area
		Value	%	Hours	Value	%	Value	%	Value	NM2
2012	Sand	237	4.5	1,989	5,017	95.5	31,587	95.5	5,254	33,088
	Muddy Sand	1	0.1	6	1,130	99.9	7,304	99.9	1,131	7,311
	Sandy Mud	0	0.0	0	179	100.0	1,150	100.0	179	1,150
2013	Sand	575	10.9	5,699	4,679	89.1	29,414	88.9	5,254	33,088
	Muddy Sand	73	6.5	853	1,058	93.6	6,837	93.5	1,131	7,311
	Sandy Mud	13	7.3	16	166	92.7	1,066	92.7	179	1,150
2014	Sand	465	8.9	5,295	4,789	91.2	30,112	91.0	5,254	33,088
	Muddy Sand	60	5.3	507	1,071	94.7	6,923	94.7	1,131	7,311
	Sandy Mud	10	5.6	16	169	94.4	1,086	94.4	179	1,150
Average 2012-2014	Sand	426	8.1	4,328	4,828	91.9	371	91.8	5,254	33,088
	Muddy Sand	45	4.0	455	1,086	96.1	7,021	96.0	1,131	7,311
	Sandy Mud	8	4.3	11	171	95.7	1,101	95.7	179	1,150

Gilkinson (2013) looked at community composition across the Grand Banks a total of 12 phyla were represented with three phyla, (Annelida, Arthropoda, and Mollusca) combining for 86% of all recorded taxa. The Annelida was the most species rich phylum (39% of all species) with polychaetes accounting for 99% of all annelid taxa, amphipods for 60% of arthropod taxa while gastropods and bivalves accounted for 51% and 43%, respectively, of mollusc taxa. This author reported that this pattern of dominance in species richness by these three phyla is typical of northwest Atlantic continental shelves dominated by sandy seabeds.

The Annelida and Arthropoda, which were dominant in terms of species richness, were minor components of total biomass whereas the species-poor Echinodermata dominated biomass (58% of the total), and the sand dollar, *E. parma* in particular (69% of total echinoderm biomass). Although the dominance of *E. parma* in terms of Grand Banks benthic biomass on sandy seabeds has been documented for many years, more recent deeper penetrating hydraulic grab sampling has meant that it is now recognised that deep-burrowing bivalve molluscs are also an important contributor to benthic biomass on Grand Bank sandy seabeds resulting in significantly higher recent estimates of benthic biomass.

Using the MSC's substratum, geomorphology and biota (SGB) criteria, (Table GSA6, MSC 2018a), the commonly encountered habitat for the assessment of the YTFF is considered to be as follows:

- Substratum: Fine (Sand)
- Geomorphology: Flat (current rippled, wave rippled)
- Biota: Small erect / encrusting / burrowing (infaunal bioturbators).

Minor habitats are considered to be similar to the commonly encountered habitat but have muddy sand and sandy mud as the substratum type.

5.3.4.1 Vulnerable marine ecosystems (VMEs)

Vulnerable marine ecosystems (VMEs) are as defined by the FAO (SA3.13.3, MSC 2018a), but generally comprise habitats with high functional significance, structural complexity and fragility. Uniqueness or rarity and potential for recovery are also considered.

Work has been undertaken to map coral, sponge and seapen concentrations throughout Atlantic Canada (e.g., Kenchington *et al*. 2010, Beazley *et al*. 2016, Guijarro *et al*. 2016). These studies used information on habitat observations from commercial fishing operations and research surveys (i.e., they employed both fishery-dependent and more systematic sampling). In Divisions 2+3KLMNO, the data show that these species are concentrated along a narrow band of the midslope (Figure 22). There is also widespread distribution of sponges into shallower water of the upper slope and lower shelf, but the shallow parts of Grand Bank have lower abundance (Figure 22, top right).

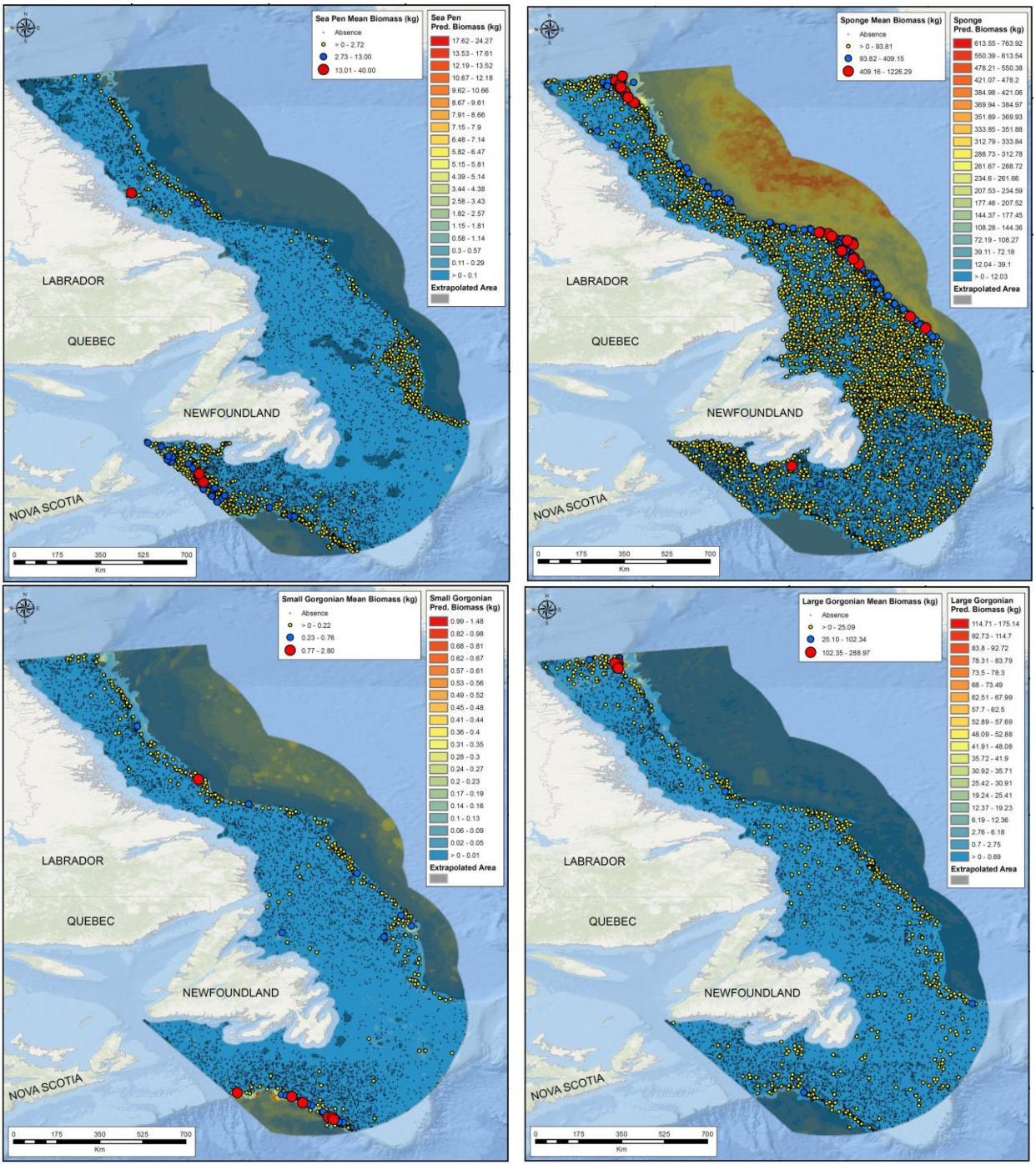


Figure 22: Predicted biomass (kg) of sea pens (top left), sponges (top right), small gorgonians (bottom left) and large gorgonians (bottom right) in the Newfoundland and Labrador region.
Derived from catch recorded in DFO multispecies surveys, DFO/industry Northern shrimp surveys, and Spanish groundfish trawl surveys conducted in the Newfoundland and Labrador Region between 2003 and 2015. Also shown are the mean biomass values per grid cell and areas of model extrapolation. Source: Guijarro et al. 2016.

In seeking to apply the Policy for Managing Impact of Fishing on Sensitive Benthic Areas (DFO 2009b), the habitat mapping effort started by Kenchington *et al*. 2010 was updated by Kenchington *et al*. 2016, who employed kernel density estimation, applied to research vessel trawl survey data in each Canadian east coast biogeographic unit (or portions thereof), to identify 'significant benthic areas' (SBAs) for four species groups – seapens, sponges, small gorgonians and large gorgonians. This work incorporated new survey data collected from 2009 to 2015. Significantly, no SBAs were identified in the area fished on the shallow Grand Bank by the YTFF (Figure 23).

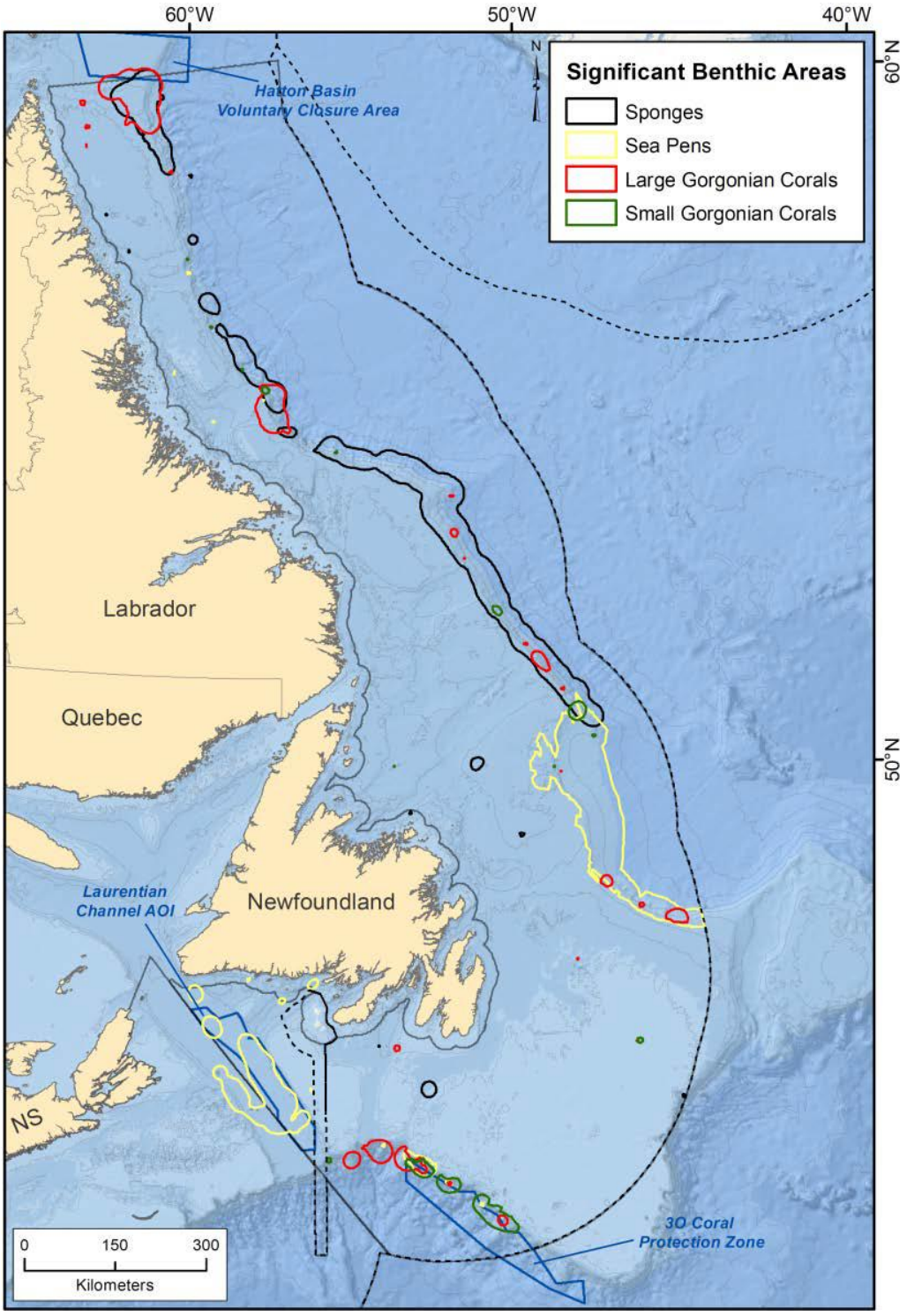


Figure 23: Location of SBAs in Canadian waters of Divisions 2+3KLMNOP. Source: Kenchington *et al*. 2016.

VMEs have also been identified by NAFO, with bottom fishing activities prohibited in seamount closure areas (shaded blue in Figure 24) and sponge, coral and seapen closures (shaded red in Figure 24). All of these sites occur in deep water, however, well in excess of the depth fished by the YTFF (for example, the 'Tail of the Bank 1' VME occurs in approximately 2,000 m of water, while the 3O Coral Closure starts on the continental slope at 800 m depth – FAO 2019).

Based on the information for VMEs in Canadian and international waters, it is considered that the YTFF, which occurs in water of less than 200 m at all times, does not come in to contact with VMEs.

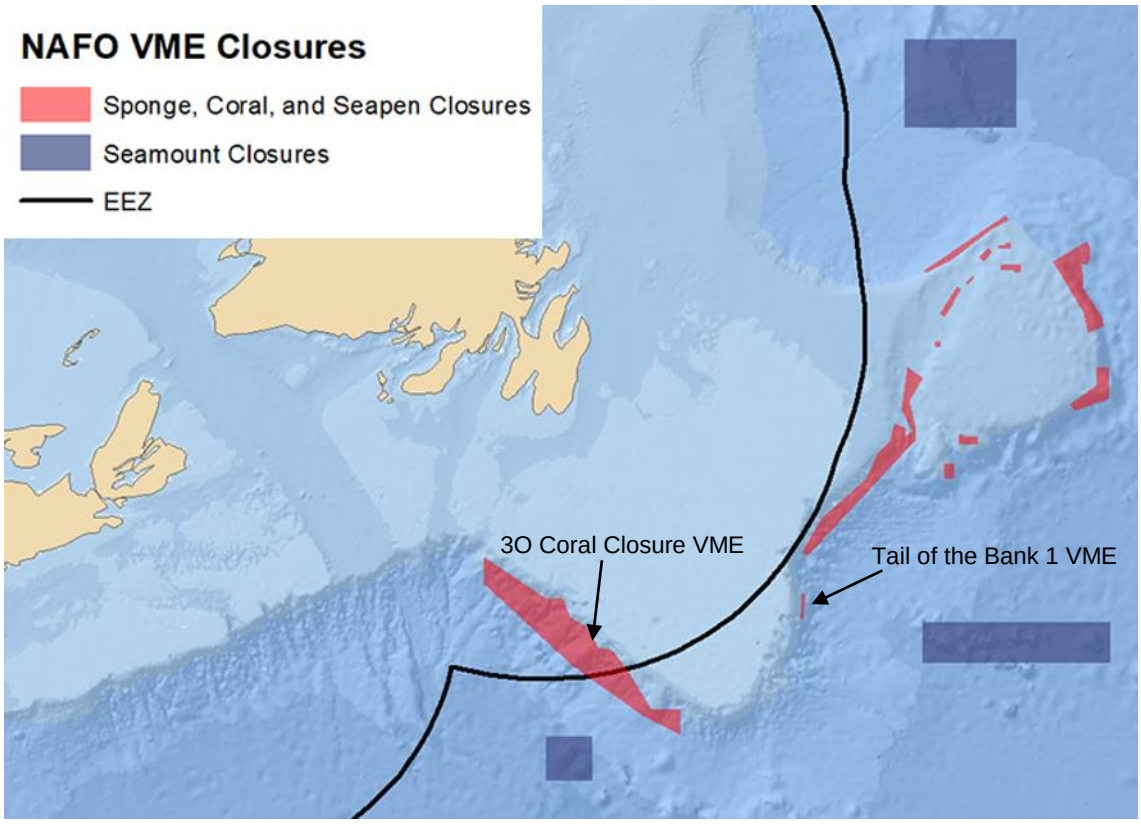


Figure 24: NAFO VME closures. Source: Adapted from https://www.nafo.int/Fisheries/VME

The assessment team notes that we were informed at the site visit in discussion with NAFO staff that work was on-going within the NAFO Scientific Council's Working Group on Science and Assessment (WG-ESA) and that they had met in November 2019 with the aim of reviewing and updating the science and understanding on VME presence. The WG-ESA report of their November meeting was not publicly available at the end of the site visit, i.e. the point at which the "line is drawn" for available information which is considered by the team in their scoring of the fishery. We note the request from the Commission for the Scientific Council to report on the work of the WG-ESA at the annual meeting in 2020. Assuming this takes place and the OCI Yellowtail Flounder Fishery is re-certified against the MSC Standard, it is anticipated that the outcome of the WG-ESA and any changes made to VMEs would be reviewed at the first annual surveillance audit.

5.3.5 Ecosystem

The focus of scoring the ecosystem 'outcome' Performance Indicator (PI 2.5.1) is the impact of the fishery on the 'key ecosystem elements'. These are defined by the MSC 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. They are features most crucial to maintaining the integrity of its structure and functions and the key determinants of the ecosystem resilience and productivity" (SA3.16.3, MSC 2018a). Further MSC guidance states that, "key ecosystem elements may include trophic structure and function (in particular key prey, predators, and competitors), community composition, productivity pattern (e.g. upwelling or spring bloom, abyssal, etc.), and characteristics of biodiversity" (GSA3.18.1, MSC 2018a). The Grand Bank is then located within the Newfoundland and Labrador Shelves bioregion (DFO 2009), so this is considered to be the ecosystem within which the YTFF exists.

The circulation pattern through most of the Newfoundland and Labrador Shelves region is dominated by the south-eastward flowing Labrador Current. This splits around the Grand Banks system with an inshore (western) arm that runs along the shelf in the trough between the coast and the offshore banks, and a much larger offshore (eastern) arm that runs as a jet along the outer slope (Figure 25).

The salinity and strength of the Labrador Current varies interannually and is influenced by freshwater runoff and ice melt to the north. A strong Labrador Current is associated with more extensive ice coverage in winter and spring across the Newfoundland and Labrador Shelves; melting of this ice contributes to stratification that develops between a surface layer of lower salinity water that warms through the summer and a cold intermediate layer (CIL) of water with a temperature of <0º C (Bernier et al. 2019). Typically, warmer (2-4º C) and more saline slope waters underlie the CIL across large areas of the Newfoundland and Labrador Shelves (Rice 2002).

The extent to which the bottom portion of the water column and the seafloor are covered with slope versus CIL waters influences the biological components of the ecosystem strongly. In particular, the stratification between the cold, relatively low salinity surface water and warm, relatively saline CIL water inhibits mixing within the water column, which affects how nutrients and species are distributed at local to regional scales; in turn, this affects productivity within the system (Colbourne et al. 2018, Bélanger et al. 2018, Bernier et al. 2019).

Probably the best-known example of flux within the Newfoundland and Labrador Shelves bioregion is the decline of northern cod (i.e., the 2J3KL stock); this historically important fishery collapsed in the early 1990s and has been under moratorium since 1992. It is now agreed generally that the collapse was driven by overfishing, but was exacerbated by a period of extremely harsh environmental conditions, with extensive and persistent sea ice, deep and broad distribution of the CIL, and extreme cold anomalies (Rice 2002, and see Figure 26). Other temperate groundfish stocks in the region collapsed at the same time (e.g., 2J3K and 3LNO American plaice, 2J3KL and 3NO witch, as well as 3LNO yellowtail flounder), but boreal species including Greenland halibut declined relatively little, while crab and shrimp stocks increased greatly in abundance and distribution (Rice 2002).

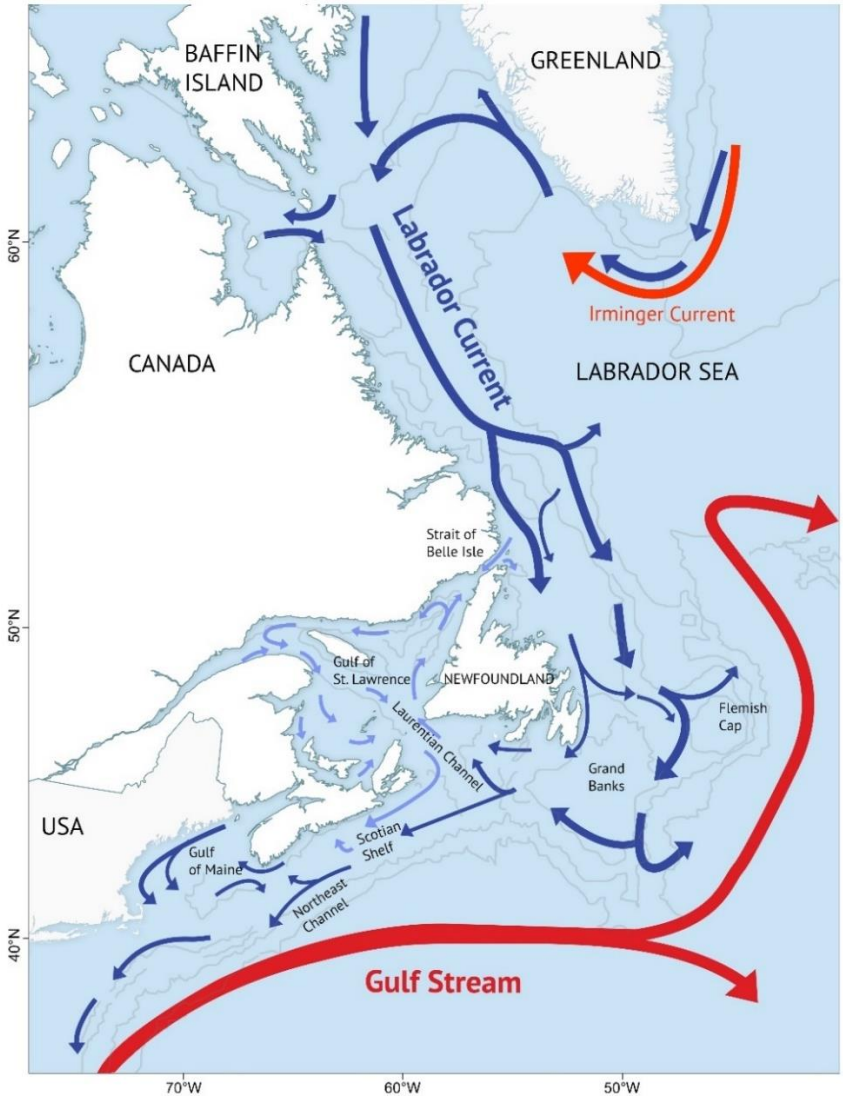


Figure 25: Currents of the Canadian Atlantic, showing the cold Labrador Current from the north, the warm Gulf Stream from the south, and the relatively warm Irminger Current. Source: Bernier *et al*. (eds.) 2019.

The relationship between primary productivity and productivity in higher trophic levels is complex, however. Conditions in the last two decades have generally been warmer, which leads to weaker CILs and reduced ice extent (Figure 26). And, while the crab and shrimp stocks in southern areas of the bioregion appear now to be in decline, the groundfish stocks (and particularly northern cod) have not rebounded strongly despite the moratorium on fishing (NAFO SC 2018c).

Different zooplankton species and groups increase and decrease in abundance over time in response to abiotic and biotic factors. Zooplankton biomass, primarily driven by *Calanus finmarchicus*, which is a key prey item for fish species during their pelagic stages, remained well below normal throughout the Canadian Atlantic for the third consecutive year to 2017 (Colbourne et al. 2018, Bélanger et al. 2018, and see Figure 27).

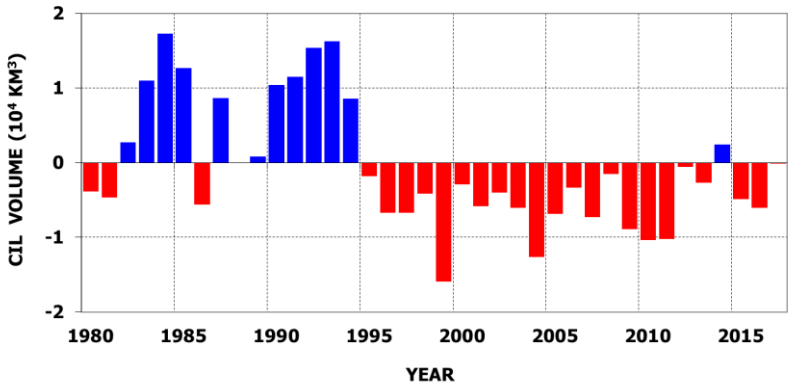


Figure 26: Time series of the CIL (<0° C) volume anomaly on the Newfoundland and Labrador Shelf in NAFO Divisions 2J3KL. Note no CIL data were available in 1988. Source: Colbourne et al. 2018.

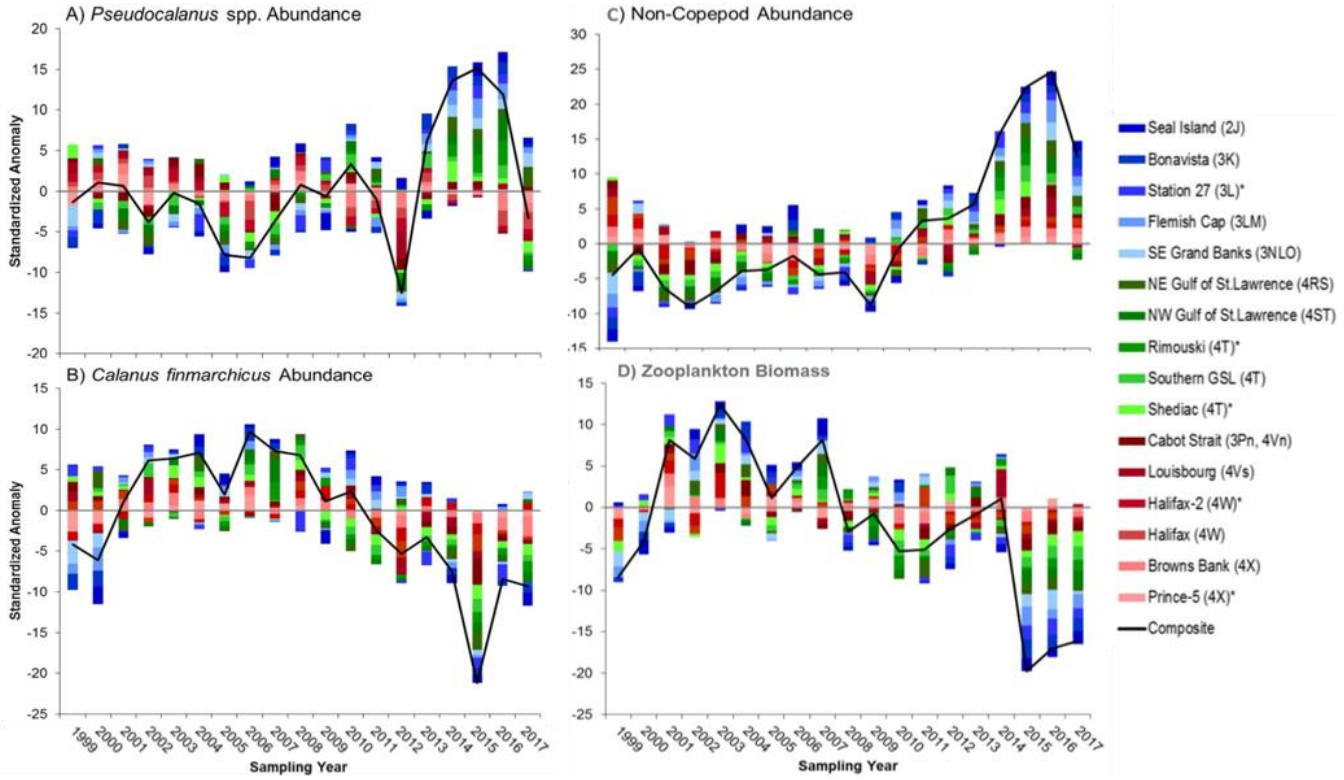


Figure 27: Time series of a) *Pseudocalanus spp*. copepods, b) *Calanus finmarchicus*, and c) non-copepod abundance anomalies, and d) zooplankton biomass anomalies, from different oceanographic sections and high frequency sampling stations from the Atlantic Zone Monitoring Program during 1999-2017. The contribution from each of the NAFO Subareas to the cumulative anomaly of a given year is represented by colour and height of the vertical bar. The solid black line is the cumulative (composite) anomaly across all Subareas in a given year. Source: Bélanger et al. 2018.

One particular consequence of changing primary and secondary productivity patterns appears to have been reduced early-life survival and prolonged stock recovery of northern capelin, which is a keystone forage species for many species of finfish, seabirds, and marine mammals in the waters off Newfoundland and Labrador (Murphy *et al*. 2018). This impact of the low abundance of capelin on groundfish, and particularly on cod as the major groundfish species of the Newfoundland and Labrador Shelves, has been studied extensively (e.g. Lilly 1994, Sherwood et al. 2007).

The effect of fishing on groundfish stocks in the region was investigated by NAFO SC 2013, where work was undertaken to determine the trophic ecology/species interactions on the Newfoundland and Labrador Shelves and Grand Bank (NAFO Divisions 2J3KLNO). For this study, the ecosystem production potential (EPP) for the region was calculated, where EPP for a region was defined as a function of the amount of primary production produced, the fraction of this

production retained and available to higher trophic levels, the transfer efficiency between successive trophic levels, and the number of trophic levels through which energy must be transferred. Overall, the model considered that sustainable ecosystem exploitation rates could not be higher than the ratio of new primary production to total primary production.

In order to understand the impact of fishing, a groundfish fisheries production potential (FPP – i.e., the production potential available to groundfish fisheries) was defined as the sum of the benthivore and piscivore production potentials. Two fishing scenarios were then defined that corresponded to ecosystem exploitation rates of 20% and 30%, which provided an initial envelope for what could be considered a sustainable level of fishing within the ecosystem. The model was then run with exploitation rates applied to all nominally fishable species/groups, while assuming that the impact of fishing lower in the food web would impact the productivity of higher trophic levels. The results of the study indicated that exploitation rates within the Newfoundland and Labrador Shelves and Grand Bank region have never exceeded the 30% EPP threshold, but they do show that catches exceeded the groundfish FPPs in the 1960s and 1970s, and exceeded the 20% groundfish EPP in the 1980s. Since then, catches declined, and were below the 20% groundfish FPP rate for the 1990-2012 period (2012 being the latest year covered by the study). It was noted by the authors that lower fisheries exploitation may have been a contributing factor in the positive trends observed in the groundfish community (NAFO SC 2013).

Nevertheless, it is noted that, since the NAFO SC (2013) report was published, nutrient and chlorophyll levels have declined, which may indicate that Atlantic ecosystems now have a lower production potential than in the previous decade. Since 2015, most parts of the region had phytoplankton and zooplankton levels well below average (Bernier *et al*. 2019).

For the purposes of this assessment, the key ecosystem elements for the YTFF in the Newfoundland and Labrador Shelves bioregion are considered to be: i) productivity patterns, with the Labrador Current as the dominant physical oceanographic feature, and ii) groundfish community structure and function, with yellowtail flounder as a constituent part.

Table 15: Principle 2 Scoring Elements

Component	Scoring elements	Main / Minor	Data-deficient
Primary	American plaice	Main	No
	Thorny skate	Main	No
	Atlantic cod	Minor	No
	Atlantic halibut	Minor	No
	Witch flounder	Minor	No
	Greenland halibut	Minor	No
Secondary	Whale / toothed whale	Main	No
	Harp seal / true seal	Main	No
	Grey seal	Main	No
	Minor species not scored	Minor	Not scored
ETP	Atlantic wolffish	N/A	No
	Northern wolffish	N/A	No
	Spotted wolffish	N/A	No
Commonly encountered habitat	Fine (Sand) Geomorphology: Flat (current rippled, wave rippled) Biota: Small erect / encrusting / burrowing (infaunal bioturbators).	Main	No
Minor habitats	Fine (Sandy mud and muddy sand) Geomorphology: Flat (current rippled, wave rippled) Biota: Small erect / encrusting / burrowing (infaunal bioturbators).	Minor	No
VME habitat	None	N/A	N/A
Key ecosystem elements	i) Productivity patterns, with the Labrador Current as the dominant physical oceanographic feature,	N/A	No
	ii) Groundfish community structure and function, with yellowtail flounder as a constituent part.	N/A	No

5.3.6 Principle 2 Performance Indicator scores and rationales

PI 2.1.1 – Primary species outcome

PI 2.1.1		The UoA aims to maintain primary species above the point where recruitment would be impaired (PRI) and does not hinder recovery of primary species if they are below the PRI		
Scoring Issue		SG 60	SG 80	SG 100
a	Main primary species stock status			
	Guide post	Main primary species are **likely** to be above the PRI. OR If the species is below the PRI, the UoA has measures in place that are **expected** to ensure that the UoA does not hinder recovery and rebuilding.	Main primary species are **highly likely** to be above the PRI. OR If the species is below the PRI, there is either **evidence of recovery** or a demonstrably effective strategy in place **between all MSC UoAs which categorise this species as main**, to ensure that they collectively do not hinder recovery and rebuilding.	There is a **high degree of certainty** that main primary species are above the PRI **and are** fluctuating around a level consistent with MSY.
	Met?	**Yes – both elements**	**Yes – both elements**	**No – both elements**

Rationale

‘Primary species’ are defined by the MSC as those species that are in scope but not target (P1) species “where management tools and measures are in place, intended to achieve stock management objectives reflected in either limit or target reference points” (SA3.1.3, MSC 2018a).

The ‘main’ designation is then given where either: i) “the catch of a species by the UoA comprises 5% or more by weight of the total catch of all species by the UoA”, or ii) “The species is classified as ‘Less resilient’ and the catch of the species by the UoA comprises 2% or more by weight of the total catch of all species by the UoA.” (SA3.4.2, MSC 2018a).

For the YTFF, main primary species are considered to be American plaice (6.4% of the total catch), and thorny skate (1.6% of the catch on average, but it made up 5.1% of the catch in the 2016/17 year, and skate (NS) made up an average of 0.9% over the period, and it is presumed that the majority of that group was made up of thorny skate as by far the most common individual species identified in the catch). No other species met the criteria for main primary species.

The following evidence indicates SG 60 is met: See SG80.

The following evidence indicates SG 80 is met: American plaice (*Hippoglossoides platessoides*) is managed as a 3LNO stock. The stock is distributed throughout Divisions 3LNO, but historically most of the biomass was found in Division 3L (NAFO SC 2018b); whereas the YTFF occurs mainly in Divisions 3NO. The stock remains low compared to historic levels and is presently at 34% of Blim. Recruitment has been low since the late 1980s, but Canadian surveys indicate a large number of pre-recruits in Division 3L in recent years. Current estimates of total fishing mortality are very low, and far below Fmsy (Figure 8). As such, while American plaice is below the PRI, it is clear that there is a demonstrably effective strategy in place to ensure that recovery and rebuilding is not hindered (SA3.4.6.c). Specifically, the OCI fleet is required to use a cod end mesh of ≤145 mm, but a larger and more selective 150-155 mm is used in practice (pers. comm Rick Ellis). The YTFF also has extensive experience of operating within bycatch limits, and considerable efforts are made to be selective for yellowtail flounder (e.g., see Blyth-Skyrme et al. 2015). The fishery is currently limited to a bycatch cap of 15% of American plaice. If the bycatch limits are exceeded in any one haul, the vessel is required to move a minimum of 10 nautical miles from any position in the previous tow before continuing fishing, and leave the Division and not return for at least 60 hours if the bycatch limit is also exceeded on the subsequent tow. After 60 hours, vessels may return but an initial trial tow of less than 3 hours is required to be undertaken (NAFO 2019). There are no other MSC UoAs that categorise this species as main; SG60 and SG80 are met.

Thorny skate (*Amblyraja radiata*) is managed as a 3LNOPs stock. Total survey biomass has remained stable since 2007, and the probability that the current biomass is above Blim (defined from survey indices as Bloss) is >95%. Recruitment in 2017 was above average. Fishing mortality is currently low (NAFO SC 2018c); SG60 and SG80 are met.

We note that measures taken to minimise catch of thorny skate, as detailed in PI 2.1.2 SIe, have likely contributed to a reduction in mortality of this species over time (SA3.4.7, MSC 2018a). However, it is impossible in the context of this assessment to tease apart any reduction in catch or mortality rate from changes in effort, practice or targeting of the fishery, or changes in distribution or abundance of the species.

The following evidence indicates SG 100 is not met: American plaice is below Blim and it is not clear that thorny skate is fluctuating around a level consistent with Bmsy. SG100 is not met for either species.

b	Minor primary species stock status			
	Guide post			Minor primary species are highly likely to be above the PRI. OR If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species.
	Met?			**Yes – all four elements**

Rationale

Minor primary species in the catch are taken in small quantities, only; i.e. Atlantic cod (estimated annual mean catch = 111 t), Atlantic halibut (estimated annual mean catch = 20 t), witch flounder estimated annual mean catch = 21 t) and Greenland halibut estimated annual mean catch = 2.5 t) (Table 11).

The following evidence indicates SG 100 is met: Atlantic cod (*Gadus morhua*) is managed as a 3NO stock (NAFO SC 2018e). The spawning biomass increased noticeably between 2010 and 2015 but has subsequently declined and the 2018 estimate of 18,537 t represents only 31% of Blim (60,000 t). Fishing mortality values over the past decade have been low and well below Flim (0.3). There is evidence that the UoA does not hinder the recovery and rebuilding of Atlantic cod; SG100 is met.

Atlantic halibut (*Hippolglossus hippoglossus*) is managed as a Scotian Shelf and southern Grand Banks stock in NAFO Divisions 3NOPs4VWX5Zc (DFO 2018a). The stock has increased dramatically since the 1990s – early 2000s and is currently at the highest level in the time series. There is evidence that the UoA does not hinder the recovery and rebuilding of Atlantic halibut; SG100 is met.

The 3NO witch stock occurs mainly in Division 3O along the southwestern slopes of the Grand Bank. The stock increased between 1999 and 2013 but declined subsequently and is now at 37% Bmsy (Bmsy = 60 000 t). Total estimated catch in the YTFF equates to approximately 20 t annually (based on scaled observer data for the fishery), which equates to <4% of the total annual catch of witch flounder as reported to NAFO (approximately 600 t annually) for the 2014-2018 period (NAFO SC 2018a). There is evidence that the UoA does not hinder the recovery and rebuilding of witch flounder; SG100 is met.

Greenland halibut (*Reinhardtius hippoglossoides*) is managed as a SA2 + Divisions 3KLMNO stock. Spawning biomass (10+) has declined since the beginning of the time series in the 1960s and is estimated to be below SSBmsy since the late 1990's (NAFO SC 2017). Fishing mortality was above Fmsy from 1991 until 2014, but is estimated to have been below Fmsy in the last 2 years. In 2016 F was estimated to be 0.14 (0.08-0.20). The catch of Greenland halibut in the YTFF is very low and represents a tiny proportion of the total catch of this species. There is evidence that the UoA does not hinder the recovery and rebuilding of Greenland halibut; SG100 is met.

References

DFO (2018a). Stock status update of Atlantic halibut (*Hippoglossus hippoglossus*) on the Scotian Shelf and Southern Grand Banks in NAFO Divisions 3NOPs4VWX5Zc. DFO Canadian Science Advisory Secretariat

Science Response 2018/022. 9 pp. http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2018/2018_022-eng.pdf.

MSC (2018a). MSC Fisheries Standard, v.2.01. Marine Stewardship Council, London. 31st August 2018. 289 pp.

NAFO SC (2017). Report of the Scientific Council Meeting, 01 -15 June 2017 Halifax, Nova Scotia. NAFO SCS Doc. 17-16 REV., serial number N6718. https://www.nafo.int/Portals/0/PDFs/sc/2017/scs17-16REV.pdf

NAFO SC (2018a). Witch flounder in Divisions 3NO; advice June 2018 for 2019-2020. NAFO Scientific Council, 1st – 14th June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/WIT3NO.pdf.

NAFO SC (2018b). American plaice in Divisions 3LNO; advice June 2018 for 2019-2021. NAFO Scientific Council, 1st – 14th June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/AmPlaice3LNO.pdf.

NAFO SC (2018d). Thorny Skate in Divisions 3LNO and Subdiv. 3Ps. Advice June 2018 for 2019-2020. SC01 – 14 June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/TSkate3LNO.pdf.

NAFO SC (2018e). Cod in Divisions 3NO. Advice June 2018 for 2019-2021. SC01 – 14 June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/cod3NO.pdf.

NAFO (2019). Conservation and Enforcement Measures 2019. NAFO / COM Doc. 19-01. Northwest Atlantic Fisheries Organization, Dartmouth, Nova Scotia. x + 181 pp. https://www.nafo.int/Portals/0/PDFs/COM/2019/comdoc19-01.pdf.

Overall Performance Indicator score	**95**
Condition number (if relevant)	**N/A**

PI 2.1.2 – Primary species management strategy

PI 2.1.2		There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are **measures** in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to be above the PRI.	There is a **partial strategy** in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the PRI.	There is a **strategy** in place for the UoA for managing main and minor primary species.
	Met?	**Yes**	**Yes**	**Yes**

Rationale

For the YTFF, main primary species are considered to be American plaice (6.4% of the total catch), and thorny skate (1.6% of the catch on average, but it made up 5.1% of the catch in the 2016/17 year, and skate (NS) made up an average of 0.9% over the period, and it is presumed that the majority of that group was made up of thorny skate as by far the most common individual species identified in the catch). Other primary species in the catch are Atlantic cod, Atlantic halibut, witch flounder and Greenland halibut; these species are taken in small quantities, only.

The following evidence indicates SG 60 is met: See SG100.

The following evidence indicates SG 80 is met: See SG100.

The following evidence indicates SG 100 is met: The YTFF is subject to a wide variety of measures which are general to all species, as well as particular measures which are specific to primary species. These include that effort is limited through licensing and the application of quota or bycatch limits for managed species, and the fishery is required to use a cod end mesh of no less than 145 mm (although 150-155 mm is used in practice – pers. comm Rick Ellis). The YTFF also has extensive experience of operating within bycatch limits, and considerable efforts are made to be selective for yellowtail flounder (e.g., see Blyth-Skyrme et al. 2015). The fishery is currently limited to a bycatch cap of 15% of American plaice, and whichever is the greater of 1,250 kg or 5% for 3NO witch flounder and 1,000 kg or 4% for of 3NO Atlantic cod. If the bycatch limits are exceeded in any one haul, the vessel is required to move a minimum of 10 nautical miles from any position in the previous tow before continuing fishing, and leave the Division and not return for at least 60 hours if the bycatch limit is also exceeded on the subsequent tow. After 60 hours, vessels may return but an initial trial tow of less than 3 hours is required to be undertaken. Minimum fish sizes also apply, and where the number of undersized fish in a single haul exceeds 10% the vessel is required to move at least 5 nautical miles from the previous tow before fishing again (NAFO 2019). Vessels are also subject to a target rate of 25% observer coverage (DFO 2014), but are required to carry an observer if operating in the NAFO Regulatory Area; around 40% of the fishery (based on yellowtail flounder observed caught versus reported caught) is therefore observed (Table 11).

Other key aspects of the strategy for primary species include that there is 100% dockside monitoring, mandatory hail out and hail in requirements, and routine monitoring of the stocks through independent surveys (e.g., Rideout & Ings 2018) and stock assessments (e.g., American plaice – NAFO SC 2018b, thorny skate – NAFO SC 2018d, Atlantic cod – NAFO SC 2018e, Atlantic halibut – DFO 2018a, witch – NAFO SC 2018a, Greenland halibut – NAFO SC 2017).

There is considered to be a strategy in place for managing main and minor primary species – SG60, SG80 and SG100 are met.

b	Management strategy evaluation			
	Guide post	The measures are considered **likely** to work, based on plausible argument (e.g., general experience, theory or	There is some **objective basis for confidence** that the measures/partial strategy will work, based on some information directly about the	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on information directly

		comparison with similar fisheries/species).	fishery and/or species involved.	about the fishery and/or species involved.
	Met?	**Yes**	**Yes**	**Yes**

Rationale

The following evidence indicates SG 60 is met: See SG100.

The following evidence indicates SG 80 is met: See SG100.

The following evidence indicates SG 100 is met: In the context of managed primary species, management strategy evaluation is undertaken through the routine monitoring of the stocks through independent surveys (e.g., Rideout & Ings 2018) and through the stock assessment process (e.g., American plaice – NAFO SC 2018b, thorny skate – NAFO SC 2018d, Atlantic cod – NAFO SC 2018e, Atlantic halibut – DFO 2018a, witch flounder – NAFO SC 2018a, Greenland halibut – NAFO SC 2017).

Although several stocks of primary species are below Blim (e.g., American plaice, Atlantic cod), fishing mortality in all cases is below Fmsy, while the YTFF is responsible for small proportions of the overall mortality of each primary species. Testing supports high confidence that the strategy will work, based on information directly about the fishery and species involved – SG60, SG80 and SG100 are met.

c	Management strategy implementation			
	Guide post		There is **some evidence** that the measures/partial strategy is being **implemented successfully**.	There is **clear evidence** that the partial strategy/strategy is being **implemented successfully and is achieving its overall objective as set out in scoring issue (a).**
	Met?		**Yes**	**Yes**

Rationale

The following evidence indicates SG 80 is met: See SG100

The following evidence indicates SG 100 is met: The strategy in place includes the use of a large minimum mesh size, move on rules, 100% dockside monitoring and high levels of observer coverage, with a target of 25% in Canadian waters (DFO 2014) and a requirement for 100% coverage in the NAFO Regulatory Area (NAFO 2019). As well as observer coverage, the YTFF is monitored routinely through at sea and overflight enforcement, as well as 100% VMS, and no fines have been issued or charges laid in the 2014-2018 period. The low level of fishing mortality observed in all stocks also indicates that the objective of the strategy is being met; SG80 and SG100 are met.

d	Shark finning			
	Guide post	It is **likely** that shark finning is not taking place.	It is **highly likely** that shark finning is not taking place.	There is a **high degree of certainty** that shark finning is not taking place.
	Met?	**NA**	**NA**	**NA**

Rationale

There are no sharks as primary species, and so this SI is not scored.

e	Review of alternative measures			
	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.

	Met?	**Yes – thorny skate** **N/A – other primary species**	**Yes – thorny skate** **N/A – other primary species**	**Yes – thorny skate** **N/A – other primary species**

Rationale

The following evidence indicates SG 60 is met: See SG100.

The following evidence indicates SG 80 is met: See SG100.

The following evidence indicates SG 100 is met: Main primary species are American plaice and thorny skate. Observer data show that the approach taken to minimise waste, including through the use of large mesh size in the cod ends (150-155 mm in practice) is effective, such that discarding rate for most primary species is tiny– American plaice = 0.15%, Atlantic cod = 0.08%, Atlantic halibut = 1.85%, witch = 0.07% and Greenland halibut = 0.26% (Table 11). These measures are required in part to ensure the fishery maintains catches within bycatch threshold limits (i.e., 15% of American plaice, whichever is the greater of 1,250 kg or 5% for 3NO witch flounder, and 1,000 kg or 4% for of 3NO Atlantic cod). For all primary species other than thorny skate, it is considered that the proportion of unwanted catch is negligible and so this SI does not need to be scored (GSA3.5.3, MSC 2018a).

In contrast, 99.55% of the thorny skate and skate (NS) are discarded. To promote survival of discarded species, live release chutes are fitted to vessels to allow for rapid separation and return of unwanted animals including thorny skate. Additionally, the fishery has strived to maximize the efficiency of the fishery for yellowtail flounder, for example by installing Trackwell Ltd. gear and catch monitoring systems that allow for spatial management of the fishery to maximise efficiency, as well as by fitting new trawl designs to the vessels that help to minimize bycatch of other species; The ongoing efforts to maximise efficiency and subsequent implementation of measures to minimise bycatch and mortality of species other than yellowtail flounder comprise a regular review of alternative measures that are implemented as appropriate, so SG60 and SG80 are met for thorny skate. SG100 is not met for thorny skate because it is not clear that a review has been undertaken on a biennial basis

References

Blyth-Skyrme, R., Atkinson, B. & J. Angel (2015). OCI Grand Bank Yellowtail Flounder Trawl Fishery Public Certification Report. Acoura Marine Ltd., October 2015. 205 pp. https://cert.msc.org/FileLoader/FileLinkDownload.asmx/GetFile?encryptedKey=UdKVdJCQc9S1Pr3k0RvwpkpqocsRH93ZvHgbfWsicaIuq4yLBQctwRKlALhyN20g.

DFO (2014). Summary Integrated Fisheries Management Plan – Yellowtail Flounder (*Limanda ferruginea*) - NAFO Divisions 3LNO - As of December 2012. https://www.dfo-mpo.gc.ca/fisheries-peches/ifmp-gmp/groundfish-poisson-fond/yellowtail-limande-div3LNO-eng.html. Date modified: 2014-04-15.

DFO (2018a). Stock status update of Atlantic halibut (*Hippoglossus hippoglossus*) on the Scotian Shelf and Southern Grand Banks in NAFO Divisions 3NOPs4VWX5Zc. DFO Canadian Science Advisory Secretariat Science Response 2018/022. 9 pp. http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2018/2018_022-eng.pdf.

MSC (2018a). MSC Fisheries Standard, v.2.01. Marine Stewardship Council, London. 31st August 2018. 289 pp.

NAFO SC (2017). Report of the Scientific Council Meeting, 01 -15 June 2017 Halifax, Nova Scotia. NAFO SCS Doc. 17-16 REV., serial number N6718. https://www.nafo.int/Portals/0/PDFs/sc/2017/scs17-16REV.pdf

NAFO SC (2018a). Witch flounder in Divisions 3NO; advice June 2018 for 2019-2020. NAFO Scientific Council, 1st – 14th June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/WIT3NO.pdf.

NAFO SC (2018b). American plaice in Divisions 3LNO; advice June 2018 for 2019-2021. NAFO Scientific Council, 1st – 14th June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/AmPlaice3LNO.pdf.

NAFO SC (2018d). Thorny Skate in Divisions 3LNO and Subdiv. 3Ps. Advice June 2018 for 2019-2020. SC01 – 14 June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/TSkate3LNO.pdf.

NAFO SC (2018e). Cod in Divisions 3NO. Advice June 2018 for 2019-2021. SC01 – 14 June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/cod3NO.pdf.

NAFO (2019). Conservation and Enforcement Measures 2019. NAFO / COM Doc. 19-01. Northwest Atlantic Fisheries Organization, Dartmouth, Nova Scotia. x + 181 pp. https://www.nafo.int/Portals/0/PDFs/COM/2019/comdoc19-01.pdf.

Rideout, R.M. and D.W. Ings (2018). Research vessel bottom trawl survey report (NL Region): a stock-by-stock summary of survey information up to and including the 2017 spring and autumn surveys. Canadian Technical Report on Fisheries and Aquatic Sciences Fs97-6/3267E-PDF: vii + 59 pp. http://publications.gc.ca/collections/collection_2018/mpo-dfo/Fs97-6-3267-eng.pdf.

Overall Performance Indicator score	**95**
Condition number (if relevant)	**N/A**

PI 2.1.2 Scoring calculation

UoA	Species	Main / minor	SIa (60, 80,	SIb (60, 80,	SIc (80,100	SId (60, 80,	SIe (60, 80,	Element score	PI Score
1	American plaice	Main	100	100	100	N/A	N/A	100	95
	Thorny skate	Main	100	100	100	N/A	80	95	
	Atlantic cod	Minor	100	100	100	N/A	N/A	100	
	Atlantic halibut	Minor	100	100	100	N/A	N/A	100	
	Witch	Minor	100	100	100	N/A	N/A	100	
	Greenland halibut	Minor	100	100	100	N/A	N/A	100	

PI 2.1.3 – Primary species information

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impact on main primary species			
	Guide post	Qualitative information is **adequate to estimate** the impact of the UoA on the main primary species with respect to status. **OR** **If RBF is used to score PI 2.1.1 for the UoA:** Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is **adequate to assess** the impact of the UoA on the main primary species with respect to status. **OR** **If RBF is used to score PI 2.1.1 for the UoA:** Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is **adequate to assess with a high degree of certainty** the impact of the UoA on main primary species with respect to status.
	Met?	**Yes – both elements**	**Yes – both elements**	**Yes – both elements**
Rationale				

For the YTFF, main primary species are considered to be American plaice (6.4% of the total catch), and thorny skate (1.6% of the catch on average, but it made up 5.1% of the catch in the 2016/17 year, and skate (NS) made up an average of 0.9% over the period, and it is presumed that the majority of that group was made up of thorny skate as by far the most common individual species identified in the catch). No other species met the criteria for main primary species.

The following evidence indicates SG 60 is met: See SG100.

The following evidence indicates SG 80 is met: See SG100.

The following evidence indicates SG 100 is met: Catch data are available representing approximately 40% of the total catch from the YTFF (based on observed versus total catch of yellowtail flounder), and there is 100% dockside monitoring of landings; together these provide a high level of detail on catches Stock assessments are then undertaken routinely for main primary species, informed by both commercial and survey data (i.e., American plaice – NAFO SC 2018b, thorny skate – NAFO SC 2018d). With reference to SA3.1.8 (MSC 2018a), to the knowledge of the assessment team, there have been no direct estimates of 'unobserved mortality' on primary species (e.g., where fish pass through the cod end mesh or come in to contact with a component of the gear but are not caught and suffer mortality as a result). However, such mortality is accounted for where stock status and retrospective estimates of F are based on surveys and observed abundance. There is no suggestion that unobserved mortality comprises a significant or unaccounted level to cause concern. Quantitative information is available and is adequate to assess with a high degree of certainty the impact of the YTFF on main primary species with respect to status; SG60, SG80 and SG100 are met.

b	Information adequacy for assessment of impact on minor primary species			
	Guide post			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.
	Met?			**Yes – all four elements**
Rationale				

Minor primary species in the catch are Atlantic cod, Atlantic halibut, witch flounder and Greenland halibut; these species are taken in small quantities, only.

The following evidence indicates SG 100 is met: Comprehensive catch data are available representing approximately 40% of the total catch from the YTFF (based on observed versus total catch of yellowtail flounder), and there is 100% dockside monitoring of landings; together these provide a high level of detail on catches. Stock assessments are then undertaken routinely for minor primary species, informed by both commercial and survey data (i.e., Atlantic cod – NAFO SC 2018e, Atlantic halibut – DFO 2018a, witch flounder – NAFO SC 2018a, Greenland halibut – NAFO SC 2017). Unobserved mortality is again accounted for through the stock assessment process, and there is no suggestion that unobserved mortality comprises a significant or unaccounted level to cause concern. At least some quantitative information is adequate to estimate the impact of the YTFF on minor primary species with respect to status; SG100 is met.

c	Information adequacy for management strategy			
	Guide post	Information is adequate to support **measures** to manage **main** primary species.	Information is adequate to support a **partial strategy** to manage **main** primary species.	Information is adequate to support a **strategy** to manage **all** primary species, and evaluate with a **high degree of certainty** whether the strategy is achieving its objective.
	Met?	**Yes – all six elements**	**Yes – all six elements**	**Yes – all six elements**

Rationale

The following evidence indicates SG 60 is met: See SG100.

The following evidence indicates SG 80 is met: See SG100.

The following evidence indicates SG 100 is met: Catch data are available for all six primary species, both main and minor, representing approximately 40% of the total catch from the YTFF (based on observed versus total catch of yellowtail flounder); this provides a high level of detail on catches. There is good knowledge of the spatial distribution of all primary stocks, and vessels are tracked with VMS and a Trackwell system, while all landings are subject to dockside monitoring; catch composition by area is known. Research vessel surveys covering groundfish stocks, including the six primary species are undertaken routinely (Rideout & Ings 2018), and survey and catch data inform stock assessments that are undertaken regularly (as detailed in SIa and SIb). It is considered that information is adequate to support a strategy to manage all primary species and evaluate with a high degree of certainty whether the strategy is achieving its objective, including detecting any changes to in risk level to primary species; SG60, SG80 and SG100 are met.

References

DFO (2018a). Stock status update of Atlantic halibut (*Hippoglossus hippoglossus*) on the Scotian Shelf and Southern Grand Banks in NAFO Divisions 3NOPs4VWX5Zc. DFO Canadian Science Advisory Secretariat Science Response 2018/022. 9 pp. http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2018/2018_022-eng.pdf.

MSC (2018a). MSC Fisheries Standard, v.2.01. Marine Stewardship Council, London. 31st August 2018. 289 pp.

NAFO SC (2017). Report of the Scientific Council Meeting, 01 -15 June 2017 Halifax, Nova Scotia. NAFO SCS Doc. 17-16 REV., serial number N6718. https://www.nafo.int/Portals/0/PDFs/sc/2017/scs17-16REV.pdf

NAFO SC (2018a). Witch flounder in Divisions 3NO; advice June 2018 for 2019-2020. NAFO Scientific Council, 1st – 14th June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/WIT3NO.pdf.

NAFO SC (2018b). American plaice in Divisions 3LNO; advice June 2018 for 2019-2021. NAFO Scientific Council, 1st – 14th June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/AmPlaice3LNO.pdf.

NAFO SC (2018d). Thorny Skate in Divisions 3LNO and Subdiv. 3Ps. Advice June 2018 for 2019-2020. SC01 – 14 June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/TSkate3LNO.pdf.

NAFO SC (2018e). Cod in Divisions 3NO. Advice June 2018 for 2019-2021. SC01 – 14 June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/cod3NO.pdf.

Rideout, R.M. and D.W. Ings (2018). Research vessel bottom trawl survey report (NL Region): a stock-by-stock summary of survey information up to and including the 2017 spring and autumn surveys. Canadian Technical

Report on Fisheries and Aquatic Sciences Fs97-6/3267E-PDF: vii + 59 pp.
http://publications.gc.ca/collections/collection_2018/mpo-dfo/Fs97-6-3267-eng.pdf.

Overall Performance Indicator score	**100**
Condition number (if relevant)	**N/A**

PI 2.2.1 – Secondary species outcome

PI 2.2.1		The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit		
Scoring Issue		SG 60	SG 80	SG 100
	Main secondary species stock status			
a	Guide post	Main secondary species are **likely** to be above biologically based limits. OR If below biologically based limits, there are **measures** in place expected to ensure that the UoA does not hinder recovery and rebuilding.	Main secondary species are **highly likely** to be above biologically based limits. OR If below biologically based limits, there is either **evidence of recovery** or a **demonstrably effective partial strategy** in place such that the UoA does not hinder recovery and rebuilding. AND Where catches of a main secondary species outside of biological limits are **considerable**, there is either **evidence of recovery** or a, **demonstrably effective strategy in place between those MSC UoAs that have considerable catches of the species**, to ensure that they collectively do not hinder recovery and rebuilding.	There is a **high degree of certainty** that main secondary species are above biologically based limits.
	Met?	**Yes – All main species**	**Yes – All main species**	**Yes – Harp seal, true seal and grey seal** **No –Toothed whale (NS).**

Rationale

Several ‘out of scope’ but not ETP species / groups were recorded in the catch (Table 11), and these are required to be treated as main secondary species (SA3.7.1.2, MSC 2018a). These are ‘toothed whale (NS)’, harp seal, ’true seal (NS)’ and grey seal. Harp seal (four years) and ‘true seals (NS)’ (two years) were the only species recorded more than once in the five-year period.

We note that measures taken to minimise catch of main secondary species, as detailed in PI 2.2.2 SIe, may have contributed to a reduction in the catch and mortality of these species over time (SA3.7.3, MSC 2018a). However, they are taken in extremely small quantities in any case, and it is impossible in the context of this assessment to tease apart any reduction in catch or mortality rate from changes in effort, practice or targeting of the fishery, or changes in distribution or abundance of the species.

The following evidence indicates SG 60 is met: See SG80.

The following evidence indicates SG 80 is met: What appears to be a single ‘toothed whale (190 kg) was recorded in the observer data in the 2013/14 year. No information is available on the species, but the weight suggests that the animal was a smaller species, and it seems likely that it was a dolphin. Candidates species include Atlantic white-sided dolphin (*Lagenorhynchus acutus*), Risso’s dolphin (*Grampus griseus*), common bottlenose dolphin (*Tursiops truncatus*), short-beaked common dolphin (*Delphinus delphis*), striped dolphin (*Stenella coeruleoalba*) and white-beaked dolphin (*Lagenorhynchus albirostris*), none of are considered to be at risk under the Species at Risk Act (SARA). All these species have Least Concern (LC) status under the IUCN and have no status under the Convention on Migratory Species (CMS) or the Convention on International Trade in Endangered Species (CITES). The high level of observer coverage and very low incidence of interaction indicate that there is a partial strategy in place such that the UoA does not hinder recovery and rebuilding; SG60 and SG80 are met.

The following evidence indicates SG 100 is not met for toothed whale (NS): In the absence of specific information on population, it is not possible to say that there is a high degree of certainty that 'toothed whale (NS) is above biologically-based limits. SG100 is not met.

The following evidence indicates SG 100 is met: Harp seal (*Pagophilus groenlandicus*) was recorded in the catch at a very low level, with possibly only a single animal in each of 2013/14 (30 kg), 2014/15 (70 kg) and 2016/17 (30 kg), but possibly two animals in 2017/18 (150 kg) (Table 11); these catches reflect a negligible proportion of the population, which is estimated at 7.4 million animals (DFO 2016a). Note that it is assumed that the 'true seal' identified in 2013/14 (50 kg) and 2015/16 (10 kg) were also harp seals, and again likely representing a single animal in each of the two years; there is a high degree of certainty that harp seals (and true seals) are above biologically-based limits; SG60, SG80 and SG100 are met for these species.

Grey seal (*Halichoerus grypus*) was reported in the observer data only in 2013/14 (20 kg) (Table 11). Although grey seals wean at approximately 50 kg (DFO 2018c), the catch possibly represents a single juvenile. In the Northwest Atlantic, grey seals form a single population, but all three Canadian herds (Sable Island, coastal Nova Scotia and Gulf of St. Lawrence) have increased in size over the last three decades, such that the Canadian population overall was estimated in 2014 (including pups) to number 505,000 animals (DFO 2018c). There is a high degree of certainty that grey seals) are above biologically-based limits; SG60, SG80 and SG100 are met.

b	Minor secondary species stock status			
	Guide post			Minor secondary species are highly likely to be above biologically based limits. OR If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
	Met?			**No**

Rationale

Other secondary species in the YTFF include a wide variety of different species, but no fish or shellfish (i.e., MSC 'in-scope' species) comprised more than a very small proportion of the catch, with only sea cucumbers (NS) exceeding 0.2% of the total. 32 species were recorded in the catch at less than 200 kg annually over the entire five-year period covered by the observer data, and as a negligible component of the catch these are not considered further in this assessment.

The following evidence indicates SG 100 is met: No evidence is presented to support a SG100 score. SG80 is met by default.

References

DFO (2016a). Harp seal. DFO webpage, date modified: 2016-11-25: http://www.dfo-mpo.gc.ca/species-especes/profiles-profils/harpseal-phoquegroenland-eng.html.

DFO (2018c). Grey seal. DFO webpage, date modified: 2018-03-14: http://www.dfo-mpo.gc.ca/species-especes/profiles-profils/greyseal-phoquesgris-eng.html

MSC (2018a). MSC Fisheries Standard, v.2.01. Marine Stewardship Council, London. 31st August 2018. 289 pp.

Overall Performance Indicator score	**85**
Condition number (if relevant)	**N/A**

PI 2.2.2 – Secondary species management strategy

PI 2.2.2		There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are **measures** in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a **partial strategy** in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a **strategy** in place for the UoA for managing main and minor secondary species.
	Met?	**Yes**	**Yes**	**No**

Rationale

Several 'out of scope' but not ETP species / groups were recorded in the catch (Table 11), and these are required to be treated as main secondary species (SA3.7.1.2, MSC 2018a). These are 'toothed whale (NS)', harp seal, 'true seal (NS)' and grey seal. Harp seal (four years) and 'true seals (NS)' (two years) were the only species recorded more than once in the five-year period.

The following evidence indicates SG 60 is met: See SG80.

The following evidence indicates SG 80 is met: The YTFF is subject to a wide variety of measures which are general to all species. These include that effort is limited through licensing and the application of quota or bycatch limits for managed species, and the fishery is required to use a cod end mesh of no less than 145 mm (although 150-155 mm is used in practice). The trawls used are also large, mobile and used exclusively as a demersal gear, such that out of scope species (e.g., whales, dolphins, seals, etc.) are almost certainly able to detect the gear in use (e.g., Jaiteh et al. 2013).

Vessels are also subject to a target rate of 25% observer coverage (DFO 2014), but are required to carry an observer if operating in the NAFO Regulatory Area; it is calculated that approximately 40% of the total catch of yellowtail flounder is observed, covering around 48% of all trips in recent years (Table 11), which provides a high level of detail on catches. Other aspects of the partial strategy for main secondary species include that there is 100% dockside monitoring, mandatory hail out and hail in requirements, and periodic assessment of out of scope species population status and size (e.g., IUCN website). There is considered to be a partial strategy in place for managing main secondary species – SG60 and SG80 are met.

The following evidence indicates SG 100 is not met: There is insufficient information available on minor secondary species for the fishery to meet SG100.

b	Management strategy evaluation			
	Guide post	The measures are considered **likely** to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is **some objective basis for confidence** that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.
	Met?	**Yes**	**Yes**	**No**

Rationale

The following evidence indicates SG 60 is met: See SG80.

The following evidence indicates SG 80 is met: For main, out of scope secondary species, management strategy evaluation is undertaken through monitoring catches at a high and representative level; this occurs in the YTFF, where approximately 40% of the fishery is monitored, annually (based on the % of the yellowtail flounder catch that is observed). This allows it to be confirmed that out of scope (i.e., main secondary) species comprise a very small proportion of the catch in all cases. There is also periodic monitoring of the population size and status of out of scope species (e.g., see the IUCN website), which together with the detailed observer data would provide indication of any likely problems in the YTFF. There is some objective basis for confidence that the partial strategy will work for main secondary species, based on information directly about the UoA and the species involved – SG60 and SG80 are met.

The following evidence indicates SG 100 is not met: It cannot be said that there is specific testing in place for the partial strategy for secondary species, so SG100 is not met.

c	Management strategy implementation			
	Guide post		There is **some evidence** that the measures/partial strategy is being **implemented successfully**.	There is **clear evidence** that the partial strategy/strategy is being **implemented successfully and is achieving its objective as set out in scoring issue (a).**
	Met?		**Yes**	**No**

Rationale

The following evidence indicates SG 80 is met: The partial strategy in place includes the use of a particular gear type, large minimum mesh size and high levels of observer coverage, with a target of 25% in Canadian waters (DFO 2014) and a requirement for 100% coverage in the NAFO Regulatory Area (NAFO 2019). Around 40% of all yellowtail flounder catches have been observed in recent years (Table 11). As well as observer coverage, the YTFF is monitored routinely through at sea and overflight enforcement, and no fines have been issued or charges laid in the 2014-2018 period. The detailed observer data show that catches of secondary species are maintained at very low levels. There is some evidence that the partial strategy is being implemented successfully – SG80 is met.

The following evidence indicates SG 100 is not met: In the absence of detailed population data for minor secondary species, it is not possible to say that there is clear evidence that the partial strategy is being implemented successfully and is achieving its objective – SG100 is not met.

d	Shark finning			
	Guide post	It is **likely** that shark finning is not taking place.	It is **highly likely** that shark finning is not taking place.	There is a **high degree of certainty** that shark finning is not taking place.
	Met?	**Yes**	**Yes**	**Yes**

Rationale

No shark species is taken in significant quantities in the YTFF, and only porbeagle shark is represented in the catch table (0.013% of the total catch, estimated total mean annual catch = 1.1 t – Table 11). Mako shark and 'shark (NS)' were ranked 37 and 45 in order of catch quantity on the comprehensive list of 62 species, as comprising ≤0.001% of the catch.

The following evidence indicates SG 60 is met: See SG100.

The following evidence indicates SG 80 is met: See SG100.

The following evidence indicates SG 100 is met: Table 11 shows that all porbeagle shark were discarded, and the full catch table also shows that the mako shark and 'shark (NS) were also discarded. In any case, finning is not permitted on Canadian vessels, and if retained, all sharks must be landed fins attached (DFO 2018k). Importantly, this is enforced by a high level of observer coverage and by 100% dockside monitoring. There is a high degree of certainty that shark finning is not taking place – SG60, SG80 and SG100 are met.

e	Review of alternative measures to minimise mortality of unwanted catch			
	Guide post	There is a review of the potential effectiveness and practicality of alternative	There is a **regular** review of the potential effectiveness and practicality of alternative	There is a **biennial** review of the potential effectiveness and practicality of alternative

		measures to minimise UoA-related mortality of **unwanted** catch of main secondary species.	measures to minimise UoA-related mortality of **unwanted** catch of main secondary species and they are implemented as appropriate.	measures to minimise UoA-related mortality of **unwanted** catch of all secondary species, and they are implemented, as appropriate.
	Met?	**Yes**	**No**	**No**

Rationale

The following evidence indicates SG 60 is met: See SG80.

The following evidence indicates SG 80 is not met: The YTFF makes considerable efforts to be selective for yellowtail flounder (e.g., see Blyth-Skyrme et al. 2015), and the use of larger mesh (150-155 mm) in the cod end than is required by regulation (145 mm – DFO 2014) effectively minimises the catch of almost all in-scope secondary species, such that there are no in-scope main secondary species in the YTFF.

Toothed whale (NS), harp seal, true seal (NS) and grey seal are main secondary species through being out-of-scope but, in any case, it is clear that interaction rates are extremely low, and recent developments mean that, for all marine mammals, there is now a requirement to consider bycatch routinely as part of the equivalency requirements under the US import rules for the Marine Mammal Protection Act. These new requirements mean that captures must now be reported immediately as part of the daily hail process, and marine mammals must be returned, where alive, in a manner that causes least harm (DFO 2018k). SG60 is met but it is not clear that there is a regular review of alternative measures for marine mammals, or that measures are implemented as appropriate, so SG80 is not met for these species. As such, a Condition of Certification is set (#1)

The following evidence indicates SG 100 is not met: It is not clear that there is a biennial review of alternative measures to minimise mortality of unwanted secondary species – SG100 is not met.

References

Blyth-Skyrme, R., Atkinson, B. & J. Angel (2015). OCI Grand Bank Yellowtail Flounder Trawl Fishery Public Certification Report. Acoura Marine Ltd., October 2015. 205 pp. https://cert.msc.org/FileLoader/FileLinkDownload.asmx/GetFile?encryptedKey=UdKVdJCQc9S1Pr3k0RvwpkpqocsRH93ZvHgbfWsicaIuq4yLBQctwRKlALhyN20g.

DFO (2014). Summary Integrated Fisheries Management Plan – Yellowtail Flounder (*Limanda ferruginea*) - NAFO Divisions 3LNO - As of December 2012. https://www.dfo-mpo.gc.ca/fisheries-peches/ifmp-gmp/groundfish-poisson-fond/yellowtail-limande-div3LNO-eng.html. Date modified: 2014-04-15.

DFO (2018k). Groundfish general licence conditions: NAFO Divisions 0, 2GHJ, 3KLNOP and 4R, Condition #15036, 15037, 15038, 15039. 9 pp.

Jaiteh, V.F., Allen, S.J., Meeuwig, J.J. & N.R. Loneragan (2013) Subsurface behavior of bottlenose dolphins (*Tursiops truncatus*) interacting with fish trawl nets in northwestern Australia: Implications for bycatch mitigation. Marine Mammal Science, V. 29, pp. E266-E28. https://researchrepository.murdoch.edu.au/id/eprint/11285/1/sub-surface_behavior_of_bottlenose_dolphins.pdf.

MSC (2018a). MSC Fisheries Standard, v.2.01. Marine Stewardship Council, London. 31st August 2018. 289 pp.

NAFO (2019). Conservation and Enforcement Measures 2019. NAFO / COM Doc. 19-01. Northwest Atlantic Fisheries Organization, Dartmouth, Nova Scotia. x + 181 pp. https://www.nafo.int/Portals/0/PDFs/COM/2019/comdoc19-01.pdf.

Overall Performance Indicator score	**75**
Condition number (if relevant)	**#1**

PI 2.2.3 – Secondary species information

PI 2.2.3		Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts on main secondary species			
	Guide post	Qualitative information is **adequate to estimate** the impact of the UoA on the main secondary species with respect to status. OR **If RBF is used to score PI 2.2.1 for the UoA:** Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	Some quantitative information is available and **adequate to assess** the impact of the UoA on main secondary species with respect to status. OR **If RBF is used to score PI 2.2.1 for the UoA:** Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	Quantitative information is available and **adequate to assess with a high degree of certainty** the impact of the UoA on main secondary species with respect to status.
	Met?	**Yes – all elements**	**Yes – all elements**	**Yes – Harp seal, true seal and grey seal** **No – Toothed whale (NS).**

Rationale

Several ‘out of scope’ but not ETP species / groups were recorded in the catch (Table 11), and these are required to be treated as main secondary species (SA3.7.1.2, MSC 2018a). These are ‘toothed whale (NS)’, harp seal, ’true seal (NS)’ and grey seal. Harp seal (four years) and ‘true seals (NS)’ (two years) were the only species recorded more than once in the five-year period. It is noted that, for all species, there is no estimate of ‘unobserved mortality’ available (SA3.1.8, MSC 2018a). However, the observed interaction with ETP species is very low, and it is inconceivable that any additional mortality that is unobserved (e.g., where secondary main species come in to contact with a component of the gear and suffer mortality as a result but are not caught) would result in significant additional mortality above that which is observed.

The following evidence indicates SG 60 is met: See SG80.

The following evidence indicates SG 80 is met: Catch data are available representing approximately 40% of the total catch from the YTFF; this provides a high level of detail. These data show that the fishery is responsible for very low levels of main secondary ‘out of scope’ species in general. They comprise what appears to be a single ‘toothed whale (190 kg), as well as possibly only a single harp seal in each of 2013/14 (30 kg), 2014/15 (70 kg) and 2016/17 (30 kg), but possibly two animals in 2017/18 (150 kg). It is assumed that the ‘true seal’ identified in 2013/14 (50 kg) and 2015/16 (10 kg) were also harp seals, and again likely representing a single animal in each of the two years, while what is assumed to be a single grey seal was recorded in 2013/14 (Table 11); these catches are very limited and are adequate to assess that the impact of the YTFF is extremely limited on any population; SG60 and SG80.

The following evidence indicates SG 100 is not met for toothed whale (NS): In the absence of specific information on population, it is not possible to say that impacts can be assess with a high degree of certainty. SG100 is not met.

The following evidence indicates SG 100 is met for seal species: For harp seal (and true seal) (DFO 2016a), as well as grey seal (DFO 2018c), there are relatively recent estimates of population size which allow the impact of the YTFF on these species to be assessed with a high degree of certainty. In essence, the catch in the YTFF of these species at the level of the population is negligible; SG100 is met for the seal species.

b	Information adequacy for assessment of impacts on minor secondary species

	Guide post			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.
	Met?			**No**

Rationale

Other secondary species in the YTFF include a wide variety of different species, but no fish or shellfish (i.e., MSC 'in-scope' species) comprised more than a very small proportion of the catch, with only sea cucumbers (NS) exceeding 0.2% of the total. 32 species were recorded in the catch at less than 200 kg annually over the entire five-year period covered by the observer data, and as a negligible component of the catch these are not considered further in this assessment.

It is noted that while unobserved mortality (i.e. SA3.1.8, MSC 2018a) is not quantified, it is likely to form the majority of the total mortality for many minor secondary species that are small and sessile and will come in to contact with gear components but not be retained in the net. Nevertheless, it is also likely that many individuals of these species will pass through the net or under the gear routinely, in particular because the YTFF fleet uses a large cod end net mesh of 150-155 mm, and 'flying doors' that are intended to minimise ground gear contact with the seabed. Given the extent of the fishery (covering just 1.0% of the Grand Bank area of < 100 m depth – Spatial analysis 2015), it is considered extremely unlikely that unobserved mortality comprises a significant level of mortality with respect to stock status of minor secondary species.

The following evidence indicates SG 100 is not met: No evidence is presented to support a SG100 score.

C	Information adequacy for management strategy			
	Guide post	Information is adequate to support **measures** to manage **main** secondary species.	Information is adequate to support a **partial strategy** to manage **main** secondary species.	Information is adequate to support a **strategy** to manage **all** secondary species, and **evaluate** with a **high degree of certainty** whether the strategy is **achieving its objective**.
	Met?	**Yes**	**Yes**	**No**

Rationale

The following evidence indicates SG 60 is met: See scoring rationale for SG80.

The following evidence indicates SG 80 is met: Catch data are available representing approximately 40% of the total catch from the YTFF; this provides a high level of detail on catches, and show that there are no main 'in scope' species, while interactions with 'out of scope' (main secondary) species are very rare. There is general knowledge of the spatial distribution of out of scope species, and of their population size (e.g., from the IUCN website), while vessels are tracked with VMS and a Trackwell system. It is considered that information is adequate to support a partial strategy to manage main secondary species, including detecting any changes to in risk level to main secondary species; SG60 and SG80 are met.

The following evidence indicates SG 100 is met: There is a wide range of secondary species taken in the YTFF in limited or very limited quantities. Given the wide variety of species, many of which have little or no population data available, means that information is not adequate to support a strategy to manage all secondary species. SG100 is not met.

References

DFO (2016a). Harp seal. DFO webpage, date modified: 2016-11-25: http://www.dfo-mpo.gc.ca/species-especes/profiles-profils/harpseal-phoquegroenland-eng.html.

DFO (2018c). Grey seal. DFO webpage, date modified: 2018-03-14: http://www.dfo-mpo.gc.ca/species-especes/profiles-profils/greyseal-phoquesgris-eng.html.

MSC (2018a). MSC Fisheries Standard, v.2.01. Marine Stewardship Council, London. 31st August 2018. 289 pp.

Spatialanalysis (2015). Footprint of The OCI-3LNO Yellowtail Flounder Fishery: 2000 to 2011 and 2012 to 2014. Prepared for: Ocean Choice International Prepared for: Ocean Choice International. Prepared for: Ocean Choice International. Ottawa, ON, Canada.

Overall Performance Indicator score	**85**
Condition number (if relevant)	**N/A**

PI 2.3.1 – ETP species outcome

PI 2.3.1		The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Effects of the UoA on population/stock within national or international limits, where applicable			
	Guide post	Where national and/or international requirements set limits for ETP species, the **effects of the UoA** on the population/ stock are known and **likely** to be within these limits.	Where national and/or international requirements set limits for ETP species, the **combined effects of the MSC UoAs** on the population /stock are known and **highly likely** to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a **high degree of certainty** that the **combined effects of the MSC UoAs** are within these limits.
	Met?	NA	NA	NA

Rationale

Only Atlantic wolffish, northern wolffish and spotted wolffish are ETP species that are considered to interact with the YTFF. Other SARA-listed species, specifically the leatherback turtle − (endangered), North Atlantic right whale − (endangered), blue whale − (endangered), ivory gull − (endangered) and roseate tern − (endangered) may occur in areas where the YTFF is prosecuted, but there have been no reports of interactions between the YTFF and the other SARA-listed species mentioned, at least since the MSC fishery assessment process began for the YTFF in 2009 (Blyth-Skyrme et al. 2015). As such, these other species are not scored as elements.

There are no national or international limits for wolffish species, so this SI is not scored.

b	Direct effects			
	Guide post	Known direct effects of the UoA are likely to not **hinder recovery** of ETP species.	Known direct effects of the UoA are likely to not **hinder recovery** of ETP species.	There is a **high degree of confidence** that there are no **significant detrimental direct effects** of the UoA on ETP species.
	Met?	Yes – all elements	Yes – all elements	Yes – all elements

Rationale

We note that measures taken to minimise catch of ETP species, as detailed in PI 2.3.2 SIe, may have contributed to a reduction in the catch and mortality of these species over time (SA3.10.3, MSC 2018a). However, it is impossible in the context of this assessment to tease apart any reduction in catch or mortality rate from changes in effort, practice or targeting of the fishery, or changes in distribution or abundance of the species.

The following evidence indicates SG 60 is met: See SG100.

The following evidence indicates SG 80 is met: See SG100.

The following evidence indicates SG 100 is met: Atlantic wolffish (*Anarhichas lupus*) is the most abundant of the three wolffish species in the Northwest Atlantic and is found from the nearshore to depths of up to 900 m (DFO 2018e) over an area in Canadian waters alone of around 500,000 km^2 (DFO 2018h). Albikovskaya (1982) reported that in the Newfoundland area it was most common between 100 m and 350 m, most of which is deeper than the YTFF operates. Atlantic wolffish underwent steep declines in both abundance and area of occupancy over much of its range from the 1980s until the mid-1990s, including its historical stronghold in waters east and north of Newfoundland. Since then it has been increasing in area of occupancy (Simpson *et al*. 2012) and abundance and biomass (Rideout & Ings 2018). Catches in the YTFF are limited to an average of about 60 – 70 t per year (Table 11), and most are returned with a good chance of survival (Grant & Hiscock 2014). There is a high degree of confidence that there are no significant detrimental direct effects of the YTFF on Atlantic wolffish – SG60, SG80 and SG100 are met.

Northern wolffish (*Anarhichas denticulatus*) is most abundant in the deep waters of the continental shelf in the centre of its range, off northeastern Newfoundland and on the Labrador Shelf and to a lesser extent along the shelf edge of the Grand Bank (DFO 2018g). Albikovskaya (1982) reported that in the Newfoundland area northern wolffish occurred

more frequently over a greater range of depth than the two other wolffish species, and mean catches generally increased with depth from 151 to 600 m (i.e. deeper than fished by the YTFF). This species showed the largest decline in area of occupancy of all three wolffish species, but since the early 2000s the trends have reversed so that the range extended to 20% (Simpson et al. 2012). Abundance and biomass indices in the fall survey (covering the main species distribution in Divisions 2J3KLNO) have increased by approximately a five-fold factor from the low point in 2003 to 2017 (Rideout & Ings 2018). Only very small quantities (an average of approximately 100 kg per year) of northern wolffish are taken in the YTFF, and all are discarded (Table 11). There is a high degree of confidence that there are no significant detrimental direct effects of the YTFF on northern wolffish – SG60, SG80 and SG100 are met.

Spotted wolffish (*Anarhichas minor*) is found in water depths of approximately 50-1000 m (DFO 2018f). Albikovskaya (1982) reported that in the Newfoundland area it was most common between 100 m and 300 m, which is somewhat deeper than the YTFF operates. Simpson et al. (2012) demonstrated that spotted wolffish underwent strong declines in abundance and distribution from the late 1970s until the mid-1990s, but since then there has been some recovery over most of its Canadian range. Abundance and biomass indices have increased considerably since the low point in the early 1990s (Rideout & Ings 2018). Spotted wolffish was identified in the observer data only in one year, when <10 kg was reported (Table 11). There is a high degree of confidence that there are no significant detrimental direct effects of the YTFF on spotted wolffish – SG60, SG80 and SG100 are met.

c	Indirect effects			
	Guide post		Indirect effects have been considered for the UoA and are thought to be **highly likely** to not create unacceptable impacts.	There is a **high degree of confidence** that there are no **significant detrimental indirect effects** of the UoA on ETP species.
	Met?		**Yes**	**No**

Rationale

Indirect effects are considered here to be impacts on behaviours, feeding efficiency, essential/critical habitats or other aspects of ETP species' life histories.

The following evidence indicates SG 80 is met: Northern wolffish, spotted wolffish and Atlantic wolffish occur on most bottom types, but seek rock/stony bottom during spawning. This bottom type is risky to trawl and is in any case not targeted for yellowtail flounder. Critical habitat has also been assessed explicitly for northern and spotted wolffish (DFO 2018h), and was identified as occurring in deeper depths than those prosecuted for yellowtail flounder (i.e., for the Newfoundland and Labrador region, northern wolffish = 118 - 636 m, spotted wolffish = 82 - 346 m). There are no known significant predator or prey links between the three wolffish species and yellowtail flounder as the target species (and dominant catch) of the YTFF. Indirect effects have been considered and are thought to be highly likely to not create unacceptable impacts, so SG80 is met.

The following evidence indicates SG 100 is not met: Because the YTFF is a bottom trawl fishery that impacts seabed species and habitats that may be of importance to wolffish species, it is not possible to say there is a high degree of confidence that there are no significant detrimental indirect effects, however. As such, SG100 is not met.

References

Albikovskaya, L.K. (1982). Distribution and abundance of Atlantic wolffish, spotted wolffish and northern wolffish in the Newfoundland area. NAFO Scientific Council Studies, V. 3, pp. 29-32. https://archive.nafo.int/open/studies/s3/albikoskaya.pdf.

Blyth-Skyrme, R., Atkinson, B. & J. Angel (2015). OCI Grand Bank Yellowtail Flounder Trawl Fishery Public Certification Report. Acoura Marine Ltd., October 2015. 205 pp. https://cert.msc.org/FileLoader/FileLinkDownload.asmx/GetFile?encryptedKey=UdKVdJCQc9S1Pr3k0RvwpkpqocsRH93ZvHgbfWsicaIuq4yLBQctwRKlALhyN20g.

DFO (2018e). Atlantic wolffish, *Anarhichas lupus*. DFO webpage, date modified: 2018-09-06. http://www.dfo-mpo.gc.ca/species-especes/profiles-profils/wolffish-loup-at-eng.html.

DFO (2018f). Spotted wolffish, *Anarhichas minor*. DFO webpage, date modified: 2018-09-06. http://www.dfo-mpo.gc.ca/species-especes/profiles-profils/spottedwolf-louptachete-eng.html.

DFO (2018g). Northern wolffish, *Anarhichas minor*. DFO webpage, date modified: 2018-09-06. http://www.dfo-mpo.gc.ca/species-especes/profiles-profils/northernwolffish-loupatetelarge-eng.html

DFO (2018h). Recovery strategy for northern wolffish (*Anarhichas denticulatus*) and spotted wolffish (*Anarhichas minor*), and management plan for Atlantic wolffish (*Anarhichas lupus*) in Canada. Original publication 2008, 1st Amendment 2018. Fisheries and Oceans Canada, Ottawa. vii + 82 pp. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/RsMpNthnSpottedAtlanticWolffish-v00-2018Jun-Eng1.pdf.

DFO (2018k). Groundfish general licence conditions: NAFO Divisions 0, 2GHJ, 3KLNOP and 4R, Condition #15036, 15037, 15038, 15039. 9 pp.

Grant, S.M. & W. Hiscock (2014). Post-capture survival of Atlantic wolffish (*Anarhichas lupus*) captured by bottom otter trawl: Can live release programs contribute to the recovery of species at risk? Fisheries Research, V. 151, pp. 169-176. https://doi.org/10.1016/j.fishres.2013.11.003.

Simpson, M.R., Mello, L.G.S., Miri, C.M. & M. Treble (2012). A pre-COSEWIC assessment of three species of Wolffish (*Anarhichas denticulatus*, *A. minor*, and *A. lupus*) in Canadian waters of the Northwest Atlantic Ocean. DFO Canadian Science Advisory Secretariat Research Document 2011/122. iv + 69 pp.

Rideout, R.M. & D.W. Ings (2018). Research vessel bottom trawl survey report (NL Region): a stock-by-stock summary of survey information up to and including the 2017 spring and autumn surveys. Canadian Technical Report on Fisheries and Aquatic Sciences Fs97-6/3267E-PDF: vii + 59 pp. http://publications.gc.ca/collections/collection_2018/mpo-dfo/Fs97-6-3267-eng.pdf.

Overall Performance Indicator score	**90**
Condition number (if relevant)	**N/A**

PI 2.3.2 – ETP species management strategy

PI 2.3.2	The UoA has in place precautionary management strategies designed to: - meet national and international requirements; - ensure the UoA does not hinder recovery of ETP species. Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species		
Scoring Issue	SG 60	SG 80	SG 100
a Management strategy in place (national and international requirements)			
Guide post	There are **measures** in place that minimise the UoA-related mortality of ETP species, and are expected to be **highly likely to achieve** national and international requirements for the protection of ETP species.	There is a **strategy** in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be **highly likely to achieve** national and international requirements for the protection of ETP species.	There is a **comprehensive strategy** in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to **achieve above** national and international requirements for the protection of ETP species.
Met?	**Yes – northern wolffish, spotted wolffish.**	**Yes – northern wolffish, spotted wolffish.**	**Yes – northern wolffish, spotted wolffish.**

Rationale

Only Atlantic wolffish, northern wolffish and spotted wolffish are ETP species that are considered to interact with the YTFF. There is a Recovery Strategy in place for northern and spotted wolffish species, which also serves as a management plan for Atlantic wolffish (DFO 2018h). However, general prohibitions under SARA that no person shall kill, harm, harass, capture or take an individual do not apply to species listed as Special Concern (DFO 2015). As such, northern wolffish and spotted wolffish are scored in SIa, but Atlantic wolffish is scored in SIb.

The following evidence indicates SG 60 is met: See SG100.

The following evidence indicates SG 80 is met: See SG100.

The following evidence indicates SG 100 is met: There is a Recovery Strategy in place for northern and spotted wolffish species (DFO 2018h). Objectives for the strategy include to enhance knowledge of the biology and life history of wolffish species, identify, conserve and/or protect wolffish habitat, and reduce the potential of wolffish population declines by mitigating human impacts. General prohibitions apply that no person shall kill, harm, harass, capture or take an individual that is listed under SARA as Threatened or Endangered.

The YTFF has operated a voluntary wolffish hotspot avoidance protocol since the fishery was first certified in 2010 (Atkinson et al. 2010), with information on wolffish catch rates shared between vessels. The SARA designation also requires that northern and spotted wolffish are released in a manner that maximizes chance of survival (DFO 2018h), which is facilitated through the development of a wolffish handling training video that is supplied to crew members, and through fitting live release chutes to YTFF vessels. The fishery also operates in areas that are outside the core geographic and depth range of the three wolffish species (Albikovskaya 1982). Catches must be recorded and reported in SARA logbooks, but there is also a high rate of observer coverage in the fishery (mean 40%, based on observed catch to total catch of yellowtail flounder) which provides high quality catch data. Finally, the fishery is monitored with 100% VMS coverage and landings are subject to 100% dockside monitoring. There is a comprehensive strategy in place for managing ETP species, to ensure the UoA does not hinder the recovery of northern wolffish and spotted wolffish as ETP species – SG60, SG80 and SG100 are met.

b Management strategy in place (alternative)				
	Guide post	There are **measures** in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a **strategy** in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a **comprehensive strategy** in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species.
	Met?	**Yes – Atlantic wolffish**	**Yes – Atlantic wolffish**	**Yes – Atlantic wolffish**

Rationale

The following evidence indicates SG 60 is met: See SG100.

The following evidence indicates SG 80 is met: See SG100.

The following evidence indicates SG 100 is met: There is a Recovery Strategy in place for northern and spotted wolffish species, which also serves as a management plan for Atlantic wolffish (DFO 2018h). General prohibitions under SARA that no person shall kill, harm, harass, capture or take an individual do not apply to species listed as Special Concern (DFO 2015). Objectives for the strategy include to enhance knowledge of the biology and life history of wolffish species, identify, conserve and/or protect wolffish habitat, and reduce the potential of wolffish population declines by mitigating human impacts.

The YTFF has operated a voluntary wolffish hotspot avoidance protocol since the fishery was first certified in 2010 (Atkinson et al. 2010), with information on wolffish catch rates shared between vessels. The SARA designation also requires that northern and spotted wolffish are released in a manner that maximizes chance of survival (DFO 2018h), which is facilitated through the development of a wolffish handling training video that is supplied to crew members, and through fitting live release chutes to YTFF vessels. The fishery also operates in areas that are outside the core geographic and depth range of the three wolffish species (Albikovskaya 1982). Catches must be recorded and reported in SARA logbooks, but there is also a high rate of observer coverage in the fishery (mean 40%, based on observed catch to total catch of yellowtail flounder) which provides high quality catch data. Finally, the fishery is monitored with 100% VMS coverage and landings are subject to 100% dockside monitoring. There is a comprehensive strategy in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species – SG60, SG80 and SG100 are met.

c	Management strategy evaluation			
	Guide post	The measures are **considered likely** to work, based on **plausible argument** (e.g., general experience, theory or comparison with similar fisheries/species).	There is an **objective basis for confidence** that the measures/strategy will work, based on **information** directly about the fishery and/or the species involved.	The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a **quantitative analysis** supports **high confidence** that the strategy will work.
	Met?	**Yes**	**Yes**	**Yes**

Rationale

The following evidence indicates SG 60 is met: See SG100.

The following evidence indicates SG 80 is met: See SG100.

The following evidence indicates SG 100 is met: Wolffish are managed through maintaining spatial separation by depth with the majority of the population, and through a hotspot avoidance protocol and live release where they are caught, facilitated by crew training and live release chutes. Where caught, releasing wolffish has good potential to be effective because these species do not have swim bladders and therefore do not suffer barotrauma in the way that fish with swim bladders do when retrieved from depth. DFO (2004) reported that the majority of captured wolffish are very lively when first captured, and post-capture survival was found to be very good (92-100%) after capture in the YTFF, even after air exposure periods of up to 2 hours (Grant & Hiscock 2014). Total catches of northern and spotted wolffish in the YTFF are extremely low (mean = approximately 0.1 t and <10 kg annually, for northern and spotted wolffish, respectively) Overall, The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work – SG60, SG80 and SG100 are met.

d	Management strategy implementation			
	Guide post		There is some **evidence** that the measures/strategy is being implemented successfully.	There is **clear evidence** that the strategy/comprehensive strategy is being implemented successfully and **is achieving its objective as set out in scoring issue (a) or (b).**

	Met?	**Yes**		**No**

Rationale

The following evidence indicates SG 80 is met: The three wolffish species are managed through maintaining spatial separation by depth with the majority of the population, a hotspot avoidance protocol and through the mandatory release requirement under SARA for northern wolffish and spotted wolffish (in place since 2004), and through the convention that Atlantic wolffish are also discarded; this is facilitated thorough fitting live release chutes to the YTFF vessels. The approach is confirmed through an average of 40% observer coverage, together with 100% VMS and dockside monitoring of landings. This provides evidence that the strategy is being implemented successfully, so SG80 is met. There is also evidence that the stocks have been recovering from lows in the late 1990s (Simpson et al. 2012), including in the Newfoundland and Labrador Shelves area recently (Rideout & Ings 2018).

The following evidence indicates SG 100 is not met: It is not clear if the recent pattern of improvement in wolffish stock status is repeated elsewhere within Canadian waters, so in the context of the objective for the wolffish strategy being recovery for the populations in general, we have determined that SG100 is not clearly met.

e	Review of alternative measures to minimize mortality of ETP species			
	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.	There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.
	Met?	**Yes**	**No**	**No**

Rationale

The following evidence indicates SG 60 is met: For the YTFF there are a range of measures in place which are designed to minimise unwanted catch and mortality of wolffish species, including the hotspot avoidance protocol, the release of wolffish species through live release chutes, and the video training for crew of wolffish handling practices. These requirements were developed over time in response to identified issues and concerns related to catch and bycatch levels and risk associated with the YTFF. It is considered that this constitutes a review of alternative measures, with some obvious implementation of appropriate measures.

The following evidence indicates SG 80 is not met: Is not clear that there is a regular review of alternative measures for wolffish species, so SG80 is not met. As such, a Condition of Certification is set (#2)

The following evidence indicates SG 100 is not met: SG100 is not met.

References

Albikovskaya, L.K. (1982). Distribution and abundance of Atlantic wolffish, spotted wolffish and northern wolffish in the Newfoundland area. NAFO Scientific Council Studies, V. 3, pp. 29-32. https://archive.nafo.int/open/studies/s3/albikoskaya.pdf.

Atkinson, B., Blyth-Skyrme, R., Angel, J., Aldous, D. & P. Knapman (2010). MSC Assessment Report for the OCI Grand Bank Yellowtail Flounder Trawl Fishery. Version 5: Public Certification Report. Moody Marine Ltd., October 2010. Ref: 82104/v5.

DFO (2004). Allowable harm assessment for spotted and northern wolffish. DFO Canadian Science Advisory Secretariat Stock Status Report 2004/031. 5 pp. http://www.dfo-mpo.gc.ca/csas/Csas/status/2004/SSR2004_031_e.pdf.

DFO (2015). Species at Risk Act: measures to protect listed wildlife species. DFO website publication, dated 2015-07-09. Available online: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/publications/act/chapter-9.html#9b.

DFO (2018h). Recovery strategy for northern wolffish (Anarhichas denticulatus) and spotted wolffish (Anarhichas minor), and management plan for Atlantic wolffish (Anarhichas lupus) in Canada. Original publication 2008, 1st Amendment 2018. Fisheries and Oceans Canada, Ottawa. vii + 82 pp. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/RsMpNthnSpottedAtlanticWolffish-v00-2018Jun-Eng1.pdf

Grant, S.M. & W. Hiscock (2014). Post-capture survival of Atlantic wolffish (*Anarhichas lupus*) captured by bottom otter trawl: Can live release programs contribute to the recovery of species at risk? Fisheries Research, V. 151, pp. 169-176. https://doi.org/10.1016/j.fishres.2013.11.003.

Rideout, R.M. & M.J. Morgan (2007). Major Changes in Fecundity and the Effect on Population Egg Production for Three Species of North-west Atlantic Flatfishes. Journal of Fish Biology 70 (6): 1759–79.

Simpson, M.R., Mello, L.G.S., Miri, C.M. & M. Treble (2012). A pre-COSEWIC assessment of three species of Wolffish (*Anarhichas denticulatus*, *A. minor*, and *A. lupus*) in Canadian waters of the Northwest Atlantic Ocean. DFO Canadian Science Advisory Secretariat Research Document 2011/122. iv + 69 pp.

Overall Performance Indicator score	**75**
Condition number (if relevant)	**#2**

PI 2.3.3 – ETP species information

PI 2.3.3		Relevant information is collected to support the management of UoA impacts on ETP species, including: - Information for the development of the management strategy; - Information to assess the effectiveness of the management strategy; and - Information to determine the outcome status of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts			
	Guide post	Qualitative information is **adequate to estimate** the UoA related mortality on ETP species. **OR** **If RBF is used to score PI 2.3.1 for the UoA:** Qualitative information is **adequate to estimate productivity and susceptibility** attributes for ETP species.	Some quantitative information is **adequate to assess** the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. **OR** **If RBF is used to score PI 2.3.1 for the UoA:** Some quantitative information is **adequate to assess productivity and susceptibility attributes** for ETP species.	Quantitative information is available to assess with a high degree of certainty the **magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status** of ETP species.
	Met?	**Yes**	**Yes**	**Yes**

Rationale

Only Atlantic wolffish, northern wolffish and spotted wolffish are ETP species that are considered to interact with the YTFF.

With respect to SA3.6.2.2, we note that Atlantic wolffish may be retained but have not been retained in the OCI YTF fishery in recent years, while northern wolffish and spotted wolffish have been returned in compliance with their SARA status (Table 11).

The following evidence indicates SG 60 is met: See SG80.

The following evidence indicates SG 80 is met: For the three wolffish species, there are high quality catch data available, based on an average annual observer coverage of around 40% of the yellowtail flounder catch. Simpson et al. (2012) undertook a thorough review of stock status for all three species, and Rideout & Ings (2018) provide a recent summary of trends in abundance and distribution. It is clear for these species that quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the three wolffish species; SG60 and SG80 are met.

The following evidence indicates SG 100 is met: SG100 is particularly difficult to meet, here, but work has been undertaken specifically in the YTFF to assess the potential for live release of wolffish, where 92-100% of the Atlantic wolffish tested survived after tows of ≤2.5 hours and air exposure of ≤2 hours (Grant & Hiscock 2014). There are also extremely small quantities of northern and spotted wolffish taken in the fishery (Table 11), which are required to be released (DFO 2018k). The Assessment Team notes that releasing live wolffish has good potential for success because these species do not have swim bladders (thus, do not suffer barotrauma in the way that fish with swim bladders do when retrieved from depth) and the majority of captured wolffish are reported to be very lively when first captured (DFO 2004). While unobserved mortality (i.e. SA3.1.8, MSC 2018a) may occur, such mortality is accounted for in analyses of stock abundance and distribution, and there is no suggestion that unobserved mortality comprises a significant or unaccounted for concern. Overall, it is considered that quantitative information is available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of the three wolffish species – SG100 is also met.

b	Information adequacy for management strategy

	Guide post	Information is adequate to support **measures** to manage the impacts on ETP species.	Information is adequate to measure trends and support a **strategy** to manage impacts on ETP species.	Information is adequate to support a **comprehensive strategy** to manage impacts, minimize mortality and injury of ETP species, and evaluate with a **high degree of certainty** whether a strategy is achieving its objectives.
	Met?	**Yes**	**Yes**	**Yes**

Rationale

The following evidence indicates SG 60 is met: See SG100.

The following evidence indicates SG 80 is met: For all three species, available catch data are high quality and they are collected routinely based on an average annual observer coverage level of 40% (based on the observed catch of yellowtail flounder). YTFF vessels are monitored with 100% VMS and specifically target predominantly sandy seabeds. Also, bottom trawl research surveys have been and continue to be undertaken annually and allow trends in abundance and distribution to be determined (e.g., Rideout & Ings 2018). Information is certainly adequate to measure trends and support a strategy to manage impacts on ETP species; SG60 and SG80 are met.

The following evidence indicates SG 100 is met: The long time series of data and work undertaken to assess post-release survival potential for wolffish (DFO 2004, Grant & Hiscock 2014) supports a higher score. Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives – SG100 is also met.

References

DFO (2004). Allowable harm assessment for spotted and northern wolffish. DFO Canadian Science Advisory Secretariat Stock Status Report 2004/031. 5 pp. http://www.dfo-mpo.gc.ca/csas/Csas/status/2004/SSR2004_031_e.pdf.

DFO (2018k). Groundfish general licence conditions: NAFO Divisions 0, 2GHJ, 3KLNOP and 4R, Condition #15036, 15037, 15038, 15039. 9 pp.

Grant, S.M. and W. Hiscock (2014). Post-capture survival of Atlantic wolffish (*Anarhichas lupus*) captured by bottom otter trawl: Can live release programs contribute to the recovery of species at risk? Fisheries Research, V. 151, pp. 169-176. https://doi.org/10.1016/j.fishres.2013.11.003.

MSC (2018a). MSC Fisheries Standard, v.2.01. Marine Stewardship Council, London. 31st August 2018. 289 pp.

Rideout, R.M. & D.W. Ings (2018). Research vessel bottom trawl survey report (NL Region): a stock-by-stock summary of survey information up to and including the 2017 spring and autumn surveys. Canadian Technical Report on Fisheries and Aquatic Sciences Fs97-6/3267E-PDF: vii + 59 pp. http://publications.gc.ca/collections/collection_2018/mpo-dfo/Fs97-6-3267-eng.pdf.

Simpson, M.R., Mello, L.G.S., Miri, C.M. & M. Treble (2012). A pre-COSEWIC assessment of three species of Wolffish (*Anarhichas denticulatus*, *A. minor*, and *A. lupus*) in Canadian waters of the Northwest Atlantic Ocean. DFO Canadian Science Advisory Secretariat Research Document 2011/122. iv + 69 pp.

Draft scoring range	**>80**
Information gap indicator	**None**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	**100**
Condition number (if relevant)	**N/A**

PI 2.4.1 – Habitats outcome

PI 2.4.1		The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates		
Scoring Issue		SG 60	SG 80	SG 100
a	Commonly encountered habitat status			
	Guide post	The UoA is **unlikely** to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is **highly unlikely** to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is **evidence** that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
	Met?	**Yes – single element**	**Yes – single element**	**Yes – single element**

Rationale

The MSC requires that assessment is based on the 'habitat under consideration' (SA3.13.5, MSC 2018a); in the case of the YTFF we have considered this to be habitats on the Grand Bank < 100 m depth.

In order to undertake an analysis of the frequency of fishing in different locations by the YTFF, Spatialanalysis (2015) divided the Grand Bank into a 3-minute grid, such that each cell equated to approximately 6.25 sq. nautical miles. Given that the area of the Grand Bank of <100 m depth was calculated as being 41,549 sq. nautical miles, this meant the analysis of fishing effort was conducted on 6,564 3-minute grid cells. The habitats of the shallow Grand Bank are then estimated to be mainly sand (79.6%), with smaller amounts of muddy sand (17.6%) and then sandy mud (0.4%) (Spatialanalysis 2015).

Based on attributing these sediment types to the different cells used in the effort analysis, and looking at hours fished by the YTFF in each year over the period 2012-2014, the YTFF was prosecuted for an annual average of 4,794 hours (range 1,990-6,567 hours), with 4,328 hours fished on sand (Table 14). Gilkinson (2013) looked at community composition across the Grand Banks. Annelida and Arthropoda were dominant in terms of species richness, but were minor components of total biomass. In contrast the species-poor Echinodermata dominated biomass (58% of the total), and the sand dollar, *E. parma* in particular (69% of total echinoderm biomass). This author also noted that deep-burrowing bivalve molluscs are an important contributor to benthic biomass on Grand Bank sandy seabeds.

The MSC requires that benthic habitats are recognised according to their substratum, geomorphology and biota (SA3.13.2, MSC 2018a). The commonly encountered habitat for the assessment of the YTFF is considered to be as follows:

- Substratum: Fine (Sand)
- Geomorphology: Flat (current rippled, wave rippled)
- Biota: Small erect / encrusting / burrowing (infaunal bioturbators).

The following evidence indicates SG 60 is met: See SG100.

The following evidence indicates SG 80 is met: See SG100.

The following evidence indicates SG 100 is met: The analysis undertaken by Spatial analysis (2015 showed that fishing occurred in 8.1% of the sand cells; not all cells in which fishing occurred were fished in their entirety, and the average annual area fished was just 1.0% of the Grand Bank area of < 100 m depth.)

A study of direct trawling impacts was conducted on the northern part of the Grand Bank, in an area of relatively stable sand in deeper water (c. 130 m) than is typically fished for yellowtail flounder (Gordon Jr. et al. 2002). This study concluded that the rich macrobenthic community in this area had recovered fully within one year after intensive fishing, although immediate impacts were readily identifiable. This is consistent with results obtained from meta-analyses of trawling studies conducted by Hiddink et al. (2017) and Sciberras et al. (2018) which allowed for estimates of recovery times for the biomass and numbers of animals in the benthic biota to be derived. These studies brought together results from a wide variety of studies and concluded that, even under very high levels of depletion, and assuming the extreme range of probability, community recovery following fishing would be expected well within 20 years. There is evidence that the UoA is highly unlikely to reduce structure and function of the

commonly encountered habitats to a point where there would be serious or irreversible harm – SG60, SG80 and SG100 are met.

b	VME habitat status			
	Guide post	The UoA is **unlikely** to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is **highly unlikely** to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is **evidence** that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
	Met?	**NA**	**NA**	**NA**

Rationale

For the purposes of commonly encountered and minor habitats, we have considered the habitat under consideration (SA3.13.5, MSC 2018) to be habitats on the Grand Bank < 100 m depth. From a precautionary perspective, for VME habitats, we have considered the 'habitat under consideration to be the wider Canadian Atlantic region and then the NAFO-CA.

Work has been undertaken to map coral, sponge and seapen concentrations throughout Atlantic Canada (e.g., Kenchington *et al*. 2010, Beazley *et al*. 2016, Guijarro *et al*. 2016). These studies used information on habitat observations from commercial fishing operations and research surveys (i.e., they employed both fishery-dependent and more systematic sampling). In Divisions 2+3KLMNO, the data show that these species are concentrated along a narrow band of the midslope (Figure 22). Kenchington *et al*. (2016) then employed kernel density estimation, applied to research vessel trawl survey data in each Canadian east coast biogeographic unit (or portions thereof), to identify 'significant benthic areas' (SBAs) for four species groups – seapens, sponges, small gorgonians and large gorgonians. This work incorporated new survey data collected from 2009 to 2015. Significantly, no SBAs were identified in the area fished on the shallow Grand Bank by the YTFF (Figure 23).

VMEs have also been identified by NAFO, with bottom fishing activities prohibited in seamount closure areas (shaded blue in Figure 24) and sponge, coral and seapen closures (shaded red in Figure 24). All of these sites occur in deep water, however, well in excess of the depth fished by the YTFF (for example, the 'Tail of the Bank 1' VME occurs in approximately 2,000 m of water, while the 3O Coral Closure starts on the continental slope at 800 m depth – FAO 2019).

Based on the information for VMEs in Canadian and international waters, it is considered that the YTFF, which occurs in water of less than 200 m at all times, and almost always in water of less than 100 m depth, does not come in to contact with VMEs.

c	Minor habitat status			
	Guide post			There is **evidence** that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.
	Met?			**Yes – both elements**

Rationale

As for the commonly encountered habitat, based on attributing sediment types to the different cells used in the Spatialanalysis (2015) effort analysis, and looking at hours fished by the YTFF in each year over the period 2012-2014, the YTFF was prosecuted for 455 hours on muddy sand and 11 hours on sandy mud.

Minor habitats are considered to be similar to the commonly encountered habitat, but have muddy sand and sandy mud as the substratum type.

- Substratum: 1) Fine (Muddy sand), and 2) Fine (Sandy mud)
- Geomorphology: Flat (current rippled, wave rippled)
- Biota: Small erect / encrusting / burrowing (infaunal bioturbators).

The following evidence indicates SG 100 is met: The analysis undertaken by Spatial analysis (2015) showed that fishing in the YTFF occurred in 4.0% of the muddy sand cells and 4.3% of the sandy mud cells. For the same

reasons as presented for commonly encountered habitats in SIa (i.e., noting habitat recovery trajectories as presented by Hiddink et al. 2017 and Sciberras et al. 2018), SG100 is met for these two minor habitats.

References

Beazley, L., Murillo, F.J., Kenchington, E., Guijarro, J., Lirette, C., Siferd, T., Treble, M., Baker, E., Bouchard Marmen, M., Tompkins MacDonald, G. 2016. Species Distribution Modelling of Corals and Sponges in the Eastern Arctic for Use in the Identification of Significant Benthic Areas. Can. Tech. Rep. Fish. Aquat. Sci. 3175: vii + 210p.

FAO (2019). Vulnerable marine ecosystems database. Food and Agriculture Organisation of the United Nations. http://www.fao.org/in-action/vulnerable-marine-ecosystems/vme-database/en/vme.html.

Hiddink, J.G., Jennings, S., Sciberrasa, M., Szosteka, C.L., Hughes, K.M., Ellis, N., Rijnsdorp, A.D., McConnaughey, R.A., Mazord, T., Hilborn, R., Collie, J.S., Pitcher, C.R., Amoroso, R.O., Parma, A.M., Suuronen, P. & M.J. Kaiser (2017). Global analysis of depletion and recovery of seabed biota after bottom trawling disturbance. Proceedings of the National Academy of Sciences of the United States of America Early Edition Online, 1–6.

Gilkinson, K. (2013). Recent DFO (Newfoundland & Labrador Region) studies of the Grand Banks benthos at small and large spatial scales. DFO Can. Sci. Advis. Sec. Res. Doc. 2012/114. v + 30 p. https://waves-vagues.dfo-mpo.gc.ca/Library/347898.pdf

Gordon Jr., D.C., Gilkinson, K.D., Kenchington, E.L.R., Prena, J., Bourbannais, C., MacIsaac, K., McKeown, D.L. & W.P. Vass (2002). Summary of the Grand Banks otter trawling experiment (1993-1995): effects on benthic habitat and communities. Can. Tech. Rep. Fish. Aquat. Sci./Rapp. Tech. Can. Sci. Halieut. Aquat., no. 2416: 72.

Guijarro, J., Beazley, L., Lirette, C., Kenchington, E., Wareham, V., Gilkinson, K., Koen-Alonso, M. & F.J. Murillo (2016). Species Distribution Modelling of Corals and Sponges from Research Vessel Survey Data in the Newfoundland and Labrador Region for Use in the Identification of Significant Benthic Areas. Canadian Technical Report on Fisheries and aquatic Sciences, No. 3171: vi + 126 pp.

Hiddink, J.G., Jennings, S., Sciberrasa, M., Szosteka, C.L., Hughes, K.M., Ellis, N., Rijnsdorp, A.D., McConnaughey, R.A., Mazord, T., Hilborn, R., Collie, J.S., Pitcher, C.R., Amoroso, R.O., Parma, A.M., Suuronen, P. & M.J. Kaiser (2017). Global analysis of depletion and recovery of seabed biota after bottom trawling disturbance. Proceedings of the National Academy of Sciences of the United States of America Early Edition Online, 1–6.

Kenchington, E., Lirette, C., Cogswell, A., Archambault, D., Archambault, P., Benoit, H., Bernier, D., Brodie, B., Fuller, S., Gilkinson, K., Lévesque, M., Power, D., Siferd, T., Treble, M. & V. Wareham (2010). Delineating coral and sponge concentrations in the biogeographic regions of the East Coast of Canada using spatial analyses. DFO Canadian Science Advisory Secretariat Science Research Document 2010/041. vi + 202 pp. http://publications.gc.ca/collections/collection_2011/mpo-dfo/Fs70-5-2010-041.pdf

Kenchington, E., Beazley, L., Lirette, C., Murillo, F.J., Guijarro, J., Wareham, V., Gilkinson, K., Koen Alonso, M., Benoît, H., Bourdages, H., Sainte-Marie, B., Treble, M. & T. Siferd (2016). Delineation of coral and sponge significant benthic areas in Eastern Canada using kernel density analyses and species distribution models. DFO Canadian Science Advisory Secretariat Science Research Document 2016/093. vi + 178 pp.

MSC (2018a). MSC Fisheries Standard, v.2.01. Marine Stewardship Council, London. 31st August 2018. 289 pp.

Spatialanalysis (2015). Footprint of The OCI-3LNO Yellowtail Flounder Fishery: 2000 to 2011 and 2012 to 2014. Prepared for: Ocean Choice International Prepared for: Ocean Choice International. Prepared for: Ocean Choice International. Ottawa, ON, Canada.

Sciberras, M., Hiddink, J.G., Jennings, S., Szostek, C.L., Hughes, K.M., Kneafsey, B., Clarke, L.J., Ellis, N., Rijnsdorp, A.D., McConnaughey, R.A., Hilborn, R., Collie, J.S., Pitcher, C.R., Amoroso, R.O., Parma, A.M., Suuronen, P. & M.J. Kaiser (2018). Response of benthic fauna to experimental bottom fishing: a global meta-analysis. Fish and Fisheries, V. 19, pp. 698–715.

Overall Performance Indicator score	**100 – all three elements**
Condition number (if relevant)	**N/A**

PI 2.4.2 – Habitats management strategy

PI 2.4.2		There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are **measures** in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a **partial strategy** in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a **strategy** in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
	Met?	**Yes**	**Yes**	**No**

Rationale

The commonly encountered habitat for the assessment of the YTFF is considered to be as follows:

- Substratum: Fine (Sand)
- Geomorphology: Flat (current rippled, wave rippled)
- Biota: Small erect / encrusting / burrowing (infaunal bioturbators).

Based on the information for VMEs in Canadian (Kenchington et al. 2016) and international (FAO 2019) waters, it is considered that the YTFF, which occurs in water of less than 200 m at all times, and almost always in water of less than 100 m depth, does not come in to contact with VMEs.

The following evidence indicates SG 60 is met: See SG80.

The following evidence indicates SG 80 is met: The YTFF occurs in sandy habitats in relatively shallow water on the Grand Bank, typically less than 100 m depth. This area is subject to wave and current-induced scour, as well as iceberg scour (Barrie et al. 1992). Recovery of the seabed and seabed communities in these conditions is relatively fast, and well within 20 years even under extreme levels of depletion (Hiddink et al. 2017, Sciberras et al. 2018). Spatialanalysis (2015) showed that the amount of ground fished by the YTFF fleet is very small, with less than 1% of the Grand Bank area <100 m being towed in any year. Nevertheless, the YTFF fleet uses a Trackwell system and 'flying doors' that are intended to minimise ground gear contact with the seabed. The fleet is also tracked with VMS such that the area fished is known, while for reasons of catching efficiency the fleet actively avoids habitats that are sub-optimal for yellowtail flounder as the target species (and main catch) for the fishery. There is at least a partial strategy in place that is expected to achieve the Habitat Outcome 80 level of performance or above – SG60 and SG80 are met.

The following evidence indicates SG 100 is not met: It is not clear that there is a habitat strategy in place for all MSC UoAs and non-MSC fisheries. As such, SG100 is not met.

b	Management strategy evaluation			
	Guide post	The measures are **considered likely** to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	There is some **objective basis for confidence** that the measures/partial strategy will work, based on **information directly about the UoA and/or habitats** involved.	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on **information directly about the UoA and/or habitats** involved.
	Met?	**Yes**	**Yes**	**Yes**

Rationale

The following evidence indicates SG 60 is met: See SG100.

The following evidence indicates SG 80 is met: See SG100.

The following evidence indicates SG 100 is met: There is at least a partial strategy for habitats in place, based on the use of a Trackwell system and 'flying doors' that are intended to minimise ground gear contact with the seabed,

as well as a focus on optimal sandy habitats for yellowtail flounder that are relatively shallow and subject to wave, current and iceberg scour. Spatialanalysis (2015) showed that less than 1% of the Grand Bank <100 m depth was impacted annually, while results from a local study (Gordon Jr. 2002) and global meta-analyses (Hiddink et al. 2017, Sciberras et al. 2018) are together considered to comprise testing that supports high confidence that the partial strategy will work, based on information directly about the YTFF and the habitats involved – SG60, SG80 and SG100 are met.

c	Management strategy implementation			
	Guide post		There is **some quantitative evidence** that the measures/partial strategy is being implemented successfully.	There is **clear quantitative evidence** that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
	Met?		**Yes**	**Yes**

Rationale

The following evidence indicates SG 80 is met: See SG100.

The following evidence indicates SG 100 is met: Spatialanalysis (2015) showed that less than 1% of the Grand Bank <100 m depth was impacted annually, comprising effort in just 8.1% of the cells characterised as sand (i.e., the commonly encountered habitat) and in just 4.0% and 4.3% of the cells characterised by muddy sand and sandy mud (i.e., the minor habitats). Results from a local study (Gordon Jr. 2002) and global meta-analyses (Hiddink et al. 2017, Sciberras et al. 2018) show that recovery in such habitats occurs well within 20 years even under extreme levels of depletion. Given the small areas of the Grand Bank that are impacted each year, this evidence is together considered to provide clear quantitative evidence that the partial strategy of minimising ground contact (for reasons of catching efficiency) is being implemented successfully and is achieving its objective for both commonly encountered and minor habitats – SG80 and SG100 are met.

d	Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs			
	Guide post	There is **qualitative evidence** that the UoA complies with its management requirements to protect VMEs.	There is **some quantitative evidence** that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	There is **clear quantitative evidence** that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
	Met?	**NA**	**NA**	**NA**

Rationale

Based on the information for VMEs in Canadian and international waters, it is considered that the YTFF, which occurs in water of less than 200 m at all times, does not come in to contact with VMEs.

References

Barrie, J.V., Lewis, C.F.M., Parrott, D.R. & W.T. Collins (1992). Submersible Observations of an Iceberg Pit and Scour on the Grand Banks of Newfoundland. Geo-Marine Letters 12 (1): 1–6.

FAO (2019). Vulnerable marine ecosystems database. Food and Agriculture Organisation of the United Nations. http://www.fao.org/in-action/vulnerable-marine-ecosystems/vme-database/en/vme.html.

Gordon Jr., D.C., Gilkinson, K.D., Kenchington, E.L.R., Prena, J., Bourbannais, C., MacIsaac, K., McKeown, D.L. & W.P. Vass (2002). Summary of the Grand Banks otter trawling experiment (1993-1995): effects on benthic habitat and communities. Can. Tech. Rep. Fish. Aquat. Sci./Rapp. Tech. Can. Sci. Halieut. Aquat., no. 2416: 72.

Hiddink, J.G., Jennings, S., Sciberrasa, M., Szosteka, C.L., Hughes, K.M., Ellis, N., Rijnsdorp, A.D., McConnaughey, R.A., Mazord, T., Hilborn, R., Collie, J.S., Pitcher, C.R., Amoroso, R.O., Parma, A.M., Suuronen, P. & M.J. Kaiser

(2017). Global analysis of depletion and recovery of seabed biota after bottom trawling disturbance. Proceedings of the National Academy of Sciences of the United States of America Early Edition Online, 1–6.

Kenchington, E., Beazley, L., Lirette, C., Murillo, F.J., Guijarro, J., Wareham, V., Gilkinson, K., Koen Alonso, M., Benoît, H., Bourdages, H., Sainte-Marie, B., Treble, M. & T. Siferd (2016). Delineation of coral and sponge significant benthic areas in Eastern Canada using kernel density analyses and species distribution models. DFO Canadian Science Advisory Secretariat Science Research Document 2016/093. vi + 178 pp.

MSC (2018a). MSC Fisheries Standard, v.2.01. Marine Stewardship Council, London. 31st August 2018. 289 pp.

Spatialanalysis (2015). Footprint of The OCI-3LNO Yellowtail Flounder Fishery: 2000 to 2011 and 2012 to 2014. Prepared for: Ocean Choice International Prepared for: Ocean Choice International. Prepared for: Ocean Choice International. Ottawa, ON, Canada.

Sciberras, M., Hiddink, J.G., Jennings, S., Szostek, C.L., Hughes, K.M., Kneafsey, B., Clarke, L.J., Ellis, N., Rijnsdorp, A.D., McConnaughey, R.A., Hilborn, R., Collie, J.S., Pitcher, C.R., Amoroso, R.O., Parma, A.M., Suuronen, P. & M.J. Kaiser (2018). Response of benthic fauna to experimental bottom fishing: a global meta-analysis. Fish and Fisheries, V. 19, pp. 698–715.

Overall Performance Indicator score	**95**
Condition number (if relevant)	**N/A**

PI 2.4.3 – Habitats information

PI 2.4.3		Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	The types and distribution of the main habitats are **broadly understood**. **OR** **If CSA is used to score PI 2.4.1 for the UoA:** Qualitative information is adequate to estimate the types and distribution of the main habitats.	The nature, distribution and **vulnerability** of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA. **OR** **If CSA is used to score PI 2.4.1 for the UoA:** Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.	The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.
	Met?	**Yes**	**Yes**	**Yes**
Rationale				
b	Information adequacy for assessment of impacts			
	Guide post	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear. OR **If CSA is used to score PI 2.4.1 for the UoA:** Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear. OR **If CSA is used to score PI 2.4.1 for the UoA:** Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	The physical impacts of the gear on all habitats have been quantified fully.

The following evidence indicates SG 60 is met: See SG100.

The following evidence indicates SG 80 is met: See SG100.

The following evidence indicates SG 100 is met: There has been extensive work undertaken to map habitats generally within the Canadian EEZ as well as to assess the extent of significant benthic areas (e.g., GSOC 1990, DFO 2007c, Kenchington et al. 2010, Gilkinson 2013, Beazely et al. 2016, Guijarro et al 2016, Kenchington et al. 2016, DFO 2017e). The vulnerability of muddy-sand habitats has been assessed through multiple research projects, summarized through several reviews (e.g., Rice 2006, Grabowski 2014, Hiddink et al. 2017, Hiddink et al. 2018, Sciberras et al. 2018), while the vulnerability of Canadian SBAs to fishing activity was undertaken by Koen-Alonso et al. (2018). The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats – SG60, SG80 and SG100 are met

	Met?	**Yes**	**Yes**	**Yes**

Rationale

The following evidence indicates SG 60 is met: See SG80.

The following evidence indicates SG 80 is met: There is ongoing, active monitoring of the YTFF fleet through VMS and the Trackwell system; the data collected through these systems allowed for a detailed analysis of the footprint of the YTFF in recent years (Spatialanalysis 2015), and showed that <1% of the Grand Bank <100 m depth was towed annually. Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear – SG60 and SG80 are met.

The following evidence indicates SG 100 is met: There has also been a study of trawling on the Grand Bank (Gordon Jr. et al. 2002), while more recently there have been detailed reviews and meta-analyses that considered the evidence for impact and recovery of habitats following fishing (e.g., Rice 2006, Grabowski 2014, Hiddink et al. 2017, Hiddink et al. 2018, Sciberras et al. 2018). At the scale and intensity of the YTFF, it is considered that the physical impacts of the gear on all habitats have been quantified fully – SG100 is also met.

c	Monitoring			
	Guide post		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in all habitat distributions over time are measured.
	Met?		**Yes**	**No**

Rationale

The following evidence indicates SG 80 is met: YTFF vessels are tracked with VMS, and the company uses a Trackwell system to monitor activity at a high resolution. The monitoring undertaken and the data produced clearly demonstrate that adequate information continues to be collected to detect any increase in risk to the main habitats – SG80 is met.

The following evidence indicates SG 100 is not met: It is not possible to say that changes in all habitat distributions over time are measured. SG100 is not met.

References

Beazley, L., Murillo, F.J., Kenchington, E., Guijarro, J., Lirette, C., Siferd, T., Treble, M., Baker, E., Bouchard Marmen, M., Tompkins MacDonald, G. 2016. Species Distribution Modelling of Corals and Sponges in the Eastern Arctic for Use in the Identification of Significant Benthic Areas. Can. Tech. Rep. Fish. Aquat. Sci. 3175: vii + 210p.

DFO (2007c). The Grand Banks of Newfoundland: Atlas of Human Activities. http://www.dfo-mpo.gc.ca/Library/336890.pdf.

DFO (2017e). Delineation of significant areas of coldwater corals and sponge-dominated communities in Canada's Atlantic and Eastern Arctic marine waters and their overlap with fishing activity. DFO Canadian Science Advisory Secretariat Science Advisory Report 2017/007. 45 pp. https://waves-vagues.dfo-mpo.gc.ca/Library/40600099.pdf.

Gilkinson, K. (2013). Recent DFO (Newfoundland & Labrador Region) studies of the Grand Banks benthos at small and large spatial scales. DFO Can. Sci. Advis. Sec. Res. Doc. 2012/114. v + 30 p. https://waves-vagues.dfo-mpo.gc.ca/Library/347898.pdf

Grabowski, J.H., Bachman, M., Demarest, C., Eayrs, S., Harris, B.P., Malkoski, V., Packer D. and D. Stevenson (2014) Assessing the vulnerability of marine benthos to fishing gear impacts, Reviews in Fisheries Science & Aquaculture, V. 22, pp. 142-155. DOI:10.1080/10641262.2013.846292.

GSOC (1990). Geology of the continental margin of eastern Canada; Keen, M.J. and G.L. Williams (eds.). Geological Survey of Canada, Geology of Canada Series no. 2, 855 pp. http://ftp.maps.canada.ca/pub/nrcan_rncan/publications/ess_sst/132/132690/dnag_02_e.zip

Guijarro, J., Beazley, L., Lirette, C., Kenchington, E., Wareham, V., Gilkinson, K., Koen-Alonso, M. & F.J. Murillo (2016). Species Distribution Modelling of Corals and Sponges from Research Vessel Survey Data in the

Newfoundland and Labrador Region for Use in the Identification of Significant Benthic Areas. Canadian Technical Report on Fisheries and aquatic Sciences, No. 3171: vi + 126 pp.

Hiddink, J.G., Jennings, S., Sciberrasa, M., Szosteka, C.L., Hughes, K.M., Ellis, N., Rijnsdorp, A.D., McConnaughey, R.A., Mazord, T., Hilborn, R., Collie, J.S., Pitcher, C.R., Amoroso, R.O., Parma, A.M., Suuronen, P. & M.J. Kaiser (2017). Global analysis of depletion and recovery of seabed biota after bottom trawling disturbance. Proceedings of the National Academy of Sciences of the United States of America Early Edition Online, 1–6.

Hiddink, J.G., Jennings, S., Sciberras, M., Bolam, S.G., Cambiè, G., McConnaughey, R.A., Mazor, T., Hilborn, R., Collie, J.S., Pitcher, R., Parma, A.M., Suuronen, P., Kaiser, M.J. & A.D. Rijnsdorp (2018). Assessing bottom trawling impacts based on the longevity of benthic invertebrates. Journal of Applied Ecology, 2018;00:1–10. https://doi.org/10.1111/1365-2664.13278.

Kenchington, E., Lirette, C., Cogswell, A., Archambault, D., Archambault, P., Benoit, H., Bernier, D., Brodie, B., Fuller, S., Gilkinson, K., Lévesque, M., Power, D., Siferd, T., Treble, M. & V. Wareham (2010). Delineating coral and sponge concentrations in the biogeographic regions of the East Coast of Canada using spatial analyses. DFO Canadian Science Advisory Secretariat Science Research Document 2010/041. vi + 202 pp. http://publications.gc.ca/collections/collection_2011/mpo-dfo/Fs70-5-2010-041.pdf

Kenchington, E., Beazley, L., Lirette, C., Murillo, F.J., Guijarro, J., Wareham, V., Gilkinson, K., Koen Alonso, M., Benoît, H., Bourdages, H., Sainte-Marie, B., Treble, M. & T. Siferd (2016). Delineation of coral and sponge significant benthic areas in Eastern Canada using kernel density analyses and species distribution models. DFO Canadian Science Advisory Secretariat Science Research Document 2016/093. vi + 178 pp.

Koen-Alonso, M., Favaro, C., Ollerhead, N., Benoît, H., Bourdages, H., Sainte-Marie, B., Treble, M., Hedges, K., Kenchington, E., Lirette, C., King, M., Coffen-Smout, S., and J. Murillo (2018). Analysis of the overlap between fishing effort and Significant Benthic Areas in Canada's Atlantic and Eastern Arctic marine waters. DFO Canadian Science Advisory Secretariat Science Research Document 2018/015. xvii + 270 pp. https://waves-vagues.dfo-mpo.gc.ca/Library/40701748.pdf

Rice, J. (2006). Impacts of mobile bottom gears on seafloor habitats, species and communities: a review and synthesis of selected international reviews. Canadian Science Advisory Secretariat Research Document 2006/057: 35 pp.

Sciberras, M., Hiddink, J.G., Jennings, S., Szostek, C.L., Hughes, K.M., Kneafsey, B., Clarke, L.J., Ellis, N., Rijnsdorp, A.D., McConnaughey, R.A., Hilborn, R., Collie, J.S., Pitcher, C.R., Amoroso, R.O., Parma, A.M., Suuronen, P. & M.J. Kaiser (2018). Response of benthic fauna to experimental bottom fishing: a global meta-analysis. Fish and Fisheries, V. 19, pp. 698–715.

Spatialanalysis (2015). Footprint of The OCI-3LNO Yellowtail Flounder Fishery: 2000 to 2011 and 2012 to 2014. Prepared for: Ocean Choice International Prepared for: Ocean Choice International. Prepared for: Ocean Choice International. Ottawa, ON, Canada.

Overall Performance Indicator score	**95**
Condition number (if relevant)	**N/A**

PI 2.5.1 – Ecosystem outcome

PI 2.5.1		The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Ecosystem status			
	Guide post	The UoA is **unlikely** to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is **highly unlikely** to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is **evidence** that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	**Yes – both elements**	**Yes – both elements**	**Yes – both elements**

Rationale

The YTFF occurs in the Newfoundland and Labrador Shelves marine bioregion. The focus of scoring PI 2.5.1 is the impact of the fishery on the 'key ecosystem elements'. These are defined by the MSC 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. They are features most crucial to maintaining the integrity of its structure and functions and the key determinants of the ecosystem resilience and productivity*" (SA3.16.3 MSC 2018a). For the purpose of the assessment, there are considered to be two key ecosystem elements:

i) Productivity patterns, with the Labrador Current as the dominant physical oceanographic feature, and
ii) Groundfish community structure and function, with yellowtail flounder as a constituent part.

The following evidence indicates SG 60 is met: See SG100.

The following evidence indicates SG 80 is met: See SG100.

The following evidence indicates SG 100 is met: A full description of the Newfoundland and Labrador Shelves marine bioregion is provided in 5.3.5. In summary, the circulation pattern through most of the Newfoundland and Labrador Shelves region is dominated by the south-eastward flowing Labrador Current. The salinity and strength of the Labrador Current varies interannually and is influenced by freshwater runoff and ice melt to the north. A strong Labrador Current is associated with more extensive ice coverage in winter and spring across the Newfoundland and Labrador Shelves; melting of this ice contributes to stratification that develops between a surface layer of lower salinity water that warms through the summer and a cold intermediate layer (CIL) of water that with a temperature of $<0^0$ C (Bernier *et al*. 2019).

The extent to which the bottom portion of the water column and the seafloor are covered with slope versus CIL waters influences the biological components of the ecosystem strongly. In particular, the stratification between the cold, relatively low salinity surface water and warm, relatively saline CIL water inhibits mixing within the water column, which affects how nutrients and species are distributed at local to regional scales; in turn, this affects productivity within the system (Colbourne et al. 2018, Bélanger et al. 2018, Bernier et al. 2019).

With respect to key ecosystem element i) (Productivity patterns in the Newfoundland and Labrador Shelves bioregion, with the Labrador Current as the dominant physical oceanographic feature), this is a major oceanographic system and there is no feasible way in which the YTFF could disrupt this key element underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. For this element, therefore, SG60, SG80 and SG100 are met.

The effect of fishing on groundfish stocks in the region was investigated by NAFO SC 2013, where work was undertaken to determine the trophic ecology/species interactions on the Newfoundland and Labrador Shelves and Grand Bank (NAFO Divisions 2J3KLNO). The results of the study indicated that exploitation rates within the Newfoundland and Labrador Shelves and Grand Bank region have never exceeded a 30% Ecosystem Production Potential (EPP) that was defined as a sustainable exploitation threshold, but they do show that catches exceeded the groundfish Fisheries Production Potentials in the 1960s and 1970s, and exceeded the 20% groundfish EPP in the 1980s. Since then, catches declined, and were below the 20% groundfish FPP rate for the 1990-2012 period (2012 being the latest year covered by the study).

With respect to key ecosystem, element ii) (Groundfish community structure and function, with yellowtail flounder as a constituent part), the impact of the YTFF on groundfish stocks is constrained through the different measures in place for the fishery, all of which contribute to a high level of selectivity for the target species; yellowtail flounder comprises >85% of the catch (Table 11). NAFO SC 2013 noted that lower fisheries exploitation may have been a contributing factor in the positive trends observed in the groundfish community in the decades since the collapse of groundfish on the Newfoundland and Labrador Shelves marine bioregion in the late 1980s-early 1990s (e.g. Rice 2002). Fishing mortality on yellowtail flounder is now well below Fmsy (Maddock Parsons et al. 2018) and the fishing mortality of other groundfish species taken in the YTFF is also low (American plaice – NAFO SC 2018b, thorny skate – NAFO SC 2018d, Atlantic cod – NAFO SC 2018e, Atlantic halibut – DFO 2018a, witch – NAFO SC 2018a, Greenland halibut – NAFO SC 2017). Hence, while nutrient and chlorophyll levels have declined and most parts of the region had phytoplankton and zooplankton levels well below average since the publication of the NAFO SC 2013 report, which may indicate that Atlantic ecosystems now have a lower production potential than in the previous decade (Bernier *et al*. 2019), it is considered that there is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm SG60, SG80 and SG100 are met.

References

Bélanger, D., Maillet, G., Pepin, P., Casault, B., Johnson, C., Plourde, S., Galbraith, P.S., Devine, L., Scarratt, M., Blais, M., Head, E., Caverhill, C., Devred, E., Spry, J., Cogswell, A., St-Amand, L., Fraser, S., Doyle, G., Robar, A., Hingdon, J., Holden, J., Porter, C. & E. Colbourne (2018). Biological oceanographic conditions in the Northwest Atlantic during 2017. Serial No. N6790 NAFO SCR Document 18/007. 27 pp. https://www.nafo.int/Portals/0/PDFs/sc/2018/scr18-007.pdf.

Bernier, R.Y., Jamieson, R.E. & A.M. Moore (eds.) (2019). State of the Atlantic Ocean synthesis report. Canadian Technical Report on Fisheries and Aquatic Sciences. No. 3167: iii + 149 pp. http://dfo-mpo.gc.ca/oceans/documents/publications/soto-rceo/2018/atlantic-ecosystems/2019-03-29_SOTO-Atlantic_FormattedReport_EN.pdf

Colbourne, E., Holden, J., Snook, S., Lewis, S., Cyr, F., Senciall, D., Bailey W. & J. Higdon (2018). Physical oceanographic environment on the Newfoundland and Labrador Shelf in NAFO Subareas 2 and 3 during 2017. Serial Number N6793. NAFO SCR Document 18/009. 40 pp.

DFO (2018a). Stock status update of Atlantic halibut (*Hippoglossus hippoglossus*) on the Scotian Shelf and Southern Grand Banks in NAFO Divisions 3NOPs4VWX5Zc. DFO Canadian Science Advisory Secretariat Science Response 2018/022. 9 pp. http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2018/2018_022-eng.pdf.

Maddock Parsons, D., Morgan, M.J. & R. Rogers (2018). Assessment of Yellowtail Flounder in NAFO Divisions 3LNO using a new Stock Production Model in a Bayesian Framework. NAFO SCR Doc. 18/038

MSC (2018a). MSC Fisheries Standard, v.2.01. Marine Stewardship Council, London. 31st August 2018. 289 pp.

NAFO SC (2013). Report of the 6th Meeting of the NAFO Scientific Council Working Group on Ecosystem Science and Assessment (WGESA) [Formerly WGEAFM]. NAFO SCS Doc. 13/24 Rev 2. Serial No. N6277.

NAFO SC (2017). Report of the Scientific Council Meeting, 01 -15 June 2017 Halifax, Nova Scotia. NAFO SCS Doc. 17-16 REV., serial number N6718. https://www.nafo.int/Portals/0/PDFs/sc/2017/scs17-16REV.pdf

NAFO SC (2018a). Witch flounder in Divisions 3NO; advice June 2018 for 2019-2020. NAFO Scientific Council, 1st – 14th June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/WIT3NO.pdf.

NAFO SC (2018b). American plaice in Divisions 3LNO; advice June 2018 for 2019-2021. NAFO Scientific Council, 1st – 14th June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/AmPlaice3LNO.pdf.

NAFO SC (2018d). Thorny Skate in Divisions 3LNO and Subdiv. 3Ps. Advice June 2018 for 2019-2020. SC01 – 14 June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/TSkate3LNO.pdf.

NAFO SC (2018e). Cod in Divisions 3NO. Advice June 2018 for 2019-2021. SC01 – 14 June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/cod3NO.pdf.

Rice, J. (2002). Changes to the large marine ecosystem of the Newfoundland-Labrador Shelf. K.S. Shermann, and H.-R. Skjoldal (eds). Large marine ecosystems of the North Atlantic: changing states and sustainability. Elsevier Science, Amsterdam, The Netherlands, p.151–193. http://www.ices.dk/sites/pub/CM%20Doccuments/CM-2010/S/S1510.pdf.

Overall Performance Indicator score	**100 – both elements**

Condition number (if relevant)	**N/A**

PI 2.5.2 – Ecosystem management strategy

PI 2.5.2		There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are **measures** in place, if necessary which take into account the **potential impacts** of the UoA on key elements of the ecosystem.	There is a **partial strategy** in place, if necessary, which takes into account **available information and is expected to restrain impacts** of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a **strategy** that consists of a **plan**, in place which contains measures to **address all main impacts of the UoA** on the ecosystem, and at least some of these measures are in place.
	Met?	**Yes – both elements**	**Yes – both elements**	**No – both elements**

Rationale

For the purpose of the YTFF assessment, the ecosystem is considered to be the Newfoundland and Labrador Shelves marine bioregion, while the key ecosystem elements are considered to be:

i) Productivity patterns, with the Labrador Current as the dominant physical oceanographic feature, and
ii) Groundfish community structure and function, with yellowtail flounder as a constituent part.

The following evidence indicates SG 60 is met: See SG80.

The following evidence indicates SG 80 is met: With respect to i) a partial strategy to restrain the effects of the YTFF on productivity patterns in the Newfoundland and Labrador Shelves bioregion, with the Labrador Current as the dominant physical oceanographic feature, is not necessary as this is a major oceanographic feature that will not be impacted by the fishery – SG60 and SG80 are met.

With respect to ii), the impact of the YTFF on groundfish community structure and function, with yellowtail flounder s a constituent part is constrained through effort controls by fleet and by vessel, and through the requirement to be highly selective for yellowtail flounder in order to avoid bycatch limits on other groundfish species, specifically American plaice, Atlantic cod and witch (NAFO 2019). The approach in this regard is to fish in areas of high yellowtail flounder abundance and avoid areas where other species are more common, and to use a large minimum mesh size (150-155 mm mesh codend). It is considered that there is a partial strategy in place which takes into account available information and is expected to restrain impacts of the YTFF on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance; SG60 and SG80 are met.

The following evidence indicates SG 100 is not met: With respect to i), although a partial strategy is not necessary, SG100 requires that there is a strategy in place, so SG100 is not met. With respect to ii), It is not possible to say that measures are in place to address all main impacts of the UoA, so SG100 is not met.

b	Management strategy evaluation			
	Guide post	The **measures** are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/ ecosystems).	There is **some objective basis for confidence** that the measures/ partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved.	**Testing** supports **high confidence** that the partial strategy/ strategy will work, based on information directly about the UoA and/or ecosystem involved.
	Met?	**Yes – both elements**	**Yes – both elements**	**No – both elements**

Rationale

The following evidence indicates SG 60 is met: See SG80.

The following evidence indicates SG 80 is met: With respect to i) a partial strategy to restrain the effects of the YTFF on productivity patterns in the Newfoundland and Labrador Shelves marine bioregion is not necessary as the Labrador Current is the dominant physical oceanographic feature that will not be impacted by the fishery. In the absence of necessity, SG60 and SG80 are met by default.

With respect to ii), the input controls and technical measures in place are clearly appropriate and consistent with established practice to manage impacts on groundfish species, and the fishery has a demonstrably high level of selectivity for the target species; yellowtail flounder comprises >85% of the catch on average (Table 11). NAFO SC (2013) noted that lower fisheries exploitation may have been a contributing factor in the positive trends observed in the groundfish community of the Newfound and Labrador Shelves region; as noted in PI 2.5.1, fishing mortality on yellowtail flounder and other assessed groundfish species is below Fmsy in all cases. This provides an objective basis for confidence that the partial strategy for the groundfish community will work, based on some information directly about the YTFF and the ecosystem involved – SG60 and SG80 are met.

The following evidence indicates SG 100 is not met: With respect to i), although a partial strategy is not necessary, SG100 requires that there is a partial strategy / strategy in place, so SG100 is not met. With respect to ii), SG100 is not met because it is not clear that there has been a decline in productivity recently (Bernier et al. 2019), and information on the effectiveness of the partial strategy in light of this change is limited.

c	Management strategy implementation			
	Guide post		There is **some evidence** that the measures/partial strategy is being **implemented successfully**.	There is **clear evidence** that the partial strategy/strategy is being **implemented successfully and is achieving its objective as set out in scoring issue (a).**
	Met?		**Yes – both elements**	**Yes – groundfish community** **No – Productivity patterns**

Rationale

The following evidence indicates SG 80 is met: With respect to i) a partial strategy to restrain the effects of the YTFF on productivity patterns in the Newfoundland and Labrador Shelves marine bioregion is not necessary as the Labrador Current is the dominant physical oceanographic feature that will not be impacted by the fishery. In the absence of necessity, SG60 and SG80 are met by default.

With respect to ii), see SG100.

The following evidence indicates SG 100 is/ is not met: With respect to i), although a partial strategy is not necessary, SG100 requires that there is a partial strategy / strategy in place, so SG100 is not met. With respect to ii), the input controls and technical measures in place are monitored with a high level of observer coverage. Key groundfish stocks are assessed, and fishing mortality on yellowtail flounder is now well below Fmsy (Maddock Parsons et al. 2018), while fishing mortality of other groundfish species taken in the YTFF is also low (American plaice – NAFO SC 2018b, thorny skate – NAFO SC 2018d, Atlantic cod – NAFO SC 2018e, Atlantic halibut – DFO 2018a, witch flounder – NAFO SC 2018a, Greenland halibut – NAFO SC 2017). These data provide clear evidence that the partial strategy is being implemented successfully and is achieving its objective of constraining impacts on groundfish community structure and function – SG80 and SG100 are met.

References

DFO (2018a). Stock status update of Atlantic halibut (*Hippoglossus hippoglossus*) on the Scotian Shelf and Southern Grand Banks in NAFO Divisions 3NOPs4VWX5Zc. DFO Canadian Science Advisory Secretariat Science Response 2018/022. 9 pp. http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2018/2018_022-eng.pdf.

Maddock Parsons, D., Morgan, M.J. & R. Rogers (2018). Assessment of Yellowtail Flounder in NAFO Divisions 3LNO using a new Stock Production Model in a Bayesian Framework. NAFO SCR Doc. 18/038

NAFO (2019). Conservation and Enforcement Measures 2019. NAFO / COM Doc. 19-01. Northwest Atlantic Fisheries Organization, Dartmouth, Nova Scotia. x + 181 pp. https://www.nafo.int/Portals/0/PDFs/COM/2019/comdoc19-01.pdf.

NAFO SC (2013). Report of the 6th Meeting of the NAFO Scientific Council Working Group on Ecosystem Science and Assessment (WGESA) [Formerly WGEAFM]. NAFO SCS Doc. 13/24 Rev 2. Serial No. N6277.

NAFO SC (2017). Report of the Scientific Council Meeting, 01 -15 June 2017 Halifax, Nova Scotia. NAFO SCS Doc. 17-16 REV., serial number N6718. https://www.nafo.int/Portals/0/PDFs/sc/2017/scs17-16REV.pdf

NAFO SC (2018a). Witch flounder in Divisions 3NO; advice June 2018 for 2019-2020. NAFO Scientific Council, 1st – 14th June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/WIT3NO.pdf.

NAFO SC (2018b). American plaice in Divisions 3LNO; advice June 2018 for 2019-2021. NAFO Scientific Council, 1st – 14th June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/AmPlaice3LNO.pdf.

NAFO SC (2018d). Thorny Skate in Divisions 3LNO and Subdiv. 3Ps. Advice June 2018 for 2019-2020. SC01 – 14 June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/TSkate3LNO.pdf.

NAFO SC (2018e). Cod in Divisions 3NO. Advice June 2018 for 2019-2021. SC01 – 14 June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/cod3NO.pdf.

Overall Performance Indicator score	**85**
Condition number (if relevant)	**N/A**

PI 2.5.3 – Ecosystem information

PI 2.5.3		There is adequate knowledge of the impacts of the UoA on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	Information is adequate to **identify** the key elements of the ecosystem.	Information is adequate to **broadly understand** the key elements of the ecosystem.	
	Met?	**Yes – both elements**	**Yes– both elements**	

Rationale

For the purpose of the YTFF assessment, the ecosystem is considered to be the Newfoundland and Labrador Shelves marine bioregion, while the key ecosystem elements are considered to be:

i) Productivity patterns, with the Labrador Current as the dominant physical oceanographic feature, and
ii) Groundfish community structure and function, with yellowtail flounder as a constituent part.

The following evidence indicates SG 60 is met: See SG80.

The following evidence indicates SG 80 is met: The Newfoundland and Labrador Shelves marine bioregion was described thoroughly by Rice (2002), highlighting (with other authors more recently, for example Colbourne et al. 2018, Bélanger et al. 2018, Bernier *et al*. 2019) the importance of the Labrador Current with respect to productivity patterns with the bioregion. The importance of groundfish community structure and function and interactions as prey and predator species has also been well studied, summarised by Rice (2002) but further investigated over time with research into specific parts of the system (e.g., capelin dynamics – Lilly 1994, Murphy *et al*. 2018, shrimp and cod dynamics – NAFO SC 2018c), while the impact of fishing on groundfish stocks more generally has been modelled (NAFO SC 2013). Information is clearly adequate to broadly understand the key elements of the ecosystem – SG60 and SG80 are met.

b	Investigation of UoA impacts			
	Guide post	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but **have not been investigated** in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and **some have been investigated in detail**.	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and **have been investigated in detail**.
	Met?	**Yes – both elements**	**Yes – both elements**	**No – both elements**

Rationale

The following evidence indicates SG 60 is met: See SG80.

The following evidence indicates SG 80 is met: With respect to productivity patterns, information is certainly adequate to infer that there are no main interactions between the fishery and productivity patterns with sea ice as the dominant physical feature – SG60 and SG80 are met.

With respect to community structure and function, fishing activity in the YTFF is monitored with comprehensive VMS and a high level of observer coverage, so catches are well monitored. The impact of fishing on yellowtail flounder and the other groundfish species has been assessed through the stock assessment process (i.e., yellowtail flounder – Maddock Parsons et al. 2018, American plaice – NAFO SC 2018b, thorny skate – NAFO SC 2018d, Atlantic cod – NAFO SC 2018e, Atlantic halibut – DFO 2018a, witch flounder – NAFO SC 2018a, Greenland halibut – NAFO SC 2017). Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail – SG60 and SG80 are met.

The following evidence indicates SG 100 is not met: With respect to productivity patterns, although there would be no value in investigating interactions with the YTFF, this would be required to meet SG100. With respect to community structure and function, the relationship between primary productivity and productivity in higher trophic levels is complex, and it is not clear that it has been investigated in sufficient detail to meet SG100.

c	Understanding of component functions			
	Guide post		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are **known**.	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are **understood**.
	Met?		**Yes**	**Yes**

Rationale

The following evidence indicates SG 80 is met: See SG100.

The following evidence indicates SG 100 is met: The Newfoundland and Labrador Shelves marine bioregion was described thoroughly by Rice (2002). The main functions of the primary species (American plaice, thorny skate, Atlantic halibut, witch flounder and Greenland halibut), secondary species (small cetaceans and seals, as well as sea cucumbers, sculpins and other minor fish species), ETP species (wolffish species) and habitats are known as described in detail throughout this report, as are the impacts of the UoA on these components. SG60, SG80 and SG100 are met.

d	Information relevance			
	Guide post		Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components **and elements** to allow the main consequences for the ecosystem to be inferred.
	Met?		**Yes**	**No**

Rationale

The following evidence indicates SG 80 is met: The Newfoundland and Labrador Shelves marine bioregion was described thoroughly by Rice 2002. There is detailed information available on impacts of the YTFF on components from the observer programme and comprehensive information on activity from VMS data. Work undertaken to investigate the ecosystem and groundfish production potential (NAFO SC 2013) as well as the extent of different SBAs as important, functional habitats (Kenchington et al. 2016) and other ongoing work to review status (e.g., NAFO SC 2018c) then means that at least some of the main consequences for the ecosystem can be inferred; SG80 is met.

The following evidence indicates SG 100 is not met: SG100 is not met as ecosystems are complex and it is not clear that all the main consequences can be inferred.

e	Monitoring			
	Guide post		Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
	Met?		**Yes**	**Yes**

Rationale

The following evidence indicates SG 80 is met: See SG100.

The following evidence indicates SG 100 is met: The YTFF is monitored with a high level of observer coverage and comprehensive VMS. These comprise adequate data to detect any increase in risk level – SG80 is met. It is also considered that the wide variety of information that has been collected and is available on factors including food webs, trophic interactions, habitat distribution, population demographics and fishing impacts is adequate to support the development of strategies to manage ecosystem impacts, so SG100 is also met here.

References

Bélanger, D., Maillet, G., Pepin, P., Casault, B., Johnson, C., Plourde, S., Galbraith, P.S., Devine, L., Scarratt, M., Blais, M., Head, E., Caverhill, C., Devred, E., Spry, J., Cogswell, A., St-Amand, L., Fraser, S., Doyle, G., Robar, A., Hingdon, J., Holden, J., Porter, C. & E. Colbourne (2018). Biological oceanographic conditions in the Northwest Atlantic during 2017. Serial No. N6790 NAFO SCR Document 18/007. 27 pp. https://www.nafo.int/Portals/0/PDFs/sc/2018/scr18-007.pdf.

Bernier, R.Y., Jamieson, R.E. & A.M. Moore (eds.) (2019). State of the Atlantic Ocean synthesis report. Canadian Technical Report on Fisheries and Aquatic Sciences. No. 3167: iii + 149 pp. http://dfo-mpo.gc.ca/oceans/documents/publications/soto-rceo/2018/atlantic-ecosystems/2019-03-29_SOTO-Atlantic_FormattedReport_EN.pdf

Colbourne, E., Holden, J., Snook, S., Lewis, S., Cyr, F., Senciall, D., Bailey W. & J. Higdon (2018). Physical oceanographic environment on the Newfoundland and Labrador Shelf in NAFO Subareas 2 and 3 during 2017. Serial Number N6793. NAFO SCR Document 18/009. 40 pp.

DFO (2018a). Stock status update of Atlantic halibut (*Hippoglossus hippoglossus*) on the Scotian Shelf and Southern Grand Banks in NAFO Divisions 3NOPs4VWX5Zc. DFO Canadian Science Advisory Secretariat Science Response 2018/022. 9 pp. http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2018/2018_022-eng.pdf.

Maddock Parsons, D., Morgan, M.J. & R. Rogers (2018). Assessment of Yellowtail Flounder in NAFO Divisions 3LNO using a new Stock Production Model in a Bayesian Framework. NAFO SCR Doc. 18/038

Murphy, H.M., Pepin, P. & D. Robert (2018). Re-visiting the drivers of capelin recruitment in Newfoundland since 1991. Fisheries Research, V. 200, pp. 1-10. https://www.sciencedirect.com/science/article/abs/pii/S0165783617303405.

NAFO SC (2013). Report of the 6th Meeting of the NAFO Scientific Council Working Group on Ecosystem Science and Assessment (WGESA) [Formerly WGEAFM]. NAFO SCS Doc. 13/24 Rev 2. Serial No. N6277.

NAFO SC (2017). Report of the Scientific Council Meeting, 01 -15 June 2017 Halifax, Nova Scotia. NAFO SCS Doc. 17-16 REV., serial number N6718. https://www.nafo.int/Portals/0/PDFs/sc/2017/scs17-16REV.pdf

NAFO SC (2018a). Witch flounder in Divisions 3NO; advice June 2018 for 2019-2020. NAFO Scientific Council, 1st – 14th June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/WIT3NO.pdf.

NAFO SC (2018b). American plaice in Divisions 3LNO; advice June 2018 for 2019-2021. NAFO Scientific Council, 1st – 14th June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/AmPlaice3LNO.pdf.

NAFO SC (2018c). Canadian Research Report for 2017, Newfoundland and Labrador Region. Serial Number N6837, NAFO SCS Document 18/15. 29 pp.

NAFO SC (2018d). Thorny Skate in Divisions 3LNO and Subdiv. 3Ps. Advice June 2018 for 2019-2020. SC01 – 14 June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/TSkate3LNO.pdf.

NAFO SC (2018e). Cod in Divisions 3NO. Advice June 2018 for 2019-2021. SC01 – 14 June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/cod3NO.pdf.

Rice, J. (2002). Changes to the large marine ecosystem of the Newfoundland-Labrador Shelf. K.S. Shermann, and H.-R. Skjoldal (eds). Large marine ecosystems of the North Atlantic: changing states and sustainability. Elsevier Science, Amsterdam, The Netherlands, p.151–193. http://www.ices.dk/sites/pub/CM%20Doccuments/CM-2010/S/S1510.pdf.

Overall Performance Indicator score	**85 – both elements**
Condition number (if relevant)	**N/A**

5.4 Principle 3

5.4.1 Principle 3 background

The intent of Principle 3 (P3) is to ensure that there is an institutional and operational framework appropriate to the size and scale of the UoAs for implementing Principles 1 and 2, and that this framework is capable of delivering sustainable fisheries in accordance with the outcomes articulated in these Principles.

In the following sections a description of the broad, high-level context of the fishery management system and the fishery specific management system is provided with the intent of supporting the scoring rationales used in section 5.4.12 of this report. The headings of each section reflect the themes covered in the scoring issues (SI) within each P3 Performance indicator (PI).

5.4.2 Area of operation of the UoA

The YTFF operates on the Grand Bank, in NAFO Divisions 3L, 3N and 3O. The fishery occurs both within the Canadian 200 nautical mile EEZ and in waters on the Grand Bank that extend beyond the Canadian EEZ.

5.4.3 Jurisdiction

Within the UoA, management of the YTFF is the responsibility of NAFO at the regional level and the Government of Canada within Canada's EEZ. Outside of the Canadian EEZ, NAFO has management responsibility within the NRA, see Figure 1.

Canada is allocated and manages 97.5% of the TAC with the other 2.5% being allocated to 'other' Contracting Parties of NAFO.

NAFO

NAFO is an inter-governmental Regional Fisheries Management Organisation (RFMO) that is, "*committed to ensuring the long-term conservation and sustainable use of the fishery in the NAFO Convention Area*" (NAFO website). NAFO was established by, "The Convention on Cooperation in the Northwest Atlantic Fisheries", in October 1978, and came into force on 1 January 1979 (NAFO 2017).

Currently NAFO has twelve Contracting Parties. Canada, Cuba, Denmark (in respect of the Faroe Islands and Greenland), European Union, France (in respect of St. Pierre and Miquelon), Iceland, Japan, Norway, Republic of Korea, Russian Federation, Ukraine and the United States of America (NAFO 2017).

Canada is the Depository for the NAFO Convention and hosts the NAFO Secretariat in Dartmouth, Nova Scotia, Canada.

NAFO has no enforcement capacity of its own. In common with other RFMOs, it relies on its Contracting Parties to implement management measures domestically, through suitable harvest strategies that will allow the stated objectives for the management of the overall fishery to be met.

Canada

Within the Canadian EEZ, the responsibility for the management of fisheries resides with the federal government. The federal Minister of Fisheries and Oceans has the ultimate responsibility for the fishery and his/her authority is delegated to officials through the organisational structure of the DFO. The Newfoundland and Labrador Region of the DFO, with oversight and referral of some matters to the department at the national level in Ottawa, is responsible for the YTFF.

5.4.4 Legal and policy framework

NAFO

The NAFO Convention (NAFO, 2017) is the formal document that establishes the international legal and administrative structure for the management of shared stocks in the Northwest Atlantic.

The Convention provides a framework for cooperation between its Contracting Parties. The Convention recognises and adopts key aspects of relevant international agreements and conventions including the United Nations Convention on the Law of the Sea (UNCLOS), the United Nations Fish Stock Agreement (UNFSA), the FAO Code of Conduct for Responsible Fisheries and the FAO Agreement on Port State Measures to prevent, deter and eliminate Illegal, Unreported and Unregulated (IUU) fishing.

In accordance with UNFSA, NAFO ensures binding procedures that, minimally, deliver cooperation between its members on the collection and sharing of scientific data, the scientific assessment of stock status and the development of scientific advice.

Article XVII of the convention specifically refers to, "Cooperation with other organisations" and states:

"The Organization shall:

a) cooperate, as appropriate, on matters of mutual interest, with the Food and Agriculture Organization of the United Nations, with other specialized agencies of the United Nations and with other relevant organizations;

b) seek to develop cooperative working relationships and may enter into agreements for this purpose with intergovernmental organizations that can contribute to its work and have competence for ensuring the long-term conservation and sustainable use of living resources and their ecosystems. It may invite such organizations to send observers to its meetings or those of any of its subsidiary bodies; it may also seek to participate in meetings of such organizations as appropriate; and

c) cooperate with other relevant regional fisheries management organizations taking note of their conservation and management measures.".

Examples of NAFOs cooperation and partnership include a number of FAO international programs and joint Working Groups with other RFMOs:

- Marine Areas Beyond National Jurisdiction (ABNJ) - which aims to promote efficient and sustainable management of fisheries resources and biodiversity conservation to achieve the global targets agreed in international fora.
- The Fisheries and Resource Monitoring System (FIRMS) which is a developing interactive data base with the intent of providing access to a wide range of high-quality information on the global monitoring and management of fishery marine resources.
- The Aquatic Sciences and Fisheries Abstracts (ASFA) information system which comprises an abstracting and indexing service covering the world's literature on the science, technology, management, and conservation of marine, brackish water, and freshwater resources and environments, including their socio-economic and legal aspects.
- Joint Advisory Group on Data Management (JAGDM) – A technical group promoting harmonisation and standardisation of fisheries data management and communications, primarily between the North East Atlantic Fisheries Commission (NEAFC) and NAFO.
- ICES / NAFO Joint Working Group on Deepwater Ecology (WG-DEC) – Collates new information and map the distributions of vulnerable marine systems (VMEs) in ICES and NAFO areas. The working group also advises on the appropriateness of the bottom fishing regulations adopted by RFMOs as well as wider ecological questions regarding deep-sea ecosystem function and diversity
- ICES/NAFO/NAMMCO Working Group on Harp and Hooded Seals (WG-HARP) -compile and analyse data regarding harp and hooded seals to provide the basis for the annual ICES advice regarding the stock status and the fisheries in the next year
- NAFO/ICES *Pandalus* Assessment Working Group (NIPAG) – Fisheries scientists specialising in Pandalus shrimp stocks, providing scientific advice and management options for a number of important Pandalus shrimp stocks in the North Atlantic.

NAFO Conservation and Enforcement Measures (CEMs) detail various provisions such as the application of technical measures or output and input controls, requirements for data collection and reporting, as well as regulations for monitoring, control and surveillance and enforcement in the NRA. The CEM are reviewed and revised every year by the NAFO Commission (NAFO, 2019).

Canada

The legislative authority for the management of seacoast and inland fisheries in Canada falls under the jurisdiction of the Parliament of Canada pursuant to the Constitution Act, 1982.

There are several pieces of legislation that apply to fishing, the major one being the Fisheries Act 1985 (as amended). On August 28th 2019, provisions of the new Fisheries Act came into force following a period of public consultation. Eight key areas were reviewed:

1. Provisions to modernize the Fisheries Act
2. Reconciliation with Indigenous peoples
3. Fish and fish habitat protection provisions
4. Enforcement provisions
5. Fisheries management provisions
6. Provisions to create a fisheries management order power
7. Biodiversity protection provisions
8. Cetaceans in captivity provisions

The regulations that support the changes to the Act are still under development and pending approval through the Canada Gazette process. It is expected that none of the regulations likely to be developed would have a significant impact on the YTFF.

The Atlantic Fishery Regulations, 1985 and the Fishery (General) Regulations are the main regulatory instruments governing the fisheries of eastern Canada. Section 35(1) of the Constitution Act, 1982 (Government of Canada 1982) recognises and affirms existing Aboriginal and treaty rights and any legislation governing the fishery may not infringe on those rights.

In addition to the legislative framework, there are a number of policy initiatives that have been developed to guide decision-making in the management of fisheries in Canada.

Relevant legislative instruments and policy documents are outlined in Table 16.

Table 16: Principal Canadian Acts and policy documents

Principal Acts and Policy Documents	Description
The Fisheries Act, 1985 (as amended)	Provides absolute discretion to the Minister for the management of fisheries and for the establishment of fishing licences, regulations, reporting requirements, powers of fishery officers, protection of fish habitat and pollution prevention.
The Atlantic Fishery Regulations, 1985	Prescribes conditions for the operation of the fishery including seasons, closures, management and conservation measures, etc. Variation Orders are used to alter conditions and to shorten or lengthen the fishing season as appropriate.
The Fishery (General) Regulations 1993	Provides for the issue of licences and the authority to specify conditions in a fishing licence, e.g. allocations, vessel monitoring systems, hail-in/hail-out requirement, observer coverage, dockside monitoring, etc.
The Species at Risk Act (SARA) 2002	Authorizes actions aimed at managing species of special concern, preventing the extirpation or extinction of endangered marine species, or promoting their recovery.
The Oceans Act 1996	Prescribes the Canadian oceans management strategy, including sustainable development, the precautionary approach, the implementation of integrated management of marine activities and the designation of Marine Protected Areas (MPAs).
The Aboriginal Fisheries Strategy (DFO 1992)	Seeks to provide for the effective management and regulation of fishing by Aboriginal groups through the negotiation of mutually acceptable and time-limited fisheries agreements between DFO and Aboriginal groups.
Atlantic Fisheries Policy Review – A Policy Framework for the Management of Fisheries on Canada's Atlantic Coast (DFO 2004)	Presents objectives to guide decision-making in Atlantic fisheries. It places conservation of the resource as the priority, sets the path for greater industry self-reliance, establishes transparent rules-based processes for decision-making and encourages a greater role for resource users and others.
Sustainable Fisheries Framework (SFF) (DFO 2009a)	Focuses on the need to incorporate the precautionary and ecosystem approaches to fishery management.
Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas (DFO, 2009b)	Highlights approaches that Canada will take in protecting benthic ecosystems that have either already been fished or in 'frontier' fisheries were opportunities for fishing in new areas might arise owing to climate change or improved fishing technologies.
Policy on Managing Bycatch (DFO 2013)	Aims to address and take account of total catch, including retained and non-retained species bycatch in all fisheries management plans.

Canada is also required to comply with constitutional legislation such as the Charter of Rights and Freedoms, The Financial Administration Act and the Canadian Environmental Assessment Act, among others. There is also a large body of common law, such as administrative and aboriginal law, which has a major effect on DFO's programs and activities

The regulations noted in Table 16 create the legal framework for the management, licensing and registration of participants of fisheries in Canada. They also provide an administrative and court sanction system with fines ranging

from relatively low levels to as high as hundreds of thousands of dollars and even jail time in extreme cases. The court also has the discretion to forfeit catch and equipment upon conviction.

5.4.5 Resolution of disputes

NAFO

Article XV of the Convention, “Settlement of Disputes” (NAFO 2017) sets out the process for settling disputes under different circumstance, e.g. where a dispute arises between 2 or more Contracting Parties concerning the interpretation or application of the Convention; management measures adopted by the Commission and their monitoring, control and enforcement; the implementation of Commission decisions.

Contracting Parties are required to resolve their dispute by, “negotiation, inquiry, mediation, conciliation, arbitration, judicial settlement, *ad hoc* panel proceedings or other peaceful means of their choice”. Where the Contracting Parties are unable to agree or reach a settlement, at the request of one of them, a compulsory proceeding, entailing a binding decision is initiated.

A dispute resolution process is also set out in Article 41 of the NAFO Conservation and Enforcement Measures (NAFO, 2019) in relation to the NAFO at-sea inspection and surveillance scheme. This includes the convening of the Standing Committee on International Control (STACTIC) which seeks to recommend resolutions to the Contracting Parties concerned which, if unsuccessful, is referred to the Commission and possible resolution through the Convention’s Article XV process.

Canada

Under the Fisheries Act, the Minister of Fisheries and Oceans has broad discretionary powers. The Federal Courts Act, 1985, provides a mechanism for someone to challenge decisions of administrative bodies or tribunals and be provided with a hearing before a justice of the court. Unresolved disputes within the Canadian fisheries management system can be, and have been, taken through the Canadian judicial system. Some of the more notable of these have been the “Sparrow”, “Marshall” and “Larocque” decisions. The Sparrow decision (1990) resolved that aboriginal groups have a right to fish for food, societal and ceremonial purposes and that this use-right is surpassed only by conservation of the resource. The Marshall decision stated that Treaties signed in 1760 and 1761 by Mi’kmaq and Maliseet communities include a communal right to hunt, fish and gather in pursuit of a moderate livelihood (Marshall Decision 1999). The Larocque decision outlawed the use of resource allocations to pay for services provided to, or on behalf of, government without the approval of Parliament (Larocque Decision 2006).

The Fisheries Act was amended in June 2012 (Bill C-38) creating a new section (10) that authorizes the Minister of Fisheries and Oceans to allocate fish for the purpose of financing Scientific and Fisheries Management activities under Joint Project Agreements.

There is provision for an appeal of licensing decisions to independent Regional (RLAC) and Atlantic Fisheries License Appeal Boards (AFLAB) but the Minister is not legally bound to accept recommendations made by them.

Generally, DFO avoid legal disputes by obtaining legal advice before the implementation of programs, activities or policies to ensure compliance with applicable legislation prior to implementation.

5.4.6 Respect of rights

NAFO

The NAFO Convention (Article VI, paragraph 12) recognises the need for the allocation of fishing opportunities in the NRA to take into account the interests of Contracting Parties and their coastal states whose vessels have traditionally fished within the area and, furthermore, explicitly mentions the need for consideration of coastal communities that are primarily dependent fishing opportunities on the Grand Bank and Flemish Cap and which have made extensive efforts through international action by providing surveillance and inspection of international fishing activities.

Canada

The Constitution Act, 1982 (Government of Canada 1982) recognizes and confirms aboriginal and treaty rights of the aboriginal peoples of Canada, including the guarantee of legal rights to fish for food and livelihood. This section has been litigated and confirmed by the Supreme Court on several occasions (see 5.4.5 above) and constitutes a formal commitment to the rights of aboriginal peoples. The outcome of the court cases have led to current policy initiatives that ensures the protection of aboriginal rights, namely the “Aboriginal Fisheries Strategy” (DFO 1992) which is aimed at ensuring that aboriginal entitlements are respected in the development of fisheries management regimes for aboriginal peoples.

First Nations organizations do not hold licences for the YTFF. However, their input is received through participation in the commercial fishery advisory committees and working groups.

5.4.7 Consultation, roles and responsibilities

NAFO

Various Articles within the Convention define the constituent bodies, their functions, roles and responsibilities, i.e., The Commission (Article VI); The Scientific Council (Article VII); and, the Secretariat (Article VIII).

The following figure shows the organisational structure of NAFO:

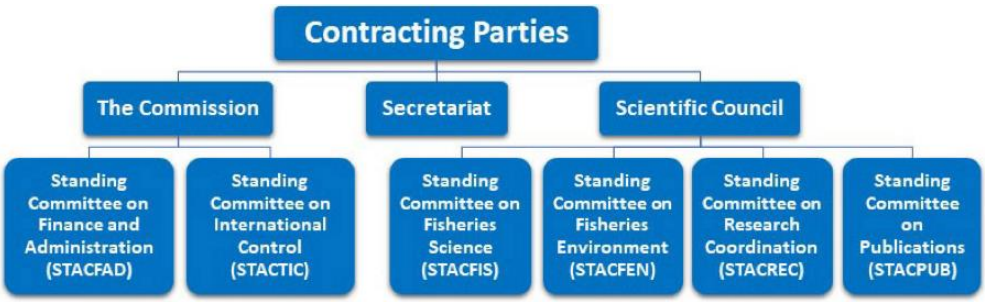


Figure 28: The organisational structure of NAFO (Source https://www.nafo.int/About-us)

The Commission

The Commission is the amalgamation of the General Council (GC) and the Fisheries Commission (FC), which occurred when the Amended Convention entered into force on May 18, 2017.

The Commission supervises and coordinates the organisational, administrative, financial and other internal affairs, including the relations among its constituent bodies and external relations of the Organisation. Each Contracting Party is a member and appoints to the Commission up to three representatives.

The Commission regularly reviews the status of fish stocks and identifies actions required for their conservation and management, by consulting, collecting, analyzing and disseminating relevant information; The Commission develops guidelines for the conduct of fishing activities for scientific purposes; and develops guidelines for the collection, submission, verification, access to and use of data.

The Commission is responsible for the management and conservation of the fishery resources of the NRA. The Commission consults upon and adopts proposals for joint action by the Contracting Parties and, in considering such proposals, takes into account any relevant information or advice provided to it by the Scientific Council. The Commission seeks to ensure consistency between:

- any proposal that applies to a stock or group of stocks occurring both within the NRA and within an area under the fisheries jurisdiction of a Coastal State, or any proposal that would have an effect through species interrelationships on a stock or group of stocks occurring in whole or in part within an area under the fisheries jurisdiction of a Coastal State; and,
- any measures or decision taken by the coastal State for the management and conservation of that stock or group of stocks with respect to fishing activities conducted within the area under its fisheries jurisdiction.

The Commission may refer to the Scientific Council any question pertaining to the scientific basis for the decisions it may need to take concerning fishery resources, the impact of fishing activities on living resources, and the safeguarding of the ecosystem in which these resources are found.

The Commission collaborates with Scientific Council in the conservation and management measures to minimize the impact of fishing activities on living resources and their ecosystems, total allowable catches and/or levels of fishing effort and determine the nature and extent of participation in fishing.

The Scientific Council

The Scientific Council compiles and maintains statistics and records, and publishes information pertaining to the fisheries including environmental and ecological factors. Upon request, Scientific Council also provides advice for the Commission and Coastal States on stocks and the conservation and management of fishery resources. Each Contracting Party is a member of the Scientific Council and appoints its own representatives.

The Secretariat

The Secretariat provides administrative services to the Organisation. Its chief administrative officer is the Executive Secretary who is appointed by the Commission. Duties of the Secretariat include:

- make all arrangements necessary for the Commission and Scientific Council meetings;
- prepare and transmit draft provisional and provisional agendas;
- address communications to the Depository Government;
- receive the credentials of the representatives and of observers at annual and special meetings and report thereon to the Commission as required; and
- perform such other functions as may be assigned by the Commission, its' Chair, or the Chair of a committee.

Standing Committees

The Commission has two Standing Committees:

- Standing Committee on Finance and Administration (STACFAD) - advises the Commission on: matters relating to the Secretariat; the budget of the Organisation; the time and place of meetings of the Organisation; and publications of the Organisation. STACFAD consists of representatives from at least five Contracting Parties. These representatives are assisted by experts and advisers.
- Standing Committee on International Control (STACTIC) - promotes the co-ordination of inspection and surveillance activities carried out by the Contracting Parties; reviews and evaluates the effectiveness of the CEM established by the Commission; reports compliance by Contracting Parties; develops inspection methodologies; compiles information on the fishing activities of non- Contracting Parties in the NRA, and makes appropriate recommendations to the Commission.

The Scientific Council has four Standing Committees:

- **Standing Committee on Fisheries Science (STACFIS)** - Assesses the status of fish stocks, the effects on fish stocks of fishing strategies and management and evaluates new methods for fish stock assessment.
- **Standing Committee on Fisheries Environment (STACFEN)** - Develops policies and procedures for the collection, compilation and dissemination of environmental information; provides periodic reviews of environmental conditions and advises the Scientific Council on the effects of the environment on fish; and, Encourages and promotes cooperation among Contracting Parties in scientific research
- **Standing Committee on Research Coordination (STACREC)** - Leads on issues relating to the collection, compilation and dissemination of statistical information on fisheries in the Convention Area; Coordinates the planning and execution of international cooperative research; Encourages and promotes cooperation in scientific research; and, reviews and evaluates data and information on advances in knowledge of biology
- **Standing Committee on Publications (STACPUB)** - Develops, coordinates and reviews the publications, editorial policies and procedures of the Scientific Council.

Working Groups

Working Groups (WG) are established to support the Commission, STACFAD, STACTIC and the Scientific Council:

- The Commission's ad-hoc Working Group on Bycatches, Discards and Selectivity (WG-BDS);
- STACTIC - Editorial Drafting Group of the CEM (EDG);
- STACTIC - Observer Program Review Working group (WG-OPR);
- Joint Commission-Scientific Council Working Group on Ecosystem Approach Framework to Fisheries Management (WG-EAFFM);
- Scientific Council Working Group on Ecosystem Science an Assessment (WG-ESA);
- Joint Commission-Scientific Council Catch Estimation Strategy Advisory Group (CESAG); and
- Working Group on Improving Efficiency of NAFO Working Group Process (E-WG).

Canada

DFO undertakes consultations on national policy and legislative issues. These are advertised on the DFO website[2]. DFO also conducts regional consultation on national and regional policy initiatives. These are also posted on DFO regional websites[3].

At the fishery specific level, DFO has established the 2+3KLMNO Groundfish Advisory Committee (GAC) for consulting with industry and other stakeholders on positions at NAFO and domestic management measures for groundfish fisheries.

[2] http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/comm/consultation-eng.htm
[3] http://www.nfl.dfo-mpo.gc.ca/NL/CC/consultations-calendar-2018;
http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/comm/consultation/nunavut-eng.htm

The management of the 3LNO YTFF was added to the existing GAC in 2013. This committee is organized, managed and chaired by DFO and serves as a forum for the discussion of issues related to the management of the groundfish fishery in NAFO Sub-Areas and Divisions 2+3KLMNO. The GAC's purpose is to provide advice and recommendations to DFO on management measures that address conservation and sustainable use of groundfish resources in those areas. The committee fosters local and industry stewardship and partnerships. Scientific advice to support management measures is sought through the annual Science Regional Advisory Process (RAP) and from the NAFO Scientific Council report on the yellowtail flounder stock. Terms of Reference have been established for the committee (see Aldous et al., 2013b) and the roles and responsibilities of the parties are defined. Meetings are held in late March or early April of each year. A quorum is reached when fifty per cent (50%) plus one of the membership is present.

The ToRs outline the following guiding principles:

- **Transparency** – The advisory process is transparent with open lines of communication and the provision of timely, accurate, accessible, clear and objective information. This information will be available to all participants in the process on an equal basis. DFO organizers will provide access to agendas and necessary information in advance of meetings.
- **Accountability** – Participants who represent a constituency are expected to bring forward the general views, knowledge and experience of those they represent, and report back about deliberations of the consultation activity and reasons for decisions taken. All participants share accountability for the success of the process.
- **Industry Representation** – Participation in the advisory process should be balanced and reflect a broad range of interests in Inshore, Midshore and Offshore fisheries in Newfoundland and Labrador. Observer status will be available at 2+3KLMNO GAC meetings if requested by non-member stakeholders. Observers can participate in discussions following input from members.
- **Effectiveness** – All participants should be satisfied that the process can achieve the goals of the mandate. This does not mean that participants will always agree with the final advice, outcome or recommendation.
- **Efficiency** – The size of the advisory committee will reflect a balance between the diversity of fleet sector interests and participant numbers that will facilitate productive discussion.
- **Membership** – The GAC is comprised of representatives from DFO, user groups, Province of Newfoundland and Labrador, and Aboriginal Organizations. Any requests for nomination to the GAC are reviewed at the annual meeting. The GAC can be expanded, with the consensus of the designated representatives, to accommodate an organization or group that has an interest in management of groundfish resources. The chair reserves the right to limit membership to maintain the committee's efficiency. All members are expected to review minutes and be aware of the discussion and outcome of the previous meeting in preparation for subsequent meetings. Further discussion of issues dealt with at previous meetings will generally be limited to correction or clarification of issues discussed.

  Membership includes fishing harvesting and processing associations, the Province of Newfoundland and Labrador, the Nunatsiavut Government and other unaffiliated industry representatives at the discretion of the Chair.

In addition there is a collaborative agreement between DFO and one non-governmental organization, the World Wildlife Fund (WWF), the Terms of Reference of which aims to *"to achieve shared objectives for the conservation, protection, and sustainable development of Canada's oceans as mandated by the Oceans Act.*" (Anon. 2008). That agreement calls for WWF-Canada and DFO commit to regular and open communications in order to affect positive exchange of information, ensure efficiencies, and implement joint initiatives. The commitment includes:

1. An annual meeting between the President of WWF-Canada and the Deputy Minister of DFO to monitor progress under the Collaborative Agreement.
2. Meetings are held as necessary between the Director General, Oceans Directorate, DFO and a WWF-Canada Vice-President to review progress, discuss specific concerns, and share ideas to support this agreement.
3. Senior regional staff of the two organizations will meet as necessary to review progress, discuss specific concerns, and share ideas to support this agreement and to assist, as necessary, the staff responsible for the delivery of joint activities.

5.4.8 Long-term and fishery specific objectives

NAFO

NAFO's principal objective is enshrined in the Convention (NAFO, 2017), "*To ensure long-term conservation and sustainable use of the fishery resources in the Convention Area and, in so doing, to safeguard the marine ecosystems in which these resources are found*."

In giving effect to the objective, Contracting Parties as individuals or as a collective, are required:

- promote the optimum utilization and long-term sustainability of fishery resources;
- adopt measures based on the best scientific advice available to ensure that fishery resources are maintained at or restored to levels capable of producing maximum sustainable yield;
- apply the precautionary approach in accordance with Article 6 of the 1995 Agreement;
- take due account of the impact of fishing activities on other species and marine ecosystems and in doing so, adopt measures to minimize harmful impact on living resources and marine ecosystems;
- take due account of the need to preserve marine biological diversity;
- prevent or eliminate overfishing and excess fishing capacity, and ensure that levels of fishing effort do not exceed those commensurate with the sustainable use of the fishery resources;
- ensure that complete and accurate data concerning fishing activities within the Convention Area are collected and shared among them in a timely manner;
- ensure effective compliance with management measures and that sanctions for any infringements are adequate in severity; and
- take due account of the need to minimize pollution and waste originating from fishing vessels as well as minimize discards, catch by lost or abandoned gear, catch of species not subject to a directed fishery and impacts on associated or dependent species, in particular endangered species.

Since its establishment, NAFO has implemented a wide range of tools for the conservation and management of stocks, including total allowable catch (TAC) and catch quotas (Contracting Party allocations), size limits, effort restrictions, observer programs, closed areas and seasons, vessel registration, information exchange, gear restrictions, and enforcement measures. NAFO defines harvest control rules primarily through the definition of TACs intended to maintain or rebuild stocks to the MSY biomass.

Canada

As a Contracting Party of NAFO, Canada is obligated to implement the management measures agreed by NAFO in accordance with its own objectives and management procedures. Canada can impose more stringent restrictions within its own waters and on its own licensed vessels, but these must not undermine the effectiveness of those measures agreed by NAFO.

Stock conservation and other sustainability objectives for the YTFF stem from Canadian legislative and evolving policy developments such as the Sustainable Fisheries Framework (DFO, 2009a). The 2+3KLMNO groundfish IFMP (DFO 2019) reflects the policy objectives set out in these documents with similar overarching long term objectives that guide the management of the fishery under the following categories: Stock Conservation and Sustainable Harvest; Ecosystem Health and Sustainability; Stewardship.

In some instances, stock-specific objectives have been identified as part of rebuilding plans for 3NO cod, 3LNO American plaice, 2+3KLMNO Greenland halibut, 3LN redfish. As yet, no fishery specific objectives have been set out for the YTFF in the IFMP (DFO, 2019), however, at the site visit the client and DFO confirmed that the objectives in the yellowtail fishery IFMP (DFO 2014) remain current and it is planned that an Annex will be added to the 2+3KLMNO groundfish IFMP specifically for the YTFF and, amongst other things, the fishery specific objectives and harvest control rules will be included.

5.4.9 The decision-making process

NAFO

The decision-making process of the Commission is set out in Article XIII of the Convention, “Decision making of the Commission” (NAFO 2017) and the “NAFO Rules of Procedure and Financial Regulations” (NAFO 2018). As a general rule, decision-making is by consensus. In instances where consensus is not possible, each Contracting Party has a vote and decisions are made by two thirds majority of all the Contracting Parties present. There needs to be a quorum of two thirds of the Contracting Parties for a vote to take place, i.e. 8 Contracting Parties need to be present.

The Commission receives advice from the Scientific Council and its Standing Committees (STACFAD, and STACTIC). The Commission meets annually to review this advice and to decide and implement conservation and management measures as well as develop administrative, financial and other internal affairs of the NAFO organisation.

The Scientific Council and the Standing Committees follow the same voting procedures as the Commission. Any subsidiary body established by the Scientific Council or the Standing Committee, establishes its own rules of procedure.

With respect to the YTFF, a designated expert prepares initial assessments, and these are peer reviewed during the June meetings of the Scientific Council and then the scientific advice is presented to the Council for their decision on TAC and management measures.

Canada

A number of policy initiatives have been developed to guide decision-making in the management of fisheries in Canada, several of which are important for this assessment. The "*Policy Framework for the Management of Fisheries on Canada's Atlantic Coast"* envisions robust fisheries that include all stakeholders, and which are biologically and economically sustainable. The *"Sustainable Fisheries Framework"* and the "*Fishery Decision-Making Framework Incorporating the Precautionary Approach"* ensures that the precautionary approach is built into fisheries management decisions. Finally, the "*Aboriginal Fisheries Strategy"* is aimed at ensuring that aboriginal entitlements are respected in the development of stable fisheries management regimes for aboriginal peoples.

As noted above, the annual TAC along with conservation and enforcement measures are set through the decision-making process of NAFO as prescribed by the Convention. The NAFO sharing key provides for 97.5% of the TAC to be allocated to Canada.

Fishery Managers at DFO consult with stakeholders on the development of IFMPs. IFMPs are 'ever-green' or 'living' documents that contain a detailed overview of the fishery, its goals, management measures and provisions for consultation with interested parties. Prior to 2013, there was a specific IFMP for yellowtail flounder, now, the fishery is covered under the 2+3KLMNO Groundfish IFMP.

The 2+3KLMNO GAC, which includes a remit for the yellowtail flounder stock, is the major consultative body for groundfish management in the Newfoundland and Labrador (NL) Region. The GAC meetings as required to review the latest scientific advice and recommend management measures to the DFO. The ToR for the GAC outline a decision-making process based on a consensus of members of the committee. Members agree to share all relevant information where possible, and to accept the concerns and goals of others as legitimate. Members agree to act in "good faith" in their deliberations, including respecting confidentiality when required in relaying information to others, maintaining a professional manner and refraining from discussions of a personal nature. Members of the committee consider issues and present recommendations to DFO. The committee is chaired by the Director of Resource Management & Aboriginal Fisheries for the NL Region and they are responsible for notifying members of upcoming meetings. Summary minutes of meetings are prepared and distributed by the DFO after they are reviewed and accepted by the chair. Recommendations from the committee are formally submitted to DFO and final decisions are made on management measures for the coming year's fishery. The federal Minister of Fisheries and Oceans (DFO) has the ultimate responsibility for the fishery and, where appropriate, his/her authority is delegated to officials through the organisational structure of the DFO.

Once decisions are reached, an annual Conservation Harvesting Plan (CHP) is developed for each species by fleet sector including for the client group's vessels. The CHP covers such things as authorized areas, fishing gear, fishing restrictions, closures (spawning and mixing times), incidental catch, discarding and size limits on a species by species basis.

In addition, a fishing licence is issued to each harvester, which outlines conditions/requirements specific to that vessel.

In-season decision making for opening and closing dates for specific areas and fleet sectors is done by DFO in consultation with industry. If issues arise during the year they are addressed through the consultative processes.

5.4.10 Monitoring, control and surveillance

NAFO

The NAFO Convention does not explicitly provide NAFO with competence related to monitoring, control and surveillance (MCS) and so it has no enforcement capacity. As with other RFMOs, NAFO relies on its Contracting Parties to implement NAFO Conservation and Enforcement Measures.

Through Article VI [The Commission] (paragraph 9), the Contracting Parties have agreed to cooperate and adopt measures and mechanisms for effective monitoring, control and enforcement of the conservation and management measures adopted by the Commission. This includes:

- reciprocal rights of boarding and inspection by Contracting Parties within the NRA and flag State prosecution and sanctions on the basis of evidence resulting from such boardings and inspections;
- minimum standards for inspection of fishing vessels by Contracting Parties in ports where landing from the NRA takes place;
- follow-up actions with respect to infringements on evidence resulting from such inspections.

Article VI (paragraph 11) states that the Commission shall seek to ensure consistency and coordination with the conservation and management measures that apply to a stock or group of stocks within the NRA and within the jurisdiction of a coastal State.

Under Article X [Contracting Party Duties], Contracting Parties are required to submit annual compliance reports, including enforcement action, it has taken with respect to their implementation of CEMs within the NRA. Furthermore, coastal State Contracting Parties are also required to report the conservation and management measures and actions they have undertaken within their jurisdictions in relation to NAFO straddling stocks.

Article XI [Flag State Duties], specifies the requirements and obligations of Flag States when their vessels fish in the NRA, with emphasis on maintaining records of authorised vessels, ensuring these vessels undertake fishing in accordance with CEM requirements and that any alleged infringements are quickly, effectively and transparently followed up and reported. Sanctions of appropriate severity that ensure compliance, discourage further infringements and ensure offenders do not benefit from illegal activities are also required.

Article XII [Port State Duties], sets out that port State Contracting Parties take full account of its rights and duties under international law to promote the effectiveness of conservation and management measures adopted by the Commission and shall implement the CEM concerning port inspections.

While NAFO has no MCS competence it does have the ability to develop procedures that take action against Contracting Parties that undermine the effectiveness of the NAFO conservation and management measures, including non-discriminatory trade-related measures, (Article VI, paragraph 13), this could include changes in their allocations of NAFO stocks.

The NAFO CEM (NAFO, 2019) incorporate all NAFO adopted measures presently in force for fishing activities conducted in the NRA in accordance with the provisions set out in Articles VI [The Commission] and XIV [Implementation of Commission Decisions]. The CEM set out requirements in relation to fishing and fishing related activities within the NRA, for harvesters and Contracting Parties, including:

- Fisheries research vessels
- Species specific conservation and management measures
- Catch and effort limitations
- Gear requirements/specifications
- Minimum landing sizes
- The protection of vulnerable marine ecosystems
- Exploratory fishing
- Fishing authorisation requirements
- Monitoring of vessels and catch
- Observers
- Protocols for at-sea inspections and surveillance
- Port state control procedures and protocols for landing and port inspection
- Reporting

The CEM are reviewed and revised annually by the Commission and published following the annual NAFO meeting that takes place every September.

NAFO's Standing Committee, STACTIC, reviews and reports on compliance of NAFO registered vessels in the NRA on an annual basis.

Fisheries Inspectors are appointed by Contracting Parties with inspection presence in the NRA (currently Canada and the EU) and assigned to fishery patrol vessels tasked to carry out NAFO inspection duties at sea within the NRA. In 2017, 6 patrol vessels deployed for a total of 365 days within the NRA. Figure 29 shows the time of year when the patrol vessels were present.

115 at-sea inspections were conducted out of which 7 detected "*Apparent Infringements (AIs)*". Two port inspections cited 2 AIs. Table 17 shows the details of the AIs detected by the at-sea inspections and port inspection services. Eight vessels were cited, with one vessel being cited twice on separate occasions. Flag State Contracting Parties are required to take immediate judicial or administrative action in-line with their national legislation when notified of an AI (CEM Article 39) and ensure that sanctions are adequately severe. The Flag State is also required to report on the judicial actions taken (CEM Article 40.1d).

also provides details of the follow up actions.

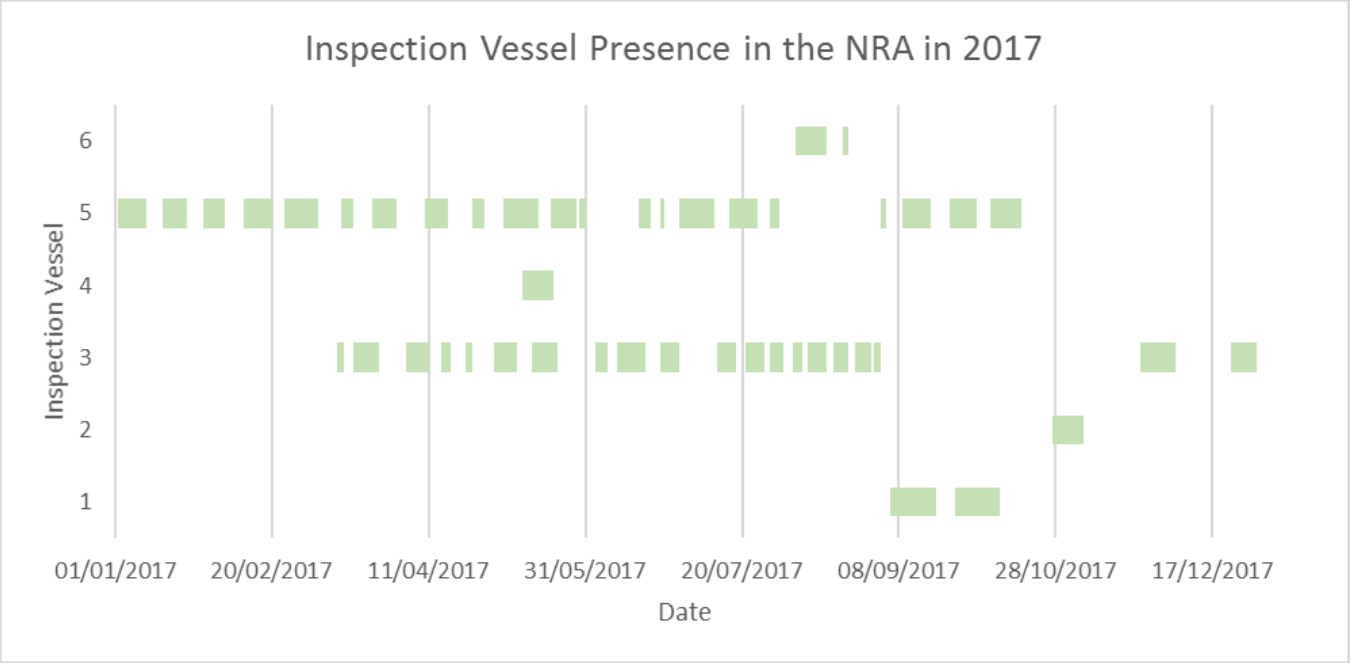


Figure 29: Inspection vessel presence in the NRA in 2017.

Table 17: Details of Apparent infringements (AIs) detected by inspectors at-sea and by port inspection services. AIs that are in bold were considered "serious" by the at-sea inspectors. NB. A list of what constitutes a serious infringement is provided in the CEM (Article 38.1).

Vessel Code	flag State CP	Date of inspection	Division (at-sea) or Port	Apparent Infringement (AI)	Confirmation of AI	Update as of Mar. 2018 (as reported by the flag State) (Art. 40.1.d.)	Remarks from Secretariat	STATUS as of May 2018 (Art. 40.2)
24	EU	05-Jan-17	St. John's	Master inaccurately recorded tow/set catch amount in 3N onb22 Dec 2016 and in 3O on 28 Dec 2016.	Section E.1.B (a) of PSC 3: Not confirmed during port inspection.		At the port inspection in Aveiro on March 2017, the AI could not be confirmed.	**CLOSED**
3	**RUS**	**07-Apr-17**	**3M**	**Issued at sea: Failed to maintain Stowage plan (art 28.5.a); failed to maintain accurate production logbook (Art 28.3.a.); failure to maintain an accurate fishing logbook (Art 28.2.b). Considered serious in accordance with 38.1.i and 38.8.b as they relate to mis-recording of catches.**	**Section E.1.B (a) of PSC 3: Art 28.2(b) and 3 (a). Master give us a document signed by officers and NAFO Observer in April 10th 2017, according as they threw to sea 71900 kg of damaged Redfish in hold #1 between April 4th and 6th. Art. 28.5 (a) - Coincident stowage plane hold #1 (partially empty). Empty space 136,23 m3 = 72.64 tons."**	**Fined 120000 Rubles**		**CLOSED**
24	EU	07-Jun-17	Vigo	PSC 3 - Section E.1.B(c) : Article 28.5a (Stowage Plan)		Proposal of resolution fine 8000 €. Case Pending	AI's issued by port inspection services are not indicated whether 'serious' or non-serious:	**PENDING**
39	**USA**	**09-May-17**	**3N**	**Contrary to Art 6.6.a -- conducting directed fishery of COD, a species classified as bycatch in accordance with art 6.2.b as it is a moratorium species. Considered serious under art 38.1.**		**Submitted for prosecution. Case Pending.**		**PENDING**

Vessel Code	flag State CP	Date of inspection	Division (at-sea) or Port	Apparent Infringement (AI)	Confirmation of AI	Update as of Mar. 2018 (as reported by the flag State) (Art. 40.1.d.)	Remarks from Secretariat	STATUS as of May 2018 (Art. 40.2)
41	EU	24-Jul-17	3M	Fishing gear requirements. Use of a multiple flap=type topside chafer, with mesh size lesser than the cod-end.; and flaps more than ten meshes long. Contrary to Art. 13.6.	Use of multiple flap-type topside chafer, with meshes less than that of cod-end, and with flaps more than ten meshes long. Contrary to Art. 13.6 as described in Annex III.B.2.	Proposal of resolution 7000 €. Case Pending.		**PENDING**
11	EU	01-Aug-17	3L	Mis-recorded on 29July catch in 3L contrary to Art 28.6.c.			Canadian inspectors issued the AI. EU inspectors could not confirm the AI.	**CLOSED**
38	EU	04-Jul-17	3M	Package labels at time of stowage could not be read by inspectors. Contrary to Art. 27.2.			During port inspection at Cangas in September 2017, fisheries inspectors did not confirm the apparent infringement in port.	**CLOSED**
42	USA	19-Sep-17	Loiusbourg	While directing for YEL in 3N, the master exceeded specified PLA bycacth limit of 15% in tow#5 of the trip, the master failed to immediately move 10 nautical miles from any position of tow #5 during tow#6, as required under Art 6.6.(b)(i).		CLOSED. Footnote 21 (now Footnote 14) applies to seasonal PLA bycatch limit.		**CLOSED**

The legal resolution of AIs may take more than a year. Contracting Parties are required to list on-going infringements steps on each subsequent annual report until it reports the final disposition of the infringement. The following Table (Table 18

) summarises the status of AI cases for the period 2013 – 2017.

Table 18: The status of the resolution of citations by at-sea and port inspection services against vessels fishing in the NRA by year in which the citations were issued, as of May 2018. (A citation is an inspection report that lists one or more AIs).

Year	Number of Inspection Reports with AI citation/s	Number of Resolved cases	Number of Pending Cases	% Resolved
2013	13	13	0	100%
2014	6	5	1	83%
2015	3	0	3*	0%
2016	10	3	7	30%
2017	9	5	4	55%

* all 3 cases are under appeal

According to CEM Article 43.10, the port State Contracting Party shall carry out inspections of at least 15% of all landings or transhipments during each reporting year.

Various CEM related reporting obligations are in place for vessels fishing in the NRA:

Observers – An Observer Program (CEM Article 30) has been established to collect reliable information and data on the fishing activities within the NRA. All vessels have to carry an observer, although there is a derogation (Article 30b) that allows a Contracting Party to carry an observer for < 100% but not < 25% of the fishing trips conducted by its fleet, or the days the vessels are present in the NRA during the year, on condition that: the area fished is expected to have negligible by-catch, all real-time reporting requirements are met, landing inspections or risk assessment of landings are conducted and reported, and the provision of a comparison of all relevant catch and fishing activities for when the vessel had an observer and for when it was withdrawn. If an infringement is found when no observer is on-board this constitute a serious infringement and the vessel will either be required to have an observer deployed before re-commencing fishing or proceed to port for a full physical inspection.

Vessel reporting – Vessel Transmitted Information (VTI): Catch on Entry (COE), Daily Catch Reports (CAT) and Catch on Exist (COX). VTI is transmitted to the Secretariat by the Fisheries Monitoring Centres (FMCs) of Flag States. COE and COX are required to be transmitted at the start and end of fishing and are equated as representing the fishing days effort in a trip. CATs are daily catch quantities by species and Division and are used by the NAFO Secretariat to monitor Contracting Party quota uptake.

Vessel Monitoring System (VMS) – Every fishing vessel operating in the NRA shall be equipped with a satellite monitoring device capable of continuous automatic transmission of position to its land-based FMC, which in turn is transmitted to the Secretariat in real time. The transmission of position reports (POS) shall be no less frequently than once an hour (CEM Article 29).

Catch reporting on sharks – Article 28.6g requires that all shark catches be reported at the species level, to the extent possible. When species specific reporting is not possible shark species are recorded as either large sharks or dogfish.

Haul by haul reports – Logbook data on haul by haul basis became mandatory in 2015 (Article 28.8b).

Closed areas - Measures concerning the protection of Vulnerable Marine Ecosystems (VMEs) from bottom fishing are set out Chapter II of the CEM. In the Compliance Review Report STACTIC report that fishing tracks were plotted from the haul by haul data by connecting the start and end points of each haul, implying that each track is a straight line. On closer examination of the fishing tracks, it was noted that some were within the closed area, however, upon cross-verification with the VMS data, the outliers were proven to be inaccurate.

The Compliance Review Report (2017) concludes that overall compliance with reporting obligations is high and has continued to improve in recent years. The submission of haul by haul logbook data in accordance with NAFO CEM Article 28.8 has reached 83.3% compliance. The submission of observer reports in accordance with the Article 30.A of the NAFO CEM is 87%. To address the above-noted reporting deficiencies, STACTIC is undertaking review of the reasons for these deficiencies and researching short-term and long-term solutions.

Canada

DFO's Conservation and Protection Division (C&P) supports conservation and sustainability of the YTFF through the delivery of their surveillance, inspection and enforcement program. C&P key roles are:

- Promoting and monitoring compliance within Canadian Fisheries waters with the Fisheries Act, Coastal Fisheries Protection Act (CFPA), Species At Risk Act, and Oceans Act;
- Enforcing prohibitions of relevant Acts, Regulations, Orders and verifying compliance with conditions of license;
- Contribute to fisheries conservation, the protection of commercial, aboriginal, and recreational fisheries, habitat and of species-at-risk; and,
- Monitoring and enforcement of conservation measures in place in international waters (e.g. NAFO Regulatory Area).

The IFMP highlights that the C&P program is delivered using the following approach:

- Promotion of compliance through education and shared stewardship;
- Monitoring, control and surveillance activities;
- Management of major cases special investigations in relation to complex compliance issues; and
- Strengthening the collection and reporting on intelligence in the fishery

Also, within the IFMP details of the compliance and enforcement program is described. The following provides a summary of the programs.

Fishery Officers in the NL region are responsible for compliance activities related to the YTFF in 2+3KLMNO. These Officers are supported by regional staff that provide oversight, SARA response and coordination, and also manage the air surveillance program. These Fishery Officers are designated under Section 5 of the Fisheries Act and have full enforcement powers and responsibilities outlined in the Fisheries Act, Coastal Fisheries Protection Act, SARA, Criminal Code and the Constitution Act. Fishery Officers can inspect and investigate fishing vessels for compliance with Variation Orders, conditions of licences, as well as the Fisheries Act and related regulations.

Certified at-sea Observers (ASO) are deployed to perform duties best described as "Observe, Record and Report." In 2+3KLMNO, they are deployed on a random basis. According to the licence conditions the target observer level is 5%. If a vessel intends to fish in the NRA, then an observer is compulsory.

Observer duties are related to monitoring of fishing activities, examination and measurement of fishing gear, collection of biological samples, recording of scientific data, monitoring the landing of fish, and verification of the weight and species of fish caught and retained (Seawatch, 2018). ASO are not enforcement personnel but, the scientific data they gather related to catch and effort and any biological sampling is used by C&P to monitor compliance with respect to incidental catch. DFO science and C&P brief observer companies and staff on a regular basis and C&P routinely debrief observers when they leave a vessel.

Off-loading can only occur in the presence of a third-party dockside monitor who is required to verify the weight, species and product form of the off-load. Shore-based Fisheries Officers also work with dockside monitors to ensure the integrity of landing data, i.e. species identification and reported catch weights.

All vessels engaged in the YTFF are required to carry a DFO approved satellite tracking device, i.e. Vessel Monitoring System (VMS), that transmits at least 1 signal per hour. This data enables C&P to monitor vessel activity particularly in and around closed areas and international boundaries as well as help and inform the deployment of surveillance resources.

Aerial surveillance is also used to monitor closed and/or conservation areas. Flight reports, photographs and other data collected from these overflights are used to direct surveillance and enforcement resources as necessary.

Licence conditions for each sector fishing within 2+3KLMNO are issued each year and include the regulatory requirements that must be followed. .

Table 19 provides information on the compliance of the YTFF.

Table 19: Compliance data for the yellowtail flounder fishery in 2+3KLMNO 2014-18 Source: NL Region

Newfoundland & Labrador Region						
Yellowtail Flounder 2014 - 2018						
Activity	**2014**	**2015**	**2016**	**2017**	**2018**	**Totals & Averages**
Dockside Monitoring Landings (t)	5532	4125	4671	4835	4196	**23359**
At Sea Observer (Trips)	10	4	10	10	8	**42**
At Sea Observer (% of coverage)	50%	25%	46%	63%	57%	48%
At Sea Observer (Sea days directed Yellowtail)	**	80	248	187	170.5	**685.5**
Air Surveillance Patrols	13	8	21	14	19	**75**
Air Surveillance Hours	32	29	22	64	16	**163**
Patrol Hours	109	213.5	151.5	32.5	40.5	**547**
Vessels Checks	11	44	3	5	9	**72**
Occurrences	2	3	1	1	1	**8**
Charges Laid	0	0	0	0	0	**0**
Fines per year (Approx. $ Value)	0	0	0	0	0	**0**
** Data unavailable						

* '*Occurrences*' can mean everything from a complaint (including an unfounded one) through to enforcement actions, such as written warnings and charges. All referrals, even those of a minor nature, from at-sea and dockside observers/monitors can be entered as 'occurrences' (Daryl Walsh, pers. comm.).

An administrative and court-based sanction framework is outlined in the Fisheries Act and regulations with court-based prosecution for serious offences through the Canadian Criminal Code (1985). Upon conviction maximum penalties of $500,000 and up to two years in jail may be imposed along with forfeiture of catch and equipment at the discretion of the court.

5.4.11 Monitoring and management performance evaluation

NAFO

RFMOs have recognised the need for performance review as an essential governance requirement as a result of some key international agreements, resolutions and conference outcomes:

- FAO Report of the Twenty-sixth Session of the Committee on Fisheries Rome, 7-11 March 2005, FAO Fisheries Report No. 780. Rome. FAO 2005. 88 p. paragraph 111;
- Conference on the Governance of High Seas Fisheries and the UN Fish Agreement, Moving from Words to Action, 5 May 2005;
- 2005 and 2006 UNGA Resolutions on Sustainable Fisheries (respectively, UNGA 60/31 and 63/112); and,
- Review Conference on UN Fish Stocks Agreement, New York, 22-26 May 2006.

A review of NAFO was first undertaken in 2007 (NAFO, 2011), and, at its 39th Annual Meeting in 2017 NAFO decided to review the Organisation's performance with regard to its mandate and objectives. The review assesses NAFO's performance during the period 2011-2017, with special attention to the follow-up to the recommendations stemming from the first Performance Assessment Report (NAFO, 2018).

In accordance with the Terms of Reference, NAFO appointed a Panel comprising six members, three external experts, none of whom had participated in the work of NAFO, and three internal experts, nominated by NAFO Contracting Parties.

In summary, the second NAFO Performance Review considered that the significant progress had been made to modernise NAFO during the period of review and noted, in particular the following achievements:

- Increased transparency in the Organisation's workings and proceedings;
- A sustained commitment towards the protection of VMEs;
- An expansion of the Organisation's use of Risk Based Management Strategies, and continuing efforts towards establishing a robust basis for the Precautionary Approach and the Ecosystem Approach to inform the conservation measures it adopts;
- Improvements in the Organisation's ability to collect and process reliable data for use by scientists and managers, particularly in regard to NAFO's Catch Estimation;
- An improved framework for dialogue between scientists and managers, in particular through the establishment of joint Scientific Council and Commission working groups on key areas;
- A generally satisfactory state of compliance in the NRA based on control measures and peer review processes that can mostly be considered robust;
- Increasingly positive cooperation with other fisheries bodies, in particular the North East Atlantic Fisheries Commission (NEAFC), with which NAFO maintains regular operational exchanges of information on control efforts and management measures regarding a shared resource.

The Review Panel highlighted the following significant external challenges:

- Many of the fish stocks under NAFO's responsibility are still in a precarious state. In some cases, this is largely due to ecosystems change including impacts of climate change;
- Various human activities have a cumulative impact on the marine environment, beyond the mandate of NAFO, for the long-term conservation and sustainable use of the fisheries resources.

And, against this background, the Panel highlighted the following areas that require further attention:

- Further improving the availability and reliability of catch data;
- Setting up mechanisms to promote compatibility of measures;
- Ensuring sufficient resources are available to handle the increasing science workload
- Establishing a decision-making framework for the provision of scientific advice;
- Addressing repeat non-compliance;
- Ensuring the practical application of an Ecosystem Approach;
- Revising the NAFO CEM for clarity and internal consistency;
- Developing an operational plan for the NAFO Secretariat.

Canada

The IFMP highlight that reviews of elements of the fishery specific management system take place, e.g. compliance and enforcement regularly reviews data enabling it to better manage risk and deploy resources. The advisory committee, GAC, provides opportunity to review aspects of the management of the groundfish fishery, including the YTFF and discuss any issues/concerns and make recommendations to DFO on the domestic management of the fishery.

With respect to external review, the Parliament of Canada has two committees related to Fisheries and Oceans: The Standing Committee on Fisheries and Oceans of the House of Commons and the Senate Standing Committee on Fisheries and Oceans of the Senate. Both committees regularly review different aspects of fishery management in Canada and publish reports with their findings and conclusions. To date, the YTFF has not been the subject of review by either committee.

No external reviews of the YTFF that meet MSC requirements, i.e. a review by another department within an agency; another agency or organisation within the country; a government audit that is external to the fisheries management agency; a peer organisation nationally or internationally, or an external expert reviewers - has taken place for the YTFF since the fishery was first assessed and certified in 2010.

5.4.12 Principle 3 Performance Indicator scores and rationales

There are two elements of the management system that need to be taken into account in the YTFF: the international (NAFO) and the domestic (Canada).

PI 3.1.1 – Legal and/or customary framework

PI 3.1.1		The management system exists within an appropriate legal and/or customary framework which ensures that it: - Is capable of delivering sustainability in the UoA(s); - Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and - Incorporates an appropriate dispute resolution framework		
Scoring Issue		SG 60	SG 80	SG 100
a	Compatibility of laws or standards with effective management			
	Guide post	There is an effective national legal system **and a framework for cooperation** with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and **organised and effective cooperation** with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and **binding procedures governing cooperation with other parties** which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	**NAFO - Yes** **Canada - Yes**	**NAFO - Yes** **Canada - Yes**	**NAFO - Yes** **Canada - Yes**

Rationale

The following evidence indicates SG 60 is met:

NAFO

The NAFO Convention (NAFO, 2017) is the formal document that establishes the international legal and administrative structure for the management of shared stocks in the Northwest Atlantic. The Convention provides a framework for cooperation between its Contracting Parties.

Canada

Within Canada's EEZ, there is a well-established legislative framework. The Fisheries Act (1985) (which has recently been amended following an extended period of public consultation - see section 5.4.4), provides the legislative basis for the implementation of regulations, e.g. The Atlantic Fishery Regulations 1985 and Fishery (General) Regulations 1993. The Regulations, amongst other things, provide the prescription of conditions for the operation of Canadian fisheries, in a manner consistent with MSC Principle 1.

The Species at Risk Act (2002) and the Oceans Act (1996) provide the framework for implementing domestic management in a manner consistent with MSC Principle 2.

These laws and regulations are implemented nationally and regionally, as appropriate, through the federal department, Fisheries and Oceans Canada (DFO). DFO's national Headquarters are in Ottawa with 6 geographic regions spanning the country: Pacific, Central and Arctic, Quebec, Gulf, Maritimes, Newfoundland and Labrador.

The following evidence indicates SG 80 is met:

NAFO

See SG 100

Canada

The federal Minister of Fisheries and Oceans has the ultimate responsibility for the fishery and his/her authority is delegated to officials through the organizational structure of DFO, i.e. there is a formal and binding system for the cooperation between national entities at the federal and regional level, which delivers management outcome consistent with MSC Principles 1 and 2.

The following evidence indicates SG 100 is met:

NAFO

In accordance with UNFSA, the NAFO Convention ensures binding procedures that, minimally, deliver cooperation between its members on the collection and sharing of scientific data, the scientific assessment of stock status and the development of scientific advice.

Article XVII of the convention specifically refers to, “Cooperation with other organisations” and examples are presented in section 5.4.4

Canada

Internationally Canada is a signatory to the FAO Code of Conduct, United Nations Convention on the Law of the Sea (UNCLOS) and United Nations Fisheries Agreement (UNFA) and, as well as being a member of ICCAT is also a member of several other Regional Fisheries Management Organisations (RFMOs), e.g. NAFO, the International Commission for the Conservation of Atlantic Tunas (ICCAT). As such, Canada is bound by procedures and governing cooperation with other international parties and organisations that, where required, are transposed at a national level.

b	Resolution of disputes			
	Guide post	The management system incorporates or is subject by law to a **mechanism** for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a **transparent mechanism** for the resolution of legal disputes which is **considered to be effective** in dealing with most issues and that is appropriate to the context of the UoA.	The management system incorporates or is subject by law to a **transparent mechanism** for the resolution of legal disputes that is appropriate to the context of the fishery and has been **tested and proven to be effective**.
	Met?	**NAFO - Yes** **Canada - Yes**	**NAFO - Yes** **Canada - Yes**	**NAFO - No** **Canada - Yes**

Rationale

The following evidence indicates SG 60 is met:

NAFO

Article XV of the Convention, “Settlement of Disputes” (NAFO 2017), sets out the process for settling disputes under different circumstance, e.g. where a dispute arises between 2 or more Contracting Parties concerning the interpretation or application of the Convention; management measures and their monitoring, control and enforcement; the implementation of Commission decisions.

Canada

The Federal Courts Act 1985 provides a mechanism for parties to challenge decisions of administrative bodies or tribunals and receive a hearing before a justice of the court.

The following evidence indicates SG 80 is met:

NAFO

Contracting Parties are required to resolve their dispute by, “negotiation, inquiry, mediation, conciliation, arbitration, judicial settlement, *ad hoc* panel proceedings or other peaceful means of their choice”. Where the Contracting Parties are unable to agree or reach a settlement, at the request of one of them, a compulsory proceeding, entailing a binding decision is initiated.

A dispute resolution process is also set out in Article 41 of the NAFO Conservation and Enforcement Measures (NAFO, 2019) in relation to the NAFO at-sea inspection and surveillance scheme. This includes the convening of the Standing Committee on International Control (STACTIC), which seeks to recommend resolutions to the Contracting Parties concerned, which, if unsuccessful, is referred to the Commission and possible resolution through the Convention’s Article XV process.

Canada

Hearings are open to the public and media and are therefore considered to be transparent.

The following evidence indicates SG 100 is not met:

NAFO

Contracting Parties are required to resolve any dispute through negotiation, mediation, conciliation, arbitration, judicial settlement, *ad hoc* panel proceedings or other peaceful means of their choice". Where the Contracting Parties are unable to agree or reach a settlement, at the request of one of them, a compulsory proceeding, entailing a binding decision is initiated. No evidence that the process has been tested was found and so the SG 100 is not met.

The following evidence indicates SG 100 is met:

Canada

The system has been tested and proven to be effective on several occasions, for example, in 1990 at the Supreme Court of Canada, "The Sparrow Decision" resolved that aboriginal groups have a right to fish for food, societal and ceremonial purposes and that this use-right is surpassed only by conservation of the resource.

C	Respect for rights			
	Guide post	The management system has a mechanism to **generally respect** the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to **observe** the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to **formally commit** to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	Met?	**NAFO - Yes** **Canada - Yes**	**NAFO - Yes** **Canada - Yes**	**NAFO - Yes** **Canada - Yes**

Rationale

The following evidence indicates SG 60 is met:

NAFO

See SG 100

Canada

The Constitution Act (1982) (Government of Canada 1982) recognizes and confirms aboriginal and treaty rights of the aboriginal peoples of Canada, including the guarantee of legal rights to fish for food and livelihood. The Atlantic Fishery Regulations (1985), Fishery (General) Regulations (1993), the Species at Risk Act 2002 and the Oceans Act (1996) provide the framework for implementing domestic management in a manner consistent with MSC Principles 1 and 2.

The following evidence indicates SG 80 is met:

NAFO

See SG 100

Canada

The Constitution Act 1982 (Government of Canada 1982)) provides a mechanism to observe the legal rights of aboriginal peoples to fish for food and livelihood.

The following evidence indicates SG 100 is met:

NAFO

The NAFO Convention (Article VI, paragraph 12) recognises the need for the allocation of fishing opportunities in the NRA to take into account the interests of Contracting Parties and their coastal states whose vessels have traditionally fished within the area and, furthermore, explicitly mentions the need for consideration of coastal communities that are primarily dependent fishing opportunities on the Grand Bank and Flemish Cap and which have made extensive efforts through international action by providing surveillance and inspection of international fishing activities.

Canada

The Constitution Act 1982 (Government of Canada 1982) recognizes and confirms aboriginal and treaty rights of the aboriginal peoples of Canada, including the guarantee of legal rights to fish for food and livelihood. This section has been litigated and confirmed by the Supreme Court on several occasions and constitutes a formal commitment to the rights of aboriginal peoples. Disputes regarding aboriginal fishing rights have been fairly resolved (R.v Sparrow,

R.v Marshall) (Supreme Court of Canada 1985) and have led to current policy initiatives that ensures the protection of aboriginal rights, namely the “Aboriginal Fisheries Strategy” (DFO 1992) which is aimed at ensuring that aboriginal entitlements are respected in the development of fisheries management regimes for aboriginal peoples

References

Section 5.4.3, 5.4.4, 5.4.5, 5.4.6

Atlantic Fishery Regulations, 1985. http://laws-lois.justice.gc.ca/eng/regulations/sor-86-21/index.html

Canadian Constitution Act, 1867. https://laws-lois.justice.gc.ca/eng/const/page-1.html

Canadian Fisheries Act, 1985. http://laws-lois.justice.gc.ca/PDF/F-14.pdf

FAO Code of Conduct for Responsible Fisheries, 1995. http://www.fao.org/docrep/005/v9878e/v9878e00.HTM

Fishery (General) Regulations, 1993. http://laws-lois.justice.gc.ca/PDF/SOR-93-53.pdf

DFO 1992, The Aboriginal Fisheries Strategy. http://www.dfo-mpo.gc.ca/fm-gp/aboriginal-autochtones/afs-srapa-eng.htm

DFO, 2019 Integrated Fisheries Management Plan for Groundfish Species – Northwest Atlantic Fisheries Organisation (NAFO) Divisions 2+3KLMNO

Northwest Atlantic Fisheries Organization (NAFO) https://www.nafo.int

NAFO, 2017. Convention on Cooperation in the Northwest Atlantic Fisheries https://www.nafo.int/Portals/0/PDFs/key-publications/NAFOConvention-2017.pdf

Nunavik Inuit Land Claims Agreement Act 2006 –https://laws-lois.justice.gc.ca/eng/acts/N-28.5/index.html

Nunavut Land Claims Agreement Act https://laws-lois.justice.gc.ca/eng/acts/n-28.7/

Oceans Act (1996) http://laws-lois.justice.gc.ca/PDF/O-2.4.pdf

Sparrow Decision https://scc-csc.lexum.com/scc-csc/scc-csc/en/item/609/index.do

Species at Risk Act (2002) http://laws-lois.justice.gc.ca/PDF/S-15.3.pdf

The Federal Courts Act (1985) http://laws-lois.justice.gc.ca/eng/acts/F-7/

United Nations Convention on the Law of the Sea (UNCLOS) (1982) http://www.un.org/Depts/los/convention_agreements/texts/unclos/unclos_e.pdf

United Nations Fisheries Agreement (UNFA) (1995) http://www.un.org/depts/los/convention_agreements/convention_overview_fish_stocks.htm

Overall Performance Indicator score	**95**
Condition number (if relevant)	**N/A**

PI 3.1.2 – Consultation, roles and responsibilities

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties		
Scoring Issue		SG 60	SG 80	SG 100
a	Roles and responsibilities			
	Guide post	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **generally understood**.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **explicitly defined and well understood for key areas** of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **explicitly defined and well understood for all areas** of responsibility and interaction.
	Met?	**NAFO - Yes** **Canada - Yes**	**NAFO - Yes** **Canada - Yes**	**NAFO - Yes** **Canada - Yes**

Rationale

The following evidence indicates SG 60 is met:

NAFO

See SG 80 and SG 100 rationale.

Canada

The IFMP clearly sets out all of the organisations and individuals involved in the management of the fishery and describes their functions, roles and responsibilities.

The following evidence indicates SG 80 and SG 100 is met:

NAFO

The NAFO Convention includes defined roles and responsibilities of the Commission, the Scientific Council, the Secretariat, Standing Committees, Working Groups and the Contracting Parties. The NAFO website provides an organogram and explicitly describes the functions, roles and responsibilities of the various NAFO bodies (replicated in section 5.4.7 of this report).

Canada

Within the Canadian EEZ, the responsibility for the management of fisheries resides with the federal government. The federal Minister of Fisheries and Oceans (DFO) has the ultimate responsibility for the fishery and his/her authority is delegated to officials through the organisational structure of the DFO.

The IFMP describes:

- The “Framework Process” - the mechanism whereby DFO science assesses the assumptions and data inputs underlying the management of the fishery.
- The Regional Assessment Process (RAP) – the development and provision of scientific advice for consideration by the industry and DFO.
- The Advisory Process – The 2+3KLMNO Groundfish Advisory Committee (GAC) facilitates collaboration between the industry and the DFO on the management of the groundfish fisheries, including the YTFF. The purpose of the GAC is set out in Terms of Reference (DFO 2013). The Committee’s purpose is to provide advice and recommendations to DFO in support of the development of management measures that address conservation and the sustainable use of groundfish resources. Ad-hoc Working groups may be established by the GAC to review specific issues and report back to the Committee.
- Compliance – The role and working practices of DFO’s Conservation and Protection (C&P) Division.

b	Consultation processes

	Guide post	The management system includes consultation processes that **obtain relevant information** from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that **regularly seek and accept** relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that **regularly seek and accept** relevant information, including local knowledge. The management system demonstrates consideration of the information and **explains how it is used or not used**.
	Met?	**NAFO - Yes** **Canada - Yes**	**NAFO - Yes** **Canada - Yes**	**NAFO - No** **Canada - No**

Rationale

The following evidence indicates SG 60 is met:

NAFO

See SG80.

Canada

National, regional and fishery specific consultations take place within the management system. National, regional and fishery specific consultations are regularly published on the DFO website (http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/comm/consultation-eng.htm) with the intent of obtaining relevant information, including local knowledge from all affected and interested parties.

The following evidence indicates SG 80 is met:

NAFO

The NAFO annual meeting cycle provides the consultative mechanism for Contracting Parties to share information concerning management of fisheries. The process allows for annual national reports, including local knowledge, to be reviewed and included in Commission meetings. Stock assessment documents and meeting proceedings are approved and published on the NAFO website.

Each year, scientists from the Contracting Parties are invited to present their latest results to the Scientific Council and/or pertinent NAFO Working Groups.

Canada

DFO also demonstrates through their website the input and consideration of local knowledge and information obtained from consultations, e.g. the following link presents information that was provided to DFO following the consultation on proposed amendments to the Fisheries Act http://dfo-mpo.gc.ca/campaign-campagne/fisheries-act-loi-sur-les-peches/index-eng.html.

With respect to fishery specific consultation, the 2+3KLMNO Groundfish Advisory Committee (GAC) serves as the main consultative body for consulting with industry and other stakeholders on positions at NAFO and domestic management measures of Canadian groundfish, including the YTFF.

The ToR for GAC and the supporting minutes of meetings, clearly demonstrates the management of the fishery includes consultation processes that regularly seek and accept relevant information, including local knowledge (see section 5.4.7 above).

The following evidence indicates SG 100 is not met:

There was no evidence to show that either the NAFO or Canadian management systems demonstrate how information is used or not used.

C	Participation			
	Guide post		The consultation process **provides opportunity** for all interested and affected parties to be involved.	The consultation process provides **opportunity and encouragement** for all interested and affected parties to be involved, and **facilitates** their effective engagement.

	Met?		**NAFO - Yes** **Canada - Yes**	**NAFO - Yes** **Canada - Yes**

Rationale

The following evidence indicates SG 80 is met:

NAFO

Through the NAFO Convention (Article VI, paragraph 'g') the Commission has adopted rules to provide the representation and participation of inter-governmental organisations, non-Contracting Parties and non-governmental organisations (NAFO 2018).

Canada

Through DFO national and regional websites, consultations are widely available and are considered to provide opportunity and encouragement for all interested and affected parties to be involved, e.g. http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/comm/consultation-eng.htm.

The following evidence indicates SG 100 is met:

NAFO

Annual meeting reports provide details of those groups or individuals who have been invited and participated at Commission and Scientific Council meetings.

Canada

Minutes of the GAC provide evidence that the fishery specific consultation process provides opportunity and encouragement for all interested and affected parties and facilitates their effective engagement.

References

Section 5.4.7

DFO consultations website - http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/comm/consultation-eng.htm

DFO, 2019. Integrated Fisheries Management Plan for Groundfish Species – Northwest Atlantic Fisheries Organisation (NAFO) Divisions 2+3KLMNO

DFO 2018, 2+3KLMNO Groundfish Advisory Committee Meeting, 17-18th April 2018, St. John's

DFO 2019, 2+3KLMNO Groundfish Advisory Committee (GAC), Terms of Reference

NAFO 2018 the "NAFO Rules of Procedure and Financial Regulations" https://www.nafo.int/Portals/0/PDFs/key-publications/Rules-Finance-2018.pdf

Overall Performance Indicator score	**95**
Condition number (if relevant)	**N/A**

PI 3.1.3 – Long term objectives

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Fisheries Standard, and incorporates the precautionary approach		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guide post	Long-term objectives to guide decision-making, consistent with the MSC Fisheries Standard and the precautionary approach, are **implicit** within management policy.	**Clear** long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach are **explicit** within management policy.	**Clear** long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach, are **explicit** within **and required by** management policy.
	Met?	**NAFO - Yes** **Canada - Yes**	**NAFO - Yes** **Canada - Yes**	**NAFO - Yes** **Canada - Yes**

Rationale

The following evidence indicates SG 60 is met:

NAFO

NAFO's principal objective is enshrined in the Convention (NAFO, 2017), "*To ensure long-term conservation and sustainable use of the fishery resources in the Convention Area and, in so doing, to safeguard the marine ecosystems in which these resources are found*.".

The NAFO Precautionary Approach Framework (PAF) to scientific advice is developed based on international policy on resource management, not least the UN Fisheries Agreement (1995). The PAF takes into consideration population and ecosystem dynamics, life history of species, and external factors that affect natural resources.

Canada

Fish stock conservation and other ecosystem sustainability objectives and the precautionary approach stem from Canadian legislation such as the Fisheries Act, Ocean's Act and Species at Risk Act, and policy initiatives such as the Atlantic Fisheries Policy Review, Sustainable Fisheries Framework.

The following evidence indicates SG 80 and 100 are met:

NAFO

As indicated in SG 60, a clear long-term objective is enshrined in the Convention (NAFO, 2017)

Upon the recommendation of the NAFO Scientific Council, the NAFO Fisheries Commission adopted a Precautionary Approach Framework to guide fisheries management decision-making from 2004. The PAF is used for improved protection of resources, and to determine appropriate resource management measures in the absence of sufficient scientific data (also see section 5.4.8 of this report).

Furthermore, through the UN Fisheries Agreement (1995) NAFO is committed to an Ecosystem Approach to fisheries management (NAFO 2017) that includes "…*safeguarding the marine environment, conserving its marine biodiversity, minimizing the risk of long term or irreversible adverse effects of fishing activities, and taking account of the relationship between all components of the ecosystem*.".

Canada

As a Contracting Party of NAFO, Canada is obligated to implement the management measures agreed by NAFO in accordance with its own objectives and management procedures. Fish stock conservation and other ecosystem sustainability objectives stem from Canadian legislation such as: the Fisheries Act, Ocean's Act and Species at Risk Act, and policy initiatives such as: the "Sustainable Fisheries Framework" (DFO 2009a), the "Atlantic Fisheries Policy Review" (DFO 2004) the "Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas" (DFO 2009b) and the "Policy on Managing Bycatch" (DFO, 2013).

The Fisheries Act provides absolute discretion to the Minister for the management of fisheries and, in so doing, section 6 of the Act explicitly requires the Minister to consider fisheries management objectives before a regulation is made.

The Oceans Act (section 35-2) explicitly requires the Minister to ensure clearly identified objectives are set for marine protected areas.

The Species at Risk Act (section 46) explicitly requires the Minister to report on the progress toward meeting recovery objectives of ETP species.

The Sustainable Fisheries Framework (SFF) establishes a precautionary approach to fisheries management; provides the basis for an ecosystem approach to fisheries management; includes tools to monitor and assess environmentally sustainable initiatives; and, combines new and evolving fisheries management policies with current ones (DFO 2009a). The "Fishery Decision-making Framework Incorporating the Precautionary Approach", helps to deliver the precautionary approach aspect of the SFF. A precautionary approach to the management of the YTFF, consistent with the basic tenants set out in the Framework, is applied. This approach is based on biological criteria established by DFO Science and peer reviewed by the NAFO Scientific Council.

The Atlantic Fisheries Policy Review provides objectives to guide decision-making in Atlantic fisheries. It places conservation of the resource as the priority, sets the path for greater industry self-reliance, establishes transparent rules-based processes for decision-making and encourages a greater role for resource users and others (DFO 2004).

The "Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas" requires the mitigation of the impacts of fishing on sensitive benthic areas or avoidance of impacts of fishing that are likely to cause serious or irreversible harm to sensitive marine habitat, communities and species.

The "Policy on Managing Bycatch" is intended to ensure that Canadian fisheries are managed in a manner that supports the sustainable harvesting of aquatic species and that minimizes the risk of fisheries causing serious or irreversible harm to bycatch species; and to account for total catch, including retained and non-retained bycatch.

These Acts and broad policy guidelines are implemented through fisheries specific objectives that are outlined in fisheries management plans.

References

Section 5.4.8

DFO 2004. Atlantic Fisheries Policy Review http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/afpr-rppa/framework-cadre-eng.htm

DFO 2008. The Emerging Species Policy http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/efp-pnp-eng.htm

DFO 2009a. Sustainable Fisheries Framework http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm

DFO 2009b. Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/benthi-back-fiche-eng.htm

DFO 2013d. Integrated Fisheries Management Plan for Groundfish Species – Northwest Atlantic Fisheries Organisation (NAFO) Divisions 2+3KLMNO

FAO Code of Conduct for Responsible Fisheries (1995) http://www.fao.org/docrep/005/v9878e/v9878e00.HTM

NAFO Ecosystem Approach https://www.nafo.int/Science/Frameworks/Ecosystem-Approach

NAFO Precautionary Approach Framework (PAF) https://www.nafo.int/Science/NAFO-Frameworks/NAFO-Precautionary-Approach

United Nations Fisheries Agreement (UNFA) (1995)
http://www.un.org/depts/los/convention_agreements/convention_overview_fish_stocks.htm

Overall Performance Indicator score	**100**
Condition number (if relevant)	**N/A**

PI 3.2.1 – Fishery-specific objectives

PI 3.2.1		The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guide post	**Objectives**, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **implicit** within the fishery-specific management system.	**Short and long-term objectives**, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **explicit** within the fishery-specific management system.	**Well defined and measurable short and long-term objectives**, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **explicit** within the fishery-specific management system.
	Met?	**NAFO - Yes** **Canada - Yes**	**NAFO - Yes** **Canada - Yes**	**NAFO - No** **Canada - No**

Rationale

The following evidence indicates SG 60 and 80 is met:

NAFO

NAFO's principal objective is enshrined in the Convention (NAFO, 2017), "*To ensure long-term conservation and sustainable use of the fishery resources in the Convention Area and, in so doing, to safeguard the marine ecosystems in which these resources are found*."

In giving effect to the objective, Contracting Parties as individuals or as a collective, are required:

- promote the optimum utilization and long-term sustainability of fishery resources;
- adopt measures based on the best scientific advice available to ensure that fishery resources are maintained at or restored to levels capable of producing maximum sustainable yield;
- apply the precautionary approach in accordance with Article 6 of the 1995 Fisheries Agreement;
- take due account of the impact of fishing activities on other species and marine ecosystems and in doing so, adopt measures to minimize harmful impact on living resources and marine ecosystems;
- take due account of the need to preserve marine biological diversity;
- prevent or eliminate overfishing and excess fishing capacity, and ensure that levels of fishing effort do not exceed those commensurate with the sustainable use of the fishery resources;
- ensure that complete and accurate data concerning fishing activities within the Convention Area are collected and shared among them in a timely manner;
- ensure effective compliance with management measures and that sanctions for any infringements are adequate in severity; and,
- take due account of the need to minimize pollution and waste originating from fishing vessels as well as minimize discards, catch by lost or abandoned gear, catch of species not subject to a directed fishery and impacts on associated or dependent species, in particular endangered species.

Canada

Fish stock conservation and other ecosystem sustainability objectives stem from Canadian legislation such as: the Fisheries Act, Ocean's Act and Species at Risk Acts, and policy initiatives such as: the "Sustainable Fisheries Framework" (DFO 2009a), the "Atlantic Fisheries Policy Review" (DFO 2004) and the "Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas" (DFO 2009b).

The IFMP (DFO 2019) reflects the policy objectives set out in these documents with long term objectives that guide the management of the fisheries under the following categories: stock conservation and sustainable harvest; ecosystem health and sustainability; stewardship. As yet, no fishery specific objectives have been set out for the YTFF in the IFMP, however, at the site visit the client and DFO confirmed that the objectives in the yellowtail fishery IFMP

(DFO 2014) remain current and it is planned that an Annex will be added to the 2+3KLMNO groundfish IFMP specifically for the yellowtail flounder fishery and, amongst other things, these fishery specific objectives will be included.

The following evidence indicates SG 100 is not met:

The NAFO and Canadian objectives, as described, are not considered to be defined in a way that the performance against the objectives can be measured.

References

Section 5.4.8

Canadian Fisheries Act 1985. http://laws-lois.justice.gc.ca/PDF/F-14.pdf

DFO 2004. Atlantic Fisheries Policy Review http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/afpr-rppa/framework-cadre-eng.htm

DFO 2009a. Sustainable Fisheries Framework http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm

DFO 1992. The Aboriginal Fisheries Strategy http://www.dfo-mpo.gc.ca/fm-gp/aboriginal-autochtones/afs-srapa-eng.htm

DFO 2014. The Yellowtail Flounder Integrated Fishery Management Plan (IFMP) https://www.dfo-mpo.gc.ca/fisheries-peches/ifmp-gmp/groundfish-poisson-fond/yellowtail-limande-div3LNO-eng.html;

DFO 2019. Integrated Fisheries Management Plan for Groundfish Species – Northwest Atlantic Fisheries Organisation (NAFO) Divisions 2+3KLMNO.

Oceans Act 1996. http://laws-lois.justice.gc.ca/PDF/O-2.4.pdf

Species at Risk Act 2002. http://laws-lois.justice.gc.ca/PDF/S-15.3.pdf

Overall Performance Indicator score	**80**
Condition number (if relevant)	**N/A**

PI 3.2.2 – Decision-making processes

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery		
Scoring Issue		SG 60	SG 80	SG 100
a	Decision-making processes			
	Guide post	There are **some** decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are **established** decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	**NAFO - Yes** **Canada - Yes**	**NAFO - Yes** **Canada - Yes**	

Rationale

The following evidence indicates SG 60 is met:

NAFO

The decision-making process of the Commission is set out in Article XIII of the Convention, “Decision making of the Commission” (NAFO 2017) and the “NAFO Rules of Procedure and Financial Regulations” (NAFO 2018).

Canada

While the Minister of Fisheries and Oceans is the final arbiter of decisions, his/her authority is delegated to officials through the organisational structure of DFO, in this instance, the Regional Director General (RGD) of the Newfoundland and Labrador Region of DFO. Their decisions are informed by consultations and recommendations made by DFO science and through GAC and guided by the fishery specific objectives for the fishery.

The following evidence indicates SG 80 is met:

NAFO

As a general rule, decision-making is by consensus. In instances, where consensus is not possible, each Contracting Party has a vote and decisions are made by two thirds majority of all the Contracting Parties present. There needs to be a quorum of two thirds of the Contracting Parties for a vote to take place, i.e. 8 Contracting Parties need to be present.

The Commission receives advice from the Scientific Council and its Standing Committees (STACFAD, and STACTIC). The Commission meets annually to review this advice and to decide and implement conservation and management measures as well as develop administrative, financial and other internal affairs of the NAFO organisation.

The Scientific Council and the Standing Committees follow the same voting procedures as the Commission. Any subsidiary body established by the Scientific Council or the Standing Committee, establishes its own rules of procedure.

With respect to the YTFF, a designated expert prepares initial assessments, and these are peer reviewed during the June meetings of the Scientific Council and then the scientific advice is presented to the Commission for consideration and adoption.

Canada

The IFMP (DFO 2019) sets out the fishery specific decision-making process within 2+3KLMNO.

In 2+3KLMNO, the focus is broader than yellowtail flounder, taking account of other groundfish, including: cod, redfish, yellowtail flounder, winter flounder, witch, American plaice and rough-head grenadier. Advisory processes are followed within the decision-making process through the 2+3KLMNO Groundfish Advisory Committee (GAC). While the TAC is allocated by NAFO and the quota is divided in accordance with pre-agreed allocation keys, GAC participants are invited to make recommendations regarding conservation and management measures.

Recommendations and outcomes of consultations from the GAC are submitted by memo to the Minister of Fisheries and Oceans and take account of the short and long-term fishery specific objectives. While he/she is the final decision

maker with regard to access, allocations and, where appropriate, TACs, in reality, his/her authority is delegated to officials through the organisational structure of DFO, in this instance, the Regional Director General (RGD) of Newfoundland and Labrador.

b	Responsiveness of decision-making processes			
	Guide post	Decision-making processes respond to **serious issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to **serious and other important issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to **all issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	**NAFO - Yes** **Canada - Yes**	**NAFO - Yes** **Canada - Yes**	**NAFO - No** **Canada - No**

Rationale

The following evidence indicates SG 60 and 80 are met:

NAFO

Contracting Party scientists meet in the Scientific Council and its working groups to evaluate the status of the stocks and develop responses to questions on science, as requested by the Commission. Contracting Party compliance experts meet in STACTIC to review and recommend NAFO Conservation and Enforcement Measures (CEM).

The key points of discussion, including the wider implications of decisions, are recorded and published in meeting reports which are available through the NAFO website.

Canada

The decision-making process is carried out in an open and transparent manner, taking account of the wider implications, through both public and industry consultations, i.e. GAC and and/or their Working groups.

Recommendations and advice from the advisory committee is taken into account by DFO when making fishery specific management decisions. Recommendations and advice from the advisory committee and any related RAP are taken into account by DFO when making fishery specific management decisions. The Minister or his/her delegated officials generally adhere to recommendations.

The following evidence indicates SG 100 are not met:

There was no evidence to suggest decision-making responded to all issues in relevant research, monitoring, evaluation and consultation and so the SG 100 is not met for both elements.

c	Use of precautionary approach			
	Guide post		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		**NAFO - Yes** **Canada - Yes**	

Rationale

The following evidence indicates SG 80 is met:

NAFO

NAFO decisions are based on the best available scientific information. The NAFO Fisheries Commission adopted a Precautionary Approach Framework (PAF) to guide fisheries management decision-making in 2004. In 2014, the joint Fisheries Commission-Scientific Council Working Group on Risk-based Management Strategies (WG-RBMS) was established. This group enhances the application of risk-based assessment approaches when evaluating management strategies, as well as implements the broader use of the NAFO PAF.

NAFO Scientific Council provides stock assessment advice within the context of the NAFO PAF.

Canada

Within the Canadian system, the use of the precautionary approach in the exploitation of marine resources is legislatively enshrined in the Oceans Act (Legislation-Oceans Act). That requirement is further detailed in the Sustainable Fisheries Framework (DFO 2009d) and the Fishery Decision-Making Framework Incorporating the Precautionary Approach (DFO 2009a) to ensure that the approach is built into fisheries management decisions.

A precautionary approach to the management of the YTFF is applied consistent with the basic tenants set out in the Sustainable Fisheries Framework. Priority is given to gathering the best available information by monitoring the stock and establishing a data time series to support management decisions. Biomass, abundance and recruitment indices are used to indicate stock status. Scientific uncertainty is quantified by including standard errors for these indices. This approach is based on biological criteria and peer reviewed by the NAFO Scientific Council. Scientific uncertainty and uncertainty related to the implementation of management measures are explicitly considered when evaluating stock status and making management decisions. The application of a precautionary approach to this fishery is done in concert with fishers, co-management organizations and other stakeholders through the IFMP process.

	Accountability and transparency of management system and decision-making process			
d	Guide post	Some information on the fishery's performance and management action is generally available on request to stakeholders.	**Information on the fishery's performance and management action is available on request**, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders **provides comprehensive information on the fishery's performance and management actions** and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	**NAFO - Yes** **Canada - Yes**	**NAFO - Yes** **Canada - Yes**	**NAFO – No** **Canada - No**

Rationale

The following evidence indicates SG 60 and 80 are met:

NAFO

The NAFO website provides comprehensive access to the various documents produced by the component bodies within NAFO, e.g. Commission, Scientific Council, Standing Committees, Working Groups. Minutes of meetings and the preamble to Scientific Council and Standing Committees, recommendations generally provide the reason why a management measure is necessary, describe the mandate within which NAFO is acting and highlights the research or other information that provides reasons for why action is or is not being taken, e.g. NAFO 2018.

NAFO also reports the decisions taken by the Commission in its annual report (NAFO 2018a).

The NAFO Secretariat is accessible to stakeholders and is able to support and direct enquiries to relevant NAFO documentation.

Canada

The GAC meetings are where details of the past season's fishery are presented and reviewed; any issues identified; scientific advice received; management proposals made; and, consensus sought on management measures for the following fishing season. Representatives of organisations directly involved in the fishery as well as representatives from interested organisations (ENGOs) are participants at these meetings. Minutes of the meetings are provided to participants (DFO, 2018) or to non-participants upon request from DFO. These include explanations for actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.

As a result, it is considered that information on each of the UoAs fishery's performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity. Thus, the SG 60/ 80 is met.

The following evidence indicates SG 100 is not met:

Evidence of formal reporting to all interested stakeholders was not available so the SG 100 is not met

e	Approach to disputes			
	Guide post	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	**NAFO - Yes** **Canada - Yes**	**NAFO - Yes** **Canada - Yes**	**NAFO - Yes** **Canada - Yes**

Rationale

The following evidence indicates SG 60 is met:

NAFO

No evidence of legal challenges against NAFO were found in the course of this re-assessment.

Canada

There have been no reported legal challenges to the Canadian YTFF fishery in 2+3KLMNO.

The following evidence indicates SG 80 and SG 100 are met:

NAFO

The various formal forums, i.e. Commission, Scientific Council, Standing Committees, Working Groups, provide and encourage an opportunity for discussion and airing of any possible concerns. This is considered to reduce or mitigate the risk of legal challenge. In the case where disputes cannot be settled, the NAFO Convention provides a process for Contracting Parties to object from endorsing and implementing an NAFO Recommendation Article XIV of the Convention (NAFO 2017).

Canada

The advisory process and fora, i.e. GAC, are considered to help mitigate disputes and legal challenges. Legal disputes within fisheries in Canada are adjudicated through the Canadian judicial process. The legal and policy framework has been tested on several occasions and shown to be effective in relation to fisheries related issues, “Larocque”, “Sparrow” and “Marshall” decisions.

References

Section 5.4.9

DFO 2009. A Fishery Decision-Making Framework Incorporating the Precautionary Approach http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/precaution-back-fiche-eng.htm

DFO 2009a Sustainable Fisheries Framework (2009) http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm

DFO 2013, 2+3KLMNO Groundfish Advisory Committee (GAC), Terms of Reference

DFO, 2019. Integrated Fisheries Management Plan for Groundfish Species – Northwest Atlantic Fisheries Organisation (NAFO) Divisions 2+3KLMNO

NAFO 2018, Report of the Commission, 17-21 September 2018 https://www.nafo.int/Portals/0/PDFs/com/2018/comdoc18-28.pdf

NAFO 2018a. NAFO Annual Report 2017 https://www.nafo.int/Library/Publications/Annual-Report

Larocque Decision http://www.fishharvesterspecheurs.ca/system/files/products/Court-LarocqueDecisionSupremeCourt-Bilingual.pdf

Marshall Decision https://www.aadnc-aandc.gc.ca/eng/1100100028614/1100100028615

NAFO, 2017. Convention on Cooperation in the Northwest Atlantic Fisheries https://www.nafo.int/Portals/0/PDFs/key-publications/NAFOConvention-2017.pdf

NAFO 2018. “NAFO Rules of Procedure and Financial Regulations” https://www.nafo.int/Portals/0/PDFs/key-publications/Rules-Finance-2018.pdf

NAFO Ecosystem Approach https://www.nafo.int/Science/Frameworks/Ecosystem-Approach

NAFO Precautionary Approach Framework (PAF) https://www.nafo.int/Science/NAFO-Frameworks/NAFO-Precautionary-Approach

Northwest Atlantic Fisheries Organization (NAFO) website https://www.nafo.int

NAFO SCR Doc. 18/038 https://www.nafo.int/Portals/0/PDFs/sc/2018/scr18-038.pdf

Sparrow Decision https://scc-csc.lexum.com/scc-csc/scc-csc/en/item/609/index.do

Overall Performance Indicator score	**85**
Condition number (if relevant)	**N/A**

PI 3.2.3 – Compliance and enforcement

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with		
Scoring Issue		SG 60	SG 80	SG 100
a	MCS implementation			
	Guide post	Monitoring, control and surveillance **mechanisms** exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance **system** has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A **comprehensive** monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	**NAFO - Yes** **Canada - Yes**	**NAFO - Yes** **Canada - Yes**	**NAFO - Yes** **Canada - Yes**

Rationale

The following evidence indicates SG 60, 80 and 100 is met:

NAFO

The NAFO Convention does not explicitly provide NAFO with competence related to monitoring, control and surveillance (MCS) and so has no enforcement capacity. As with other RFMOs, NAFO relies on its Contracting Parties to implement NAFO Conservation and Enforcement Measures (CEM) that will allow the stated objectives for the management of the overall fishery to be met. Fisheries Inspectors are appointed by Contracting Parties with inspection presence in the NAFO Regulatory Area (NRA) (currently Canada and the EU) and assigned to fishery patrol vessels tasked to carry out NAFO inspection duties at sea within the NRA.

Through Article VI (paragraph 9), the Contracting Parties have agreed to cooperate and adopt measures and mechanisms for effective monitoring, control and enforcement of the conservation and management measures adopted by the Commission.

Article VI (paragraph 11), states that the Commission shall seek to ensure consistency and coordination with the conservation and management measures that apply to a stock or group of stocks within the NRA and within the jurisdiction of a coastal State.

Under Article X [Contracting Party Duties], Contracting Parties are required to submit annual compliance reports, including enforcement action, it has taken with respect to their implementation of CEMs within the NRA. Furthermore, coastal State Contracting Parties are also required to report the conservation and management measures and actions they have undertaken within their jurisdictions in relation to NAFO straddling stocks.

Article XI [Flag State Duties], specifies the requirements and obligations of Flag States when their vessels fish in the NRA, with emphasis on maintaining records of authorised vessels, ensuring these vessels undertake fishing in accordance with CEM requirements and that any alleged infringements are quickly, effectively and transparently followed up and reported. Sanctions of appropriate severity that ensure compliance, discourage further infringements and ensure offenders do not benefit from illegal activities are also required.

Article XII [Port State Duties], sets out that port State Contracting Parties take full account of its rights and duties under international law to promote the effectiveness of conservation and management measures adopted by the Commission and shall implement the CEM concerning port inspections.

The NAFO CEM (NAFO, 2018) set out requirements in relation to fishing and fishing related activities within the NRA, for harvesters and Contracting Parties. The CEM are reviewed and revised annually by the Commission and published following the annual NAFO meeting that takes place every September.

Various CEM related reporting obligations are in place for vessels fishing in the NRA, including on-board observers, satellite Vessel Monitoring Systems (VMS, catch reporting through Vessel Transmitted Information (VTI) and closed areas.

NAFO's Standing Committee, STACTIC, reviews and reports on compliance of NAFO registered vessels in the NRA on an annual basis. The Compliance Review Report (NAFO 2017) concludes that overall compliance with reporting obligations is high and has continued to improve in recent years.

Canada

DFO's Conservation and Protection Division (C&P) supports conservation and sustainability of the YTFF through the delivery of their surveillance, inspection and enforcement program. Fishery Officers in the Newfoundland & Labrador region are responsible for compliance activities related to the YTFF in 2+3KLMNO. These Officers are supported by regional staff that provide oversight, SARA response and coordination and also manage the aerial surveillance, at-sea observer (ASO) and dockside monitoring programmes.

Certified ASO are not enforcement personnel but, the scientific data they gather related to catch and effort and any biological sampling is used by C&P to monitor compliance with respect to incidental catch. DFO science and C&P brief observer companies and staff on a regular basis and C&P routinely debrief observers when they leave a vessel.

Catch landing can only take place in the presence of a third-party dockside monitor who is required to verify the weight, species and product form of the landing. Shore-based Fisheries Officers also work with dockside monitors to ensure the integrity of landing data, i.e. species identification and reported catch weights.

All vessels engaged in the NAFO 2+3KLMNO YTFF are required to carry a DFO approved VMS, that transmits at least 1 signal per hour. This data enables C&P to monitor fleet activity particularly in and around closed areas and international boundaries as well as help and inform the deployment of surveillance resources.

Aerial surveillance is also used to monitor closed and/or conservation areas for illegal Unreported and Unregulated (IUU) fishing. Flight reports, photographs and other data collected from these overflights are used to direct surveillance and enforcement resources as necessary.

Coastguard patrols are used to monitor boundary lines and closed areas, as well as provide a platform from which C&P Fishery Officers can conduct at-sea boarding to inspect catch and catch records, monitor fishing activity, assess species composition and check weights.

b	Sanctions			
	Guide post	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, **are consistently applied** and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and **demonstrably** provide effective deterrence.
	Met?	**NAFO – N/A** **Canada - Yes**	**NAFO – N/A** **Canada - Yes**	**NAFO – N/A** **Canada - No**

Rationale

NAFO

NAFO relies on its Contracting Parties to implement effective sanctions over their flagged vessels and so this PI is not scored for the NAFO element. However, it is noted that it does have the ability to develop procedures that take action against Contracting Parties that undermine the effectiveness of the NAFO conservation and management measures, including non-discriminatory trade-related measures, (NAFO Convention, Article VI, paragraph 13), this could include changes in their allocations of NAFO stocks. To date, no measures/sanctions have been applied. The ability of the Commission to act at an international level is considered to provide an effective deterrent for ensuring contracting parties meet their obligations.

Canada

The following evidence indicates SG 60 is met:

An administrative and court-based sanction framework is outlined in the Fisheries Act and Regulations with court-based prosecution for serious offences through the Canadian Criminal Code (1985). Upon conviction maximum penalties of $500,000 and up to two years in jail may be imposed along with forfeiture of catch and equipment at the discretion of the court. DFO have also recently consulted on a ticketing system for minor offences, where relatively small fines would be associated with breeches in minor fishery offences.

The following evidence indicates SG 80 is met:

While there is no quantitative information on the effectiveness of enforcement (e.g., likelihood of violators being prosecuted and convicted) or the deterrent value of the sanction system, the sanctions are considered to be consistently applied. Furthermore, the low number of reported offences (see .

Table 19) is thought to indicate an effective deterrent.

The following evidence indicates SG 100 is not met:

There was no substantive evidence to show that sanctions are demonstrably effective and therefore the SG 100 is not met.

c	Compliance			
	Guide post	Fishers are **generally thought** to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	**Some evidence exists** to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a **high degree of confidence** that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	**NAFO – N/A** **Canada - Yes**	**NAFO – N/A** **Canada - Yes**	**NAFO – N/A** **Canada - No**

Rationale

NAFO

Monitoring, control and surveillance does not directly apply to NAFO and so this PI is not scored for the NAFO management element.

Canada

The following evidence indicates SG 60 and SG80 is met:

The relatively low level of offences detected by Conservation & Protection (C&P) (see Table 19) provides an indication that fishers generally comply with the management system.

Important information required to support the fishery is provided by the fishers, particularly through the completion of logbooks, which includes the quantity of fish caught and area of capture – all of which can be confirmed via dockside monitoring, VMS and observer reports. This information is used as part of Canada's annual submission to NAFO.

The following evidence indicates SG 100 is not met:

There is not enough evidence to confirm a high degree of confidence that fishers comply with the management and so the SG 100 is not met.

d	Systematic non-compliance			
	Guide post		There is no evidence of systematic non-compliance.	
	Met?		**NAFO - Yes** **Canada - Yes**	

Rationale

The following evidence indicates SG 80 is met:

NAFO

NAFO compliance reports indicate a high level of compliance. No evidence of systematic non-compliance was provided.

Canada

DFO compliance and enforcement reports indicate a high level of compliance within the fishery. No evidence of systematic non-compliance was provided.

References

See section 5.4.10

Canadian Fisheries Act 1985. http://laws-lois.justice.gc.ca/PDF/F-14.pdf

DFO consultation on a minor fisheries offence ticketing system http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/comm/ticketing-contraventions/propose-eng.htm

NAFO 2018. NAFO COM Doc. 18-19 Serial no. N6876 . https://www.nafo.int/Portals/0/PDFs/COM/2018/comdoc18-19.pdf

NAFO 2018. NAFO COM Doc.19-01 Serial No. N6901 https://www.nafo.int/Portals/0/PDFs/COM/2019/comdoc19-01.pdf

NAFO 2017. Convention on Cooperation in the Northwest Atlantic Fisheries https://www.nafo.int/Portals/0/PDFs/key-publications/NAFOConvention-2017.pdf

DFO, 2019. Integrated Fisheries Management Plan for Groundfish Species – Northwest Atlantic Fisheries Organisation (NAFO) Divisions 2+3KLMNO

Overall Performance Indicator score	**95**
Condition number (if relevant)	**N/A**

PI 3.2.4 – Monitoring and management performance evaluation

PI 3.2.4		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives There is effective and timely review of the fishery-specific management system		
Scoring Issue		SG 60	SG 80	SG 100
a	Evaluation coverage			
	Guide post	There are mechanisms in place to evaluate **some** parts of the fishery-specific management system.	There are mechanisms in place to evaluate **key** parts of the fishery-specific management system.	There are mechanisms in place to evaluate **all** parts of the fishery-specific management system.
	Met?	**NAFO - Yes** **Canada - Yes**	**NAFO - Yes** **Canada - Yes**	**NAFO – No** **Canada - No**

Rationale

The following evidence indicates SG 60 and SG 80 are met:

NAFO

NAFO, along with other RFMOs, have recognised the need for performance review as an essential governance requirement as a result of some key international agreements, resolutions and conference outcomes:

- FAO Report of the Twenty-sixth Session of the Committee on Fisheries Rome, 7-11 March 2005, FAO Fisheries Report No. 780. Rome. FAO 2005. 88 p. paragraph 111.
- Conference on the Governance of High Seas Fisheries and the UN Fish Agreement, Moving from Words to Action, 5 May 2005. http://waves-vagues.dfo-mpo.gc.ca/Library/320014.pdf
- 2005 and 2006 UNGA Resolutions on Sustainable Fisheries (respectively, UNGA 60/31 and 63/112)
- Review Conference on UN Fish Stocks Agreement, New York, 22-26 May 2006.

NAFO has mechanisms to evaluate and review all parts of the fishery specific management system, e.g. the SC evaluates scientific research, the STACTIC monitors and evaluates compliance with the Convention and NAFO Conservation and Enforcement Measures (CEM). ICCAT also conducts periodic reviews of its own performance by using external and independent experts, e.g. NAFO, 2011, NAFO, 2018.

Canada

Annual meetings of the GAC provide an opportunity to monitor, review and evaluate key parts of the management system. The GAC may also establish Working Groups to review and assess specific policy and management measures. DFOs Conservation and Protection (C&P) Divisions also review compliance regularly as part of their risk management approach and deployment of resources.

The following evidence indicates SG 100 is met:

There was no evidence to show that mechanisms are in place to evaluate all parts of the fishery-specific management system.

b	Internal and/or external review			
	Guide post	The fishery-specific management system is subject to **occasional internal** review.	The fishery-specific management system is subject to **regular internal** and **occasional external** review.	The fishery-specific management system is subject to **regular internal and external** review.
	Met?	**NAFO - Yes** **Canada - Yes**	**NAFO - Yes** **Canada - No**	**NAFO – Yes** **Canada – Not scored**

Rationale

The following evidence indicates SG 60 is met:

NAFO

A review of NAFO was first undertaken in 2007 (NAFO, 2011) and, more recently in 2017, when a review of the organisation's performance with regard to its mandate and objectives was undertaken.

Canada

The IFMP highlights that reviews of elements of the fishery specific management system take place, e.g. compliance and enforcement regularly reviews data enabling it to better manage risk and deploy resources. The advisory committee – GAC - provides opportunity to review aspects of the management of the groundfish fishery, including the YTFF and discuss any issues/concerns and make recommendations to DFO on the domestic management of the fishery. Furthermore, DFO conducts annual post-season reviews which include the management of the fishery and whether any improvements or adjustments in management should be considered.

The following evidence indicates SG 80 and 100 is met:

NAFO

This review assesses NAFO's performance during the period 2011-2017, with special attention to the follow-up to the recommendations stemming from the first Performance Assessment Report (NAFO, 2018). A team of six, three of which were external experts with no NAFO association, were appointed by NAFO after nomination by Contracting Parties. A summary of the review can be found at 5.4.11.

The status of the yellowtail flounder stock is reviewed and assessed through the NAFO Scientific Council, which includes external peer review, and, the STACTIC annually review compliance and the application of conservation measures by Contracting Parties.

The following evidence indicates SG 80 is not met:

Canada

With respect to external review, the Parliament of Canada has two committees related to Fisheries and Oceans: The Standing Committee on Fisheries and Oceans of the House of Commons and the Senate Standing Committee on Fisheries and Oceans of the Senate. Both committees regularly review different aspects of fishery management in Canada and publish reports with their findings and conclusions. Furthermore, under the auspicious of the Office of the Auditor General, the Commissioner of the Environment and Sustainable Development undertakes performance audits of the governments performance and efforts to protect the environment and foster sustainable development. However, since certification of the YTFF fishery in 2010, there has been no external review of the fishery. As such, a Condition of Certification is set (#3)

References

See section 5.4.11

DFO, 2019. Integrated Fisheries Management Plan for Groundfish Species – Northwest Atlantic Fisheries Organisation (NAFO) Divisions 2+3KLMNO

NAFO 2011, Performance Assessment Review, https://www.nafo.int/Portals/0/PDFs/Performance/PAR-2011.pdf

NAFO 2018, Report of the NAFO Performance Review Panel 2018 https://www.nafo.int/Portals/0/PDFs/Performance/NAFOPerformanceReviewPanelRpt2018.pdf

DFO 2017, Corporate Management and Reporting – Management Action Plan http://www.dfo-mpo.gc.ca/ae-ve/audits-verifications/16-17/map-eng.html

Overall Performance Indicator score	**75**
Condition number (if relevant)	#3

6 Appendices

6.1 Assessment information

6.1.1 Previous assessments

The YTFF has been assessed twice before. It was initially assessed in 2009 and subsequently in 2014 https://fisheries.msc.org/en/fisheries/oci-grand-bank-yellowtail-flounder-trawl/@@assessments. One condition of certification was provided to the fishery at the last re-assessment and one non-binding recommendation was made.

The condition of certification required the following outcome: By the end of the first year of certification, the SG 80 scoring requirements for PI 3.2.4 had to be met in full by demonstrating that: SIa, SG 80 – "A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2."

This was met within the specified timescale and the condition closed out.

Table 20: Summary of previous assessment conditions

Condition	PI(s)	Year closed	Justification
Condition 1	PI 3.2.4	2016	Research and data analyses have been conducted on 3LNO yellowtail flounder for many years. The focus of the research has been the development of a knowledge base sufficient to support management of the commercial harvest. Foremost among current work is the routine gathering and analyses of information on stock abundance and trends leading to a full scientific assessment of the stock by the NAFO Scientific Council every three years, with an interim review in intermediate years. Additional research on such things as age and growth, maturity, fecundity and reproductive potential is being conducted, mainly by Canadian scientists but with the collaboration of international colleagues. For Principle 2, research has been conducted to identify areas of the oceans and coasts that are considered to be ecologically or biologically significant (EBSAs) (DFO 2007b). Separately, the NAFO Scientific Council Working Group on Ecosystem Science and Assessment (WGESA) is focused on work intended to advance the "Roadmap for developing an ecosystem approach to fisheries (EAF) for NAFO" as well as conducting work intended to address specific requests from Scientific Council and/or Fisheries Commission. Accordingly, at its June 2013 meeting, Scientific Council outlined that the WG should focus on such things as identification and mapping of sensitive species and habitats and appropriate ecosystem-based management areas, an update of recent and relevant research related to status, functioning and dynamics of ecosystems in the NAFO areas as well as on recent and relevant research related to the application of ecosystem knowledge for fisheries management in the NAFO area. A full summary of the work of the WG is contained in NAFO 2013b. The research conducted by Walsh et al. (2001) resulted in the conclusion that the physical bounds of the yellowtail flounder nursery area could be defined with some certainty All of the research is aimed at providing information to allow management of the fishery in a manner consistent with MSC's Principles 1 and 2. However, there is not a written document that includes a specific research plan for the fishery under assessment as required by CB4.10.3 of the MSC CR (MSC 2013b). The research has been set out in a DFO research plan that provides a strategic approach to its implementation. DFO intends to include the research plan in the IFMP at its next update. Therefore, the SG 60 and 80 are met

6.1.2 Small-scale fisheries

Table 21: Small scale fisheries

Unit of Assessment (UoA)	Percentage of vessels with length <15m	Percentage of fishing activity completed within 12 nautical miles of shore
UoA 1	0%	0%

6.2 Evaluation processes and techniques

6.2.1 Site visits

An on-site, combined 4th audit / re-assessment took place the week of 13th January 2020. The audit team (Paul Knapman, Robin Cook and Rob Blyth Skyrme met Carey Bonnell (Vice President, Sustainability and Engagement), Rick Ellis (Director of Fleet Operations), Steve Devitt (Atlantic Groudfish Council) at the OCI Offices, Topsail Road, St. John's Newfoundland & Labrador.

The audit team also met with DFO staff: Troy Osmond, Kelly Dooley, Christine Dymond, Dawn Maddock Parsons, Ellen Careen, Paul Glavine, Gillian Janes and Mariano Koen Alonso. Steve Devitt participated in the meeting on behalf of the client.

The audit team undertook a conference call with Dr. Tom Blasdale and Dr. Ricardo Federizon from NAFO. Steve Devitt participated in the meeting on behalf of the client.

A closing meeting was held between the assessment team and client representatives: Carey Bonnell, Rick Ellis, Steve Devitt.

Prior to the site visit the client provided a submission which included minutes and materials associated with the Groudfish Advisory Committee; TAC and catch data; stock assessment updates; examples of licence conditions; a C&P compliance report for the fishery.

This information was reviewed by the audit team prior to the site visit and formed the basis of questions and clarifications at the site visit meetings. The main activities and issues that were discussed, reviewed and inspected on the site visit included:

- Vessels and area of target fishery operation
- The UoA
- The stock status
- Current performance of the fishery
- Application of DFO harvest control measures
- The IFMP
- The role of NAFO
- Scientific research
- Internal / external review of the fishery
- At-sea Observer programme
- Bycatch information, including information on ETP species
- Legislation and regulations
- DFO processes and decision making – science, management, compliance
- Traceability, including the dockside monitoring programme, landing points, hail-out and hail-in requirements, logbooks
- The status of MPAs, EBSAs, Coral and Sponge Conservation Areas and VMEs
- The Conservation and Protection programme, including levels of monitoring and compliance, licence conditions
- The Groudfish Advisory Committee
- Decision making processes
- Regional and federal management
- The internal and external management evaluation process
- Traceability

6.2.2 Stakeholder participation

The audit was announced on the MSC website on 13th December 2019. A total of 46 stakeholder organisations and individuals having relevant interest in the assessment were identified and consulted during this surveillance audit. The interest of others was solicited through the posting on the MSC website.

No stakeholders responded or requested to meet/speak with the audit team.

6.2.3 Evaluation techniques

The full assessment was publicly announced on the MSC website on 13th December 2019 as well as sent by email in the MSC Fishery Announcements newsletter to all registered recipients. The announcement was also distributed to all LR stakeholders via the LR Mailchimp system. This was also the method used for consultation on subsequent steps (e.g. peer reviewers announcement, new UoA, etc.). This was done according to the process requirements in MSC's Fisheries Certification Process v2.1, and in the MSC Fisheries Standard v2.01. Together, these media presented the

announcement to a wide audience representing industry, agencies, and other stakeholders. Meetings and conference calls held during the site visit constituted the main tool in guaranteeing the participation of relevant stakeholders.

6.2.3.1 Information gathering

The assessment team reviewed documents sent by the client ahead of the onsite visit. For a detailed list of references used see section 7. Discussions with the clients and management agencies centred on the content within the provided documentation. In cases where relevant documentation was not provided in advance of the meeting, it was requested by the assessment team and subsequently supplied during, or shortly after the meeting. The assessment team and the clients set up meetings with the relevant stakeholders during the site visit, as per MSC Fisheries Certification Process v2.1, Section 6.2.1.

6.2.3.2 Scoring

Scoring was performed according to the procedure established in Certification Requirement 7.10 (MSC Standard v2.01). The Standard v2.01 default assessment tree used for this assessment, the MSC has 28 PIs, six in Principle 1, 15 in Principle 2, and seven in Principle 3. The PIs are grouped in each principle by 'component.' Principle 1 has two components, Principle 2 has five, and Principle 3 has two. Each PI consists of one or more 'scoring issues;' a scoring issue is a specific topic for evaluation. 'Scoring Guideposts' define the requirements for meeting each scoring issue at the 60 (conditional pass), 80 (full pass), and 100 (state of the art) levels.

Note that some scoring issue may not have a scoring guidepost at each of the 60, 80, and 100 levels; in the case of the example above, scoring issue (b) does not have a scoring issue at the SG 60 level. The scoring issues and scoring guideposts are cumulative; this means that a PI is scored first at the SG 60 levels. If not all of the SG scoring issues meet the 60 requirements, the fishery fails, and no further scoring occurs. If all of the SG 60 scoring issues are met, the fishery meets the 60 level, and the scoring moves to SG80 scoring issues. If no scoring issues meet the requirements at the SG 80 level, the fishery receives a score of 60. As the fishery meets increasing numbers of SG 80 scoring issues, the score increases above 60 in proportion to the number of scoring issues met; PI scoring occurs at 5-point intervals. If the fishery meets half the scoring issues at the 80 level, the PI would score 70; if it meets a quarter, then it would score 65; and it would score 75 by meeting three-quarters of the scoring issues. If the fishery meets all of the SG80 scoring issues, the scoring moves to the SG 100 level. Scoring at the SG 100 level follows the same pattern as for SG 80. Principle scores result from averaging the scores within each component, and then from averaging the component scores within each Principle. If a Principle averages less than 80, the fishery fails. Scoring for this fishery followed a consensus process in which the assessment team discussed the information available for evaluating PIs to develop a broad opinion of performance of the fishery against each PI. Review of sections 6.3 by all team members assured that the assessment team was aware of the issues for each PI.

The assessment team held preliminary scoring meetings along the site visit where the Performance Indicators of the fishery were evaluated jointly by the team in order to assess whether there was still information needs to be communicated to the client. After the site visit, each team member was assigned their relevant section in the report to complete before proceeding to a joint evaluation of every PI and the pertaining scoring systems and rationales through scoring meetings which took place via conference calls. Team members are responsible for completely their relevant scoring tables and providing a provisional score. The necessary harmonisation procedure was already described in section 6.7. PI scores were entered into MSC's Fishery Assessment Scoring Worksheet (Section 5.1) to arrive at Principle-level scores.

The team agrees that none of the scoring issues assessed for the YTFF fails to meet at the SG60 level, and a weighted average score of 80 or more was achieved for each of the 3 MSC Principles. Scores allocated to the default performance indicators are summarised in Section 5.1.

The YTFF complies with MSC Fisheries Certification Requirements v2.01.

The team has set 3 binding conditions for certification (see section 6.5 for more details).

6.3 Peer Review reports

The MSC's Peer Review College compiled a shortlist of potential peer reviewers to undertake the peer review for the YTFF and selected two from the following list:

- Don Bowen
- John Neilson
- Matthew Cieri
- Neil Campbell

The peer reviewers chosen by the Peer Review College are kept anonymous and referred to as Peer Reviewer A and B. Details of the experience and qualification of the peer review short-list are available on request by email to the Peer Review College.

6.3.1 Peer Reviewer A

General Comments

Question	Yes/ No	Peer Reviewer Justification (at initial Peer Review stage).	CAB Response to Peer Reviewer's comments
Is the scoring of the fishery consistent with the MSC standard, and clearly based on the evidence presented in the assessment report?	Yes	The scoring of the fishery is consistent with the MSC standards, and relevant evidence to support the decision making process of the CAB is liberally cited throughout.	Thank you - no further comment.
Are the condition(s) raised appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCP v2.1, 7.18.1 and sub-clauses]	Yes	All three conditions set are appropriately defined and achievable. The incremental steps described towards their delivery will aid in monitoring of progress towards their delivery in a timely manner. If they are achieved in the manner described then they will be suffiecnt to meet at least SG80 for the relevant PI's.	Thank you - no further comment.
Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary)		This is a well written report which makes good use of the extensive literature available on the topic. If I could offer a suggestion, it would be to take care to be specific about NAFO bodies (Scientific Council and Fisheries Commission) in the body of the text, as each has specific roles and responsibilities. E.g. Response to PI 1.2.2 should probably start "NAFO's Scientific Council advises...".	Thank you – and noted.

PI Specific Comments

PI	PI Information	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
1.1.1	Yes	Yes	NA	Scoring agreed. The use of empirical proxies for recruitment and Blim means there can be no high degree of certainty, the CAB present evidence that recruitment is fluctuating without trend while the biomass is around 1.7 times Bmsy, which would imply the stock is a very long way from suffering reproductive impairment	No response required	Accepted (no score change)
1.1.2	Yes	Yes	NA	Scoring agreed. As above, the CAB present ample evidence that the stock is at or above Bmsy. It might be helpful to specify that the intervals on the SSB plot in fig. 4 represent 90% confidences.	No response required	Accepted (no score change)
1.2.1	No (non-material score reduction expected)	No (non-material score reduction expected)	NA	While evidence presented for PI 1.2.1b-f is comprehensive and appropriate to justify these elements of the score, NAFO's approach to quota setting is subject to agreement amongst contracting parties. On occasion this has resulted in TACs being set above levels consistent with scientific advice in line with the overarching harvest strategy of NAFO's PA Framework (e.g. Northern Shrimp in Div. 3LNO, 2014, https://www.nafo.int/Portals/0/PDFs/fc/2013/fcdoc13-30.pdf). While the elements of the strategy, as they have been applied to 3NO Yellowtail flounder, have thus far worked towards achieving stock management objectives, I would suggest that the framework within which these elements are implemented leaves the strategy short of being designed to achieve these objectives. A reduction to SG80 does not have implications for the overall score against this PI.	This is not an easy judgement. In our view the harvest strategy is designed to meet objectives as it clearly sets out how TACs should respond to maintain the stock at or above MSY. If NAFO contracting parties fail to agree a TAC in line with advice the issue falls partly under P3.1.1 which is scored to recognise the weakness in the mechanism for dispute resolution. In the example given by the reviewer (shrimp in 3LNO) the fishery is very different and the issue has not arisen for yellowtail flounder. In the shrimp example it appears other measures were agreed, within the bounds of the NAFO decision making process, to manage the fishery and the TAC was reduced by 50%.	Not accepted (no score change)

PI	PI Information	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
1.2.2	Yes	Yes	NA	Scoring agreed. The CAB report presents information justifying the scoring, highlighting the lack of consideration of the ecological role of yellowtail flounder and the greater quantification of uncertainty that could be achieved with an age-based assessment.	No response required	Accepted (no score change)
1.2.3	Yes	Yes	NA	Scoring agreed. As the CAB notes, NAFO Scientific Council regularly produces and reviews a wide range of relevant data, however the lack of an age-based assessment which can be used in a management strategy evaluation prevents the scoring against this PI.	No response required	Accepted (no score change)
1.2.4	No (no score change expected)	Yes	NA	Scoring agreed. The issues around lack of independent peer review (PI 1.2.4e) of data input to, and scientific output from, NAFO Scientific Council can be referenced to NAFO's Performance Assessment documents (e.g. https://www.nafo.int/Portals/0/PDFs/Performance/NAFOPerformanceReviewPanelRpt2018.pdf)	No response required	Accepted (no score change)
2.1.1	Yes	Yes	NA	Scoring agreed. American plaice has a <1% chance of reaching Blim by 2022, and while several MSY proxies for thorny skate have been presented to Scientific Council, none have been accepted. While there may be issues with the recovery and rebuilding of the minor primary species stocks, the CAB provide evidence that the UoA is not a contributory factor to these.	No response required	Accepted (no score change)
2.1.2	Yes	Yes	NA	Scoring agreed. Evidence is presented of the extensive measures surrounding bycatch in both Canada and NAFO, which when taken together can constitute a strategy, and which is clearly effective in meeting its objectives.	No response required	Accepted (no score change)

PI	PI Information	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
2.1.3	Yes	Yes	NA	Scoring agreed. Evidence is presented showing adequate information is available to assess the main and minor primary species, as well as the management strategy. While reliability of data collected by NAFO in the past has been questioned, these concerns have largely been addressed by the measures laid out in the response to PI2.1.3.c.	No response required	Accepted (no score change)
2.2.1	Yes	Yes	NA	Scoring agreed. The CAB are correct in asserting that better identification of the whale species and true seal species taken in the catch of the YTFF would help secure the score.	No response required	Accepted (no score change)
2.2.2	Yes	Yes	Yes	Scoring agreed. Evidence presented for the PI shows that there are partial strategies and measures in place to mitigate impacts on secondary species, however a lack of data, review and testing means the highest scores are not achieved. This lack of review forms the basis of the condition imposed on this PI, and as such is appropriate.	No response required	Accepted (no score change)
2.2.3	Yes	Yes	NA	Scoring agreed. As above, lack of identification of the toothed whale impacts upon the score for this PI.	No response required	Accepted (no score change)
2.3.1	Yes	Yes	NA	Scoring agreed. The CAB present ample evidence that the YTFF has very limited impacts on the three wolffish species classed as ETP species. Uncertainty around indirect impacts on prey and habitats prevents the awarding of SG100.	No response required	Accepted (no score change)
2.3.2	Yes	Yes	Yes	Scoring agreed. As above, ample evidence is presented of the strategy for mitigating the impacts of the YTFF on wolffish. The lack of a	No response required	Accepted (no score change)

PI	PI Information	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
				process of regular review of this strategy warrants a condition on this PI.		
2.3.3	Yes	Yes	NA	Scoring agreed.	No response required	Accepted (no score change)
2.4.1	No (scoring implications unknown)	No (scoring implications unknown)	NA	Scoring is agreed for PI.2.4.1a and 2.4.1c, however 2.4.1b has not been scored, as the CAB have considered it to be out of scope. Evidence is presented showing that within the Canadian EEZ there is no overlap between the YTFF and areas identified by Kenchington et al. as containing high densities of sponges, seapens and corals, while in the NAFO regulatory area, given the depths in which the fishery takes place, relative to the depths at which VME indicator species are found and closures are implemented, there is unlikely to be overlap. However, in line with the FAO Guidelines for the Management of Deep-sea Fisheries in the High Seas, NAFO also considers a number of areas to be "Physical VMEs" (NAFO Conservation and Enforcement Measures, Annex 1.E.VII) which includes the Southeast Shoal, in light of its significance as a spawning/nursery area (not least for Yellowtail flounder, as documented on p.23). This area was also proposed as an EBSA to the Convention on Biological Diversity in 2014. NAFO has not, as yet, adopted management measures associated with this physical VME area, however given its status this could reflect a shortcoming of the management system, and deserves to be commented upon, particularly with respect to the distribution of the YTFF and the significance of this area for its recruitment.	The Southeast Shoal was identified as a 'Physical VME Indicator Element' (NAFO Conservation and Enforcement Measures, Annex 1.E.VII) under the NAFO WG on the Ecosystem Approach to Fisheries Management (WGEAFM) analysis identifying “topographical features known to support vulnerable species, communities, or habitats”, available here: https://archive.nafo.int/open/sc/2008/scs08-10.pdf. We believe the thinking behind using the 'VME element' term is then laid out in the document https://archive.nafo.int/open/sc/2013/scs13-24.pdf where it states: “*Another important consideration is that areas were VMEs are likely to occur should also be identified. These VME elements are topographical, hydrophysical or geological features, including fragile geological structures, that potentially support species groups or communities that qualify as VMEs*.” As such, we understand that the Southeast Shoal is considered a 'VME element' because it is an area where VMEs may be more likely to be found, but no VMEs or pVMEs have been identified on the Southeast Shoal to date to the knowledge of the assessment team (e.g. https://www.nafo.int/Fisheries/VME). Nevertheless, from discussions the	Accepted (no score change)

PI	PI Information	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
					assessment team had with NAFO staff while on the site visit, we understood work was on-going within the NAFO Scientific Council's Working Group on Science and Assessment (WG-ESA) and that they had met in November 2019 with the aim of reviewing and updating the science and understanding on VME presence. The WG-ESA report of their November meeting was not publicly available at the end of the site visit, i.e. the point at which the "line is drawn" for available information which is considered by the team in their scoring of the fishery. We note the request from the Commission for the Scientific Council to report on the work of the WG-ESA at the annual meeting in 2020. Assuming this takes place and the OCI Yellowtail Flounder Fishery is re-certified against the MSC Standard, it is anticipated that the outcome of the WG-ESA and any changes made to VMEs would be reviewed at the first annual surveillance audit. A note to this effect has been added by the Assessment Team in the report (See end of section 5.3.4.1 - VMEs).	
2.4.2	Yes	Yes	NA	Scoring agreed, but see previous comment on the Southeast Shoal.	Please see response to comment on PI 2.4.1.	Accepted (no score change)
2.4.3	Yes	Yes	NA	Scoring agreed. Extensive evidence is presented of the distribution, impacts and monitoring of habitats.	No response required	Accepted (no score change)
2.5.1	Yes	Yes	NA	Scoring agreed. In reaching their conclusions, the CAB make full use of the extensive literature	No response required	Accepted

PI	PI Information	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
				available for this fishery on impacts on ecosystem structure and functioning.		(no score change)
2.5.2	Yes	Yes	NA	Scoring agreed.	No response required	Accepted (no score change)
2.5.3	Yes	Yes	NA	Scoring agreed.	No response required	Accepted (no score change)
3.1.1	Yes	Yes	NA	Scoring agreed. It is perhaps an unfortunate feature of the scoring system that a lack of disputes prevents NAFO meeting SG100	No response required	Accepted (no score change)
3.1.2	Yes	Yes	NA	Scoring agreed.	No response required	Accepted (no score change)
3.1.3	Yes	Yes	NA	Scoring agreed.	No response required	Accepted (no score change)
3.2.1	Yes	Yes	NA	Scoring agreed. While both Canada and NAFO have (compatible) short- and long-term objectives, a lack of feedback and review of these is evident from the evidence presented.	No response required	Accepted (no score change)
3.2.2	Yes	Yes	NA	Scoring agreed. Sufficient evidence is presented to demonstrate the overall effectiveness and responsiveness of the decision-making processes in NAFO and Canada, however, as noted in the comment on PI 1.2.1, within NAFO at least, the decision-making process does not always result in measures which achieve fishery-specific objectives.	No response required	Accepted (no score change)

PI	PI Information	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
3.2.3	Yes	Yes	NA	Scoring agreed. Evidence of a comprehensive and transparent system of compliance and enforcement monitoring in both NAFO and Canada is demonstrated	No response required	Accepted (no score change)
3.2.4	Yes	Yes	Yes	Scoring agreed. Reference is made to the regular independent reviews of NAFO's performance which have been carried out. Although means exist to do so, the management system applicable to the YTFF within Canada has not been reviewed since initial certification in 2010, justifying the score for this PI and the condition set.	No response required	Accepted (no score change)

6.3.2 Peer Reviewer B

General Comments

Question	Yes /No	Peer Reviewer Justification (at initial Peer Review stage)	CAB Response to Peer Reviewer's comments
Is the scoring of the fishery consistent with the MSC standard, and clearly based on the evidence presented in the assessment report?	Yes	I found this to be a thorough and clearly prepared assessment that is consistent with the MSC standard. With several exceptions outlined in my comments, I believe the scoring is clearly based on evidence provided in the assessment report. I agree with the team's overall scoring and assessment.	Thank you - no further response required.

Question	Yes /No	Peer Reviewer Justification (at initial Peer Review stage)	CAB Response to Peer Reviewer's comments
Are the condition(s) raised appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCP v2.1, 7.18.1 and sub-clauses]	Yes	The assessment team has raised three conditions. The **second condition** concerns PI 2.3.2 and states that "By the fourth annual audit the client shall provide evidence that there is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate." I believe this condition is appropriate and can be achieved as outlined by the milestones and should result in a score of 80. The **third condition** concerns PI 3.2.4 and states that "By the third annual audit the client shall provide evidence that the YTFF management system is subject to regular internal and occasional external review." I believe this condition is appropriate and the milestones are written to achieve a score of 80.	Thank you - no further response required.
Are the condition(s) raised appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCP v2.1, 7.18.1 and sub-clauses]	No	The **first condition** concerns PI 2.2.2 with regard to main secondary species, specifically marine mammals. The condition states that "By the fourth annual audit the client shall provide evidence that there is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species and they are implemented as appropriate." Given that the interaction between marine mammals and the fishery are so rare, it is not clear that regular review of alternative measures could materially improve the present situation. Therefore, I believe that the SG80 is met and that a condition is not warranted. Alternatively, as the fishery essential does not impact marine mammal species, the team might score SIe as N/A (noting the FCR requirements SA3.8.4 and SA3.5.3)	Thank you - we have added a comment to the comment on PI 2.2.2 in the 'PI comments' tab.
Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary)		Well prepared draft.	Thank you - no further response required.

PI Specific Comments

PI	PI Information	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
1.1.1	Yes	Yes			No response required	Accepted (no score change)
1.1.2				Not scored.		
1.2.1	Yes	Yes			No response required	Accepted (no score change)
1.2.2	No (score increase expected)	No (score increase expected)		SI(a) requires that the harvest control rules are expected to keep the stock fluctuating at or above a target level consistent with MSY, ***or*** another more appropriate level taking into account the ecological role of the stock, most of the time. It seems to me that the rule does meet the SG100 level based on the first criterion so the fact that the ecological role has not been considered should not be necessary for the SG100 level to be meet.	The Assessment Team agree with the comment and have revised the score to the SG 100 level.	Accepted (score increased)
1.2.3	Yes	Yes			No response required	Accepted (no score change)
1.2.4	Yes	Yes			No response required	Accepted (no score change)

PI	PI Information	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
2.1.1	Yes	Yes		In reference to SI a, the report states that "American plaice is below the PRI but there is a demonstrably effective strategy in place to ensure that recovery and rebuilding is not hindered." Is the effective strategy the low F alone or are there other elements? Clarification would be useful here and in the following text on thorny skate. Regarding SI b, reference to Table 11 would be valuable to support the following statement "Minor primary species in the catch are Atlantic cod, Atlantic halibut, witch flounder and Greenland halibut; these species are taken in small quantities, only."	For American plaice, we have added some text to the report in PI 2.4.1 SIa to reflect the elements of the strategy that is in place to ensure the fishery does not hinder recovery and rebuilding. This includes using a large cod end mesh size, operating within bycatch limits, and the move-on rule requirements that are in place to avoid catching excessive quantities of American plaice. The strategy is demonstrably effective because F is very low. For thorny skate, as noted in the text already, thorny skate is above the PRI with >95% probability. This clearly meets the requirement at SG80 that the species is highly likely to be above the PRI. No change has been made for thorny skate. Catch quantities for the minor species, and a link to Table 11 have been added to the text of 2.1.1 SIb.	Accepted (no score change)
2.1.2	Yes	Yes			No response required	Accepted (no score change)
2.1.3	Yes	Yes			No response required	Accepted (no score change)
2.2.1	Yes	Yes			No response required	Accepted (no score change)

PI	PI Information	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
2.2.2	Yes	No (score increase expected)	No	Although there is no regular review of alternative measures for minimizing the mortality of secondary species (SIe), given the very low rate of interaction with marine mammal species, I believe that the SG80 is met here and that a condition is not needed. Alternatively, as the fishery essential does not impact marine mammal species, the team might score SIe as N/A (noting the FCR requirements SA3.8.4 and SA3.5.3)	We agree that the interaction rate for marine mammals is very low, and almost certainly has no discernible impact on the populations overall. However, we understand that the intent of the requirement in SIe is to minimise unnecessary waste. It may be that it is not possible to further minimise mortalities, but that should be determined by the client through undertaking a regular review of alternative measures and meeting the condition.	Not accepted (no score change)
2.2.3	Yes	No (score increase expected)		SIa - As only 1 unidentified toothed whale has been encountered in the past 5 years, it seems perhaps excessive to not award the SG100. Strictly speaking the team is correct in their assessment, but in this case the decision seems overly cautious.	Whilst we agree that 1 whale in five years is a very small number, the issue here is that the animal was not identified to species. We couldn't say, therefore, that we had a high degree of certainty with respect to status. No change has been made.	Not accepted (no score change)
2.3.1	Yes	Yes			No response required	Accepted (no score change)
2.3.2	Yes	No (score increase expected)	Yes	With respect to SId, it is not clear why "the recent pattern of improvement in wolffish stock status is repeated elsewhere within Canadian waters" is relevant to the team not awarding the SG100 level. Each of the three species has a broad geographic distribution. It is not clear why improvement elsewhere would be needed to score the 100 level. Some clarification is needed here.	Here the assessment team agrees there is a case for SG100 to be met. However, in the context of the strategy overall being to recover the wolffish stocks, and in the absence of there being evidence from across Canadian waters that the stocks are recovering, we decided that SG80 was an appropriate and precautionary score. We have added a clarification to the scoring text.	Not accepted (no score change)
2.3.3	Yes	Yes			No response required	Accepted (no score change)

PI	PI Information	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
2.4.1	Yes	Yes			No response required	Accepted (no score change)
2.4.2	Yes	Yes			No response required	Accepted (no score change)
2.4.3	Yes	Yes			No response required	Accepted (no score change)
2.5.1	Yes	Yes			No response required	Accepted (no score change)
2.5.2	Yes	Yes			No response required	Accepted (no score change)
2.5.3	Yes	Yes			No response required	Accepted (no score change)
3.1.1	Yes	Yes			No response required	Accepted (no score change)
3.1.2	Yes	Yes			No response required	Accepted (no score change)
3.1.3	Yes	Yes			No response required	Accepted (no score change)
3.2.1	Yes	Yes			No response required	Accepted (no score change)
3.2.2	Yes	Yes			No response required	Accepted (no score change)
3.2.3	Yes	Yes		Regarding SI b, it would be clearer to move the text "The following evidence indicates SG 60 is met:" to below the heading for Canada.	The Assessment Team agree with the comment and have revised the text.	Accepted (no score change)
3.2.4	Yes	Yes	Yes		No response required	Accepted (no score change)

6.4 Stakeholder input

No stakeholder submissions were received prior to or after the site visit.

Stakeholders are once again encouraged to review the PCDR and scoring (and responses to previous input where relevant) presented in this assessment and use the Stakeholder Input Form to provide evidence to the team of where changes to scoring are still necessary.

6.5 Conditions

Table 22: Condition 1: PI 2.2.2

Performance Indicator	**PI 2.2.2** - There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch. **Scoring Issue (e)** - There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species and they are implemented as appropriate.
Score	75
Rationale	Toothed whale (NS), harp seal, true seal (NS) and grey seal are main secondary species through being out-of-scope but, in any case, it is clear that interaction rates are extremely low, and recent developments mean that, for all marine mammals, there is now a requirement to consider bycatch as part of the equivalency requirements under the US import rules for the Marine Mammal Protection Act. Currently, captures must be reported immediately as part of the daily hail process, and marine mammals must be returned, where alive, in a manner that causes least harm (DFO 2018k). SG60 is met but it is not clear that there is a regular review of alternative measures for marine mammals, or that measures are implemented as appropriate, so SG80 is not met for these species.
Condition	By the fourth annual audit the client shall provide evidence that there is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species and they are implemented as appropriate.
Milestones	**At the first audit** the client will provide evidence that there is a plan in place to undertake a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species. This milestone is an incremental step toward fulfilling the condition. Its successful completion will not result in a change of score to the PI; the score will remain at 75. **At the second audit** the client shall provide evidence that the review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species has been undertaken. This milestone is an incremental step toward fulfilling the condition. Its successful completion will not result in a change of score to the PI; the score will remain at 75. **At the third audit** the client shall provide evidence that there is a plan in place to implement appropriate measures to minimise UoA-related mortality of unwanted catch of main secondary species; the score will remain at 75. **At the fourth audit** the client shall provide evidence that appropriate measures to minimise UoA-related mortality of unwanted catch of main secondary species have been implemented, and that there is a plan in place to undertake a further review of alternative measures within no more than a five-year timescale (meeting the MSC's definition of 'regular' – SA3.5.3.2, MSC 2018a). Successful completion of this and the previous milestones will demonstrate that the YTFF management system is subject to occasional external review. This will result in the rescoring of this PI to at least 80.
Client Action Plan	**At the first surveillance audit** the client will provide written evidence of discussions with management authorities and other stakeholders on the adoption of a process to undertake a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species and, where appropriate, to implement them. Evidence to include: - Meeting minutes with DFO personnel, advisory committee members, client members and researchers to describe the problem, define an appropriate process for

	undertaking the review, including due consideration of SA3.5.3.3, MSC 2014, and establish the TOR for the review. **At the second surveillance audit** the client will provide evidence of having completed a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species, including due consideration of their appropriateness (i.e., with respect to the criteria detailed in SA3.5.3.3, MSC 2014). Evidence to include: - Meeting minutes with DFO personnel, advisory committee members, client members and researchers showing the schedule for a review of alternative measures. **At the third surveillance audit** the client will provide evidence that there is a plan in place to implement appropriate measures to minimise UoA-related mortality of unwanted catch of main secondary species. Evidence to include: - A written review of the alternative measures; - Meeting minutes presenting discussion results of the alternative measures between DFO personnel, advisory committee members, client members and researchers and an agreed plan for future reviews of alternative measures. **At the fourth surveillance audit** the client will provide evidence that the appropriate alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species have been implemented and there is a process in place to regularly review (at least once every 5 years) the potential effectiveness and practicality of alternative measures on an on-going basis.
Consultation on condition	It is considered that the client could undertake the work required to meet this condition independent of any other party. As such, no consultation on the condition is required.

Table 23: Condition 2: PI 2.3.2

Performance Indicator	**PI 2.3.2** - The UoA has in place precautionary management strategies designed to: • meet national and international requirements; • ensure the UoA does not hinder recovery of ETP species. Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species **Scoring Issue (e) -** There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.
Score	75
Rationale	For the YTFF there are a range of measures in place which are designed to minimise unwanted catch and mortality of wolffish species, including the hotspot avoidance protocol, the release of wolffish species through live release chutes, and the video training for crew of wolffish handling practices. These requirements were developed over time in response to identified issues and concerns related to catch and bycatch levels and risk associated with the YTFF. It is considered that this constitutes a review of alternative measures, with some obvious implementation of appropriate measures. However, it is not clear that there is a regular review of alternative measures for wolffish species, so SG80 is not met.
Condition	By the fourth annual audit the client shall provide evidence that there is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.
Milestones	**At the first audit** the client will provide evidence that there is a plan in place to undertake a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.

	This milestone is an incremental step toward fulfilling the condition. Its successful completion will not result in a change of score to the PI; the score will remain at 75. **At the second audit** the client shall provide evidence that the review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species has been undertaken. This milestone is an incremental step toward fulfilling the condition. Its successful completion will not result in a change of score to the PI; the score will remain at 75. **At the third audit** the client shall provide evidence that there is a plan in place to implement appropriate measures to minimise UoA-related mortality of ETP species; the score will remain at 75. **At the fourth audit** the client shall provide evidence that appropriate measures to minimise UoA-related mortality of ETP species have been implemented, and that there is a plan in place to undertake a further review of alternative measures within no more than a five-year timescale (meeting the MSC's definition of 'regular' – SA3.5.3.2, MSC 2018a). Successful completion of this and the previous milestones will demonstrate that the YTFF management system is subject to occasional external review. This will result in the rescoring of this PI to at least 80.
Client Action Plan	**At the first surveillance audit** the client will provide written evidence of discussions with management authorities and other stakeholders on the adoption of a process to undertake a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of ETP species and, where appropriate, to implement them. Evidence to include: - Meeting minutes with DFO personnel, advisory committee members, client members and researchers to describe the problem, define an appropriate process for undertaking the review, including due consideration of SA3.5.3.3, MSC 2014, and establish the TOR for the review. **At the second surveillance audit** the client will provide evidence of having completed a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of ETP species, including due consideration of their appropriateness (i.e., with respect to the criteria detailed in SA3.5.3.3, MSC 2014). Evidence to include: - Meeting minutes with DFO personnel, advisory committee members, client members and researchers showing the schedule for a review of alternative measures. **At the third surveillance audit** the client will provide evidence that there is a plan in place to implement appropriate measures to minimise UoA-related mortality of unwanted catch of ETP species. Evidence to include: - A written review of the alternative measures; - Meeting minutes presenting discussion results of the alternative measures between DFO personnel, advisory committee members, client members and researchers and an agreed plan for future reviews of alternative measures. **At the fourth surveillance audit** the client will provide evidence that the appropriate alternative measures to minimise UoA-related mortality of unwanted catch of ETP species have been implemented and there is a process in place to regularly review (at least once every 5 years) the potential effectiveness and practicality of alternative measures on an on-going basis.
Consultation on condition	It is considered that the client could undertake the work required to meet this condition independent of any other party. As such, no consultation on the condition is required.

Table 24: Condition 3: PI 3.2.4

Performance Indicator	**PI 3.2.4** - There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives. There is effective and timely review of the fishery-specific management system. **Scoring Issue (b) scoring element, Canada -** The fishery-specific management system is subject to regular internal and occasional external review.
Score	75
Rationale	With respect to external review, the Parliament of Canada has two committees related to Fisheries and Oceans: The Standing Committee on Fisheries and Oceans of the House of Commons and the Senate Standing Committee on Fisheries and Oceans of the Senate. Both committees regularly review different aspects of fishery management in Canada and publish reports with their findings and conclusions. Furthermore, under the auspicious of the Office of the Auditor General, the Commissioner of the Environment and Sustainable Development undertakes performance audits of the governments performance and efforts to protect the environment and foster sustainable development. However, since certification of the YTFF fishery in 2010, there has been no external review of the fishery.
Condition	By the third annual audit the client shall provide evidence that the YTFF management system is subject to occasional external review.
Milestones	**At the first audit** the client will provide evidence in the form of minutes and/or meeting reports showing discussion on how it will initiate and adopt an occasional external review of the YTFF management system. This milestone is an incremental step toward fulfilling the condition. Its successful completion will not result in a change of score to the PI; the score will remain at 75. **At the second audit** the client shall provide evidence in the form of minutes and/or meeting reports showing how an occasional external review of the YTFF fishery management system will be adopted. This milestone is an incremental step toward fulfilling the condition. Its successful completion will not result in a change of score to the PI; the score will remain at 75. **At the third audit** the client shall provide evidence that the YTFF management system is subject to occasional external review and the review has or will be initiated and completed within four years of the re-certification date of the fishery. Successful completion of this and the previous milestones will demonstrate that the YTFF management system is subject to occasional external review. This will result in the rescoring of this PI to at least 80.
Client Action Plan	**At the first surveillance audit,** with the assistance of an external consultant, the client will provide written evidence in the form of minutes and/or meeting reports showing discussion on how it will initiate and adopt an occasional external review of the YTFF management system. **At the second audit** the client will provide evidence in the form of minutes and/or meeting reports showing how an occasional external review of the YTFF fishery management system will be adopted. **At the third audit** the client shall provide evidence that the YTFF management system is subject to occasional external review and the review has or will be initiated and completed within four years of the re-certification date of the fishery.
Consultation on condition	It is considered that the client could undertake the work required to meet this condition independent of any other party, however, having DFO support would likely strengthen the likelihood that the outcome of a review would be formally considered or taken into account by the management organisation. Therefore, consultation on this condition is not required but is encouraged.

6.6 Surveillance

Table 25: Fishery surveillance program

Surveillance level	Year 1	Year 2	Year 3	Year 4
Level 4	On-site surveillance audit	Off-site surveillance audit	Off-site surveillance audit	On-site surveillance audit & re-certification site visit

Table 26: Timing of surveillance audit

Year	Anniversary date of certificate	Proposed date of surveillance audit	Rationale
1	TBC	Within 1 year of anniversary date	The time between a fishery being evaluated at a re-assessment and the fishery being certified is likely to be more than a year since and so an audit will be required.

Table 27: Surveillance level rationale

Year	Surveillance activity	Number of auditors	Rationale
1	On-site audit	1 auditor on-site with remote support from 1 auditor	The conditions are related to P2 and P3 and so it should be possible to complete the audit with 2 appropriately qualified team members

6.7 Harmonised fishery assessments

MSC Fisheries Certification Process (FCP) v 2.1 states, "*Teams assessing overlapping UoAs shall ensure consistency of outcomes so as not to undermine the integrity of MSC fishery assessments*.". MSC (FCP v 2.1 GPB 1.2) confirms that Conformity Assessment Bodies (CAB) do not have to harmonise fishery assessments that use different versions of the assessment tree (i.e. MSC Fisheries Standards Annex SA, Annex SB, Annex SC and Annex SD), however, the MSC Interpretation webpage also confirms that harmonisation of similar fisheries using different versions of the default assessment tree, i.e. v1.3 and v2.0, should still take place for relevant PIs where they are materially unchanged: https://mscportal.force.com/interpret/s/global-search/harmonisation

The YTFF overlaps with multiple fisheries that have been certified - see Table 28. At the time of writing, no other overlapping fisheries were in assessment.

Table 28. Overlapping fisheries

Fishery Name	Certification status and date	PIs to harmonise
Canada 3LN Redfish Bottom and Midwater Trawl fishery	Certified – 22nd May 2017 (v1.3)	PIs 3.1.1, 3.1.2, 3.1.3, 3.1.4
Canada Atlantic Halibut Trawl, Gillnet, Entangle Net, Longline	Certified – 16th May 2013 (v1.3)	PIs 3.1.1, 3.1.2, 3.1.3, 3.1.4
Canada Northern and Striped Shrimp Trawl	Certified – 24th June 2011 (v1.3)	PIs 3.1.1, 3.1.2, 3.1.3, 3.1.4
Clearwater Seafoods Banquereau and Grand Bank Arctic Surf Clam Hydraulic Dredge	Certified – 17th July 2012 (v1.3)	PIs 3.1.1, 3.1.2, 3.1.3, 3.1.4
Newfoundland and Labrador Snow Crab Trap	Certified - 16th April 2013 (v2.0)	PIs 2.4.2a,c, 3.1.1, 3.1.2, 3.1.3, 3.1.4
Canada 0AB 2+3KLMNO Greenland Halibut Trawl and Gillnet	Certified – 5th Dec 2019 (v2.0)	PIs 2.4.2a,c, 3.1.1, 3.1.2, 3.1.3, 3.1.4

Only two fisheries – Newfoundland and Labrador Snow Crab Trap Fishery and Canada 0AB 2+3KLMNO Greenland Halibut Trawl and Gillnet Fishery have been certified against the same version of the standard (v2.0) that is being used to assess the YTFF, however all the fisheries share aspects of the "Governance and Policy" component of Principle 3 (the PIs pre-fixed with 3.1), i.e. focusing on the high-level context of the fishery management system within the UoAs, as they all fall under the same national management regime.

The MSC has provided guidance for which PIs need to be considered for harmonisation (FCR v2.1 GPB1.1). Table 29 sets out the MSC guidance identifying which PIs need to be considered for harmonisation (shaded orange) and applies this to the YTFF and the overlapping fisheries (shaded blue).

Table 29: Harmonisation requirements and how they apply to the YTFF and overlapping fisheries.

PI / SIs	Harmonisation requirements and their application with the YTFF and overlapping fisheries
All P1 PIs	P1 always considers the impacts of all fisheries on a stock. Any fisheries that have the same P1 species (stocks) should be harmonised.
	The P1 target species for the YTFF and Newfoundland Snow Crab Trap Fishery and Canada 0AB 2+3KLMNO Greenland Halibut Trawl and Gillnet Fishery are different and so no P1 PIs are harmonised.
PI 2.1.1a	For stocks that are 'main' in both UoAs, harmonise status relative to PRI (at SG 60, 80 and 100), and if below PRI, harmonise cumulative impacts at SG 80 (not at SG60).
	There are no main primary species in the Canada 0AB 2+3KLMNO Greenland Halibut Trawl and Gillnet Fishery. The main primary species in the Newfoundland Snow Crab Trap Fishery (Argentine squid - bait) and YTFF (American plaice and thorny skate - bycatch) are different and so there is no need to harmonise cumulative impacts.

PI / SIs	Harmonisation requirements and their application with the YTFF and overlapping fisheries
PI 2.2.1a	For stocks that are 'main' in both UoAs, harmonise status relative to Biologically Based Limits (at SG 60, 80, and 100), and if below Biologically Based Limits, harmonise cumulative impacts at SG 80 (not at SG 60).
	There are no main secondary species in the Newfoundland Snow Crab Trap Fishery. There are 4 main secondary species in the Canada 0AB 2+3KLMNO Greenland Halibut Trawl Fishery (Greenland shark, Narwhal, Grey seal and Harp seal) and 5 main secondary species in the Canada 0AB 2+3KLMNO Greenland Halibut Gillnet Fishery (Roughhead grenadier, Northern gannet, Harp seal, Northern fulmar, Iceland gull), Four species ('toothed whale', 'true' seal, Harp seal and Grey seal) are identified as main secondary species in the YTFF. Therefore, Harp and Grey seal need to be harmonised. Very low numbers (single digit) have been recorded in all three fisheries. There is a high degree of certainty that these species are above biologically-based limits, therefore there is no need to harmonise cumulative effects.
PI 2.3.1a	Harmonise recognition of any limits applicable to both UoAs (at SG 60, 80 and 100), and cumulative effects of the UoAs at SG 80 and SG 100 (not at SG 60).
	No species with national or international limits are identified in YTFF fishery so no harmonisation is required.
PI 2.4.1b	Harmonise recognition of VMEs where both UoAs operate in the same 'managed area/s' (see Guidance to the MSC Fisheries Standard).
	The Newfoundland Snow Crab Trap Fishery and the Canada 0AB 2+3KLMNO Greenland Halibut Trawl and Gillnet Fishery overlaps with several VMEs, however, the YTFF does not overlap with any VMEs and therefore, harmonisation is not required on PI 2.4.1b.
PI 2.4.2 a & PI 2.4.2c	Harmonise scoring at SG 100 since all fishery impacts are considered (not at SG 60 or 80).
	The Newfoundland Snow Crab Trap Fishery concludes that the fishery meets the SG 100 for both 2.4.2 a and c. The Canada 0AB 2+3KLMNO Greenland Halibut Trawl and Gillnet Fishery score 80 and 100 for 2.4.2 a and c, respectively. The YTFF also scores 80 and 100 for 2.4.2 a and c, respectively. This results in no material change, i.e. a condition for either fishery, the fisheries are considered to be harmonised.
All P2 PIs	If 2 UoAs are identical in scope, even if the UoCs are different (e.g. separate clients), harmonisation is required.
	The Newfoundland Snow Crab Trap Fishery, the Canada 0AB 2+3KLMNO Greenland Halibut Trawl and Gillnet Fishery and YTFF are not identical, i.e. the fishing gear and the area fished, are not the same and so harmonisation is not applicable.
PIs 3.1.1 – 3.1.3	Both UoAs are part of the same larger fishery or fleet or have stocks in either P1 or P2 that are at least partially managed by the same jurisdiction(s) (nation states, RFMOs, or others) or under the same agreements. Harmonisation may sometimes be possible for those management arrangements that apply to both UoAs (noting the limitations accepted in GPB1.3). The MSC accepts that it may be impractical to attempt full harmonisation, due to the large number of fisheries that may be managed under the relevant policy framework, and the differences in application between them.
	The MSC certified fisheries that fish in NAFO Divisions 3LNO share aspects of the "Governance and Policy" component of Principle 3 (the PIs pre-fixed with 3.1), i.e. focusing on the high-level context of the fishery management system within the UoAs. The majority have been assessed using MSC FAM v1.3, in so doing, they include PI 3.1.4 that relates to incentives and subsidies, which is no longer included in FCR v2.0. Table 31 shows the scores assigned to PIs pre-fixed with 3.1 for MSC certified fisheries that overlap with the YTFF.
PIs 3.2.1 - 3.2.4	Both UoAs have stocks within either P1 or P2 that are at least partially managed by the same jurisdiction(s) (nation states, RFMOs, or others) or under the same agreements. Harmonisation is needed for those management arrangements that apply to both UoAs e.g. at the RFMO level but not the national level in the case of 2 separate national fleets both fishing the same regional stock.
	The Newfoundland Snow Crab Trap Fishery and YTFF target different P1 stocks, use different gears and operate under different IFMPs and so harmonisation is not applicable in this instance.

Table 30: Details of any harmonisation activities carried out during the course of the assessment

Supporting information	
Describe any background or supporting information relevant to the harmonisation activities, processes and outcomes.	
The YTFF Assessment Team compared the scoring rationales and scores for each PI identified in **Error! Reference source not found.** with the scoring rationales and scores for the YTFF.	
Was either FCP v2.1 Annex PB1.3.3.4 or PB1.3.4.5 applied when harmonising?	~~Yes~~ / No
Date of harmonisation meeting	N/A
If applicable, describe the meeting outcome	
e.g. Agreement found among teams or lowest score adopted.	

Table 31: Scoring differences

PIs	Canada 3LN Redfish Bottom and Midwater Trawl fishery	Canada Atlantic Halibut Trawl, Gillnet, Entangle Net, Longline	Canada Northern and Striped Shrimp Trawl	Clearwater Seafoods Banquereau and Grand Bank Arctic Surf Clam Hydraulic Dredge	Newfoundland and Labrador Snow Crab Trap	Canada 0AB 2+3KLMNO Greenland Halibut Trawl and Gillnet	YTFF
PI 2.4.2a	N/A	N/A	N/A	N/A	100	80	80
PI 2.4.2c	N/A	N/A	N/A	N/A	100	100	100
PI 3.1.1	85	80	100	95	95	100	100
PI 3.1.2	95	90	95	85	95	95	95
PI 3.1.3	80	90	100	90	85	100	100
PI 3.1.4	90	100	80	N/A	N/A	N/A	N/A

Table 32: Rationale for scoring differences

If applicable, explain and justify any difference in scoring and rationale for the relevant Performance Indicators (FCP v2.1 Annex PB1.3.6)
The differences in scores are a result of the NAFO component being included in the Canada 0AB 2+3KLMNO Greenland Halibut Trawl and Gillnet and YTFF.
If exceptional circumstances apply, outline the situation and whether there is agreement between or among teams on this determination

6.8 Objection Procedure – delete if not applicable

To be added at Public Certification Report stage

The report shall include all written decisions arising from a 'Notice of Objection', if received and accepted by the Independent Adjudicator.

Reference(s): FCP v2.1 Annex PD

7 References

Albikovskaya, L.K. (1982). Distribution and abundance of Atlantic wolffish, spotted wolffish and northern wolffish in the Newfoundland area. NAFO Scientific Council Studies, V. 3, pp. 29-32. https://archive.nafo.int/open/studies/s3/albikoskaya.pdf.

Amaratunga, T., ed. (1999). Scientific Council Meeting on the Precautionary Approach (PA), 27 April -01 May, 1999, San Sebastian, Spain. Northwest Atlantic Fisheries Organization (NAFO) Annual Report 1999, 109–12.

Atkinson, B., Blyth-Skyrme, R., Angel, J., Aldous, D. & P. Knapman (2010). MSC Assessment Report for the OCI Grand Bank Yellowtail Flounder Trawl Fishery. Version 5: Public Certification Report. Moody Marine Ltd., October 2010. Ref: 82104/v5.

Barrie, J.V., Lewis, C.F.M., Parrott, D.R. & W.T. Collins (1992). Submersible Observations of an Iceberg Pit and Scour on the Grand Banks of Newfoundland. Geo-Marine Letters 12 (1): 1–6.

Beazley, L., Murillo, F.J., Kenchington, E., Guijarro, J., Lirette, C., Siferd, T., Treble, M., Baker, E., Bouchard Marmen, M., Tompkins MacDonald, G. 2016. Species Distribution Modelling of Corals and Sponges in the Eastern Arctic for Use in the Identification of Significant Benthic Areas. Can. Tech. Rep. Fish. Aquat. Sci. 3175: vii + 210p.

Bélanger, D., Maillet, G., Pepin, P., Casault, B., Johnson, C., Plourde, S., Galbraith, P.S., Devine, L., Scarratt, M., Blais, M., Head, E., Caverhill, C., Devred, E., Spry, J., Cogswell, A., St-Amand, L., Fraser, S., Doyle, G., Robar, A., Hingdon, J., Holden, J., Porter, C. and E. Colbourne (2018). Biological oceanographic conditions in the Northwest Atlantic during 2017. Serial No. N6790 NAFO SCR Document 18/007. 27 pp. https://www.nafo.int/Portals/0/PDFs/sc/2018/scr18-007.pdf.

Bernier, R.Y., Jamieson, R.E., and A.M. Moore (eds.) (2019). State of the Atlantic Ocean synthesis report. Canadian Technical Report on Fisheries and Aquatic Sciences. No. 3167: iii + 149 pp. http://dfo-mpo.gc.ca/oceans/documents/publications/soto-rceo/2018/atlantic-ecosystems/2019-03-29_SOTO-Atlantic_FormattedReport_EN.pdf

Blyth-Skyrme, R., Atkinson, B. & J. Angel (2015). OCI Grand Bank Yellowtail Flounder Trawl Fishery Public Certification Report. Acoura Marine Ltd., October 2015. 205 pp. https://cert.msc.org/FileLoader/FileLinkDownload.asmx/GetFile?encryptedKey=UdKVdJCQc9S1Pr3k0RvwpkpqocsRH93ZvHgbfWsicaIuq4yLBQctwRKlALhyN20g

Brodie, W.B., Kulka, D.W. & D. Power (2004). The Canadian Fishery for Yellowtail Flounder in NAFO Divisions 3LNO in 2002 and 2003. NAFO SCR Doc. 04/41. Serial No. N4992.

Cadrin, S.X. & M.S. Vaughn (2005). Morphometric Variation of Yellowtail Flounder. ICES Journal of Marine Science : Journal Du Conseil 62 (4): 683–94.

C-NLOPB (2014). Eastern Newfoundland Strategic Environmental Assessment, Final Report. Canada-Newfoundland and Labrador Offshore Petroleum Board, August 2014, 527.

Colbourne, E.B. & S.J. Walsh (2006). The Distribution and Abundance of Yellowtail Flounder (Limanda Ferruginea) in Relation to Bottom Temperatures in NAFO Divisions 3LNO Based on Multi- Species Surveys from 1990-2005. NAFO SCR Doc. 06/23, 16.

Colbourne, E., Holden, J., Snook, S., Lewis, S., Cyr, F., Senciall, D., Bailey W. & J. Higdon (2018). Physical oceanographic environment on the Newfoundland and Labrador Shelf in NAFO Subareas 2 and 3 during 2017. Serial Number N6793. NAFO SCR Document 18/009. 40 pp.

Collins, R.K., Simpson, M.R., Miri, C.M., Mello, L.G.S., Chabot, D., Hedges, K,. Benoît, H. & T.M. McIntyre (2015). Assessment of Northern Wolffish, Spotted Wolffish, and Atlantic Wolffish in the Atlantic and Arctic Oceans. DFO Canadian Science Advisory Secretariat Science Research Document 2014/034. iv + 86 pp.

DFO (2004). Allowable harm assessment for spotted and northern wolffish. DFO Canadian Science Advisory Secretariat Stock Status Report 2004/031. 5 pp. http://www.dfo-mpo.gc.ca/csas/Csas/status/2004/SSR2004_031_e.pdf.

DFO (2006). Impacts of trawl gears and scallop dredges on benthic habitats, populations and communities. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2006/025.

DFO (2007c). The Grand Banks of Newfoundland: Atlas of Human Activities. http://www.dfo-mpo.gc.ca/Library/336890.pdf.

DFO (2009). Development of a Framework and Principles for the Biogeographic Classification of Canadian Marine Areas. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2009/056. https://waves-vagues.dfo-mpo.gc.ca/Library/338958.pdf

DFO (2012a). Integrated Fisheries Management Plan (IFMP) NAFO Division 3LNO Yellowtail Flounder (Limanda Ferruginea). Unpublished DFO Document.

DFO (2012b). Results and Recommendations from the Ecosystem Research Initiative –Newfoundland and Labrador's Expanded Research on Ecosystem Relevant but Under- Surveyed Splicers. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2012/058.

DFO (2014). Summary Integrated Fisheries Management Plan – Yellowtail Flounder (Limanda ferruginea) - NAFO Divisions 3LNO - As of December 2012. https://www.dfo-mpo.gc.ca/fisheries-peches/ifmp-gmp/groundfish-poisson-fond/yellowtail-limande-div3LNO-eng.html. Date modified: 2014-04-15.

DFO (2015). Species at Risk Act: measures to protect listed wildlife species. DFO website publication, dated 2015-07-09. Available online: https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/publications/act/chapter-9.html#9b.

DFO (2016a). Harp seal. DFO webpage, date modified: 2016-11-25: http://www.dfo-mpo.gc.ca/species-especes/profiles-profils/harpseal-phoquegroenland-eng.html.

DFO (2018a). Stock status update of Atlantic halibut (Hippoglossus hippoglossus) on the Scotian Shelf and Southern Grand Banks in NAFO Divisions 3NOPs4VWX5Zc. DFO Canadian Science Advisory Secretariat Science Response 2018/022. 9 pp. http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2018/2018_022-eng.pdf.

DFO (2018c). Grey seal. DFO webpage, date modified: 2018-03-14: http://www.dfo-mpo.gc.ca/species-especes/profiles-profils/greyseal-phoquesgris-eng.html

DFO (2018e). Atlantic wolffish, Anarhichas lupus. DFO webpage, date modified: 2018-09-06. http://www.dfo-mpo.gc.ca/species-especes/profiles-profils/wolffish-loup-at-eng.html.

DFO (2018f). Spotted wolffish, Anarhichas minor. DFO webpage, date modified: 2018-09-06. http://www.dfo-mpo.gc.ca/species-especes/profiles-profils/spottedwolf-louptachete-eng.html.

DFO (2018g). Northern wolffish, Anarhichas minor. DFO webpage, date modified: 2018-09-06. http://www.dfo-mpo.gc.ca/species-especes/profiles-profils/northernwolffish-loupatetelarge-eng.html

DFO (2018h). Recovery strategy for northern wolffish (Anarhichas denticulatus) and spotted wolffish (Anarhichas minor), and management plan for Atlantic wolffish (Anarhichas lupus) in Canada. Original publication 2008, 1st Amendment 2018. Fisheries and Oceans Canada, Ottawa. vii + 82 pp. https://wildlife-species.canada.ca/species-risk-registry/virtual_sara/files/plans/RsMpNthnSpottedAtlanticWolffish-v00-2018Jun-Eng1.pdf.

DFO (2018k). Groundfish general licence conditions: NAFO Divisions 0, 2GHJ, 3KLNOP and 4R, Condition #15036, 15037, 15038, 15039. 9 pp.

Drinkwater, K.F. & R.W. Trites (1986). "Monthly Means of Temperature and Salinity in the Grand Banks Region." Can. Tech. Rep. Fish. Aquat. Sci. 1450. http://www.dfompo.gc.ca/Library/98237.pdf.

Dwyer, K.S., Walsh, S.J. & S.E. Campana (2003). Age Determination, Validation and Growth of Grand Bank Yellowtail Flounder (Limanda Ferruginea). ICES Journal of Marine Science : Journal Du Conseil 60 (5): 1123–38.

FAO (2019). Vulnerable marine ecosystems database. Food and Agriculture Organisation of the United Nations. http://www.fao.org/in-action/vulnerable-marine-ecosystems/vme-database/en/vme.html.

Gilkinson, K. (2013). Recent DFO (Newfoundland & Labrador Region) studies of the Grand Banks benthos at small and large spatial scales. DFO Can. Sci. Advis. Sec. Res. Doc. 2012/114. v + 30 p. https://waves-vagues.dfo-mpo.gc.ca/Library/347898.pdf

Gordon Jr., D.C., Gilkinson, K.D., Kenchington, E.L.R., Prena, J., Bourbannais, C., MacIsaac, K., McKeown, D.L. & W.P. Vass (2002). Summary of the Grand Banks otter trawling experiment (1993-1995): effects on benthic habitat and communities. Can. Tech. Rep. Fish. Aquat. Sci./Rapp. Tech. Can. Sci. Halieut. Aquat., no. 2416: 72.

Grabowski, J.H., Bachman, M., Demarest, C., Eayrs, S., Harris, B.P., Malkoski, V., Packer D. and D. Stevenson (2014) Assessing the vulnerability of marine benthos to fishing gear impacts, Reviews in Fisheries Science & Aquaculture, V. 22, pp. 142-155. DOI:10.1080/10641262.2013.846292.

Grant, S.M. & W. Hiscock (2014). Post-capture survival of Atlantic wolffish (Anarhichas lupus) captured by bottom otter trawl: Can live release programs contribute to the recovery of species at risk? Fisheries Research, V. 151, pp. 169-176. https://doi.org/10.1016/j.fishres.2013.11.003.

GSOC (1990). Geology of the continental margin of eastern Canada; Keen, M.J. and G.L. Williams (eds.). Geological Survey of Canada, Geology of Canada Series no. 2, 855 pp. http://ftp.maps.canada.ca/pub/nrcan_rncan/publications/ess_sst/132/132690/dnag_02_e.zip.

Guijarro, J., Beazley, L., Lirette, C., Kenchington, E., Wareham, V., Gilkinson, K., Koen-Alonso, M. & F.J. Murillo (2016). Species Distribution Modelling of Corals and Sponges from Research Vessel Survey Data in the Newfoundland and Labrador Region for Use in the Identification of Significant Benthic Areas. Canadian Technical Report on Fisheries and aquatic Sciences, No. 3171: vi + 126 pp.

Hiddink, J.G., Jennings, S., Kaiser, M.J., Queirós, A.M., Duplisea, D.E. & G.J. Piet (2006). Cumulative Impacts of Seabed Trawl Disturbance on Benthic Biomass, Production, and Species Richness in Different Habitats. Canadian Journal of Fisheries and Aquatic Sciences 63 (4): 721–36.

Hiddink, J.G., Jennings, S., Sciberrasa, M., Szosteka, C.L., Hughes, K.M., Ellis, N., Rijnsdorp, A.D., McConnaughey, R.A., Mazord, T., Hilborn, R., Collie, J.S., Pitcher, C.R., Amoroso, R.O., Parma, A.M., Suuronen, P. & M.J. Kaiser (2017). Global analysis of depletion and recovery of seabed biota after bottom trawling disturbance. Proceedings of the National Academy of Sciences of the United States of America Early Edition Online, 1–6.

Hiddink, J.G., Jennings, S., Sciberras, M., Bolam, S.G., Cambiè, G., McConnaughey, R.A., Mazor, T., Hilborn, R., Collie, J.S., Pitcher, R., Parma, A.M., Suuronen, P., Kaiser, M.J. & A.D. Rijnsdorp (2018). Assessing bottom trawling impacts based on the longevity of benthic invertebrates. Journal of Applied Ecology, 2018;00:1–10. https://doi.org/10.1111/1365-2664.13278.

Jaiteh, V.F., Allen, S.J., Meeuwig, J.J. & N.R. Loneragan (2013) Subsurface behavior of bottlenose dolphins (Tursiops truncatus) interacting with fish trawl nets in northwestern Australia: Implications for bycatch mitigation. Marine Mammal Science, V. 29, pp. E266-E28. https://researchrepository.murdoch.edu.au/id/eprint/11285/1/sub-surface_behavior_of_bottlenose_dolphins.pdf

Jennings, S. & M.J. Kaiser (1998). The Effects of Fishing on Marine Ecosystems. Advances in Marine Biology 34: 201–352.

Kaiser, M.J., Collie, J.S., Hall, S.J., Jennings, S. & I.R. Poiner (2002). Modification of Marine Habitats by Trawling Activities: Prognosis and Solutions. Fish and Fisheries 3 (2): 114–36.

Kenchington, E., Lirette, C., Cogswell, A., Archambault, D., Archambault, P., Benoit, H., Bernier, D., Brodie, B., Fuller, S., Gilkinson, K., Lévesque, M., Power, D., Siferd, T., Treble, M. & V. Wareham (2010). Delineating coral and sponge concentrations in the biogeographic regions of the East Coast of Canada using spatial analyses. DFO Canadian Science Advisory Secretariat Science Research Document 2010/041. vi + 202 pp. http://publications.gc.ca/collections/collection_2011/mpo-dfo/Fs70-5-2010-041.pdf

Kenchington, E., Beazley, L., Lirette, C., Murillo, F.J., Guijarro, J., Wareham, V., Gilkinson, K., Koen Alonso, M., Benoît, H., Bourdages, H., Sainte-Marie, B., Treble, M. & T. Siferd (2016). Delineation of coral and sponge significant benthic areas in Eastern Canada using kernel density analyses and species distribution models. DFO Canadian Science Advisory Secretariat Science Research Document 2016/093. vi + 178 pp.

Koen-Alonso, M., Favaro, C., Ollerhead, N., Benoît, H., Bourdages, H., Sainte-Marie, B., Treble, M., Hedges, K., Kenchington, E., Lirette, C., King, M., Coffen-Smout, S., and J. Murillo (2018). Analysis of the overlap between fishing effort and Significant Benthic Areas in Canada's Atlantic and Eastern Arctic marine waters. DFO Canadian Science Advisory Secretariat Science Research Document 2018/015. xvii + 270 pp. https://waves-vagues.dfo-mpo.gc.ca/Library/40701748.pdf

Lilly, G.R. (1994). Predation by Atlantic cod on capelin on the southern Labrador and Northeast Newfoundland shelves during a period of changing spatial distributions. ICES Marine Science Symposium, No. 198, pp. 600-611. http://www.ices.dk/sites/pub/Publication%20Reports/Marine%20Science%20Symposia/ICES%20Marine%20Science%20Symposia%20-%20Volume%20198%20-%201994%20-%20Part%2051%20of%2063.pdf

Maddock Parsons, D., Brodie, W.B., Morgan, M.J. & D. Power (2008). The 2008 Assessment of the Grand Bank Yellowtail Flounder Stock, NAFO Divisions 3LNO. NAFO SCR Doc. 08/45. Serial No. N5547.

Maddock Parsons, D., Morgan, J., Brodie, B. & D. Power (2013). Assessment of NAFO Div. 3LNO Yellowtail Flounder. NAFO SCR Doc. 13/37. Serial No. N6192, 57.

Maddock Parsons, D., Morgan M.J. & R. Rogers (2018). Assessment of Yellowtail Flounder in NAFO Divisions 3LNO using a new Stock Production Model in a Bayesian Framework. NAFO SCR Doc. 18/038

McClintock, J., McKenna, R. & C. Woodworth-Lynas (2007). Grand Banks Iceberg Management. PERD/CHC Report 20-84, 92.

Meyer R. & R.B. Millar (1999). Bayesian stock assessment using a state–space implementation of the delay difference model. Can. J. Fish. Aquat. Sci. 56: 37-52.

MSC (2018a). MSC Fisheries Standard, v.2.01. Marine Stewardship Council, London. 31st August 2018. 289 pp.

MSC (2018b). MSC Fisheries Certification Process, v.2.1. Marine Stewardship Council, London. 31st August 2018. 189 pp.

Murphy, H.M., Pepin, P. and D. Robert (2018). Re-visiting the drivers of capelin recruitment in Newfoundland since 1991. Fisheries Research, V. 200, pp. 1-10. https://www.sciencedirect.com/science/article/abs/pii/S0165783617303405.

NAFO (2004a). NAFO Precautionary Approach Framework. NAFO/FC Doc. 04/18. Serial No. N5069.

NAFO (2004c). Report of the NAFO Study Group on Limit Reference Points, Lorient, France, 15-20 April 2004. NAFO SCS Doc. 04/12. Serial No. N4980.

NAFO (2010b). Fisheries Commission’s Request for Scientific Advice on Management in 2011 of Certain Stocks in Subareas 2, 3 and 4. NAFO SCS Doc. 10/01. Serial No. N5743.

NAFO (2010d). Scientific Council Reports 2009. Scientific Council Reports.

NAFO (2013a). Report of Scientific Council Meeting, 7-20 June 2013. NAFO SCS Doc. 13/17. Serial No. N6208, 252.

NAFO (2013d). NAFO improves information sharing. Press Release, September.

NAFO (2014c). Report of the Scientific Council 30 May-12 June 2014. NAFO SCS Doc. 14/17 (REV). Serial No. N6343, 270.

NAFO (2014d). NAFO Continues Implementation of the Ecosystem Approach. Press Release, September.

NAFO Advice June 2018 for 2019-2021. NAFO SC01

NAFO (2019). Conservation and Enforcement Measures 2019. NAFO / COM Doc. 19-01. Northwest Atlantic Fisheries Organization, Dartmouth, Nova Scotia. x + 181 pp. https://www.nafo.int/Portals/0/PDFs/COM/2019/comdoc19-01.pdf.

NAFO (2018a). The Commission's Request for Scientific Advice on Management in 2019 and Beyond of Certain Stocks in Subareas 2, 3 and 4 and Other Matters SCS Doc. 18-01

NAFO SC (2013). Report of the 6th Meeting of the NAFO Scientific Council Working Group on Ecosystem Science and Assessment (WGESA) [Formerly WGEAFM]. NAFO SCS Doc. 13/24 Rev 2. Serial No. N6277.

NAFO SC (2016a). Witch flounder in Divisions 2J+3KL; advice June 2016 for 2017-2019. NAFO Scientific Council, 3rd – 16th June 2016. https://www.nafo.int/Portals/0/PDFs/Advice/2016/wf2j.pdf.

NAFO SC (2017). Report of the Scientific Council Meeting, 01 -15 June 2017 Halifax, Nova Scotia. NAFO SCS Doc. 17-16 REV., serial number N6718. https://www.nafo.int/Portals/0/PDFs/sc/2017/scs17-16REV.pdf

NAFO SC (2018a). Witch flounder in Divisions 3NO; advice June 2018 for 2019-2020. NAFO Scientific Council, 1st – 14th June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/WIT3NO.pdf.

NAFO SC (2018b). American plaice in Divisions 3LNO; advice June 2018 for 2019-2021. NAFO Scientific Council, 1st – 14th June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/AmPlaice3LNO.pdf.

NAFO SC (2018d). Thorny Skate in Divisions 3LNO and Subdiv. 3Ps. Advice June 2018 for 2019-2020. SC01 – 14 June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/TSkate3LNO.pdf.

NAFO SC (2018e). Cod in Divisions 3NO. Advice June 2018 for 2019-2021. SC01 – 14 June 2018. https://www.nafo.int/Portals/0/PDFs/Advice/2018/cod3NO.pdf.

OCI (2014). Ocean Choice International L.P. Fourth Annual Audit Report: Grand Bank Yellowtail Flounder. Certificate No. MML-F-086. Unpublished Manuscript, November.

Pitt, T. K. (1970). Distribution, Abundance, and Spawning of Yellowtail Flounder, Limanda Ferruginea, in the Newfoundland Area of the Northwest Atlantic. Journal of the Fisheries Board of Canada 27 (12): 2261–71.

Pitt, T.K. (1971). Fecundity of the Yellowtail Flounder (Limanda Ferruginea) from the Grand Bank, Newfoundland. Journal of the Fisheries Board of Canada 28 (3): 456–57.

Prager, M. H. (1994). A Suite of Extensions to a Nonequilibrium Surplus-Production Model. Fishery Bulletin 92 (2): 374–89.

Prager, M.H. (1995). User's Manual for ASPIC: A Stock Production Model Incorporating Covariates, Program Version 3.6 X. Miami Lab. Doc. MIA 92: 93–55.

Prager, M.H. (2005). Users Manual for ASPIC: A Stock-Production Model Incorporating Covariates (ver. 5) and Auxiliary Programs. Beaufort Lab. Doc., No. BL-2004-01.

Rice, J. (2002). Changes to the large marine ecosystem of the Newfoundland-Labrador Shelf. K.S. Shermann, and H.-R. Skjoldal (eds). Large marine ecosystems of the North Atlantic: changing states and sustainability. Elsevier Science, Amsterdam, The Netherlands, p.151–193. http://www.ices.dk/sites/pub/CM%20Doccuments/CM-2010/S/S1510.pdf

Rice, J. (2006). Impacts of mobile bottom gears on seafloor habitats, species and communities: a review and synthesis of selected international reviews. Canadian Science Advisory Secretariat Research Document 2006/057: 35 pp.

Rideout, R.M. & M.J. Morgan (2007). Major Changes in Fecundity and the Effect on Population Egg Production for Three Species of North-west Atlantic Flatfishes. Journal of Fish Biology 70 (6): 1759–79.

Sciberras, M., Hiddink, J.G., Jennings, S., Szostek, C.L., Hughes, K.M., Kneafsey, B., Clarke, L.J., Ellis, N., Rijnsdorp, A.D., McConnaughey, R.A., Hilborn, R., Collie, J.S., Pitcher, C.R., Amoroso, R.O., Parma, A.M., Suuronen, P. & M.J. Kaiser (2018). Response of benthic fauna to experimental bottom fishing: a global meta-analysis. Fish and Fisheries, V. 19, pp. 698–715.

Scott, W.B. & M.G. Scott (1988). Atlantic Fishes of Canada. Can. Bull. Fish. Aquat. Sci. 219: 731.

Sherwood, G.D., Rideout, R.M., Fudge, S.B. & G.A. Rose (2007). Influence of diet on growth, condition and reproductive capacity in Newfoundland and Labrador cod (Gadus morhua): Insights from stable carbon isotopes (d13C) Deep-Sea Research II, V. 54, pp. 2794-2809.

Simpson, M.R. & S.J. Walsh (2004). Changes in the spatial structure of Grand Bank yellowtail flounder: testing McCall's Basin Hypothesis. Journal of Sea Research, V. 51, pp 199-210.

Simpson, M.R., Mello, L.G.S., Miri, C.M. & M. Treble (2012). A pre-COSEWIC assessment of three species of Wolffish (Anarhichas denticulatus, A. minor, and A. lupus) in Canadian waters of the Northwest Atlantic Ocean. DFO Canadian Science Advisory Secretariat Research Document 2011/122. iv + 69 pp.

Spatialanalysis (2015). Footprint of The OCI-3LNO Yellowtail Flounder Fishery: 2000 to 2011 and 2012 to 2014. Prepared for: Ocean Choice International Prepared for: Ocean Choice International. Prepared for: Ocean Choice International. Ottawa, ON, Canada.

Walsh, S.J. (1992). Factors Influencing Distribution of Juvenile Yellowtail Flounder (Limanda Ferruginea) on the Grand Bank of Newfoundland. Netherlands Journal of Sea Research 29 (1): 193–203.

Walsh, S.J. & J. Burnett, eds. (2001). Report of the Canada-United States Yellowtail Flounder Age Reading Workshop November 28-30, 2000, St. John's, Newfoundland. NAFO SCR Doc. 01/54. Serial No. N4432, 57.

Walsh, S.J. & M.J. Morgan (2004). Observations of Natural Behaviour of Yellowtail Flounder Derived from Data Storage Tags. ICES Journal of Marine Science: Journal Du Conseil 61 (7): 1151–56.

Walsh, S.J., Morgan, M.J., Power, D., Darby, C., Stansbury, D., Veitch, M.J. & W.B. Brodie (2000). The Millennium Assessment of Grand Bank Yellowtail Flounder Stock in NAFO Divisions 3LNO. NAFO SCR Doc. 00/45. Serial No. N4276.

Walsh, S.J., Simpson, M., Morgan, M.J., Dwyer, K.S. & D. Stansbury (2001). Distribution of Juvenile Yellowtail Flounder, American Plaice and Atlantic Cod on the Southern Grand Bank: A Discussion of Nursery Areas and Marine Protected Areas. NAFO SCR Doc. 01/78. Serial No. N4457, 49.

Walsh, S.J., Brodie, W.B., Veitch, M., Orr, D., McFadden, C. & D. Maddock Parsons (1998). An Assessment of the Grand Bank Yellowtail Flounder Stock in NAFO Divisions 3LNO. NAFO SCR Doc. 98/78. Serial No. N3064.

Walsh, S.J., Brodie, W.B., Morgan, M.J., Bowering, W.R., Orr, D. & M. Veitch (1997). An Assessment of the Grand Bank Yellowtail Flounder Stock in NAFO Divisions 3LNO. NAFO SCR Doc. 97/72. Serial No. N2906.

Walsh, S.J., Brodie, W.B., Morgan, M.J. & D. Power (1999). The 1999 Assessment of Grand Bank Yellowtail Flounder Stock in NAFO Divisions 3LNO. NAFO SCR Doc. 99/68. Serial No. N4129.

Walsh, S.J. & E.B. Colbourne (2007). Investigating the Effects of Variation in Surplus Production, Stock Biomass, Catch and Climate on the Grand Bank Yellowtail Flounder Population. NAFO SCR Doc. 07/43. Serial No. N5395.

Walsh, S.J. & M.J. Morgan (1999). Variation in Maturation of Yellowtail Flounder (Pleuronectes Ferruginea) on the Grand Bank. J. Northw. Atl. Fish. Sci. 25: 47–59.

Principle 3 References

Atlantic Fishery Regulations, 1985. http://laws-lois.justice.gc.ca/eng/regulations/sor-86-21/index.html

Canadian Constitution Act, 1867. https://laws-lois.justice.gc.ca/eng/const/page-1.html

Canadian Fisheries Act 1985. http://laws-lois.justice.gc.ca/PDF/F-14.pdf

DFO 1992, The Aboriginal Fisheries Strategy. http://www.dfo-mpo.gc.ca/fm-gp/aboriginal-autochtones/afs-srapa-eng.htm

DFO 1992. The Aboriginal Fisheries Strategy http://www.dfo-mpo.gc.ca/fm-gp/aboriginal-autochtones/afs-srapa-eng.htm

DFO 2004. Atlantic Fisheries Policy Review http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/afpr-rppa/framework-cadre-eng.htm

DFO 2008. The Emerging Species Policy http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/efp-pnp-eng.htm

DFO 2009. A Fishery Decision-Making Framework Incorporating the Precautionary Approach http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/precaution-back-fiche-eng.htm

DFO 2009a Sustainable Fisheries Framework (2009) http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm

DFO 2009b. Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/benthi-back-fiche-eng.htm

DFO 2013, 2+3KLMNO Groundfish Advisory Committee (GAC), Terms of Reference

DFO 2017, Corporate Management and Reporting – Management Action Plan http://www.dfo-mpo.gc.ca/ae-ve/audits-verifications/16-17/map-eng.html

DFO 2018, 2+3KLMNO Groundfish Advisory Committee Meeting, 17-18th April 2018, St. John's

DFO 2019, 2+3KLMNO Groundfish Advisory Committee (GAC), Terms of Reference

DFO, 2019 Integrated Fisheries Management Plan for Groundfish Species – Northwest Atlantic Fisheries Organisation (NAFO) Divisions 2+3KLMNO http://www.dfo-mpo.gc.ca/fisheries-peches/ifmp-gmp/groundfish-poisson-fond/2019/groundfish-poisson-fond-2_3klmno-eng.htm

DFO consultation on a minor fisheries offence ticketing system http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/comm/ticketing-contraventions/propose-eng.htm

DFO consultations website - http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/comm/consultation-eng.htm

FAO Code of Conduct for Responsible Fisheries (1995) http://www.fao.org/docrep/005/v9878e/v9878e00.HTM

Fishery (General) Regulations, 1993. http://laws-lois.justice.gc.ca/PDF/SOR-93-53.pdf

Larocque Decision http://www.fishharvesterspecheurs.ca/system/files/products/Court-LarocqueDecisionSupremeCourt-Bilingual.pdf

Marshall Decision https://www.aadnc-aandc.gc.ca/eng/1100100028614/1100100028615

NAFO 2011, Performance Assessment Review, https://www.nafo.int/Portals/0/PDFs/Performance/PAR-2011.pdf

NAFO 2017. Convention on Cooperation in the Northwest Atlantic Fisheries https://www.nafo.int/Portals/0/PDFs/key-publications/NAFOConvention-2017.pdf

NAFO 2018 the "NAFO Rules of Procedure and Financial Regulations" https://www.nafo.int/Portals/0/PDFs/key-publications/Rules-Finance-2018.pdf

NAFO 2018a, Report of the Commission, 17-21 September 2018 https://www.nafo.int/Portals/0/PDFs/com/2018/comdoc18-28.pdf

NAFO 2018b, Report of the NAFO Performance Review Panel 2018 https://www.nafo.int/Portals/0/PDFs/Performance/NAFOPerformanceReviewPanelRpt2018.pdf

NAFO 2018c. "NAFO Rules of Procedure and Financial Regulations" https://www.nafo.int/Portals/0/PDFs/key-publications/Rules-Finance-2018.pdf

NAFO 2018d. NAFO COM Doc. 18-19 Serial no. N6876 . https://www.nafo.int/Portals/0/PDFs/COM/2018/comdoc18-19.pdf

NAFO 2018e. NAFO COM Doc.19-01 Serial No. N6901 https://www.nafo.int/Portals/0/PDFs/COM/2019/comdoc19-01.pdf

NAFO 2018f. NAFO Annual Report 2017 https://www.nafo.int/Library/Publications/Annual-Report

NAFO Ecosystem Approach https://www.nafo.int/Science/Frameworks/Ecosystem-Approach

NAFO Precautionary Approach Framework (PAF) https://www.nafo.int/Science/NAFO-Frameworks/NAFO-Precautionary-Approach

NAFO SCR Doc. 18/038 https://www.nafo.int/Portals/0/PDFs/sc/2018/scr18-038.pdf

NAFO, 2017. Convention on Cooperation in the Northwest Atlantic Fisheries https://www.nafo.int/Portals/0/PDFs/key-publications/NAFOConvention-2017.pdf

NAFO, 2017. Convention on Cooperation in the Northwest Atlantic Fisheries https://www.nafo.int/Portals/0/PDFs/key-publications/NAFOConvention-2017.pdf

Northwest Atlantic Fisheries Organization (NAFO) website https://www.nafo.int

Nunavik Inuit Land Claims Agreement Act 2006 –https://laws-lois.justice.gc.ca/eng/acts/N-28.5/index.html

Nunavut Land Claims Agreement Act https://laws-lois.justice.gc.ca/eng/acts/n-28.7/

Oceans Act (1996) http://laws-lois.justice.gc.ca/PDF/O-2.4.pdf

Oceans Act 1996. http://laws-lois.justice.gc.ca/PDF/O-2.4.pdf

Sparrow Decision https://scc-csc.lexum.com/scc-csc/scc-csc/en/item/609/index.do

Species at Risk Act 2002. http://laws-lois.justice.gc.ca/PDF/S-15.3.pdf

The Federal Courts Act (1985) http://laws-lois.justice.gc.ca/eng/acts/F-7/

United Nations Convention on the Law of the Sea (UNCLOS) (1982)
http://www.un.org/Depts/los/convention_agreements/texts/unclos/unclos_e.pdf

United Nations Fisheries Agreement (UNFA) (1995)
http://www.un.org/depts/los/convention_agreements/convention_overview_fish_stocks.htm