Northwest Atlantic Fisheries Organization

Serial No. N7391 **NAFO SCS Doc. 23/12**

SCIENTIFIC COUNCIL MEETING – June 2023

Canadian Research Report for 2022

Compiled by Katherine Skanes and Mark Simpson

A. STATUS OF FISHERIES

Nominal landings from 2017 to 2022 for fish stocks are listed in Table 1. Length sampling information is available in all other tables. Additional information on the status of the fisheries is as follows:

A.1 SUBAREA 2

American plaice–Subarea 2 + Division 3K

The Div. 2+3K American plaice stock was closed to directed commercial fishing in 1994. An LRP was established in 2012, and the status of the stock was updated in 2020. The stock remains below the LRP, in the critical zone of the Canadian PA framework. Preliminary Canadian landings of this species were 16 t in 2022 and averaged 4 t during the period 2018 to 2021.

Tables 2 - 5 show the total catch length distributions for Divs. 2+3K were available from 5 samples with a total of 427 measured individuals. Lengths varied from 12 cm to 50 cm with a mean of 28.69 cm.

Atlantic cod–Divisions 2GH, Divisions 2J3KL

Although the Atlantic cod stock in Div. 2GH has been under a moratorium on directed fishing since 1996, there has been no reported catch since 1993. Bycatch of cod occurs in shrimp fisheries in 2GH and from 2004-2009 estimates of bycatch have ranged between 250 kg to 5,200 kg annually (Orr et al. 2010). More recent data have not been compiled.

The Div. 2J3KL Atlantic cod stock was closed to directed commercial fishing in 1992 but has been subjected to ongoing stewardship and recreational fisheries in the inshore since 2006. Preliminary Canadian landings of this species were 12,408 t in 2022 and averaged 10,232 t during the period 2018 to 2021. This stock was last assessed in 2021 and is currently below its established LRP and is considered to be within the Critical Zone of the Canadian Precautionary Approach (PA) framework.

Tables 9 - 13 show the total catches. Length distributions for Divs 2J3KL cod were available from 92 samples with a total of 20,297 measured individuals. Lengths varied from 12 cm to 228 cm with a mean of 58.46 cm.

There are no direct estimates of recreational landings for the majority of the past 10 years; therefore reported landings are less than total catch in those years. Evidence from tagging data has shown that, although removals by the recreational fishery have been substantial in some years since 1997, they had been about 25% for several years up to 2021. There was no update for recreational landings in 2022.

Atlantic salmon–Subarea 2

The commercial fishery for Atlantic salmon in Subarea 2 has remained closed since 1998. Estimates of recreational catches for Newfoundland and Labrador have been highly variable since 2005 (total catch range of 31,050 to 68,663 salmon). Preliminary estimates or recreational Atlantic salmon catch for Subarea 2 in 2022 are 952 retained and 5,314 released salmon. 12% and 15% below the previous generation average (2015-2021), respectively. Estimated Labrador Aboriginal and subsistence fisheries harvest was inferred from logbook returns (63% return rate) at 14,165 salmon in 2022 (9,130 small and 5,035 large), which was 5% above the previous generation average (2015-2021) of 13,441 salmon. In 2022, two of four assessed rivers in Subarea 2 were above the upper stock reference point (healthy zone), one was below the limit reference point (critical zone), and one fell between the two reference points (cautious zone).

Greenland halibut-Subarea 2 + Divisions 3KLMNO

Preliminary landings for the Subarea 2 + Divisions 3KLMNO Greenland halibut stock were 5,570 t in 2022 and averaged 5,576 t during the period 2018 to 2021.

Tables 17 - 22 show the total catches. Length distributions for Divs. Subarea 2 + Divisions 3KLMNO Greenland halibut were available from 73 samples with a total of 17,981 measured individuals. Lengths varied from 10 cm to 98 cm with a mean of 46.58 cm.

Iceland scallop–Divisions 2HJ

Preliminary Canadian landings for the Divs. 2HJ Iceland scallop stock were 7 t in 2022 and averaged 18 t during the period 2018 to 2021.

Northern shrimp–Subarea 2 + Division 3K

The Northern shrimp (*Pandalus borealis*) fishery in Subarea 2 and the northern portion of Subarea 3 is divided into three management areas, each referred to as a shrimp fishing area (SFA): 2G (SFA 4), Hopedale and Cartwright Channels in 2HJ (SFA 5), and Hawke Channel in 2J3K (SFA 6).

SFA 4 (NAFO Division 2G)

Preliminary Canadian landings for the SFA 4 shrimp stock were 8,580 t in 2022 and averaged 10,164 t during the period 2018 to 2021.

SFA 5 (Hopedale and Cartwright Channels)

Preliminary Canadian landings for the SFA 5 shrimp stock were 11,035 t in 2022 and averaged 16,171 t during the period 2018 to 2021.

SFA 6 (Hawke Channel + NAFO Division 3K)

Preliminary Canadian landings for the SFA 6 shrimp stock were 21,196 t in 2022 and averaged 7,623 t during the period 2018 to 2021.

Redfish–Subarea 2 + Division 3K

The Div. 2+3K redfish stock remains under moratorium. Preliminary Canadian landings of this species were 8 t in 2022 and averaged 7 t during the period 2017 to 2021.

In the absence of a limit reference point (LRP) it was not possible to determine the zone within the Canadian Precautionary Approach (PA) framework that this stock currently resides in.

Tables 23 & 24 show the total catches. Length distributions for Divs. 2+3K redfish were available from 13 samples with a total of 2,755 measured individuals. Lengths varied from 5 cm to 22 cm with a mean of 10.95 cm.

Snow crab–Divisions 2HJ

Preliminary Canadian landings for the Divs. 2HJ snow crab stock were 890 t in 2022 and averaged 1,518 t during the period 2018 to 2021.

Size-at-terminal molt in males has precipitously declined in recent years and the maturation of 50% of males has been well below exploitable size. Due to the absence of a trawl survey in 2022, the male size-at-terminal molt could not be updated. However, a continuation of this trend could dampen short-term recruitment prospects.

Squid–Subarea 2+3

Preliminary Canadian landings for the Subarea 2+3 squid stock were 31 t in 2022 and averaged 4,375 t during the period 2018 to 2021.

Witch flounder-Divisions 2J3KL

The Div. 2J3KL witch flounder stock has been under moratorium since 1994; it is currently below its established LRP and is considered to be within the Critical Zone of the Canadian Precautionary Approach (PA) framework. Preliminary Canadian landings of this species were 111 t in 2022 and averaged 102 t during the period 2018 to 2021.

Length frequencies were not available for this stock.

A.2 SUBAREA 3

American plaice–Divisions 3LNO

The Div. 3LNO American plaice stock remains under moratorium. Preliminary Canadian landings of this species were 441 t in 2022 and averaged 524 t during the period 2018 to 2021.

Tables 6 - 8 show the total catches. Length distributions for Divs. 3LNO American plaice were available from 35 samples with a total of 7,577 measured individuals. Lengths varied from 12 cm to 70 cm with a mean of 40.74 cm.

American plaice-Subdivision 3Ps

Preliminary Canadian landings for the Subdiv. 3Ps American plaice stock were 12 t in 2022 and averaged 76 t during the period 2018 to 2021.

Length frequencies were not available for this stock.

Atlantic cod–Divisions 3NO

The Div. 3NO Atlantic cod stock remains under moratorium. Preliminary Canadian landings of this species were 98 t in 2022 and averaged 108 t during the period 2018 to 2021, taken primarily in the yellowtail flounder fishery.

This stock is currently below the established spawning stock biomass limit reference point and is considered to be in the Critical Zone.

Tables 14 & 15 show the total catches. Length distributions for Divs. 3NO cod were available from 31 samples with a total of 374 measured individuals. Lengths varied from 15 cm to 135 cm with a mean of 61.84 cm.

Atlantic cod-Subdivision 3Ps

Preliminary Canadian landings for the Subdiv. 3Ps Atlantic cod stock were 844 t in 2022 and averaged 2,668 t during the period 2018 to 2021.

A new state-space model was accepted for the provision of advice in 2019 and the limit reference point was revised. It was determined that this stock was below the limit reference point (LRP) and therefore within the Critical Zone of the Canadian Precautionary Approach (PA) framework.

Table 16 shows the total catches. Length distributions for Subdiv. 3Ps cod were available from 17 samples with a total of 4,358 measured individuals. Lengths varied from 42 cm to 123 cm with a mean of 64.31 cm.

Atlantic salmon-Subarea 3

The commercial fishery for Atlantic salmon in Subarea 3 has remained closed since 1992. Estimates of recreational catches for Newfoundland and Labrador have been highly variable since 2005 (total catch range of 31,050 to 68,663 salmon). Preliminary estimates of recreational Atlantic salmon catch in Subarea 3 and Division 4R in 2022 are 17,078 retained and 21,635 released salmon, 2% and 29% below the previous generation average (2016-2021_, respectively. Of the eleven rivers assessed in Subarea 3 in 2022, seven were below their limit reference point (critical zone), three were above their upper stock reference point (healthy zone), and one fell between the two reference points (cautious zone).

Capelin–2+3KL

There was no 2022 capelin fishery in Subarea 2 + Div. 3KL.

Iceland scallop–Divisions 3LNO and Subdivision 3Ps

Preliminary Canadian landings for the Divs. 3LNO Iceland scallop stock were 0 t in 2022 and averaged 0 t during the period 2018 to 2021.

Preliminary Canadian landings for the Divs. 3Ps Iceland scallop stock were 5 t in 2022 and averaged 30 t during the period 2018 to 2021.

Redfish – Divisions 3LN

Preliminary Canadian landings for the Divs. 3LN redfish stock were 1,472 t in 2022 and averaged 2,852 t during the period 2018 to 2021.

Table 25 show the total catches, there were no length data available from Div. 3N. Length distributions for Divs. 3LN redfish were available from 59 samples with a total of 14,024 measured individuals. Lengths varied from 14 cm to 72 cm with a mean of 32.26 cm.

Redfish – Division 3O

Preliminary Canadian landings for the Divs. 3O redfish stock were 44 t in 2022 and averaged 279 t during the period 2018 to 2021.

Length frequencies were not available for this stock.

Redfish–Unit 2 (3Ps4Vs, 3Pn4Vn-June to December, 4Wfgi)

Preliminary Canadian landings for the Unit 2 redfish stock were 1,592 t in 2022 and averaged 3,276 t during the period 2018 to 2021.

Tables 26 & 27 shows the total catches. Length distributions for Unit 2 redfish were available from 10 samples with a total of 2,751 measured individuals. Lengths varied from 19 cm to 40 cm with a mean of 26.19 cm. Note these length frequencies are only from Newfoundland and Labrador landings.

Sea scallop–Division 3KLNO

Preliminary Canadian landings for the Divs. 3KLNO sea scallop stock were 4 t in 2022 and averaged 1 t during the period 2018 to 2021.

Sea scallop–Subdivision 3Ps

Preliminary Canadian landings for the Divs. 3Ps sea scallop stock were 1,032 t in 2022 and averaged 798 t during the period 2018 to 2021.

The abundance in the inshore (north bed) is currently dominated by a modal group of scallop 75 mm while in the offshore (south and middle beds) the modal group is 120mm and 130mm.

Northern shrimp–Divisions 3LNO

There has been no directed fishing for Northern Shrimp in Divs. 3LNO since 2015. Preliminary Canadian landings for the Divs. 3LNO Northern shrimp stock were 0 t in 2022 and averaged 0 t during the period 2018 to 2021.

Snow crab–Divisions 3KLNO and Subdivision 3Ps

Preliminary Canadian landings for the Divs. 3KLNO snow crab stock were 40,734 t in 2022 and averaged 12,654 t during the period 2018 to 2021.

Due to the absence of a trawl survey in 2022, the male size-at-terminal molt could not be updated.

Preliminary Canadian landings for the Divs. 3Ps snow crab stock were 7,713 t in 2022 and averaged 3,300 t during the period 2018 to 2021.

Thorny skate–Divisions 3LNO and Subdivision 3Ps

Commercial catches of skates comprise a mix of skate species, however Thorny skate dominates the catch. Preliminary Canadian landings for the Divs. 3LNO thorny skate stock were 1 t in 2022 and averaged 5 t during the period 2018 to 2021.

Table 28 show the total catches; there were no length frequency data available from Divs. 3LN. Length distributions for Divs. 3LNO thorny skate were available from 1 samples with a total of 64 measured individuals. Lengths varied from 27 cm to 90 cm with a mean of 54.94 cm.

Preliminary Canadian landings for the Subdiv. 3Ps thorny skate stock were 219 t in 2022 and averaged 708 t during the period 2018 to 2021.

Length frequencies were not available for this stock.

White hake–Divisions 3NO and Subdivision 3Ps

Preliminary Canadian landings for the Divs. 3NO white hake stock were 66 t in 2022 and averaged 122 t during the period 2018 to 2021.

Length frequencies were not available for this stock.

Preliminary Canadian landings for the Subdiv. 3Ps white hake stock were 58 t in 2022 and averaged 173 t during the period 2018 to 2021.

Table 29 shows the total catches. Length distributions for Subdiv. 3Ps white hake were available from 1 samples with a total of 186 measured individuals. Lengths varied from 54 cm to 105 cm with a mean of 76.19 cm.

Witch flounder-Divisions 3NO

Preliminary Canadian landings for the Divs. 3NO witch flounder stock were 362 t in 2022 and averaged 443 t during the period 2018 to 2021.

Table 30 show the total catches; there were no length data available from Div. 3N. Length distributions for Divs. 3NO witch flounder were available from 21 samples with a total of 5,193 measured individuals. Lengths varied from 32 cm to 56 cm with a mean of 42.54 cm.

Witch flounder-Subdivision 3Ps

Preliminary Canadian landings for the Subdiv. 3Ps witch flounder stock were 38 t in 2022 and averaged 234 t during the period 2018 to 2021.

An interim limit reference point was adopted in 2017, and the stock is currently above the LRP, as defined by the Canadian Precautionary Approach (PA) framework.

Table 31 shows the total catches. Length distributions for Subdiv. 3Ps witch flounder were available from 2 samples with a total of 549 measured individuals. Lengths varied from 36 cm to 52 cm with a mean of 43.5 cm.

Yellowtail flounder–Divisions 3LNO

Preliminary Canadian landings for the Divs. 3LNO yellowtail flounder stock were 10,024 t in 2022 and averaged 11,463 t during the period 2018 to 2021.

An interim limit reference point was adopted in 2017, and the stock is currently above the LRP, as defined by the Canadian Precautionary Approach (PA) framework.

Tables 32 & 33 show the total catches. Length distributions for Divs. 3LNO yellowtail flounder were available from 245 samples with a total of 63,101 measured individuals. Lengths varied from 12 cm to 56 cm with a mean of 37.13 cm.

A.3 SUBAREA 4

Atlantic salmon–Subarea 4

The commercial fishery for Atlantic salmon in Subarea 3 has remained closed since 1992. Estimates of recreational catches for Newfoundland and Labrador have been highly variable since 2005 (total catch range of 31,050 to 68,663 salmon). Preliminary estimates of recreational Atlantic salmon catch in Subarea 3 and Division 4R in 2022 are 17,078 retained and 21,635 released salmon, 2% and 29% below the previous generation average (2016-2021_, respectively. Of the four Newfoundland rivers assessed in Subarea 4 in 2022, two were above their upper stock reference point (healthy zone) and two were below their limit reference point (critical zone).

Iceland scallop–Div. 4R

Preliminary Canadian landings for the Div. 4R Iceland scallop stock were 43 t in 2022 and averaged 72 t during the period 2018 to 2021.

Sea scallop–Div. 4R

Preliminary Canadian landings for the Div. 4R sea scallop stock were 0 t in 2022 and averaged 6 t during the period 2018 to 2021.

Snow crab–Div. 4R

Preliminary Canadian landings for the Div. 4R snow crab stock were 488 t in 2022 and averaged 249 t during the period 2018 to 2021.

B. SPECIAL RESEARCH STUDIES

Environmental Studies

The Atlantic Zonal Monitoring Program (AZMP) initiated in 1998 continued during 2022. This program was established to include biological and chemical oceanographic sampling at a high-frequency coastal monitoring station (S27) and along cross-shelf oceanographic sections sampled at biweekly to seasonal time scales during ice-free period. The main objectives are to establish the seasonal, temporal, and spatial distribution and abundance of nutrients, phytoplankton pigments, and zooplankton in relation to the physical environment. Monitored variables include temperature, salinity, dissolved oxygen, ocean currents, spring phytoplankton bloom metrics, nutrients concentration, chlorophyll biomass, and mesozooplankton abundance, biomass and community composition. Additional physical oceanographic observations are also routinely collected during

marine resource assessments and research surveys. The oceanographic monitoring program currently conducted on the Newfoundland and Labrador Region aims at understanding the changes in the ecosystem structure and productivity over time. Data from this effort are used to produce annual reports on the physical and biogeochemical state of the ocean and other studies relating environmental conditions to marine resources. While the summer mission did not occur due to ship limitations, the spring and summer missions were successful. During the spring survey, 5 hydrographic sections were completed (SWSPB, SESPB, SEGB, FC and BB). During the fall survey, 4 sections were completed (SEGB, FC, BB and SI). In addition, the high-frequency monitoring station S27 was occupied 33 times between January and November.

Physical Environment

The winter North Atlantic Oscillation (NAO) index, a key indicator of the direction and intensity of the winter wind field patterns over the Northwest Atlantic back to positive value after being negative for the first time in 8 years in 2021. Despite a relatively cold winter in the Northern part of the convention area driven by the positive winter NAO, the large majority of the environmental parameters presented in this report were above normal (defined as the average over the 1991-2020 climatological period). The air temperatures across the NW Atlantic were above normal in all regions, with 2022 being the fifth warmest year on record. The sea-ice season volume and area across the Newfoundland and Labrador shelf was normal. Sea surface temperatures averaged over the ice-free months established a warm record warm. Spatially-averaged bottom temperatures in NAFO divisions 3Ps (spring) and 2J3K (fall) were at their third warmest since 1980, but including a record warm in 3Ps. There were no CIL metrics measured during the summer due to limited ship availability. The transport on the Scotian Slope in 2021 remained negative for a ninth consecutive year.

Nutrients and Plankton Studies

Spatiotemporal variability in biogeochemical indices are derived from satellite observations (spring phytoplankton bloom initiation, duration and magnitude) and from in situ measurement of oceanographic variables (nitrate and chlorophyll-a concentration, and zooplankton abundance and biomass) across NAFO Subareas 2, 3 and 4. These indices were updated using 2022 data. The initiation of the spring phytoplankton bloom was earlier than normal in the Gulf of St. Lawrence and on the Scotian Shelf, later than normal on the Grand Bank and the Flemish Cap, and near normal elsewhere. Nitrate inventories increased from near normal to above normal and were at their highest level since 2015, while chlorophyll a inventories remained near normal for a 2nd consecutive year. The decrease in total copepod abundance from above normal to near normal was mainly driven by a decrease in small copepod taxa such as *Pseudocalanus spp*., which was at its lowest level since 2012. A similar decrease in total zooplankton biomass from above normal to near normal was driven by a decline in the abundance of the large and energy-rich *Calanus finmarchicus* copepods which was at its lowest level since 2015.

Biological Studies

Multispecies Trawl Surveys

The NL Region has two new offshore research survey vessels for which conversion factors will need to be developed for many commercial species. In 2022, the annual spring survey was impacted by time constraints largely due to mechanical issues with the primary survey platform (CCGS Alfred Needler). The CCGS John Cabot was used to complete the survey in Subdiv. 3Ps and in Div. 3NO at a reduced allocation. This vessel is not yet converted, so survey indices are not available at this time.

In addition, to a comparative fishing program occurred for a limited portion of Sudiv 3Ps and Div. 3N. Coverage of the Div. 3L survey area was insufficient to provide spring survey indices. The autumn 2022 survey was not undertaken. Instead, the NL Region decided to conduct a targeted comparative fishing program in order to collect sufficient data to develop conversion factors between the outgoing and new research vessels. For further details see Wheeland and Rideout (2023).

During a standard survey and depending upon the species, sampling occurs for length, age, growth, maturity stage, condition and stomach contents analyses. In addition, sampling for lengths and weights were conducted on a suite of other species to support ecosystem monitoring. Analysis of maturity data is conducted regularly on Atlantic cod, American plaice, Greenland halibut, yellowtail flounder and other species and are presented to the annual meeting of NAFO Scientific Council during assessments of cod in Div. 3NO, American plaice in Div. 3LNO, yellowtail flounder in Div. 3LNO, Greenland halibut in SA2+Div. 3KLMNO when required and when data are available. For further details see Rideout et al. (2022).

Sentinel Studies

The Sentinel Survey of Atlantic cod (*Gadus morhua*) has been conducted in NAFO Subdivision 3Ps and Divs. 3Pn4Rs since 1994, and Divs. 2J3KL since 1995. Data collected and analyses were tabled at the Regional Stock Assessment in the spring 2021 for Divs. 2J3KL Atlantic Cod, and in the fall 2021 for Subdiv. 3Ps Atlantic Cod; there were no assessments of these stocks in 2022. The objectives of the program are: the use of Atlantic Cod catch rates to develop indices of relative abundance for resource assessments; to incorporate knowledge of inshore fish harvesters in the resource assessment process; to evaluate inter-annual variability in resource distribution over inshore areas; and to collect information on key biological parameters used in assessments (e.g. fish length, sex, and otoliths to determine fish age), as well as biological samples used for genetic, physiological, and toxicological analyses, along with stomach contents for food and feeding studies. Trends in the standardized catch rate for gillnet and linetrawl in Subdiv. 3Ps (both control and experimental sites) were similar. Catch rates were highest at the beginning of the time-series, declined sharply after 1997 and remained near or below the historical mean catch rate for gillnet, but increased steadily in 2019 and 2020 for linetrawl. Standardized catch rate for gillnet in Divs. 2J3KL (both control and experimental sites) were higher at the beginning of the time-series, declined rapidly to their lowest values in 2002, then increased and peaked in 2014 before declining once more between 2015-2020. The model fit for linetrawl catch rate was questionable and not considered in further analyses.

Cod Tagging and Telemetry

Ongoing mark-recapture studies continued in 2022, with 3165cod tagged and released with Floy tags in Div. 2J3KL and 2064 in Div. 3Ps. This tagging effort is consistent with annual average over the last decade. This tagging program provides critical information on mortality to the Northern Cod Assessment Model and an estimate of the recreational fishery catch for NAFO Div 2J3KL. In addition to the mark-recapture tagging program, acoustic telemetry studies have been carried out in the region since 2005 providing information on cod movement and survival. In 2022, 421 Atlantic cod were tagged with acoustic transmitters in Div. 3KL and 81 in 3Ps. Due to the long battery life of these transmitters, there are approximately total of 1100 Atlantic cod carrying active transmitters in Newfoundland and Labrador waters. DFO-NL Groundfish and partners maintain a network of 184 active acoustic receivers in the region. This network of receivers includes 120 stations in 2J3KL (25 inshore, 75 offshore) and 51 in 3Ps (31 inshore, 20 offshore).

Capelin

The spring acoustic offshore 3L capelin survey targets the primary area of distribution of the age 2 (non-migratory) portion of the capelin stock and produces abundance and biomass indices. In 2022, the spring acoustic survey was completed and monitoring of beach spawning of capelin was conducted through logbook recordings by citizen scientists and researchers at a number of beaches around the province of Newfoundland, biological samples were collected at various sites. Recently emerged larvae into the Bellevue Beach inshore area of Trinity Bay (Div. 3L) were monitored in July and August 2022. Larval surveys were also conducted in August and September 2022 in Trinity Bay to map capelin larval abundance and dispersal in the Bay. In 2022, acoustic data was collected during the fall comparative fishing surveys in Divs. 2J3KL, along with enhanced sampling of the biology and feeding of forage fishes. Analysis of acoustic data is ongoing.

Squid

A new 3-year research project related to Northern Shortfin Squid was initiated in 2022 (funding provided by Genomics Research and Development Initiative – GDRI and Canadian Scientific Research Fund – CSRF). This project aims to employ new methods (i.e., online surveys, dockside visits, commercial index harvesters, and detailed fishery sampling) to enhance our understanding of the spatio-temporal dynamics of effort, catch, and catch composition in fisheries throughout Atlantic Canada, and use genomic techniques to provide insights into squid stock structure throughout their range. In addition, a species distribution model based on survey trawl data from throughout Atlantic Canada remains in development.

Snow crab

A trap survey for snow crab was conducted in the northern portion of Div. 2J and Div. 2H in the summers of 2013-2022. The surveys, conducted by the Torngat Joint Fisheries Secretariat with in-kind support from DFO, were performed to quantify the distribution and abundance of commercial-sized males in the Nunatsiavut Settlement Area. The survey covered areas to the north, west, and south of the Makkovik Bank. Small-meshed pots were also incorporated into the study to capture females and small males. DFO trap surveys in Fortune Bay (3Ps), St. Mary's Bay (3L), Trinity Bay (3L), Bonavista Bay (3L), Conception Bay (3L), White Bay (3K), and Notre Dame Bay (3K), were continued in 2022. These surveys collect information on biological and population parameters and are used in annual assessments of snow crab. The surveys have also been used for past and on-going monitoring and research into the incidence and impacts of Bitter Crab Disease (BCD), as well as sperm limitation in NL snow crab . A post-season trap survey, conducted by snow crab harvesters, which began throughout most of 2J3KLNOPs4R in 2004 was continued in 2022. These surveys have expanded in spatial scale since 2018 and now cover both a horizontally and vertically broader area of the continental shelf than the historic design. The frequency of small-mesh pots in this survey has also increased since 2018, with near full coverage of the 1250 allocated stations having a small-mesh pot included in 2022. All trap survey series, as well as the multispecies trawl surveys, are integral components of the annual stock assessment and are used to monitor present biomass along with recruitment prospects, mortality, and reproductive capacity of the stock.

Northern shrimp

A new deep learning (AI) model is being developed in collaboration with industry representatives to assess and project Northern Shrimp stock abundance/biomass across the majority of its range from the Eastern Arctic through to the Grand Banks (Shrimp Fishing Areas 0-7). Preliminary genomics research demonstrates localized genetically-distinct pools that may be linked to smaller-

scale oceanographic profiles (i.e., gyres) (PANOMICS project). Those results were compared to those of larval dispersal patterns from biophysical simulations and showed similar large-scale population divergence over the Northwest Atlantic, but further research is needed to better understand localized genetically-distinct pools.

References

Orr, D., P. Veitch, D. Sullivan, J. Firth, C. Peters and T. Inkpen. 2010. Groundfish by-catch within the northern shrimp fishery off the eastern coasts of Newfoundland and Labrador over the years 2007-2009. NAFO SCR Doc. 2010/045 Serial No. N5813 53 p.

Rideout, R.M. B. Rogers, L. Wheeland and M. Koen-Alonso. 2022. Temporal And Spatial Coverage Of Canadian (Newfoundland And Labrador Region) Spring And Autumn Multi-Species RV Bottom Trawl Surveys, With An Emphasis On Surveys Conducted In 2021. NAFO SCR Doc. 22/007, Ser. No. N7271.

Wheeland, L. and R. Rideout. 2023 (NAFO DOCUMENT TO BE ADDED)

Tables

Table 1. Summary of preliminary catches (t) for stocks within the DFO, Newfoundland and Labrador Region. This table presents Newfoundland and Labrador and DFO Maritimes landings combined. Catches are totaled for a Jan 01- Dec 31 calendar year.

Species	Stock	2017	2018	2019	2020	2021	2022
American plaice	2+3K	3	11	0	1	6	16
	3LNO	226	464	633	448	551	441
	3Ps	207	132	99	58	17	12
Atlantic cod	2GH	0	0	0	0	0	0
	2J3KL	12,781	9,448	10,452	10,153	10,876	12,408
	3NO	287	119	130	83	98	98
	3Ps	5,800	4,495	3,397	2,025	753	844
Capelin	2J3KL	19,917	19,840	19,509	16,109	13,945	--
	3NO	0	0	0	0	0	0
Greenland halibut	2+3KLMNO	5,361	6,071	6,065	5,575	4,593	5,570
Haddock	3LNO	228	28	73	10	10	20
	3Ps	334	188	168	70	47	23
Iceland scallop	2HJ	5	6	6	34	25	7
	3LNO	0	0	0	0	0	0
	3Ps	527	53	51	0	15	5
	4R	115	140	48	24	76	43
Lobster	3K	77	82	116	136	175	301
	3L	95	102	163	125	145	186
	3PN	162	216	297	356	440	332
	3Ps	1,088	1,263	1,572	1,750	1,601	1,490
	4R	1,488	1,756	2,511	2,549	2,623	3,743
Pollock	3LNO	1	11	0	--	0	0
	3Ps	580	280	119	79	66	42

Species	Stock	2017	2018	2019	2020	2021	2022
Redfish	2+3K	104	9	4	4	11	8
	3LN	4,177	4,536	2,982	1,518	2,373	1,472
	3O	59	80	212	467	358	44
	Unit 2	1,203	1,734	2,410	3,742	5,219	1,592
Roughhead grenadier	2HJK	1	0	0	3	7	4
	3LNO	1	0	0	0	0	0
Sea scallop	3KLNO	0	1	0	0	4	4
	3Ps	846	414	924	909	946	1,032
	4R	10	6	3	7	9	0
Shrimp	3L	0	0	0	0	0	0
	3M	0	0	0	0	795	0
	SFA 4	16,439	15,697	11,232	7,526	6,200	8,580
	SFA 5	26,102	23,257	23,440	10,587	7,399	11,035
	SFA 6	10,065	8,702	8,638	4,683	8,470	21,196
Snow crab	2HJ	1,758	1,753	1,768	1,372	1,180	890
	3K	5,509	5,984	6,047	6,541	7,554	9,813
	3LNO	23,230	17,787	15,583	17,786	23,951	30,921
	3P	1,173	2,082	2,789	3,249	5,079	7,713
	4R	524	302	186	196	313	488
Squid	2+3	313	1,322	2,540	3,088	10,551	31
Thorny skate	3LNO	6	2	7	4	7	1
	3Ps	413	916	891	487	536	219
White hake	3LNO	557	57	159	148	125	66
	3Ps	239	277	186	116	114	58
Witch flounder	2J3KL	98	138	35	83	151	111
	3NO	349	479	479	427	386	362
	3Ps	394	277	535	109	16	38

Species	Stock	2017	2018	2019	2020	2021	2022
Yellowtail flounder	3LNO	6,262	7,134	11,541	13,469	13,707	10,024
	3Ps	16	5	5	1	0	0

Table 2. Length composition (0/000) of American plaice from Canadian commercial landings in NAFO Division 2G in 2022.

Length	Oct	May	Jul
10	980.95	--	--
12	--	932.36	--
14	--	--	126.49
20	--	--	584.81
22	--	67.64	81.10
24	3.81	--	207.60
26	3.81	--	--
28	7.62	--	--
30	3.81	--	--
SNPT	1000	1000	1000
AL	18.8	10.7	8.3
ALMF			
AW	0.06	0.03	0.12
N	4	2	2
SLF	6	3	6

Table 3. Length composition (0/000) of American plaice from Canadian commercial landings in NAFO Division 2H in 2022.

Length	May	Dec	Jan	Oct
10	45.64	--	--	--
12	69.62	56.01	81.93	--
14	347.91	115.55	552.66	250
16	399.84	193.99	227.52	250
18	51.93	363.39	34.91	--
20	45.09	215.05	7.03	--
22	9.43	18.90	51.44	--
24	19.40	37.11	41.01	--
26	11.13	--	3.51	--
34	--	--	--	500
SNPT	1000	1000	1000	1000
AL	16.1	13.8	13.9	23
ALMF				
AW	0.03	0.02	0.02	0.16
N	3	6	4	1
SLF	36	114	250	4

Table 4. Length composition (0/000) of American plaice from Canadian commercial landings in NAFO Division 2J in 2022.

Length	Jan	Mar
12	18.18	--
16	54.55	--
18	72.73	--
20	36.36	--
22	236.36	--
24	218.18	7.49
26	218.18	7.49
28	90.91	7.49
30	36.36	37.45
32	--	44.94
34	18.18	52.44
36	--	131.09
38	--	134.83
40	--	194.76
42	--	213.48
44	--	97.38
46	--	56.18
48	--	11.24
50	--	3.74
SNPT	1000	1000
AL	21.9	37.6
ALMF		
AW	0.09	0.47
N	2	1
SLF	55	267

Table 5. Length composition (0/000) of American plaice from Canadian commercial landings in NAFO Division 3K in 2022.

Length	Feb
16	47.62
18	85.71
20	76.19
22	200.00
24	266.67
26	180.95
28	95.24
30	38.10
32	9.52
SNPT	1000
AL	21.9
ALMF	
AW	0.09
N	2
SLF	105

Table 6. Length composition (0/000) of American plaice from Canadian commercial landings in NAFO Division 3L in 2022.

Length	Mar	Feb
24	0.45	--
26	13.57	--
28	38.90	19.76
30	103.12	43.48
32	116.24	110.67
34	101.77	130.44
36	127.55	201.58
38	133.87	209.49
40	99.50	83.00
42	108.55	86.96
44	55.63	71.15
46	52.92	35.57
48	17.64	--
50	21.71	3.95
52	4.52	3.95
54	0.90	--
56	3.17	--
SNPT	1000	1000
AL	35.6	35.7
ALMF		
AW	0.4	0.45
N	1	2
SLF	253	586

Table 7. Length composition (0/000) of American plaice from Canadian commercial landings in NAFO Division 3N in 2022.

Length	Jan	May	Jun	Sep	Apr	Oct	Nov
12	2.14	--	--	--	--	--	--
14	22.08	2.55	--	--	--	--	--
16	8.70	10.20	--	--	--	--	--
18	--	6.50	--	--	--	--	--
20	--	5.10	--	--	--	--	--
22	--	10.68	0.71	3.47	--	--	--
24	--	7.65	1.55	--	--	--	--
26	10.22	47.56	3.45	12.53	2.10	--	--
28	20.57	66.99	8.65	24.31	4.21	7.96	--
30	36.03	92.76	19.94	72.92	72.17	16.50	7.93
32	15.13	168.83	42.59	160.40	63.05	27.14	25.49
34	16.40	304.89	79.13	197.57	97.35	51.56	70.10
36	27.58	327.37	132.37	230.35	135.68	83.37	130.61
38	43.34	257.66	117.76	200.42	85.89	168.63	192.90
40	78.54	180.64	120.35	174.45	79.90	320.37	272.55
42	87.07	136.96	133.39	180.62	64.21	424.13	365.88
44	106.38	130.77	109.53	255.53	51.40	391.03	338.54
46	86.00	83.30	87.81	202.22	44.42	249.50	274.22
48	124.18	70.82	73.60	137.42	67.06	113.56	190.50
50	95.49	20.03	41.02	81.31	102.81	87.50	71.62
52	72.02	40.70	12.48	30.52	27.69	32.08	27.87
54	48.40	10.62	2.37	5.63	15.06	2.62	9.66
56	14.14	4.18	2.74	13.48	22.11	10.57	9.26
58	35.09	2.79	1.89	--	34.12	2.64	3.22
60	9.85	3.94	6.05	2.25	13.84	2.64	6.44
62	12.24	2.55	0.71	1.13	14.82	2.64	1.61
64	10.10	3.94	1.89	--	2.10	--	1.61
66	11.04	--	--	--	--	5.54	--

Length	Jan	May	Jun	Sep	Apr	Oct	Nov
68	3.41	--	--	13.44	--	--	--
70	3.85	--	--	--	--	--	--
SNPT	1000	1000	1000	2000	2000	2000	2000
AL	40.2	43.2	39.2	71.7	82.3	82.1	77.6
ALMF							
AW	0.71	0.91	0.59	0.95	1.48	1.39	1.24
N	3	3	3	4	6	4	3
SLF	486	535	865	842	1416	738	668

Table 8. Length composition (0/000) of American plaice from Canadian commercial landings in NAFO Division 3O in 2022.

Length	Oct	Apr	May	Nov	Dec
26	3.04	--	--	--	--
28	15.85	26.09	--	--	--
30	16.46	52.17	3.98	--	--
32	10.97	95.65	11.95	19.23	--
34	26.82	147.83	67.73	57.69	59.11
36	42.05	208.70	123.51	84.62	64.04
38	94.43	182.61	119.52	161.54	49.26
40	99.34	104.35	147.41	200.00	68.97
42	122.44	104.35	143.43	234.62	152.71
44	148.05	60.87	143.43	180.77	167.49
46	154.17	17.39	83.67	53.85	123.15
48	118.84	--	83.67	7.69	177.34
50	75.58	--	55.78	--	108.37
52	29.29	--	11.95	--	29.56
54	16.45	--	--	--	--
56	14.02	--	--	--	--
58	4.88	--	3.98	--	--
60	4.88	--	--	--	--
62	2.44	--	--	--	--
SNPT	1000	1000	1000	1000	1000
AL	35.5	42.3	40	39	42
ALMF					
AW	0.42	0.75	0.63	0.58	0.82
N	1	1	1	1	2
SLF	115	203	251	260	359

Table 9. Length composition (0/000) of Atlantic cod from Canadian commercial landings in NAFO Division 2G in 2022.

Length	May
24	500
30	500
SNPT	1000
AL	25
ALMF	
AW	0.14
N	1
SLF	2

Table 10. Length composition (0/000) of Atlantic cod from Canadian commercial landings in NAFO Division 2H in 2022.

Length	May	Jan
12	5.03	--
15	196.80	--
18	271.72	400
21	316.38	600
24	91.62	--
27	118.44	--
SNPT	1000	1000
AL	18.4	18.1
ALMF		
AW	0.05	0.07
N	1	16
SLF	5	36

Table 11. Length composition (0/000) of Atlantic cod from Canadian commercial landings in NAFO Division 2J in 2022.

Length	Jan	Mar	Sep	Aug	Nov	Oct
12	21.06	--	--	--	--	--
15	195.74	--	--	--	--	--
18	237.86	--	--	--	--	--
21	443.78	--	--	--	--	--
24	94.56	--	--	--	--	--
27	3.53	--	--	--	--	--
33	3.46	--	--	--	--	--
39	--	109.16	--	--	--	--
42	--	--	16.26	--	--	--
45	--	147.61	28.45	0.25	--	--
48	--	258.28	208.54	1.52	23.26	51.18
51	--	46.76	166.67	5.08	62.02	94.49
54	--	179.92	179.47	18.71	112.40	145.67
57	--	258.28	181.29	70.11	131.78	181.10
60	--	--	181.67	176.26	162.79	181.10
63	--	--	270.65	251.93	178.29	114.17
66	--	--	375.27	221.56	170.54	86.61
69	--	--	253.36	146.95	89.15	59.06
72	--	--	96.31	54.02	31.01	43.31
75	--	--	14.02	21.94	15.50	19.68
78	--	--	9.35	11.37	3.88	11.81
81	--	--	9.35	7.41	3.88	7.87
84	--	--	--	4.57	11.63	--
87	--	--	4.67	4.16	--	3.94
90	--	--	4.67	2.66	--	--
93	--	--	--	0.34	3.88	--
96	--	--	--	0.92	--	--
105	--	--	--	0.25	--	--

Length	Jan	Mar	Sep	Aug	Nov	Oct
SNPT	1000	1000	1000	1000	1000	2000
AL	62.7	17.2	48.4	59.6	57.8	117.1
ALMF						
AW	2.34	0.05	0.95	1.95	1.79	4.13
N	14	2	5	1	1	2
SLF	3099	286	6	258	254	460

Table 12. Length composition (0/000) of Atlantic cod from Canadian commercial landings in NAFO Division 3K in 2022.

Length	Feb	Sep	Aug
12	63.84	--	--
15	288.34	--	--
18	148.16	--	--
21	376.13	--	--
24	112.42	--	--
27	7.98	--	--
33	3.12	--	--
39	--	1.18	--
42	--	3.54	--
45	--	13.16	2.19
48	--	26.67	2.97
51	--	123.15	4.53
54	--	184.56	42.16
57	--	216.07	116.13
60	--	302.37	318.59
63	--	273.60	450.87
66	--	262.95	345.07
69	--	215.73	283.00
72	--	148.67	189.60
75	--	90.07	114.65
78	--	59.23	54.48
81	--	34.73	34.64
84	--	14.62	10.37
87	--	6.60	10.84
90	--	8.33	8.09
93	--	5.84	3.87
96	--	2.54	3.67
99	--	0.55	--

Length	Feb	Sep	Aug
102	--	5.83	2.21
105	--	--	1.42
111	--	--	0.64
SNPT	2000	1000	2000
AL	128.2	16.6	123.2
ALMF			
AW	4.82	0.04	4.55
N	10	2	11
SLF	1723	366	2416

Table 13. Length composition (0/000) of Atlantic cod from Canadian commercial landings in NAFO Division 3L in 2022.

Length	Apr	Aug	Sep
24	45.45	--	--
39	--	0.92	2.19
42	--	2.84	6.56
45	--	2.47	15.71
48	45.45	6.56	44.93
51	90.91	15.01	92.67
54	136.36	149.88	157.64
57	45.45	351.04	198.82
60	90.91	336.88	244.43
63	90.91	368.95	315.00
66	272.73	363.03	251.66
69	90.91	339.15	223.17
72	--	265.14	145.41
75	--	228.64	74.28
78	--	196.04	64.96
81	45.45	117.64	51.08
84	--	65.40	34.52
87	45.45	52.49	21.97
90	--	39.39	26.09
93	--	28.27	10.44
96	--	21.06	8.08
99	--	11.27	4.71
102	--	5.60	1.66
105	--	6.13	1.20
108	--	2.54	0.65
111	--	--	1.33
114	--	--	0.44
117	--	0.28	0.44

Length	Apr	Aug	Sep
204	--	0.01	--
207	--	5.18	--
210	--	4.62	--
213	--	2.74	--
216	--	2.18	--
219	--	2.98	--
222	--	0.07	--
225	--	5.11	--
228	--	0.52	--
SNPT	1000	3000	2000
AL	58.8	201.4	125.5
ALMF			
AW	2.03	96.16	5.10
N	1	24	19
SLF	22	7958	3449

Table 14. Length composition (0/000) of Atlantic cod from Canadian commercial landings in NAFO Division 3N in 2022.

Length	May	Oct	Jan	Sep	Dec	Jun
15	75.61	13.15	--	--	--	--
18	75.61	--	--	--	--	--
21	75.61	26.30	4.33	--	--	--
24	78.76	26.30	16.84	--	--	--
27	--	13.15	108.41	--	--	--
30	151.22	--	87.30	--	--	--
33	75.61	--	23.57	3.90	--	--
36	250.22	26.30	--	--	--	--
39	--	13.15	--	--	--	--
42	--	67.82	6.20	--	--	--
45	--	--	18.91	--	17.86	--
48	--	92.05	21.23	25.60	--	--
51	--	98.25	--	102.39	53.57	--
54	--	96.19	34.81	80.69	--	--
57	--	146.72	22.31	76.79	17.86	--
60	--	15.22	44.01	3.90	--	--
63	--	54.67	23.69	76.79	--	366.34
66	--	65.75	28.95	106.29	17.86	--
69	--	71.95	42.24	3.90	53.57	366.34
72	--	39.45	18.89	25.60	35.71	84.16
75	78.76	41.52	38.51	55.09	17.86	--
78	--	13.15	21.52	76.79	35.71	--
81	--	26.30	43.29	76.79	53.57	--
84	--	13.15	3.11	102.39	53.57	--
87	--	13.15	12.62	25.60	89.28	183.17
90	--	13.15	--	3.90	53.57	--
93	--	--	24.69	51.20	53.57	--
96	75.61	--	22.00	51.19	53.57	--

Length	May	Oct	Jan	Sep	Dec	Jun
99	--	--	26.19	--	89.28	--
102	--	--	63.08	--	142.86	--
105	--	--	54.45	25.60	53.57	--
108	63.01	--	53.12	--	--	--
111	--	--	36.86	25.60	17.86	--
114	--	13.15	45.16	--	35.71	--
117	--	--	13.78	--	--	--
120	--	--	8.36	--	17.86	--
123	--	--	18.36	--	17.86	--
126	--	--	5.12	--	17.86	--
129	--	--	4.07	--	--	--
135	--	--	4.03	--	--	--
SNPT	1000	1000	1000	1000	1000	1000
AL	87.2	70.7	68.4	40.4	54.9	70.3
ALMF						
AW	7.89	6.57	3.33	2.28	2.07	4.02
N	1	17	2	4	2	2
SLF	56	171	6	12	74	45

Table 15. Length composition (0/000) of Atlantic cod from Canadian commercial landings in NAFO Division 3O in 2022.

Length	Oct	Jun
33	500	--
36	500	--
45	--	98.95
48	--	98.95
54	--	307.36
57	--	197.90
60	--	98.95
66	--	98.95
75	--	98.95
SNPT	1000	1000
AL	55.2	32.5
ALMF		
AW	1.63	0.29
N	2	1
SLF	8	2

Table 16. Length composition (0/000) of Atlantic cod from Canadian commercial landings in NAFO Division 3Ps in 2022.

Length	Dec	Feb	Jan	Oct	Nov
42	3.67	--	--	--	--
45	17.09	2.24	8.24	2.05	--
48	43.04	4.47	50.96	--	3.34
51	125.15	28.21	114.27	1.66	23.41
54	477.38	24.80	146.00	8.21	130.44
57	525.93	76.45	163.84	27.64	204.01
60	355.61	62.06	192.97	117.63	157.19
63	425.60	83.26	125.39	212.07	140.47
66	308.09	64.83	84.06	262.95	133.78
69	406.04	62.39	42.10	196.29	76.92
72	216.40	69.00	28.38	91.23	60.20
75	56.07	57.48	17.24	55.05	30.10
78	20.59	47.80	13.12	16.25	20.07
81	12.91	36.52	10.07	7.31	16.72
84	1.51	51.11	--	1.66	--
87	1.13	30.35	3.36	--	3.34
90	0.76	25.34	--	--	--
93	1.51	57.48	--	--	--
96	0.76	39.39	--	--	--
99	0.76	40.02	--	--	--
102	--	53.44	--	--	--
105	--	32.05	--	--	--
108	--	18.63	--	--	--
111	--	15.76	--	--	--
114	--	9.05	--	--	--
117	--	2.24	--	--	--
120	--	3.40	--	--	--
123	--	2.24	--	--	--

Length	Dec	Feb	Jan	Oct	Nov
SNPT	3000	1000	1000	1000	1000
AL	178.7	75.8	57.3	60.2	64.2
ALMF					
AW	6.06	4.61	1.73	2.01	2.41
N	9	2	2	1	3
SLF	2229	508	615	299	707

Table 17. Length composition (0/000) of Greenland halibut from Canadian commercial landings in NAFO Division 2G in 2022.

Length	Dec	Oct	May	Jun	Nov	Jul	Aug	Mar
8	0.68	4.46	--	--	--	--	--	--
10	57.78	--	4.92	--	--	--	--	--
12	0.68	13.38	179.24	100	7.92	--	--	--
14	4.24	188.06	346.64	140	106.77	283.40	--	--
16	133.09	436.50	46.34	380	261.26	145.41	139.64	9.90
18	425.88	80.31	34.18	240	256.87	251.48	95.60	39.60
20	208.95	15.10	138.15	40	124.21	261.92	345.84	425.74
22	38.85	46.33	156.40	80	15.83	23.70	183.69	445.54
24	58.87	75.85	53.87	--	132.13	34.10	235.24	79.21
26	25.84	40.16	28.09	20	55.42	--	--	--
28	22.23	53.54	6.08	--	23.75	--	--	--
30	18.67	19.56	6.08	--	15.83	--	--	--
32	3.56	13.38	--	--	--	--	--	--
34	--	13.38	--	--	--	--	--	--
38	0.68	--	--	--	--	--	--	--
SNPT	1000	1000	1000	1000	1000	1000	1000	1000
AL	18.9	17.4	15.8	15.3	19.6	15.5	17.4	16.9
ALMF								
AW	0.05	0.06	0.03	0.03	0.06	0.03	0.05	0.05
N	2	6	6	1	2	2	4	2
SLF	21	301	38	50	101	185	95	218

Table 18. Length composition (0/000) of Greenland halibut from Canadian commercial landings in NAFO Division 2H in 2022.

Length	Dec	Jan	Oct	May	Apr	Mar
8	17.68	5.37	26.92	--	--	--
10	139.87	172.68	3.85	10.86	--	--
12	4.60	465.53	53.85	47.01	12.28	--
14	34.81	45.72	161.54	128.29	303.78	--
16	180.95	31.86	238.46	262.76	326.53	50
18	370.90	83.14	153.85	333.91	261.57	--
20	99.31	102.86	42.31	137.56	88.82	500
22	19.50	62.95	100.00	49.90	7.02	450
24	38.94	11.73	130.77	10.53	--	--
26	43.12	14.06	34.62	7.64	--	--
28	24.61	3.18	26.92	6.79	--	--
30	6.96	0.17	23.08	3.40	--	--
32	12.20	--	3.85	0.68	--	--
34	4.36	--	--	0.68	--	--
36	0.65	--	--	--	--	--
38	1.53	--	--	--	--	--
40	--	0.74	--	--	--	--
SNPT	1000	1000	1000	1000	1000	1000
AL	14.7	16.1	12.7	19.2	15.8	16.9
ALMF						
AW	0.02	0.05	0.03	0.05	0.04	0.05
N	6	3	9	1	7	1
SLF	873	773	1055	20	593	260

Table 19. Length composition (0/000) of Greenland halibut from Canadian commercial landings in NAFO Division 2J in 2022.

Length	Feb	Jan	Mar	May	Apr	Jun	Sep
10	4.48	13.56	--	--	--	--	--
12	93.38	295.43	133.33	--	--	--	--
14	376.66	104.30	333.33	220.00	--	--	--
16	184.48	18.75	293.33	780.00	--	--	--
18	31.02	167.89	200.00	--	--	--	--
20	140.96	254.03	40.00	--	--	--	--
22	65.39	52.71	--	--	--	--	--
24	32.62	21.45	--	--	--	--	--
26	28.67	24.19	--	--	--	--	--
28	37.43	18.92	0.72	--	--	--	--
30	4.89	7.84	1.26	--	--	--	--
32	--	10.46	1.13	--	--	--	--
34	--	10.46	0.45	--	--	--	--
36	3.86	--	3.72	13.51	--	--	--
38	6.61	--	12.99	20.27	16.93	--	--
40	17.64	--	30.83	74.33	97.67	--	--
42	51.98	--	47.61	175.68	142.97	2.89	6.37
44	115.55	--	68.25	182.43	124.59	5.76	6.37
46	181.01	--	131.69	162.16	131.00	7.24	31.85
48	170.47	--	176.51	121.62	154.57	38.45	70.06
50	148.45	--	192.79	60.81	135.46	64.84	152.87
52	104.20	--	122.80	47.30	129.28	109.61	200.64
54	66.22	--	70.25	54.05	67.53	144.43	181.53
56	40.35	--	35.06	27.03	--	114.52	152.87
58	21.53	--	22.46	27.03	--	129.49	60.51
60	17.00	--	17.60	13.51	--	149.78	44.59
62	9.69	--	14.96	--	--	146.17	35.03
64	11.18	--	10.19	6.76	--	149.22	22.29

Length	Feb	Jan	Mar	May	Apr	Jun	Sep
66	6.39	--	8.63	6.76	--	113.33	15.92
68	0.68	--	7.37	6.76	--	106.59	6.37
70	7.42	--	3.33	--	--	82.10	--
72	3.91	--	4.83	--	--	127.84	--
74	5.61	--	3.61	--	--	101.06	3.18
76	1.82	--	1.84	--	--	132.59	3.18
78	--	--	2.69	--	--	50.76	3.18
80	4.55	--	1.02	--	--	67.05	3.18
82	2.05	--	3.31	--	--	40.21	--
84	--	--	1.57	--	--	38.48	--
86	1.82	--	0.36	--	--	33.02	--
88	--	--	--	--	--	29.55	--
90	--	--	0.16	--	--	3.56	--
92	--	--	--	--	--	8.58	--
94	--	--	--	--	--	2.89	--
SNPT	1000	2000	1000	2000	2000	2000	1000
AL	45.1	63.6	15.8	127.8	62.4	59.2	52.6
ALMF							
AW	0.79	0.94	0.04	4.98	1.1	0.82	1.28
N	10	8	3	4	9	2	1
SLF	2634	1609	344	1086	1859	298	314

Table 20. Length composition (0/000) of Greenland halibut from Canadian commercial landings in NAFO Division 3K in 2022.

Length	Feb	Jun	Jul	Aug
10	10.85	--	--	--
12	245.74	--	--	--
14	478.99	--	--	--
16	19.30	--	--	--
18	25.56	--	--	--
20	59.35	--	--	--
22	110.39	--	--	--
24	38.57	--	--	--
26	9.89	--	--	--
28	0.50	--	--	--
30	0.86	--	--	--
38	--	4.17	--	--
40	--	20.83	--	--
42	--	45.28	3.46	--
44	--	58.33	5.45	2.37
46	--	136.87	12.16	7.03
48	--	195.73	27.31	16.88
50	--	211.68	64.13	21.95
52	--	238.76	85.47	60.78
54	--	267.45	99.71	88.75
56	--	241.93	118.12	117.94
58	--	195.63	109.79	111.72
60	--	139.29	129.49	109.52
62	--	93.55	164.80	120.43
64	--	67.04	200.27	98.28
66	--	36.02	207.37	77.93
68	--	18.03	211.59	42.89
70	--	19.26	160.41	38.31

Length	Feb	Jun	Jul	Aug
72	--	0.79	114.50	27.35
74	--	3.67	75.20	26.41
76	--	1.53	57.98	4.66
78	--	2.08	48.13	7.03
80	--	--	28.95	7.03
82	--	--	24.04	1.39
84	--	--	21.66	3.31
86	--	2.08	15.71	2.37
88	--	--	8.66	--
90	--	--	2.67	4.74
92	--	--	1.35	--
96	--	--	0.54	0.94
98	--	--	1.07	--
SNPT	1000	1000	2000	2000
AL	59.4	13.8	126.1	104.7
ALMF				
AW	1.9	0.04	4.58	2.56
N	3	5	11	3
SLF	810	770	2942	1299

Table 21. Length composition (0/000) of Greenland halibut from Canadian commercial landings in NAFO Division 3L in 2022.

Length	Jul	Jun
44	3.41	2.14
46	6.02	4.65
48	15.63	20.68
50	87.52	79.16
52	172.58	167.22
54	250.97	199.24
56	321.54	257.23
58	325.68	209.97
60	306.82	203.51
62	169.44	197.20
64	150.79	146.76
66	86.64	132.67
68	44.36	88.81
70	16.82	78.31
72	10.36	52.62
74	14.15	43.87
76	6.04	38.63
78	6.18	21.85
80	1.72	23.10
82	--	16.77
84	0.85	6.15
86	0.76	4.69
88	1.72	2.12
90	--	1.60
94	--	0.52
98	--	0.52
SNPT	2000	2000
AL	113.6	118.6

Length	Jul	Jun
ALMF		
AW	3.21	3.81
N	5	8
SLF	1568	2444

Table 22. Length composition (0/000) of Greenland halibut from Canadian commercial landings in NAFO Division 3N in 2022.

Length	Jan
28	250
30	500
34	250
SNPT	1000
AL	29
ALMF	
AW	0.19
N	1
SLF	4

Table 23. Length composition (0/000) of redfish from Canadian commercial landings in NAFO Division 2J in 2022.

Length	Jan	Mar	Feb	May
6	1.58	24	--	--
7	--	108	3.06	176.41
8	7.29	188	18.33	249.05
9	35.84	308	28.77	236.40
10	165.03	284	124.88	196.35
11	275.66	24	215.77	98.56
12	146.22	32	169.72	39.66
13	153.35	32	100.78	3.55
14	148.63	--	106.82	--
15	62.25	--	129.06	--
16	2.54	--	76.03	--
17	1.58	--	17.89	--
19	--	--	1.28	--
20	--	--	1.53	--
22	--	--	6.11	--
SNPT	1000	1000	1000	1000
AL	12.5	11.9	9.1	8.9
ALMF				
AW	0.03	0.02	0.01	0.01
N	3	2	1	2
SLF	681	488	250	430

Table 24. Length composition (0/000) of redfish from Canadian commercial landings in NAFO Division 3K in 2022.

Length	Feb
5	1.34
6	0.67
8	42.31
9	198.90
10	121.34
11	65.69
12	49.37
13	81.83
14	153.71
15	169.03
16	80.89
17	27.54
18	4.03
20	3.36
SNPT	1000
AL	12.3
ALMF	
AW	0.03
N	5
SLF	906

Table 25. Length composition (0/000) of redfish from Canadian commercial landings in NAFO Division 3L in 2022.

Length	Feb	Oct	Mar	Apr	Jan
14	0.30	--	--	--	--
17	--	2.63	--	--	--
18	--	9.12	1.33	--	--
19	--	9.12	1.78	--	--
20	0.80	10.90	8.18	2.01	--
21	4.66	14.28	8.88	--	--
22	5.37	34.51	23.30	1.31	--
23	23.88	25.90	71.61	6.00	--
24	43.80	36.73	94.64	11.72	--
25	54.71	40.07	78.77	21.98	8.70
26	59.48	43.75	74.93	53.68	13.79
27	105.22	50.50	64.06	71.25	23.61
28	143.31	63.40	65.05	86.45	31.70
29	170.07	60.80	72.93	96.11	51.62
30	162.25	55.16	56.21	105.64	64.21
31	94.61	64.20	62.47	85.71	66.74
32	144.52	60.78	50.43	79.56	64.70
33	235.48	55.63	55.81	71.42	65.92
34	219.35	45.22	38.46	67.20	72.71
35	153.67	64.47	35.26	64.16	70.27
36	124.80	51.10	25.11	44.58	61.40
37	57.64	48.58	22.88	32.66	59.16
38	43.03	19.88	21.41	23.79	51.35
39	31.00	21.98	12.14	15.08	40.78
40	18.14	19.56	9.22	18.13	39.18
41	16.43	12.40	7.39	10.10	33.85
42	16.25	8.86	6.49	7.84	29.15
43	13.25	5.66	5.91	9.00	23.42

Length	Feb	Oct	Mar	Apr	Jan
44	10.23	8.10	4.28	3.18	21.96
45	8.73	7.66	2.06	2.42	18.63
46	6.62	3.36	2.54	2.16	14.36
47	6.47	5.62	2.02	0.97	13.63
48	3.04	2.85	1.39	0.48	9.74
49	5.26	11.60	3.60	3.01	8.69
50	3.52	1.96	0.63	--	8.21
51	2.96	2.99	1.01	0.33	4.91
52	3.16	2.85	0.67	0.31	5.02
53	3.49	5.98	3.02	0.31	4.38
54	1.60	3.92	0.67	0.54	2.78
55	1.13	2.99	1.34	0.33	2.72
56	1.35	--	0.34	--	1.95
57	0.41	1.96	--	0.33	1.86
58	--	--	0.69	--	1.28
59	--	--	0.35	--	1.26
60	--	--	--	--	1.14
61	--	2.99	0.28	0.12	0.57
62	--	--	--	--	0.92
63	--	--	0.07	--	0.88
64	--	--	--	--	0.67
65	--	--	0.17	0.12	0.17
66	--	--	--	--	0.22
67	--	--	0.21	--	0.22
68	--	--	--	--	0.46
69	--	--	--	--	0.12
70	--	--	--	--	0.24
71	--	--	--	--	0.49
72	--	--	--	--	0.24
SNPT	1000	2000	1000	1000	1000

Length	Feb	Oct	Mar	Apr	Jan
AL	31.7	64.5	36.1	29.5	31.8
ALMF					
AW	0.51	1.30	1.01	0.49	0.59
N	10	12	16	15	6
SLF	2476	3159	4207	3679	503

Table 26. Length composition (0/000) of redfish from Canadian commercial landings in NAFO Division 3PN in 2022.

Length	Jul
20	2.78
21	20.23
22	61.69
23	195.63
24	308.52
25	233.16
26	118.90
27	40.09
28	12.99
29	3.15
32	0.53
37	1.43
38	0.90
SNPT	1000
AL	24.3
ALMF	
AW	0.22
N	5
SLF	1506

Table 27. Length composition (0/000) of redfish from Canadian commercial landings in NAFO Division 3Ps in 2022.

Length	Feb	Jul
19	0.96	0.13
20	5.76	--
21	12.58	8.44
22	32.99	58.14
23	64.23	166.75
24	184.14	259.03
25	265.34	231.86
26	374.57	150.04
27	310.78	65.69
28	244.00	25.67
29	291.30	9.77
30	89.02	6.63
31	48.30	3.17
32	20.79	4.06
33	27.97	2.83
34	10.86	1.56
35	6.77	2.69
36	5.81	1.47
38	0.96	1.20
39	2.88	--
40	--	0.86
SNPT	2000	1000
AL	53.8	25
ALMF		
AW	0.57	0.25
N	4	6
SLF	1026	1725

Table 28. Length composition (0/000) of thorny skate from Canadian commercial landings in NAFO Division 3O in 2022.

Length	Sep
27	15.62
30	46.88
36	46.88
39	31.25
42	78.12
45	125.00
48	109.38
51	62.50
54	46.88
57	78.12
60	78.12
63	15.62
66	62.50
72	31.25
75	62.50
78	46.88
84	15.62
87	15.62
90	31.25
SNPT	1000
AL	53
ALMF	
AW	1.72
N	1
SLF	64

Table 29. Length composition (0/000) of white hake from Canadian commercial landings in NAFO Division 3Ps in 2022.

Length	Dec
54	32.26
57	32.26
60	59.14
63	5.38
66	129.03
69	129.03
72	64.52
75	64.52
78	96.77
81	112.90
84	75.27
87	37.63
90	32.26
93	21.50
96	48.39
99	26.88
102	21.50
105	10.75
SNPT	1000
AL	74.2
ALMF	
AW	3805.26
N	1
SLF	186

Table 30. Length composition (0/000) of witch flounder from Canadian commercial landings in NAFO Division 3O in 2022.

Length	Mar
32	1.46
34	22.33
36	67.15
38	120.50
40	359.51
42	605.83
44	442.61
46	221.32
48	103.59
50	42.45
52	10.51
54	2.41
56	0.34
SNPT	2000
AL	82
ALMF	
AW	0.88
N	21
SLF	5193

Table 31. Length composition (0/000) of witch flounder from Canadian commercial landings in NAFO Division 3Ps in 2022.

Length	Dec
36	16.72
38	62.00
40	137.03
42	240.84
44	245.40
46	158.80
48	79.96
50	37.53
52	21.72
SNPT	1000
AL	41.9
ALMF	
AW	0.47
N	2
SLF	549

Table 32. Length composition (0/000) of yellowtail flounder from Canadian commercial landings in NAFO Division 3N in 2022.

Length	Apr	Jan	Sep	Jun	May	Nov	Aug	Dec	Feb	Mar	Oct
12	0.30	0.17	--	--	--	--	--	--	--	--	--
14	--	0.11	--	--	--	--	--	--	--	--	--
16	--	0.51	2.95	--	--	--	--	--	--	--	--
18	--	1.41	2.48	1.21	2.16	1.39	--	--	--	--	--
20	5.28	4.11	5.57	3.48	3.24	2.18	3.34	5.33	2.93	0.46	2.02
22	7.15	8.21	19.81	6.77	7.83	5.58	20.93	4.88	4.23	1.92	10.79
24	7.01	9.37	41.87	10.36	10.10	12.18	27.20	5.43	10.91	2.83	16.58
26	6.45	12.65	61.93	17.60	8.47	15.21	62.04	6.79	9.03	9.07	27.57
28	11.84	10.11	82.75	18.52	6.21	29.36	96.35	20.73	11.68	6.89	81.17
30	21.93	20.83	105.70	47.03	66.19	57.57	115.22	81.50	27.62	26.61	124.45
32	85.27	57.96	178.41	105.42	255.49	110.23	151.10	125.33	116.65	73.70	170.12
34	168.98	159.42	247.16	162.37	493.66	254.58	180.47	289.14	306.95	153.10	267.68
36	247.48	238.19	317.16	186.48	600.90	451.22	282.41	416.85	488.37	212.93	395.39
38	190.18	211.00	306.23	160.64	541.72	452.30	364.11	487.07	484.17	219.57	397.36
40	128.29	161.81	271.22	129.94	433.55	325.35	294.54	366.74	328.39	152.79	248.87
42	76.60	78.38	184.38	77.82	312.82	196.56	186.38	121.33	146.03	85.06	124.02
44	29.19	19.18	112.57	37.24	167.69	64.23	102.16	52.33	38.17	36.02	73.56
46	9.29	4.76	37.98	21.02	56.21	18.99	57.80	16.56	14.33	12.86	23.86
48	4.45	1.50	13.06	10.65	25.35	1.05	33.60	--	6.51	6.20	21.85
50	0.30	0.21	5.12	2.73	5.64	1.68	11.19	--	1.96	--	14.48
52	--	0.05	0.81	0.68	1.69	0.34	10.68	--	2.08	--	0.21
54	--	--	2.82	0.03	--	--	0.50	--	--	--	--
56	--	0.05	--	--	1.07	--	--	--	--	--	--
SNPT	1000	2000	2000	2000	1000	1000	1000	3000	2000	2000	2000
AL	35	70	70	71	35	34.8	35.6	108	71.	70	69
ALMF											
AW	0.39	0.78	0.80	0.80	0.4	0.41	0.39	1.29	0.85	0.77	0.78
N	15	6	6	11	37	33	10	28	24	13	17
SLF	4192	1650	1410	1901	9318	8977	2856	7208	6400	3136	4456

Table 33. Length composition (0/000) of yellowtail flounder from Canadian commercial landings in NAFO Division 3O in 2022.

Length	Sep	Nov	Oct	Aug	Jun	Apr	Dec	May
16	0.49	--	--	--	--	--	--	--
18	0.49	--	--	--	--	--	--	--
20	3.81	--	--	--	--	--	--	--
22	10.29	1.46	2.47	--	--	--	--	--
24	12.69	7.43	4.95	2.18	2.48	--	--	--
26	36.32	13.17	6.81	7.61	6.09	1.16	2.97	--
28	73.51	10.36	17.48	13.01	20.72	8.93	17.74	2.39
30	102.81	25.62	47.71	46.45	27.19	51.99	32.42	26.61
32	178.98	46.12	90.63	83.80	61.61	99.06	67.93	114.72
34	212.03	118.39	129.36	134.39	137.14	109.02	113.23	243.71
36	317.47	186.55	176.75	153.52	206.07	179.86	136.49	380.20
38	291.10	212.18	184.55	168.93	195.71	172.43	190.68	431.36
40	295.75	127.21	140.99	133.66	136.10	141.02	138.40	354.34
42	186.57	117.93	87.15	118.26	104.29	116.56	122.65	205.44
44	132.94	67.80	57.65	70.77	60.12	56.28	89.06	139.47
46	83.25	50.52	30.79	36.10	23.19	38.83	61.03	68.54
48	41.18	15.26	16.46	25.93	15.21	17.10	18.01	23.24
50	16.42	--	3.52	4.32	3.15	7.77	7.19	7.79
52	1.39	--	0.64	--	0.92	--	0.33	2.22
54	1.66	--	2.08	--	--	--	1.88	--
56	0.87	--	--	1.06	--	--	--	--
SNPT	1000	1000	1000	1000	2000	1000	1000	2000
AL	36.2	36.3	37	36.1	73	36.5	35.8	72
ALMF								
AW	0.43	0.43	0.48	0.44	0.92	0.45	0.45	0.85
N	2	3	5	5	10	3	5	12
SLF	513	837	1413	1365	2626	782	1021	3040