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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 2023

by

R.M. Rideout, L. Wheeland, K. Skanes, A. Perreault

Northwest Atlantic Fisheries Centre, Fisheries and Oceans Canada,
St. John's, Newfoundland, Canada

Abstract

We update basic vessel performance and document the timing and spatial coverage of the annual spring and autumn multispecies bottom trawl surveys conducted by the Department of Fisheries and Oceans, Newfoundland and Labrador Region including new data for surveys in 2022 and 2023. The current survey designs cover an expansive spatial area, spanning six NAFO Divisions (2HJ3KLNO) and 515,000 km² in the autumn and four NAFO Divisions (3LNOP) and 324,000 km² in the spring. Coverage issues over the past decade or more were a result of aged vessels with frequent mechanical issues, impacts from the Covid-19 pandemic, and weather. There have been systemic coverage issues for deep-water strata in the autumn survey, particularly those in Div. 2H and Div. 3L. Coverage of Division 3L has been problematic in the spring survey as well. Surveys in 2022 and 2023 were conducted by the new offshore research vessels CCGS John Cabot and CCGS Jacques Cartier. Major holes in survey coverage during those years were primarily a result of sacrificing survey time to focus on comparative fishing between the new and old vessels. This resulted in no autumn survey in 2022. In 2023 77% of intended fishing sets and 94% of intended strata were completed. In spring 2022 a large portion of Div 3L was not covered and in spring 2023 there was no coverage of Subdivision 3Ps. Survey coverage issues are adding an unquantified level of uncertainty to groundfish and invertebrate assessments, and a lack of conversion factors for some vessel/survey/species combinations may result in the need to end longstanding data time series and begin new ones, potentially impacting the ability to provide advice for some taxa/stocks.

Introduction

The Canadian Department of Fisheries and Oceans (DFO), Newfoundland and Labrador Region, has undertaken stratified-random surveys in portions of NAFO subareas 2+3 since the early 1970's. A full description of the history of these surveys, including stratification, trawl gear, towing protocols, vessels employed, as well as details of spatial coverage have been detailed in previous documents (e.g. Brodie, 2005, Brodie and Stansbury, 2007, Healey and Brodie, 2009, Healey et al., 2012, and references therein). The current document, which is typically produced annually for the June meeting of NAFO Scientific Council (see Rideout et al., 2022 for the most recent full version), generally focusses on survey timing and coverage and recent versions also update survey indices for NAFO-managed fish stocks. Last year's version of the survey document focused on the spatial coverage of comparative fishing efforts by Canada-NL research vessels and presented uncalibrated survey data for the spring 2022 survey (e.g. Wheeland et al. 2023). Here we again provide more detailed summaries of survey timing and coverage, including surveys conducted in 2022 and



2023 by the new research vessels. Updates on survey indices are not provided here since not all work related to the development of conversion factors between new and old vessels has been completed. It is expected that the survey indices will be updated for the 2025 survey report.

Methods

The Canadian (NL Region) research vessel (RV) multispecies bottom trawl surveys cover Divisions 2HJ3KLNO (515,000 km²) in the autumn and Divisions 3LNOP (324,000 km²) in the spring. The survey area is stratified by depth range, as depicted in Figs. 1-7. Survey sets (i.e. standardized fishing hauls at a randomly selected sampling unit) for these stratified-random surveys are distributed using a proportional-allocation scheme, whereby the number of sets allocated for a given stratum is proportional to the stratum area, subject to the condition that each stratum must be allocated a minimum of two sets. Tow sites are randomly selected from sampling units within each stratum, with each sampling unit typically encompassing an area of approximately 3.5 square nautical miles (Doubleday, 1981). Within each stratum, alternate stations are also selected, and are occupied if a sample from one of the other units cannot be obtained (e.g. untrawlable bottom). A constraint is applied to the random sampling to permit selection of only one sampling unit within each consecutive group of 10 units (i.e. maximum of one unit selected from units 1-10, 11-20, 21-30, etc.).

When computing the stratified estimators of abundance or biomass for any given species, individual strata must have a minimum of two successful survey sets to be considered completed to enable calculation of stratum variance. Strata down to 1500 m are included in the survey design for some NAFO Divisions in the autumn survey, whereas the spring survey does not cover strata deeper than 732 m.

The Canadian Coast Guard vessels CCGS *Jacques Cartier* and CCGS *John Cabot* were employed in the spring and autumn surveys in 2022 and 2023. These vessels replace the CCGS *Alfred Needler* and the CCGS *Teleost*. The CCGS *Alfred Needler* previously conducted fishing sets at depths down to 732m, whereas the CCGS *Teleost* fished to depths of 1500m. During spring surveys, typically only the CCGS *Alfred Needler* was used; the CCGS *Teleost* was deployed at times when the CCGS *Alfred Needler* was unavailable due to significant mechanical problems. The CCGS *Alfred Needler* was decommissioned in 2023. Its sister ship, the CCGS *Wilfred Templeman*, which also previously participated in the surveys was decommissioned in 2008. The current sampling gear used for the RV surveys is the modified Campelen shrimp trawl, which replaces the Campelen 1800 shrimp trawl (introduced in the autumn 1995 survey, and has been used in all spring surveys since 1996). McCallum and Walsh (1996) provide a detailed description of the Campelen 1800 trawl.

Survey Design: Autumn Surveys

The current autumn survey design (Table 1) includes Divisions 2HJ3KLNO. Division 2G has not been surveyed since 1999 and is no longer included in survey planning. Likewise, Division 3M (the deep-water strata in the Flemish Pass and the western slopes of the Flemish Cap) was permanently excluded from survey planning starting in 2010. In the early-2000s, coverage of Division 2H was planned for every second year, but in 2011 the decision was made to cover Division 2H annually. The increased coverage of Div. 2H (84 planned sets annually) was deemed necessary for the assessment of key commercial species, primarily northern shrimp. However, since there was no increase in the amount of allotted vessel time for the survey, the increase in spatial coverage had to come at the expense of other areas that were previously part of the survey design. Starting in 2011, coverage of deep strata (>732 m) in Divs. 3NO was no longer included in the autumn survey design (a reduction of 48 planned sets). The decision to remove these strata was based on the fact that portions of these strata were unsuitable for trawling and often, a considerable amount of time was used to search for deployment sites near the intended locations. In addition, the inshore strata of Divs. 3K and 3L (19 and 34 planned sets respectively) were permanently removed from the survey design. These inshore strata were initially added to the survey design in the mid-1990s but have not been consistently covered since 2007. The limited survey coverage that has been attained in these inshore areas typically occurred at times when the survey vessels have had to leave the offshore area due to severe weather but were able to conduct fishing in the near shore areas. There have been no further substantive changes to the planned autumn survey coverage of Divs. 2HJ3KLNO in the years since 2011.

The autumn survey is generally conducted from mid-September to mid-December, although in some years (1995, 2002-2005, 2014) the survey has extended into January of the subsequent year (Table 2, Fig. 8). The general plan has been for one vessel (previously the CCGS *Alfred Needler*) to start in the south, surveying Div. 3O, then Div. 3N and finally Div. 3L. A second vessel (previously the CCGS *Teleost*) starts in the north, surveying Div. 2H, then to Div. 2J, Div. 3K and finally Div. 3L deep strata (>732m). It is common for both vessels to share some of the survey work in Div. 3K once the Div. 3LNO portion has been covered (Table 4, Fig. 11-12). In 2023, overall autumn survey timing was similar to previous years (Fig. 8). However, when examined by division it is clear that Div. 2H and 2J were surveyed slightly earlier than in previous years (Fig. 13).

Survey Design: Spring Surveys

The spring survey encompasses Divs. 3LNOPs, and is typically conducted from early-April through to late June (Table 3, Fig. 8). The only major change in the spring survey design in recent years was the removal of inshore strata in Division 3L. These inshore strata were always considered of lower priority and were only infrequently surveyed. This change resulted in the planned number of sets decreasing from 512 to 478 (Table 1). The spring survey typically utilizes a single vessel, the CCGS *Alfred Needler*, but mechanical issues with this vessel in some years have required the use of the CCGS *Teleost* to complete the survey (Table 5, Fig. 9-10). Spring survey times for Divs 3L, 3N, and 3O in 2023 were slightly earlier than most years in the time series (Fig. 13).

Comparative Fishing in 2023

Comparative fishing for the CAN-NL surveys continued in 2023, with paired tows between the CCGS *Teleost* and CCGS *John Cabot* in the spring and fall. The spring program used a shadow survey approach on the Grand Banks (Div. 3LNO), completing 141 paired tows across this area during the standard multispecies survey. A targeted approach was used in Subdiv. 3Ps, focusing on strata important for Atlantic cod and Snow crab. The 3Ps comparative fishing occurred in June – approximately two months later than the normal survey in this area – following the completion of the multispecies survey.

In fall 2023 paired tows were completed on the slope of Div. 2J (N = 28) and 3L (N = 14) from 750 to 1,500m, extending paired tows into areas and depths not previously sampled by the comparative fishing program. This extension allowed for the estimation of representative conversions for deep water species (e.g., Greenland Halibut, Roughhead Grenadier). In Division 3K, 22 additional paired tows were completed, targeting areas for small snow crab and shallow water, addressing a gap in coverage previously identified (DFO 2024).

In the spring of 2023 Comparative fishing also occurred between the CCGS *John Cabot* and a fishing vessel the MV *Calvert*, completing 36 paired tows in Div. 3L within the Canadian EEZ. This program aims to estimate conversion factors to allow data collected by the *Calvert* fishing the Campelen 1800 trawl following standard survey protocols to be used in series with the new DFO Research Vessels. Additional paired work with the MV *Calvert* may occur in spring 2024 in Div. 3LNO.

Survey summaries

This document summarizes the intended and realized coverage of the Canadian spring and autumn multispecies bottom trawl surveys. This includes an examination of the total number and spatial coverage of fishing sets conducted in each division as well as by individual research vessels. Years and areas with poor/inadequate survey coverage are highlighted.

The RV survey data described here form the primary basis for science advice regarding NAFO and Canadian ecosystem and stock assessments. Typically within this report we also provide plots summarizing trends in biomass for various functional groups within the Ecosystem Production Units (EPUs), as well as survey indices and other relevant data (length frequencies and distribution plots) for NAFO stocks. In this year's report, however, we have temporarily excluded such analyses while we continue to explore the impacts of

conversion factors (and in many cases the lack thereof) on survey data time series. We expect to return to updating survey indices in next year's survey report.

Results

The autumn survey design has remained the same since 2011 (Table 1), but substantive mechanical issues with the research vessels have become commonplace in recent years and have resulted in reduced coverage (reduced number of fishing sets per stratum or failure to complete some strata) or a complete lack of coverage of certain areas in some years.

An examination of the successful sets completed during the autumn survey in recent years (Tables 6-11; Fig. 14) demonstrates the difficulties that have been encountered in completing this survey. The number of sets completed (Fig. 14) has declined. In 2022 there was no autumn survey as the survey had to be sacrificed in favour of comparative fishing between the new and old research vessels. In 2023, 77% of intended fishing sets and 94% of intended strata were completed. This survey marked the first time in several years that the deep strata of Div. 3L were covered (Fig15, Table 9). However, there was again no coverage of deep strata in Div. 2H, marking the tenth consecutive year with coverage issues for these strata (Fig. 15, Table 6).

In general, prior to 2014 (with the exception of 2006) the spring survey provided good coverage of the area in the survey design. However, coverage has been sporadic and generally reduced since that time (Fig. 16). In particular there have been major coverage issues for Div. 3L in most recent years (e.g. 2015, 2017, 2018). There was no spring survey in 2020 and no coverage of Divs. 3LNO in 2021. In 2022, there were major coverage issues in Div. 3L. In 2023, there was no coverage of Subdivision 3Ps and sporadic strata missed in the other divisions. Overall 44% of the intended sets in the survey design were successfully completed, and 60% of strata. The four strata in Subdivision 3Pn have not been covered since 2013.

Discussion

Substantive mechanical issues with the research vessels in recent years have made completion of the autumn multispecies bottom trawl survey very difficult. In some instances, when one of the two vessels used during the autumn survey has been inoperative it has been possible to extend the usage time of the second vessel. This is not always possible due to the fact that vessels and vessel time are shared across multiple monitoring programs and multiple regions within Fisheries and Oceans Canada. Over 2021-2023, extensive issues with survey coverage were primarily a result of the deployment of the new research vessels CCGS John Cabot and CCGS Jacques Cartier and the need to sometimes sacrifice survey coverage in order to focus on comparative fishing. The development of effective conversion factors based on comparative fishing was critical for the integrity of the existing survey time series. Unfortunately, conversion factors could not be achieved for all vessel/taxa/area combinations. Future assessments for some stocks will likely have to consider how to handle the potential end of longstanding time series and the beginning of new series based on the new vessels.

In recent years the main coverage issues for the autumn survey have been for the deeper strata within Div. 2H and Div. 3L. There was also incomplete coverage of deep strata in Divs. 2J3K in 2018, 2019, and 2021. With respect to Div. 2H, the inclusion of this area in the annual survey design was expected to be beneficial in monitoring resource trends for Northern shrimp (*Pandalus borealis*) within Shrimp Fishing Area 5, and perhaps to a lesser extent Greenland halibut (*Reinhardtius hippoglossoides*). However, given the recent inability to cover the deeper strata within Div 2H, the added value for the assessment of deep-water demersal fish such as Greenland halibut is questionable.

The issues with covering the deep strata in Div. 3L in the autumn survey are perhaps magnified by the fact that the spring survey coverage of Div. 3L has also been very poor in recent years. These coverage issues are likely to create a great deal of uncertainty in the assessment of fishery resources and ecosystem conditions on the Grand Bank. These coverage issues are occurring at an unfortunate time as ecosystem changes in total biomass and community structure appear to be occurring. Complete coverage of Div. 3L could help contribute to a better understanding of the changes that are occurring in this area and the implications for

resource management. The new research vessels are now fully operational, though it remains to be seen if their introduction will lead to improvements in the recent rate of survey downtime and in-situ unplanned reductions in survey coverage. The planned coverage at present has very limited scope for further reductions when survey delays inevitably arise. Any loss of coverage in the areas presently having long-standing time series is likely to have an adverse effect on the stock assessments of multiple species, as well as on ecosystem monitoring. The magnitude of the uncertainty introduced by such coverage shortfalls is unknown and is typically not reflected in assessment results nor management advice.

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Table 1. Number of survey sets planned per Division, for Canadian Autumn and Spring RV multispecies bottom trawl surveys over 2010-2021.

Survey	Division	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Autumn	2H	84	84	84	84	84	84	84	84	84	84	84	84
Autumn	2J	117	117	117	117	117	117	117	117	117	117	117	117
Autumn	3K	156	156	156	156	156	156	156	156	156	156	156	156
Autumn	3L	172	172	172	172	172	172	172	172	172	172	172	172
Autumn	3M												
Autumn	3N	70	70	70	70	70	70	70	70	70	70	70	70
Autumn	3O	75	75	75	75	75	75	75	75	75	75	75	75
	Total	674	674	674	674	674	674	674	674	674	674	674	674
Spring	3L	142	142	142	142	142	142	142	142	142	142	142	142
Spring	3N	79	79	79	79	79	79	79	79	79	79	79	79
Spring	3O	79	79	79	79	79	79	79	79	79	79	79	79
Spring	3Ps	178	178	178	178	178	178	178	178	178	178	178	178
	Total	478	478	478	478	478	478	478	478	478	478	478	478

Table 2. Start and end dates (corresponding to the first and last fishing set) for the Canadian Autumn RV multispecies bottom trawl surveys in Divs. 2HJ3KLNO. Note that Divs. 2G and 3M have not been included in the survey design since 1999 and 2007, respectively, and have not been included here.

Year	Div 2H Start	Div 2H End	Div 2J Start	Div 2J End	Div 3K Start	Div 3K End	Div 3L Start	Div 3L End	Div 3N Start	Div 3N End	Div 3O Start	Div 3O End	All Divs Start	All Divs End	Total Days*
1977	NA	NA	1977-11-11	1977-12-01	1977-11-20	1977-12-02	NA	NA	NA	NA	NA	NA	1977-11-11	1977-12-02	21 days
1978	1978-09-16	1978-09-30	1978-08-03	1978-11-27	1978-07-30	1978-11-27	NA	NA	NA	NA	NA	NA	1978-07-30	1978-11-27	120 days
1979	1979-08-03	1979-08-19	1979-10-05	1979-11-30	1979-09-29	1979-12-04	NA	NA	NA	NA	NA	NA	1979-08-03	1979-12-04	123 days
1980	NA	NA	1980-10-09	1980-12-03	1980-10-04	1980-12-08	NA	NA	NA	NA	NA	NA	1980-10-04	1980-12-08	65 days
1981	1981-10-26	1981-11-08	1981-11-15	1981-11-27	1981-11-14	1981-12-13	NA	NA	NA	NA	NA	NA	1981-10-26	1981-12-13	48 days
1982	NA	NA	1982-10-31	1982-11-15	1982-10-30	1982-12-08	NA	NA	NA	NA	NA	NA	1982-10-30	1982-12-08	39 days
1983	NA	NA	1983-10-28	1983-12-04	1983-11-16	1983-12-07	1983-10-13	1983-11-14	NA	NA	NA	NA	1983-10-13	1983-12-07	72 days
1984	NA	NA	1984-10-28	1984-11-14	1984-10-27	1984-12-05	1984-07-26	1984-09-03	NA	NA	NA	NA	1984-07-26	1984-12-05	78 days
1985	NA	NA	1985-10-23	1985-11-07	1985-11-07	1985-12-02	1985-10-09	1985-11-18	NA	NA	NA	NA	1985-10-09	1985-12-02	80 days
1986	NA	NA	1986-11-03	1986-11-21	1986-11-21	1986-12-11	1986-11-13	1986-11-30	NA	NA	NA	NA	1986-11-03	1986-12-11	55 days
1987	1987-08-15	1987-08-26	1987-10-29	1987-11-15	1987-11-15	1987-12-08	1987-10-15	1987-11-01	NA	NA	NA	NA	1987-08-15	1987-12-08	132 days
1988	1988-08-18	1988-09-06	1988-11-04	1988-11-26	1988-11-27	1988-12-13	1988-10-26	1988-11-13	NA	NA	NA	NA	1988-08-18	1988-12-13	135 days
1989	NA	NA	1989-11-02	1989-11-20	1989-11-24	1989-12-19	1989-10-12	1989-10-29	NA	NA	NA	NA	1989-10-12	1989-12-19	64 days
1990	NA	NA	1990-11-03	1990-11-20	1990-11-24	1990-12-15	1990-10-18	1990-11-18	1990-12-02	1990-12-09	1990-11-22	1990-12-01	1990-10-18	1990-12-15	94 days
1991	1991-11-20	1991-11-29	1991-11-06	1991-11-23	1991-11-23	1991-12-17	1991-11-08	1991-12-02	1991-10-27	1991-11-10	1991-10-19	1991-11-04	1991-10-19	1991-12-17	94 days
1992	NA	NA	1992-10-29	1992-11-15	1992-11-13	1992-12-09	1992-11-05	1992-11-29	1992-10-26	1992-11-05	1992-10-20	1992-10-29	1992-10-20	1992-12-09	81 days
1993	NA	NA	1993-11-02	1993-11-14	1993-10-30	1993-12-06	1993-11-12	1993-12-04	1993-11-01	1993-11-12	1993-10-24	1993-11-01	1993-10-24	1993-12-06	78 days
1994	NA	NA	1994-11-09	1994-11-25	1994-11-25	1994-12-19	1994-11-08	1994-12-07	1994-10-29	1994-11-13	1994-10-25	1994-11-12	1994-10-25	1994-12-19	83 days
1995	NA	NA	1995-12-04	1996-01-22	1995-11-28	1996-01-25	1995-10-03	1996-01-25	1995-09-27	1995-10-26	1995-09-26	1995-10-20	1995-09-26	1996-01-25	136 days
1996	1996-09-18	1996-09-30	1996-10-22	1996-11-07	1996-11-07	1996-11-26	1996-10-09	1996-12-05	1996-11-25	1996-12-13	1996-11-24	1996-12-17	1996-09-18	1996-12-17	179 days
1997	1997-10-09	1997-10-19	1997-10-19	1997-11-04	1997-11-04	1997-12-19	1997-10-23	1997-12-20	1997-10-08	1997-11-05	1997-09-26	1997-10-19	1997-09-26	1997-12-20	164 days
1998	1998-10-07	1998-10-30	1998-10-20	1998-11-04	1998-11-04	1998-11-30	1998-11-02	1998-12-15	1998-10-16	1998-12-16	1998-10-10	1998-12-13	1998-10-10	1998-12-16	142 days
1999	1999-10-22	1999-11-09	1999-11-06	1999-11-25	1999-11-20	1999-12-11	1999-11-07	1999-12-12	1999-11-03	1999-11-22	1999-10-13	1999-11-13	1999-10-12	1999-12-12	121 days
2000	NA	NA	2000-11-01	2000-11-14	2000-11-14	2000-12-18	2000-10-24	2000-12-18	2000-10-17	2000-12-05	2000-10-11	2000-11-24	2000-10-11	2000-12-18	132 days
2001	2001-12-08	2001-12-15	2001-11-21	2001-12-08	2001-11-27	2001-12-18	2001-10-04	2001-12-06	2001-09-28	2001-10-29	2001-09-22	2001-10-14	2001-09-22	2001-12-18	179 days
2002	NA	NA	2002-12-07	2003-01-12	2002-12-01	2003-01-14	2002-10-23	2002-12-02	2002-10-13	2002-10-26	2002-10-05	2002-10-16	2002-10-05	2003-01-14	196 days
2003	NA	NA	2003-12-01	2003-12-17	2003-12-17	2004-01-31	2003-11-07	2004-01-20	2003-10-21	2003-11-07	2003-09-23	2003-10-21	2003-09-23	2004-01-31	227 days
2004	2004-10-08	2004-10-26	2004-10-27	2004-11-19	2004-11-13	2005-02-01	2004-11-24	2004-12-19	2004-11-11	2004-11-23	2004-10-31	2004-11-10	2004-10-08	2005-02-01	188 days
2005	NA	NA	2005-11-17	2005-12-16	2005-11-24	2006-01-28	2005-10-29	2006-01-29	2005-10-10	2005-11-19	2005-10-04	2005-10-17	2005-10-04	2006-01-29	239 days
2006	2006-10-05	2006-10-20	2006-10-20	2006-11-14	2006-11-06	2006-12-21	2006-10-21	2006-12-21	2006-10-12	2006-10-21	2006-09-30	2006-10-09	2006-09-30	2006-12-21	142 days
2007	NA	NA	2007-11-01	2007-11-30	2007-11-22	2007-12-16	2007-10-16	2007-12-20	2007-10-09	2007-11-14	2007-10-06	2007-10-31	2007-10-06	2007-12-20	138 days
2008	2008-10-04	2008-10-18	2008-11-07	2008-12-07	2008-11-11	2008-12-21	2008-11-01	2008-11-13	2008-10-24	2008-11-01	2008-10-03	2008-10-20	2008-10-03	2008-12-21	166 days
2009	NA	NA	2009-11-05	2009-11-23	2009-11-18	2009-12-13	2009-11-01	2009-12-20	2009-10-24	2009-11-12	2009-10-02	2009-10-25	2009-10-02	2009-12-20	139 days
2010	2010-10-07	2010-10-23	2010-10-21	2010-11-15	2010-11-15	2010-12-17	2010-10-29	2010-12-20	2010-10-12	2010-12-12	2010-09-30	2010-10-12	2010-09-30	2010-12-20	144 days
2011	2011-10-12	2011-10-27	2011-10-28	2011-11-26	2011-11-11	2011-12-19	2011-11-02	2011-12-18	2011-10-13	2011-11-20	2011-09-29	2011-10-17	2011-09-29	2011-12-19	134 days
2012	2012-10-07	2012-10-26	2012-10-14	2012-11-24	2012-11-12	2012-12-20	2012-10-27	2012-12-03	2012-10-11	2012-11-05	2012-09-30	2012-10-10	2012-09-30	2012-12-20	140 days
2013	2013-10-07	2013-10-25	2013-10-25	2013-11-18	2013-11-10	2013-12-18	2013-10-18	2013-11-25	2013-09-29	2013-10-18	2013-09-19	2013-09-29	2013-09-19	2013-12-18	147 days
2014	2014-10-06	2014-10-13	2014-10-18	2014-11-14	2014-11-08	2014-12-06	2014-12-06	2015-01-17	2015-01-17	2015-01-17	NA	NA	2014-10-06	2015-01-17	103 days
2015	2015-10-18	2015-10-24	2015-10-08	2015-11-14	2015-11-13	2015-12-13	2015-10-30	2015-12-14	2015-10-07	2015-10-30	2015-09-25	2015-10-16	2015-09-25	2015-12-14	134 days
2016	2016-10-07	2016-10-23	2016-10-28	2016-11-29	2016-11-15	2016-12-15	2016-10-28	2016-12-09	2016-09-29	2016-11-07	2016-09-16	2016-10-06	2016-09-16	2016-12-15	159 days
2017	2017-10-14	2017-10-29	2017-10-23	2017-12-02	2017-11-08	2017-12-09	2017-10-20	2017-12-15	2017-09-22	2017-10-22	2017-09-14	2017-09-24	2017-09-14	2017-12-15	148 days
2018	2018-10-14	2018-10-30	2018-10-26	2018-12-09	2018-11-02	2018-12-18	2018-10-05	2018-11-02	2018-09-24	2018-10-05	2018-09-14	2018-09-24	2018-09-14	2018-12-18	140 days
2019	2019-10-11	2019-10-26	2019-10-20	2019-12-07	2019-11-26	2019-12-22	2019-10-16	2019-11-26	2019-10-01	2019-10-16	2019-09-17	2019-10-01	2019-09-17	2019-12-22	156 days
2020	2020-10-23	2020-10-30	2020-10-15	2020-12-11	2020-10-19	2020-12-15	2020-09-26	2020-10-18	2020-09-11	2020-09-26	2020-08-29	2020-09-10	2020-08-29	2020-12-15	164 days
2021	2021-10-09	2021-10-28	2021-10-15	2021-11-13	2021-11-13	2021-12-15	NA	NA	NA	NA	2021-09-26	2021-09-27	2021-09-26	2021-12-15	68 days
2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2023	2023-09-19	2023-09-26	2023-09-27	2023-10-13	2023-10-13	2023-12-02	2023-10-27	2023-11-25	2023-10-20	2023-10-27	2023-10-09	2023-10-20	2023-09-19	2023-12-02	191 days

* Total Days = the cumulative total days (End date - Start date) combined for each vessel that operated within a given year.

Table 3. Start and end dates (corresponding to the first and last fishing set) for the Canadian Spring RV multispecies bottom trawl surveys in Divs. 3LNOP.

Year	Div 3L Start	Div 3L End	Div 3N Start	Div 3N End	Div 3O Start	Div 3O End	Subdiv 3Pn Start	Subdiv 3Pn End	Subdiv 3Ps Start	Subdiv 3Ps End	All Divs Start	All Divs End	Total Days
1984	1984-05-17	1984-05-21	1984-04-30	1984-05-06	1984-04-28	1984-05-08	NA	NA	NA	NA	1984-04-28	1984-05-21	23 days
1985	1985-04-17	1985-05-26	1985-04-18	1985-05-05	1985-04-11	1985-04-22	NA	NA	NA	NA	1985-04-11	1985-05-26	54 days
1986	1986-05-07	1986-05-25	1986-04-23	1986-05-03	1986-04-18	1986-05-04	NA	NA	NA	NA	1986-04-18	1986-05-25	37 days
1987	1987-05-14	1987-06-01	1987-05-02	1987-05-14	1987-04-23	1987-05-02	NA	NA	NA	NA	1987-04-23	1987-06-01	39 days
1988	1988-05-05	1988-05-24	1988-04-28	1988-05-05	1988-04-21	1988-04-28	NA	NA	NA	NA	1988-04-21	1988-05-24	33 days
1989	1989-05-06	1989-05-28	1989-04-29	1989-05-06	1989-04-20	1989-05-02	NA	NA	NA	NA	1989-04-20	1989-05-28	38 days
1990	1990-05-18	1990-06-04	1990-05-07	1990-06-01	1990-04-22	1990-05-07	NA	NA	NA	NA	1990-04-22	1990-06-04	43 days
1991	1991-05-11	1991-05-29	1991-05-03	1991-05-11	1991-04-19	1991-05-03	NA	NA	NA	NA	1991-04-19	1991-05-29	40 days
1992	1992-05-13	1992-06-07	1992-05-02	1992-05-13	1992-04-22	1992-05-01	NA	NA	NA	NA	1992-04-22	1992-06-07	46 days
1993	1993-05-18	1993-06-10	1993-05-05	1993-05-18	1993-04-27	1993-05-05	NA	NA	1993-04-02	1993-04-20	1993-04-02	1993-06-10	69 days
1994	1994-05-22	1994-06-10	1994-05-14	1994-05-22	1994-04-18	1994-05-11	NA	NA	1994-04-06	1994-04-26	1994-04-06	1994-06-10	65 days
1995	1995-05-27	1995-06-14	1995-05-13	1995-05-27	1995-05-03	1995-05-13	NA	NA	1995-04-04	1995-04-28	1995-04-04	1995-06-14	71 days
1996	1996-05-30	1996-06-27	1996-05-22	1996-05-30	1996-05-07	1996-05-22	NA	NA	1996-04-10	1996-05-01	1996-04-10	1996-06-27	78 days
1997	1997-06-04	1997-06-26	1997-05-18	1997-06-04	1997-04-30	1997-05-17	NA	NA	1997-04-02	1997-04-23	1997-04-02	1997-06-26	85 days
1998	1998-06-06	1998-06-30	1998-05-24	1998-06-04	1998-05-12	1998-05-30	NA	NA	1998-04-10	1998-05-05	1998-04-10	1998-06-30	81 days
1999	1999-06-06	1999-06-29	1999-05-19	1999-06-07	1999-05-11	1999-05-28	NA	NA	1999-04-13	1999-05-06	1999-04-13	1999-06-29	77 days
2000	2000-06-03	2000-06-29	2000-05-23	2000-06-09	2000-05-11	2000-06-05	NA	NA	2000-04-08	2000-05-11	2000-04-08	2000-06-29	82 days
2001	2001-05-26	2001-06-24	2001-05-14	2001-06-06	2001-04-29	2001-05-13	NA	NA	2001-04-07	2001-04-29	2001-04-07	2001-06-24	78 days
2002	2002-05-29	2002-06-22	2002-05-13	2002-05-29	2002-04-27	2002-05-14	NA	NA	2002-04-05	2002-04-27	2002-04-05	2002-06-22	78 days
2003	2003-06-04	2003-06-26	2003-05-18	2003-06-04	2003-05-08	2003-05-15	NA	NA	2003-04-05	2003-05-02	2003-04-05	2003-06-26	82 days
2004	2004-06-04	2004-06-26	2004-05-24	2004-06-08	2004-05-12	2004-05-24	2004-05-01	2004-05-11	2004-04-11	2004-05-11	2004-04-11	2004-06-26	68 days
2005	2005-06-11	2005-06-29	2005-05-22	2005-06-19	2005-05-09	2005-05-22	2005-05-06	2005-05-08	2005-04-17	2005-05-09	2005-04-17	2005-06-29	74 days
2006	2006-06-10	2006-06-29	2006-06-27	2006-06-29	2006-06-25	2006-06-30	2006-04-20	2006-04-21	2006-04-13	2006-04-18	2006-04-13	2006-06-30	82 days
2007	2007-06-05	2007-07-12	2007-06-16	2007-06-29	2007-05-03	2007-06-19	2007-04-13	2007-04-15	2007-04-04	2007-05-02	2007-04-04	2007-07-12	103 days
2008	2008-06-04	2008-06-30	2008-06-01	2008-06-22	2008-05-23	2008-06-01	NA	NA	2008-04-10	2008-05-23	2008-04-10	2008-06-30	86 days
2009	2009-05-21	2009-06-23	2009-05-26	2009-06-11	2009-05-13	2009-05-26	2009-04-16	2009-04-18	2009-04-08	2009-05-13	2009-04-08	2009-06-23	86 days
2010	2010-06-07	2010-06-25	2010-05-24	2010-06-06	2010-05-08	2010-05-20	2010-04-18	2010-04-26	2010-04-08	2010-05-08	2010-04-08	2010-06-25	78 days
2011	2011-05-29	2011-06-22	2011-05-21	2011-05-30	2011-05-08	2011-05-24	2011-04-14	2011-04-16	2011-04-07	2011-05-08	2011-04-07	2011-06-22	76 days
2012	2012-05-31	2012-06-19	2012-05-21	2012-06-03	2012-04-27	2012-05-21	2012-04-09	2012-04-12	2012-03-31	2012-04-26	2012-03-31	2012-06-19	80 days
2013	2013-05-24	2013-06-20	2013-05-11	2013-05-24	2013-04-23	2013-05-10	2013-04-08	2013-04-10	2013-03-26	2013-04-23	2013-03-26	2013-06-20	86 days
2014	2014-06-07	2014-06-22	2014-06-05	2014-06-17	2014-05-29	2014-06-05	NA	NA	2014-04-05	2014-05-10	2014-04-05	2014-06-22	127 days
2015	2015-06-03	2015-06-17	2015-05-21	2015-06-03	2015-05-10	2015-05-21	NA	NA	2015-04-11	2015-05-10	2015-04-11	2015-06-17	67 days
2016	2016-05-09	2016-06-15	2016-05-05	2016-05-31	2016-04-29	2016-05-09	NA	NA	2016-04-02	2016-05-01	2016-04-02	2016-06-15	74 days
2017	2017-05-21	2017-06-17	2017-05-26	2017-06-14	2017-05-12	2017-05-28	NA	NA	2017-04-06	2017-05-08	2017-04-06	2017-06-17	72 days
2018	2018-06-03	2018-06-21	2018-06-02	2018-06-12	2018-05-24	2018-06-07	NA	NA	2018-04-28	2018-05-27	2018-04-28	2018-06-21	79 days
2019	2019-05-28	2019-06-16	2019-05-16	2019-06-08	2019-05-04	2019-05-16	NA	NA	2019-03-30	2019-05-04	2019-03-30	2019-06-16	78 days
2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2021	NA	NA	NA	NA	NA	NA	NA	NA	2021-04-24	2021-05-17	2021-04-24	2021-05-17	23 days
2022	2022-06-19	2022-06-26	2022-06-06	2022-06-19	2022-04-15	2022-06-07	NA	NA	2022-04-08	2022-05-27	2022-04-08	2022-06-26	79 days
2023	2023-05-17	2023-06-07	2023-05-04	2023-05-20	2023-04-14	2023-05-07	NA	NA	NA	NA	2023-04-14	2023-06-07	86 days

* Total Days = the cumulative total days (End date – Start date) combined for each vessel that operated within a given year.

Table 4. Number of successful fishing sets per division and vessel (AN=*Alfred Needler*, Tel=*Teleost*, CAB=*John Cabot*, CAR=*Capt. Jacques Cartier*) as well as the depth ranges fished by each vessel in the most recent five years of the Canadian Autumn RV multispecies bottom trawl surveys.

Year	Div	AN sets	AN depth (m)	Tel sets	Tel depth (m)	CAB sets	CAB depth (m)	CAR sets	CAR depth (m)	Total sets
2018	2H	0	NA	83	98-1399	0	NA	0	NA	83
2018	2J	0	NA	106	129-1357	0	NA	0	NA	106
2018	3K	46	139-474	65	207-658	0	NA	0	NA	111
2018	3L	141	64-668	0	NA	0	NA	0	NA	141
2018	3N	70	40-634	0	NA	0	NA	0	NA	70
2018	3O	75	64-665	0	NA	0	NA	0	NA	75
2019	2H	0	NA	58	107-1166	0	NA	0	NA	58
2019	2J	0	NA	76	107-648	0	NA	0	NA	76
2019	3K	40	153-634	38	138-746	0	NA	0	NA	78
2019	3L	129	64-620	0	NA	0	NA	0	NA	129
2019	3N	70	42-684	0	NA	0	NA	0	NA	70
2019	3O	75	62-650	0	NA	0	NA	0	NA	75
2020	2H	0	NA	39	107-634	0	NA	0	NA	39
2020	2J	0	NA	91	135-1415	0	NA	0	NA	91
2020	3K	69	139-949	56	181-1386	0	NA	0	NA	125
2020	3L	105	63-670	0	NA	0	NA	0	NA	105
2020	3N	52	46-609	0	NA	0	NA	0	NA	52
2020	3O	60	66-634	0	NA	0	NA	0	NA	60
2021	2H	0	NA	53	120-993	0	NA	0	NA	53
2021	2J	0	NA	70	114-875	0	NA	0	NA	70
2021	3K	0	NA	81	130-962	0	NA	0	NA	81
2021	3L	0	NA	0	NA	0	NA	0	NA	0
2021	3N	0	NA	0	NA	0	NA	0	NA	0
2021	3O	0	NA	0	NA	3	70-107	0	NA	3
2023	2H	0	NA	19	201-697	33	91-900	0	NA	52
2023	2J	0	NA	42	107-852	55	133-1401	0	NA	97
2023	3K	0	NA	89	154-1332	23	152-657	10	220-636	122
2023	3L	0	NA	10	748-1136	65	62-1404	62	64-670	137
2023	3N	0	NA	0	NA	19	48-305	34	50-695	53
2023	3O	0	NA	0	NA	0	NA	60	64-650	60

Table 5. Number of successful fishing sets per division and vessel (AN=*Alfred Needler*, Tel=*Teleost*, CAB=*John Cabot*) as well as the depth ranges fished by each vessel in the most recent five years of the Canadian Spring RV multispecies bottom trawl surveys.

Year	Div	AN sets	AN depth (m)	Tel sets	Tel depth (m)	CAB sets	CAB depth (m)	Total sets
2018	3L	65	61-340	46	96-665	0	NA	111
2018	3N	43	41-80	36	42-725	0	NA	79
2018	3O	31	70-151	48	64-621	0	NA	79
2018	3Ps	170	39-663	0	NA	0	NA	170
2019	3L	133	62-694	0	NA	0	NA	133
2019	3N	71	39-685	0	NA	0	NA	71
2019	3O	77	64-620	0	NA	0	NA	77
2019	3Ps	171	39-611	0	NA	0	NA	171
2020	3L	0	NA	0	NA	0	NA	0
2020	3N	0	NA	0	NA	0	NA	0
2020	3O	0	NA	0	NA	0	NA	0
2020	3Ps	0	NA	0	NA	0	NA	0
2021	3L	0	NA	0	NA	0	NA	0
2021	3N	0	NA	0	NA	0	NA	0
2021	3O	0	NA	0	NA	0	NA	0
2021	3Ps	0	NA	143	40-691	0	NA	143
2022	3L	0	NA	0	NA	37	61-681	37
2022	3N	0	NA	0	NA	43	43-717	43
2022	3O	0	NA	0	NA	48	66-691	48
2022	3Ps	0	NA	0	NA	129	41-638	129
2023	3L	0	NA	38	65-650	71	59-695	109
2023	3N	0	NA	10	68-570	37	36-711	47
2023	3O	0	NA	12	118-610	40	64-602	52
2023	3Ps	0	NA	0	NA	0	NA	0

Table 6. Number of successful fishing sets per stratum in Div. 2H over the last 15 years of the Canadian Autumn RV multispecies bottom trawl surveys.

stratum	depth range (m)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
930	<=200	0	3	4	5	5	3	5	4	5	5	5	2	2	0	2
954	<=200	0	3	4	5	5	5	5	4	5	5	5	2	2	0	2
956	<=200	0	3	5	6	6	6	6	6	6	6	6	3	2	0	3
957	<=200	0	5	6	7	6	7	4	7	7	7	7	2	2	0	3
931	201-300	0	2	2	2	2	2	2	2	2	2	0	1	2	0	2
943	201-300	0	2	2	2	2	2	2	2	2	2	0	2	2	0	2
950	201-300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
953	201-300	0	2	2	2	2	2	2	3	2	2	2	2	2	0	2
955	201-300	0	2	2	2	2	2	2	2	2	2	1	2	2	0	2
958	201-300	0	2	2	2	2	2	2	2	2	2	2	2	2	0	2
932	301-400	0	2	2	2	2	2	2	2	2	2	0	1	2	0	2
944	301-400	0	3	4	5	6	5	5	4	5	5	5	3	2	0	3
949	301-400	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
952	301-400	0	2	2	2	2	2	2	2	2	2	2	2	2	0	2
959	301-400	0	2	2	2	2	2	2	2	2	2	2	1	2	0	2
933	401-500	0	2	3	2	2	2	2	2	2	2	0	1	2	0	2
942	401-500	0	2	2	2	1	2	2	1	2	2	1	1	2	0	2
945	401-500	0	2	2	2	2	2	2	2	2	2	2	1	2	0	2
948	401-500	0	0	1	2	2	2	2	0	2	2	2	2	2	0	1
951	401-500	0	2	2	2	2	2	2	2	2	2	2	1	2	0	2
960	401-500	0	2	2	2	2	2	2	2	2	2	2	1	2	0	2
934	501-750	0	2	2	2	2	2	0	1	2	2	0	1	2	0	2
941	501-750	0	2	2	2	2	2	0	2	2	2	0	1	2	0	2
946	501-750	0	2	3	4	4	4	0	4	4	4	4	2	2	0	2
947	501-750	0	2	2	2	2	2	0	2	2	2	2	2	2	0	2
961	501-750	0	2	2	2	2	2	0	2	2	2	2	1	2	0	2
935	751-1000	0	2	2	2	2	0	0	2	0	2	0	0	1	0	0
940	751-1000	0	2	2	2	2	0	0	2	0	2	0	0	2	0	2
962	751-1000	0	2	2	2	2	0	0	2	0	2	2	0	2	0	0
936	1001-1250	0	2	1	2	2	0	0	2	0	1	0	0	0	0	0
939	1001-1250	0	2	2	2	2	0	0	1	0	2	0	0	0	0	0
963	1001-1250	0	2	2	2	2	0	0	2	0	2	2	0	0	0	0
937	1251-1500	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
938	1251-1500	0	2	2	2	2	0	0	2	0	2	0	0	0	0	0
964	1251-1500	0	2	2	2	2	0	0	2	0	2	0	0	0	0	0
all strata		0	70	79	84	83	66	53	77	68	83	58	39	53	0	52

Table 7. Number of successful fishing sets per stratum in Div. 2J over the last 15 years of the Canadian Autumn RV multispecies bottom trawl surveys.

stratum	depth range (m)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
201	<=200	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2
205	<=200	5	6	4	6	6	6	6	6	6	6	4	4	2	0	5
206	<=200	6	7	5	7	7	7	8	7	7	7	4	4	3	0	4
207	<=200	8	7	5	8	9	5	6	9	8	5	5	5	3	0	6
237	<=200	2	3	0	3	3	2	2	2	2	3	2	2	2	0	2
238	<=200	3	2	3	2	2	2	2	2	2	2	2	0	2	0	2
202	201-300	2	2	2	2	2	2	2	2	2	2	2	1	1	0	2
209	201-300	2	3	2	3	3	3	3	3	3	2	2	2	2	0	2
210	201-300	3	4	3	4	4	4	4	4	4	3	2	2	2	0	2
213	201-300	5	6	5	6	6	5	7	6	6	5	4	4	2	0	4
214	201-300	5	5	4	5	5	5	5	5	5	5	3	3	2	0	3
215	201-300	4	4	4	5	5	5	4	5	5	5	3	3	2	0	3
228	201-300	7	8	6	8	8	8	8	8	8	6	5	5	3	0	5
234	201-300	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2
203	301-400	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2
208	301-400	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2
211	301-400	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2
216	301-400	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2
222	301-400	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2
229	301-400	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2
204	401-500	2	2	2	2	2	2	2	2	2	2	2	2	2	0	3
217	401-500	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2
223	401-500	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2
227	401-500	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2
235	401-500	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2
240	401-500	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2
212	501-750	2	2	2	2	2	2	3	2	2	2	2	2	2	0	2
218	501-750	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2
224	501-750	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2
230	501-750	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2
239	501-750	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2
219	751-1000	2	2	2	2	2	2	2	2	2	2	0	2	2	0	2
231	751-1000	2	2	2	2	2	2	2	2	2	2	0	2	2	0	2
236	751-1000	2	2	2	2	2	2	2	2	2	2	0	2	2	0	2
220	1001-1250	2	2	2	2	2	2	2	2	2	3	0	2	0	0	2
225	1001-1250	2	2	2	2	2	2	2	2	2	2	0	2	0	0	2
232	1001-1250	2	2	2	2	2	2	2	2	2	1	0	2	0	0	2
221	1251-1500	2	2	2	2	2	2	2	2	2	2	0	2	0	0	2
226	1251-1500	2	2	2	2	2	2	2	2	2	2	0	2	0	0	2
233	1251-1500	2	2	2	2	2	2	2	2	2	1	0	2	0	0	2
all strata		108	113	99	115	116	110	114	115	114	106	76	91	70	0	97

Table 8. Number of successful fishing sets per stratum in Div. 3K over the last 15 years of the Canadian Autumn RV multispecies bottom trawl surveys. NA denotes strata that have been removed from the survey design (note however that some small amount of opportunistic fishing of these strata may still have occurred when poor weather forced survey vessels to the inshore).

stratum	depth range (m)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
608	<=200	0	4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
612	<=200	0	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
616	<=200	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
618	<=200	5	5	3	2	6	5	6	5	6	5	5	4	4	0	5
619	<=200	7	8	2	3	8	7	6	8	8	6	5	4	4	0	6
609	201-300	2	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
611	201-300	0	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
615	201-300	0	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
620	201-300	10	11	8	10	10	11	11	11	11	7	5	6	7	0	8
621	201-300	8	11	6	8	11	11	10	11	10	9	8	9	7	0	9
624	201-300	4	5	4	5	5	5	5	5	5	4	2	4	3	0	4
634	201-300	6	7	5	7	4	7	7	6	7	5	2	6	3	0	5
635	201-300	5	5	5	5	4	5	3	4	5	5	2	4	2	0	4
636	201-300	6	6	6	6	4	6	7	5	6	4	2	4	2	0	4
637	201-300	4	5	5	5	4	5	5	5	5	4	4	4	2	0	4
610	301-400	0	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
614	301-400	0	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
617	301-400	2	3	2	3	3	3	3	3	2	3	2	2	2	0	2
623	301-400	2	2	2	2	2	2	2	2	2	3	2	2	2	0	2
625	301-400	4	4	3	3	3	4	4	4	5	2	2	3	3	0	3
626	301-400	4	5	4	5	5	5	4	5	5	4	4	4	3	0	4
628	301-400	4	5	4	6	5	5	5	5	5	5	4	4	3	0	4
629	301-400	2	2	2	2	2	2	2	2	2	2	0	2	2	0	1
630	301-400	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2
633	301-400	8	9	7	8	5	9	9	6	7	6	2	7	6	0	7
638	301-400	8	9	9	8	6	9	9	9	9	7	7	7	4	0	7
639	301-400	6	6	6	6	6	6	6	5	6	3	3	6	2	0	4
613	401-500	0	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
622	401-500	3	3	2	3	3	3	3	3	3	3	2	2	2	0	2
627	401-500	5	5	4	5	5	5	5	5	5	5	2	4	3	0	4
631	401-500	5	6	4	6	3	6	6	5	6	5	2	5	4	0	5
640	401-500	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2
645	401-500	2	2	2	2	2	2	2	2	2	2	0	2	2	0	2
650	401-500	2	2	2	2	2	2	2	1	2	2	2	2	0	0	2
641	501-750	2	2	2	2	2	2	2	2	2	2	2	2	2	0	2
646	501-750	2	2	2	2	2	2	2	2	2	2	1	2	0	0	2
651	501-750	2	2	2	2	2	2	2	2	2	2	2	2	1	0	2
642	751-1000	2	2	2	2	2	2	2	2	2	0	0	2	0	0	2
647	751-1000	2	2	2	2	2	2	2	2	2	0	0	2	0	0	2
652	751-1000	2	2	2	2	2	2	2	2	2	0	0	2	2	0	2
643	1001-1250	3	3	2	3	3	3	3	2	3	0	0	2	0	0	2
648	1001-1250	2	2	2	2	2	2	2	2	2	0	0	2	0	0	0
653	1001-1250	2	2	2	2	2	2	2	2	2	0	0	2	0	0	2
644	1251-1500	2	2	2	2	2	2	2	2	2	0	0	2	0	0	2
649	1251-1500	2	2	2	2	2	2	2	2	2	0	0	2	0	0	0
654	1251-1500	2	2	2	2	2	2	2	0	2	0	0	2	0	0	2
all strata		143	173	125	141	137	154	151	143	153	111	78	125	81	0	122

Table 9. Number of successful fishing sets per stratum in Div. 3L over the last 15 years of the Canadian Autumn RV multispecies bottom trawl surveys. NA denotes strata that have been removed from the survey design (note however that some small amount of opportunistic fishing of these strata may still have occurred when poor weather forced survey vessels to the inshore).

stratum	depth range (m)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
784	<=55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350	56-91	6	7	7	7	7	7	7	7	7	7	7	5	0	0	5
363	56-91	5	6	5	6	6	6	6	6	6	6	6	4	0	0	4
371	56-91	3	4	3	4	4	4	4	4	4	4	4	3	0	0	3
372	56-91	7	8	6	8	8	7	8	8	8	8	8	5	0	0	5
384	56-91	3	4	3	4	4	4	4	4	4	4	4	3	0	0	3
785	56-91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
328	92-183	4	5	5	5	5	5	5	5	5	5	5	3	0	0	3
341	92-183	5	5	5	5	5	5	5	5	5	5	5	3	0	0	3
342	92-183	2	2	2	2	2	2	2	2	2	2	2	2	0	0	2
343	92-183	2	2	2	2	2	2	2	2	2	2	2	2	0	0	2
348	92-183	6	7	5	7	7	7	7	7	6	7	6	5	0	0	5
349	92-183	6	7	7	7	7	7	7	6	7	7	7	5	0	0	5
364	92-183	8	9	7	9	9	9	9	8	9	9	8	5	0	0	6
365	92-183	3	3	2	3	3	3	4	3	3	3	2	2	0	0	2
370	92-183	4	4	3	4	4	4	4	4	4	4	3	3	0	0	3
385	92-183	7	8	6	8	8	8	8	8	8	8	6	6	0	0	7
390	92-183	4	5	4	5	5	5	5	5	5	5	5	3	0	0	3
786	92-183	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
787	92-183	0	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
788	92-183	0	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
790	92-183	0	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
793	92-183	1	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
794	92-183	0	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
797	92-183	0	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
799	92-183	0	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
344	184-274	4	5	2	5	5	4	4	5	5	5	4	3	0	0	3
347	184-274	3	3	2	3	3	3	3	3	3	3	3	2	0	0	2
366	184-274	4	5	4	5	5	5	5	5	5	5	4	4	0	0	4
369	184-274	3	3	2	3	3	3	3	3	3	3	2	2	0	0	2
386	184-274	3	3	2	3	3	3	3	3	3	3	2	2	0	0	2
389	184-274	2	3	2	3	3	3	3	3	3	3	2	2	0	0	2
391	184-274	2	2	2	2	2	2	2	2	2	2	2	2	0	0	2
791	184-274	0	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
795	184-274	0	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
345	275-366	4	4	3	5	5	5	5	4	5	5	4	3	0	0	4
346	275-366	3	3	3	3	3	3	3	3	3	3	2	2	0	0	2
368	275-366	2	2	2	2	2	2	2	2	2	2	2	2	0	0	2
387	275-366	2	2	2	2	2	2	2	2	2	2	2	2	0	0	2
388	275-366	2	2	2	2	2	2	2	2	2	2	2	2	0	0	2
392	275-366	2	2	2	2	2	2	2	2	2	2	2	2	0	0	2
789	275-366	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
796	275-366	0	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
798	275-366	0	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
800	275-366	2	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
729	367-549	2	2	2	2	2	2	2	2	2	2	2	2	0	0	2
731	367-549	2	2	0	2	2	2	2	2	2	2	2	2	0	0	2
733	367-549	2	2	2	2	2	2	2	2	2	2	2	2	0	0	2
735	367-549	2	2	2	2	2	2	2	2	2	2	2	2	0	0	2
792	367-549	0	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
730	550-731	2	2	2	2	2	2	2	2	2	2	2	2	0	0	2
732	550-731	2	2	2	2	2	2	2	2	2	2	2	2	0	0	2
734	550-731	2	2	2	2	2	2	2	2	2	1	2	2	0	0	2
736	550-731	2	2	2	2	2	2	2	2	2	2	2	2	0	0	2
737	732-914	2	2	0	0	0	2	0	0	0	0	0	0	0	0	2
741	732-914	2	2	0	0	0	2	0	0	1	0	0	0	0	0	2
745	732-914	2	2	0	0	0	2	0	0	0	0	0	0	0	0	2
748	732-914	2	2	0	0	0	2	0	0	0	0	0	0	0	0	2
738	915-1097	2	2	0	0	0	2	0	0	0	0	0	0	0	0	2
742	915-1097	2	2	0	0	0	2	0	0	0	0	0	0	0	0	2
746	915-1097	2	2	0	0	0	2	0	0	0	0	0	0	0	0	2
749	915-1097	2	2	0	0	0	2	0	0	0	0	0	0	0	0	2
739	1098-1280	2	2	0	0	0	2	0	0	0	0	0	0	0	0	2
743	1098-1280	2	2	0	0	0	2	0	0	0	0	0	0	0	0	2
747	1098-1280	2	2	0	0	0	2	0	0	0	0	0	0	0	0	2
750	1098-1280	2	2	0	0	0	2	0	0	0	0	0	0	0	0	2
740	1281-1463	2	2	0	0	0	2	0	0	0	0	0	0	0	0	2
744	1281-1463	2	2	0	0	0	2	0	0	1	0	0	0	0	0	2
751	1281-1463	2	2	0	0	0	2	0	0	0	0	0	0	0	0	1
all strata		160	196	116	142	142	170	142	138	143	141	129	105	0	0	137

Table 10. Number of successful fishing sets per stratum in Div. 3N over the last 15 years of the Canadian Autumn RV multispecies bottom trawl surveys. NA denotes strata removed from survey design.

stratum	depth range (m)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2023	2021	2022
375	<=55	4	4	4	4	4	0	4	4	4	4	4	2	2	0	0
376	<=55	3	4	4	4	4	0	4	4	4	4	4	2	2	0	0
360	56-91	7	8	8	8	8	0	8	8	8	8	8	4	4	0	0
361	56-91	4	5	5	5	5	0	4	5	5	5	5	3	3	0	0
362	56-91	6	7	7	7	7	0	7	7	7	7	7	4	4	0	0
373	56-91	6	7	7	7	7	0	7	7	7	7	7	4	4	0	0
374	56-91	2	3	3	3	3	0	3	3	3	3	3	2	2	0	0
383	56-91	2	2	2	2	2	0	2	2	2	2	2	2	2	0	0
359	92-183	2	2	2	2	2	0	2	2	2	2	2	2	2	0	0
377	92-183	2	2	2	2	2	0	2	2	2	2	2	2	2	0	0
382	92-183	2	2	2	2	2	0	2	2	2	2	2	2	2	0	0
358	184-274	2	2	2	2	2	0	2	2	2	2	2	2	2	0	0
378	184-274	2	1	2	2	2	0	2	2	2	2	2	2	2	0	0
381	184-274	2	2	2	2	2	0	2	2	2	2	2	2	2	0	0
357	275-366	2	2	2	2	2	0	2	2	2	2	2	2	2	0	0
379	275-366	2	2	2	2	2	0	2	2	2	2	2	2	2	0	0
380	275-366	2	2	2	2	2	1	2	2	2	2	2	2	2	0	0
723	367-549	2	2	2	2	2	0	2	2	2	2	2	2	2	0	0
725	367-549	2	1	2	2	2	0	2	2	2	2	2	2	2	0	0
727	367-549	2	2	2	2	2	1	2	2	2	2	2	2	2	0	0
724	550-731	2	2	2	2	2	0	2	2	2	2	2	2	2	0	0
726	550-731	2	2	2	2	2	0	2	2	2	2	2	1	2	0	0
728	550-731	2	2	2	2	2	1	2	2	2	2	2	2	2	0	0
752	732-914	0	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
756	732-914	1	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
760	732-914	2	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
753	915-1097	1	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
757	915-1097	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
761	915-1097	2	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
754	1098-1280	0	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
758	1098-1280	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
762	1098-1280	2	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
759	1281-1463	1	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
763	1281-1463	2	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
all strata		75	72	70	70	70	3	69	70	70	70	70	52	53	0	0

Table 11. Number of successful fishing sets per stratum in Div. 30 over the last 15 years of the Canadian Autumn RV multispecies bottom trawl surveys. NA denotes strata removed from survey design.

stratum	depth range (m)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
330	56-91	7	6	6	6	6	0	6	6	6	6	6	4	1	0	4
331	56-91	2	2	2	2	2	0	2	2	2	2	2	2	0	0	2
338	56-91	6	5	5	5	5	0	5	5	5	5	5	3	0	0	3
340	56-91	5	6	5	5	5	0	5	5	5	5	5	3	0	0	3
351	56-91	7	6	7	7	7	0	7	7	7	7	7	5	0	0	5
352	56-91	7	7	7	7	7	0	7	7	7	7	7	5	0	0	5
353	56-91	4	4	4	4	4	0	4	4	4	4	4	3	0	0	3
329	92-183	5	5	5	5	5	0	5	5	5	5	5	3	2	0	3
332	92-183	3	3	3	3	3	0	3	3	3	3	3	2	0	0	2
337	92-183	3	3	3	3	3	0	3	3	3	3	3	2	0	0	2
339	92-183	2	2	2	2	2	0	2	2	2	2	2	2	0	0	2
354	92-183	2	2	2	2	2	0	2	2	2	2	2	2	0	0	2
333	184-274	2	2	2	2	2	0	2	2	2	2	2	2	0	0	2
336	184-274	1	2	2	2	2	0	2	1	2	2	2	2	0	0	2
355	184-274	2	2	2	2	2	0	2	2	2	2	2	2	0	0	2
334	275-366	2	2	2	2	2	0	2	2	2	2	2	2	0	0	2
335	275-366	2	2	2	2	2	0	2	2	2	2	2	2	0	0	2
356	275-366	2	2	2	2	2	0	2	2	2	2	2	2	0	0	2
717	367-549	2	2	2	2	2	0	2	2	2	2	2	2	0	0	2
719	367-549	2	2	2	2	2	0	2	2	2	2	2	2	0	0	2
721	367-549	2	2	2	2	2	0	2	2	2	2	2	2	0	0	2
718	550-731	2	2	2	2	2	0	2	2	2	2	2	2	0	0	2
720	550-731	2	2	2	2	2	0	2	2	2	2	2	2	0	0	2
722	550-731	2	2	2	2	2	0	2	2	0	2	2	2	0	0	2
764	732-914	2	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
768	732-914	2	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
772	732-914	2	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
765	915-1097	2	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
769	915-1097	2	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
773	915-1097	2	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
766	1098-1280	2	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
770	1098-1280	2	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
774	1098-1280	2	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
767	1281-1463	2	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
771	1281-1463	2	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
775	1281-1463	2	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
all strata		100	75	75	75	75	0	75	74	73	75	75	60	3	0	60

Table 12. Number of successful fishing sets per stratum in Div. 3L over the last 15 years of the Canadian Spring RV multispecies bottom trawl surveys. NA denotes strata that have been removed from the survey design (note however that some small amount of opportunistic fishing of these strata may still have occurred when poor weather forced survey vessels to the inshore).

stratum	depth range (m)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
350	56-91	7	7	7	7	7	6	0	7	7	7	7	0	0	1	10
363	56-91	6	6	6	6	6	6	0	6	6	5	6	0	0	2	5
371	56-91	3	4	4	4	3	4	0	4	4	3	4	0	0	1	3
372	56-91	9	8	8	8	7	8	0	8	8	6	8	0	0	2	5
384	56-91	4	4	4	4	3	4	3	4	4	3	4	0	0	2	3
328	92-183	5	5	5	6	6	4	0	5	0	5	4	0	0	0	5
341	92-183	5	5	5	5	5	4	0	5	3	5	5	0	0	0	5
342	92-183	2	2	2	2	2	2	2	2	0	2	2	0	0	0	2
343	92-183	2	1	2	2	2	2	2	2	0	2	2	0	0	0	2
348	92-183	7	5	7	5	6	7	4	7	0	4	7	0	0	1	4
349	92-183	7	6	7	7	5	7	0	7	0	6	7	0	0	0	6
364	92-183	9	9	7	9	9	9	3	9	0	6	9	0	0	1	4
365	92-183	3	3	3	2	3	3	2	3	0	2	3	0	0	0	2
370	92-183	4	4	4	4	5	4	4	4	0	3	4	0	0	0	2
385	92-183	8	7	8	8	7	8	6	9	0	7	7	0	0	2	5
390	92-183	5	5	5	5	4	5	4	4	0	4	4	0	0	2	3
786	92-183	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
787	92-183	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
344	184-274	5	2	5	5	3	3	2	4	0	5	3	0	0	0	0
347	184-274	3	3	3	2	3	3	2	3	0	1	2	0	0	0	2
366	184-274	5	4	5	0	5	5	2	5	0	0	3	0	0	0	3
369	184-274	3	3	3	3	3	3	2	3	0	2	3	0	0	0	2
386	184-274	3	3	3	3	3	3	0	3	0	2	3	0	0	0	3
389	184-274	3	3	3	3	3	3	0	3	0	2	3	0	0	2	2
391	184-274	2	2	2	2	2	2	2	2	0	2	2	0	0	2	2
345	275-366	5	3	5	3	5	4	2	4	0	3	4	0	0	0	2
346	275-366	3	3	3	3	3	2	2	3	0	0	3	0	0	0	2
368	275-366	2	2	2	2	2	2	2	2	0	2	2	0	0	2	2
387	275-366	2	2	2	2	2	2	0	2	0	2	2	0	0	2	2
388	275-366	2	2	2	2	2	2	0	2	0	2	2	0	0	2	2
392	275-366	2	2	2	2	2	2	2	2	0	2	2	0	0	2	2
729	367-549	2	1	2	2	2	2	2	2	0	2	2	0	0	0	2
731	367-549	2	2	2	2	2	2	0	2	0	2	2	0	0	2	2
733	367-549	2	2	2	2	2	2	0	2	0	2	2	0	0	2	2
735	367-549	2	2	2	2	2	2	2	2	0	2	2	0	0	2	3
730	550-731	2	2	2	2	2	2	2	2	0	2	2	0	0	0	2
732	550-731	2	2	1	2	2	2	0	2	0	2	2	0	0	2	2
734	550-731	2	2	3	2	2	2	0	2	0	2	2	0	0	1	2
736	550-731	2	2	2	2	2	2	2	2	0	2	2	0	0	2	2
all strata		142	130	140	132	134	135	56	140	32	111	133	0	0	37	109

Table 13. Number of successful fishing sets per stratum in Div. 3N over the last 15 years of the Canadian Spring RV multispecies bottom trawl surveys.

stratum	depth range (m)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
375	<=55	5	5	5	5	5	3	5	5	4	5	5	0	0	2	2
376	<=55	5	5	5	5	5	3	4	5	3	5	4	0	0	2	2
360	56-91	10	10	10	10	10	6	9	10	8	10	8	0	0	2	2
361	56-91	6	6	6	6	6	4	5	6	5	6	5	0	0	2	2
362	56-91	9	8	9	9	9	5	7	9	8	9	7	0	0	2	4
373	56-91	8	9	9	9	9	5	7	8	8	9	7	0	0	2	4
374	56-91	3	3	3	3	3	2	3	3	2	3	3	0	0	2	2
383	56-91	2	2	2	2	2	2	2	2	2	2	2	0	0	2	2
359	92-183	2	2	2	2	2	2	2	2	2	2	2	0	0	3	2
377	92-183	2	2	2	2	2	2	2	2	2	2	2	0	0	2	2
382	92-183	2	2	2	2	2	2	2	2	2	2	2	0	0	2	2
358	184-274	2	2	2	2	2	2	2	2	2	2	2	0	0	2	1
378	184-274	2	2	2	2	2	2	2	2	2	2	2	0	0	2	2
381	184-274	2	2	2	2	2	2	2	2	2	2	2	0	0	3	2
357	275-366	2	2	2	2	2	2	2	2	2	2	2	0	0	2	2
379	275-366	2	2	2	2	2	2	2	2	2	2	2	0	0	0	2
380	275-366	2	2	2	2	2	2	2	2	2	2	2	0	0	2	2
723	367-549	2	2	2	2	2	2	2	2	2	2	2	0	0	2	2
725	367-549	2	2	2	2	2	2	2	2	2	2	2	0	0	0	1
727	367-549	2	2	2	2	2	2	2	2	2	2	2	0	0	2	2
724	550-731	2	2	2	1	2	2	2	2	0	2	2	0	0	2	1
726	550-731	2	2	2	2	2	2	2	2	2	2	2	0	0	0	2
728	550-731	2	2	2	2	2	2	2	2	2	2	2	0	0	3	2
all strata		78	78	79	78	79	60	72	78	68	79	71	0	0	43	47

Table 14. Number of successful fishing sets per stratum in Div. 30 over the last 15 years of the Canadian Spring RV multispecies bottom trawl surveys.

stratum	depth range (m)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
330	56-91	7	7	7	7	7	4	6	7	7	7	7	0	0	4	4
331	56-91	2	2	2	2	2	2	2	2	2	2	2	0	0	2	2
338	56-91	6	6	6	6	6	3	5	6	5	6	6	0	0	2	3
340	56-91	5	5	5	5	5	3	5	5	4	5	5	0	0	2	2
351	56-91	8	8	8	8	8	5	7	7	6	8	8	0	0	3	4
352	56-91	8	8	8	8	8	5	7	9	6	8	7	0	0	2	4
353	56-91	4	4	4	4	4	2	3	4	3	4	4	0	0	2	1
329	92-183	5	5	5	5	5	3	5	5	5	5	5	0	0	2	2
332	92-183	3	3	3	3	3	2	3	3	3	3	3	0	0	3	2
337	92-183	3	3	3	3	3	2	3	2	2	3	3	0	0	2	2
339	92-183	2	2	2	2	2	2	2	2	2	2	2	0	0	2	2
354	92-183	2	2	2	2	2	2	2	2	2	2	2	0	0	2	2
333	184-274	2	2	2	2	2	2	2	2	2	2	2	0	0	2	2
336	184-274	2	2	2	2	2	2	2	2	2	2	2	0	0	2	2
355	184-274	2	2	2	2	2	2	2	2	2	2	2	0	0	2	2
334	275-366	2	2	2	2	2	2	2	2	2	2	2	0	0	2	2
335	275-366	2	2	2	2	2	2	2	2	2	2	2	0	0	0	2
356	275-366	2	2	2	2	2	2	2	2	2	2	2	0	0	2	2
717	367-549	2	2	2	2	2	2	1	2	2	2	2	0	0	2	2
719	367-549	2	2	2	2	2	2	2	2	2	2	2	0	0	1	2
721	367-549	2	2	2	2	2	2	2	2	2	2	2	0	0	2	2
718	550-731	2	2	2	2	2	2	0	2	2	2	1	0	0	2	0
720	550-731	2	2	1	2	2	2	2	2	2	2	2	0	0	1	2
722	550-731	2	3	2	2	2	2	2	2	2	2	2	0	0	2	2
all strata		79	80	78	79	79	59	74	75	71	79	77	0	0	48	52

Table 15. Number of successful fishing sets per stratum in Div. 3Ps over the last 15 years of the Canadian Spring RV multispecies bottom trawl surveys.

stratum	depth range (m)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
314	<=55	8	7	8	8	8	7	8	6	8	8	6	0	5	4	0
320	<=55	10	11	11	10	11	8	11	9	11	11	10	0	10	7	0
293	56-91	2	2	2	2	2	2	2	2	2	2	2	0	1	2	0
308	56-91	2	2	2	2	2	2	2	2	2	2	2	0	2	2	0
312	56-91	2	2	2	2	2	2	2	2	2	2	2	0	2	2	0
315	56-91	7	7	7	7	7	6	7	6	7	7	7	0	7	4	0
321	56-91	9	10	10	10	10	8	10	8	10	10	10	0	9	7	0
325	56-91	8	8	8	8	8	7	8	7	8	8	8	0	7	6	0
326	56-91	2	2	2	2	2	2	2	2	2	2	2	0	2	2	0
783	56-91	2	2	2	2	2	2	2	2	2	2	2	0	2	2	0
294	92-183	2	2	2	2	2	2	2	2	2	2	2	0	2	2	0
297	92-183	2	2	2	2	2	2	2	2	2	2	2	0	2	2	0
307	92-183	3	3	3	3	3	2	3	3	3	3	3	0	2	2	0
311	92-183	3	3	3	3	3	2	3	3	3	3	3	0	2	2	0
317	92-183	2	2	2	2	2	2	2	2	2	2	2	0	2	2	0
319	92-183	8	8	8	8	8	7	8	7	8	8	8	0	5	5	0
322	92-183	13	13	12	13	14	12	13	11	13	13	11	0	9	8	0
323	92-183	6	6	5	6	6	5	5	5	6	6	6	0	5	4	0
324	92-183	4	4	4	4	4	4	4	3	4	4	3	0	3	2	0
781	92-183	4	4	4	4	4	4	4	4	4	4	4	0	3	2	0
782	92-183	2	2	2	2	2	2	2	2	2	2	2	0	2	2	0
295	184-274	2	2	0	2	2	2	2	2	2	2	2	0	2	2	0
298	184-274	2	2	2	2	2	2	2	2	2	2	2	0	2	2	0
300	184-274	2	2	2	2	2	2	2	2	2	2	2	0	2	2	0
306	184-274	3	3	3	3	3	2	3	3	3	3	3	0	2	2	0
309	184-274	2	2	2	2	2	2	2	2	2	2	2	0	2	2	0
310	184-274	2	2	2	2	2	2	2	2	3	2	2	0	2	2	0
313	184-274	2	2	2	2	2	2	2	2	2	2	2	0	2	2	0
316	184-274	2	2	2	2	2	2	2	2	2	2	2	0	2	2	0
318	184-274	2	2	2	2	2	2	2	2	2	2	2	0	2	2	0
779	184-274	4	4	4	4	4	4	4	3	4	4	4	0	3	3	0
780	184-274	3	3	3	3	3	3	3	3	3	2	3	0	2	2	0
296	275-366	2	2	2	2	2	2	2	2	2	2	2	0	2	2	0
299	275-366	2	2	2	2	2	2	2	2	2	2	2	0	2	2	0
705	275-366	2	2	2	2	2	2	2	2	2	2	2	0	2	2	0
706	275-366	4	4	4	4	4	3	4	3	4	4	4	0	2	2	0
707	275-366	2	2	2	2	2	2	2	2	2	1	2	0	2	2	0
715	275-366	2	2	2	2	2	2	2	2	2	1	2	0	2	2	0
716	275-366	4	4	4	4	4	4	4	3	4	2	3	0	3	2	0
708	367-549	2	2	2	2	2	1	2	1	2	1	2	0	2	2	0
711	367-549	5	5	5	5	5	4	5	4	5	5	5	0	2	3	0
712	367-549	6	6	6	6	6	5	6	5	6	6	6	0	3	4	0
713	367-549	7	7	7	7	7	6	7	6	7	5	7	0	5	5	0
714	367-549	8	9	9	9	9	7	7	8	9	9	9	0	7	5	0
709	550-731	2	2	2	2	2	1	2	2	2	2	2	0	2	2	0
all strata		175	177	174	177	179	156	175	157	179	170	171	0	143	129	0

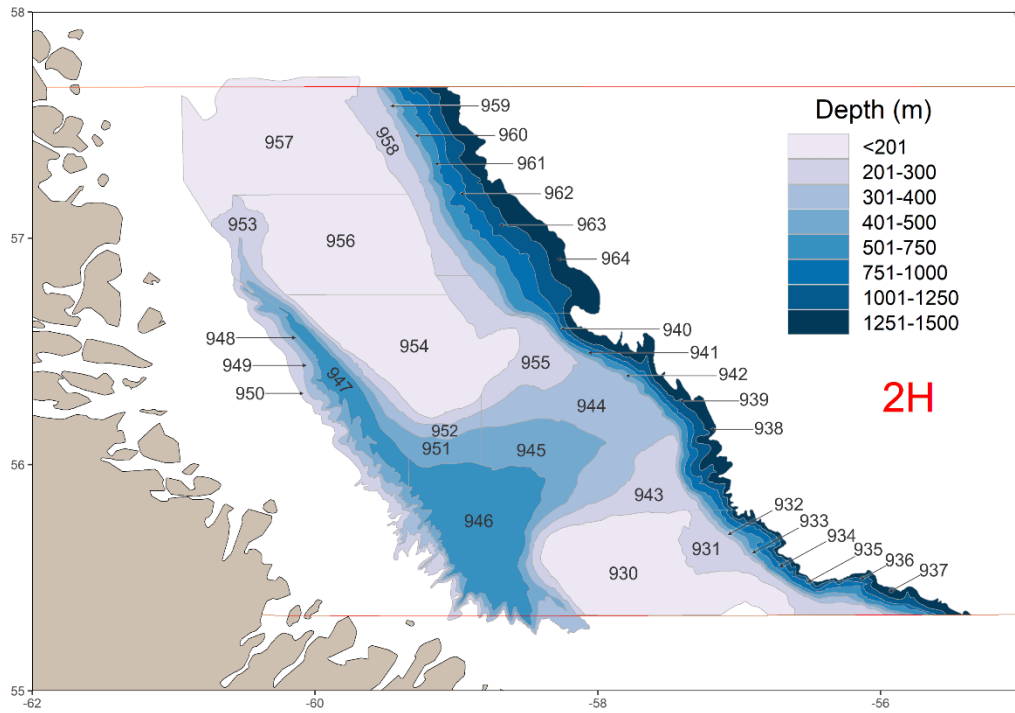


Figure 1. Stratification scheme for NAFO Division 2H.

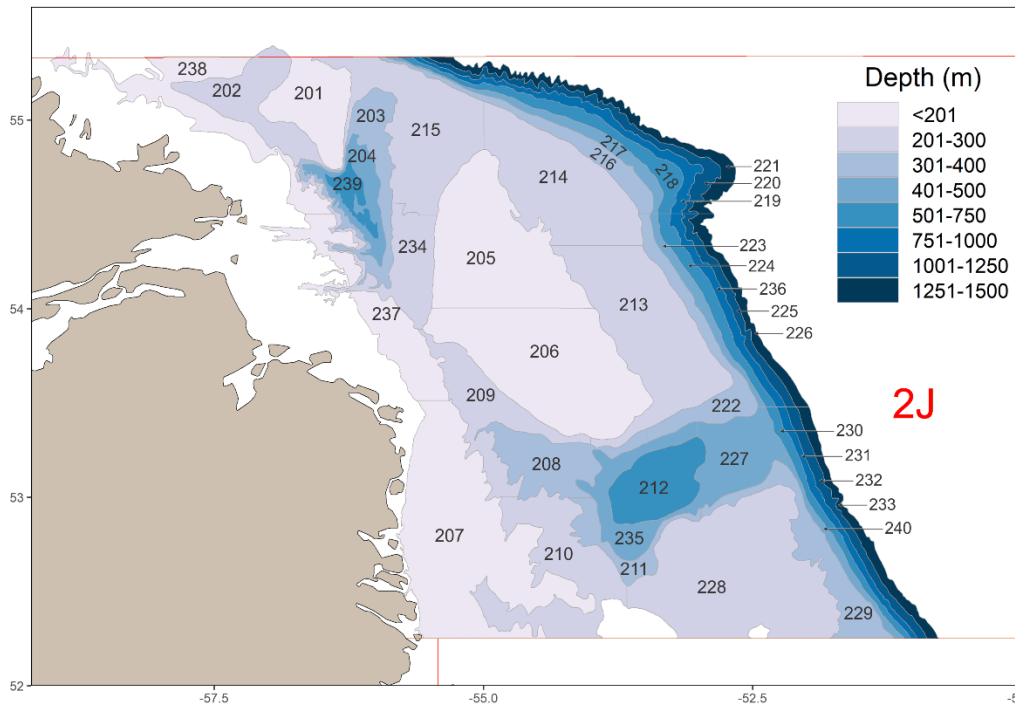


Figure 2. Stratification scheme for NAFO Division 2J.

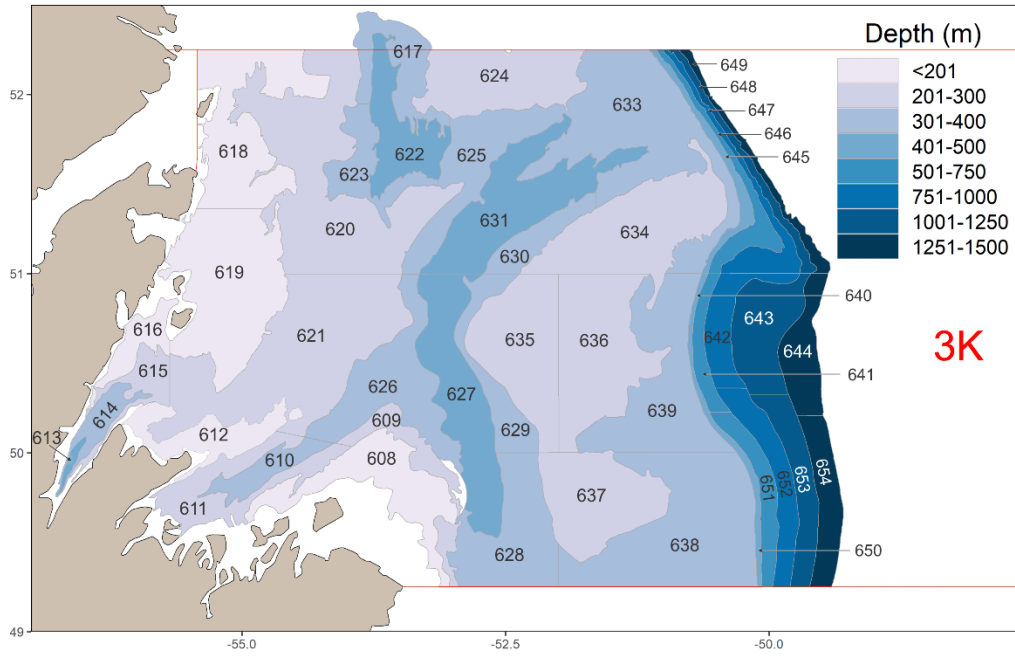


Figure 3. Stratification scheme for NAFO Division 3K.

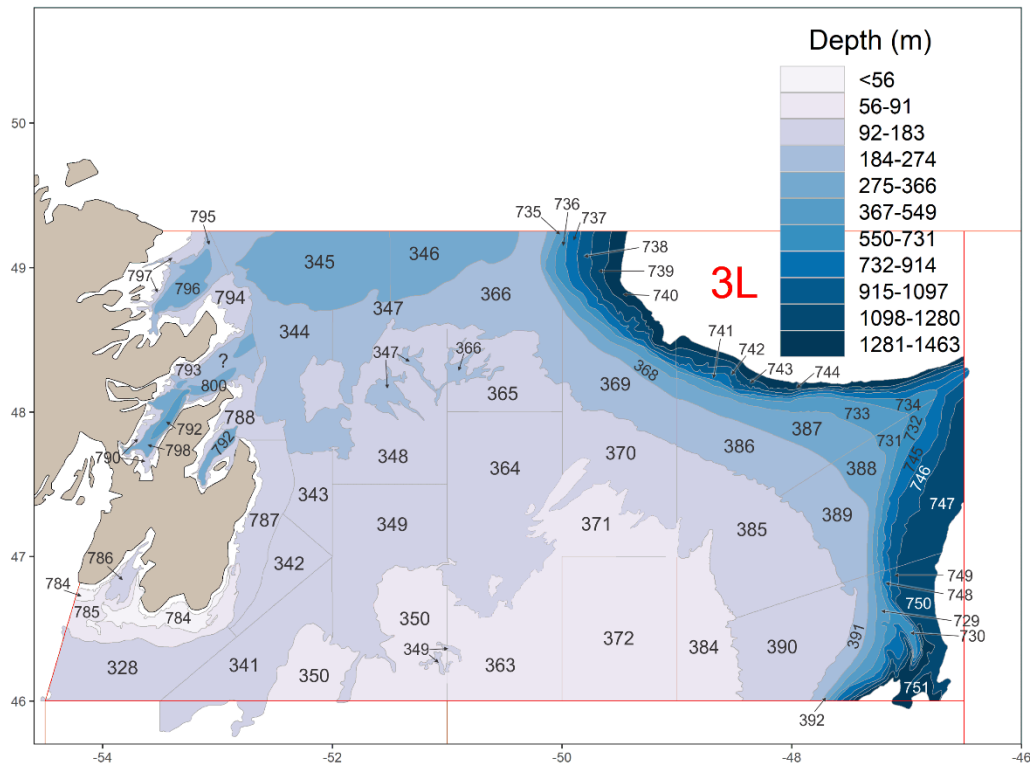


Figure 4. Stratification scheme for NAFO Division 3L.

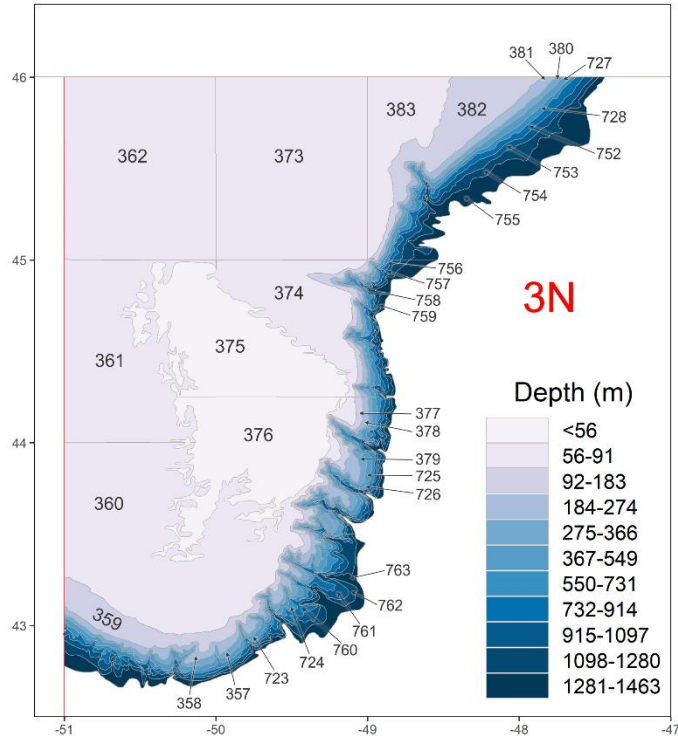


Figure 5. Stratification scheme for NAFO Division 3N.

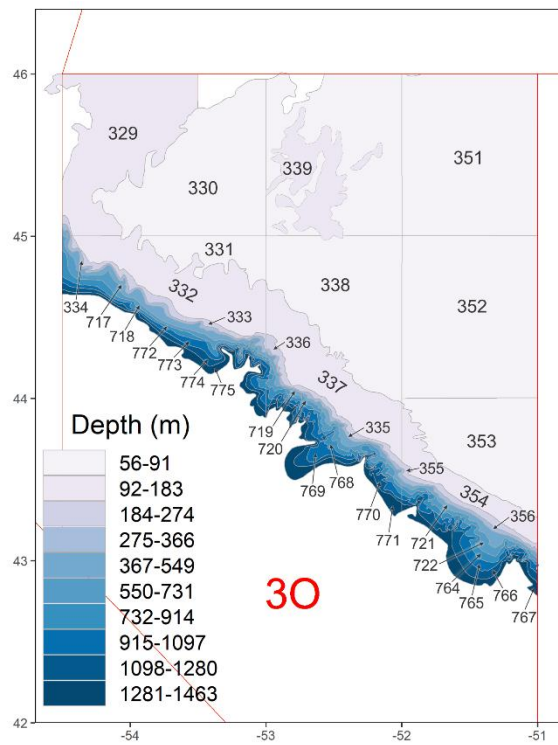


Figure 6. Stratification scheme for NAFO Division 30.

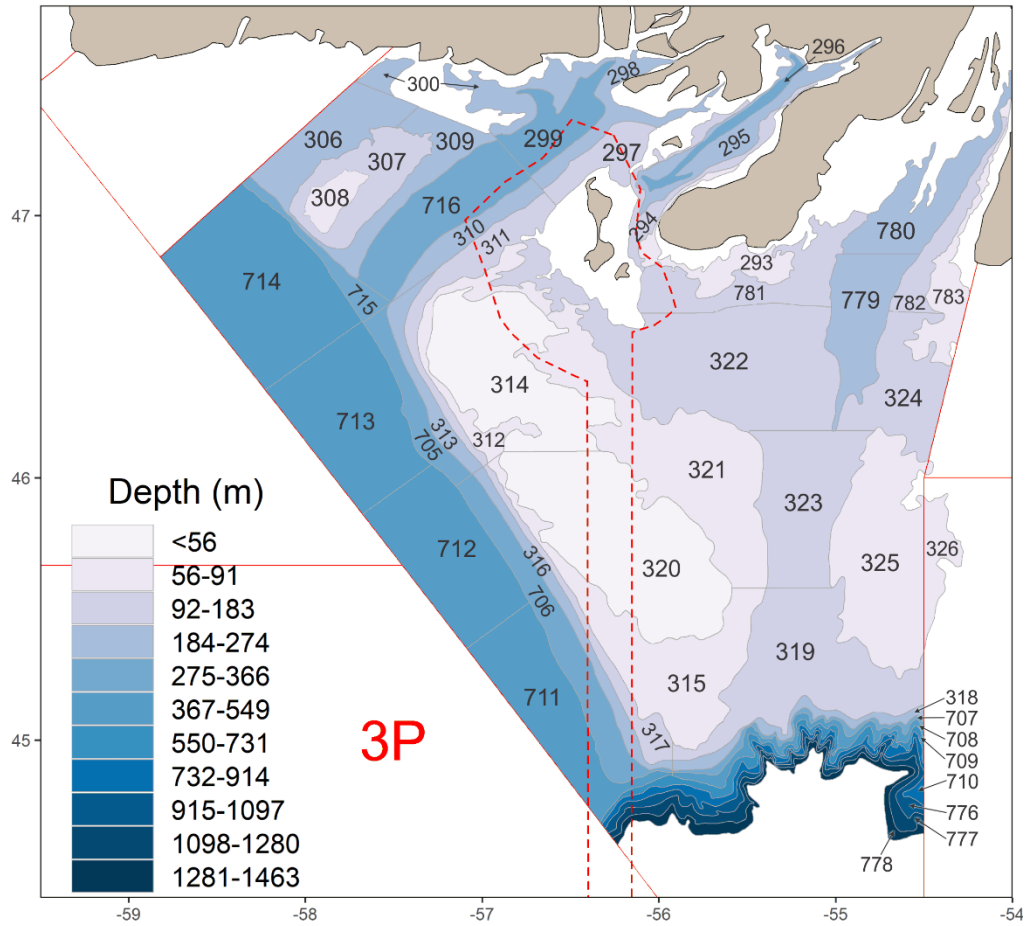


Figure 7. Stratification scheme for NAFO Subdivision 3Ps.

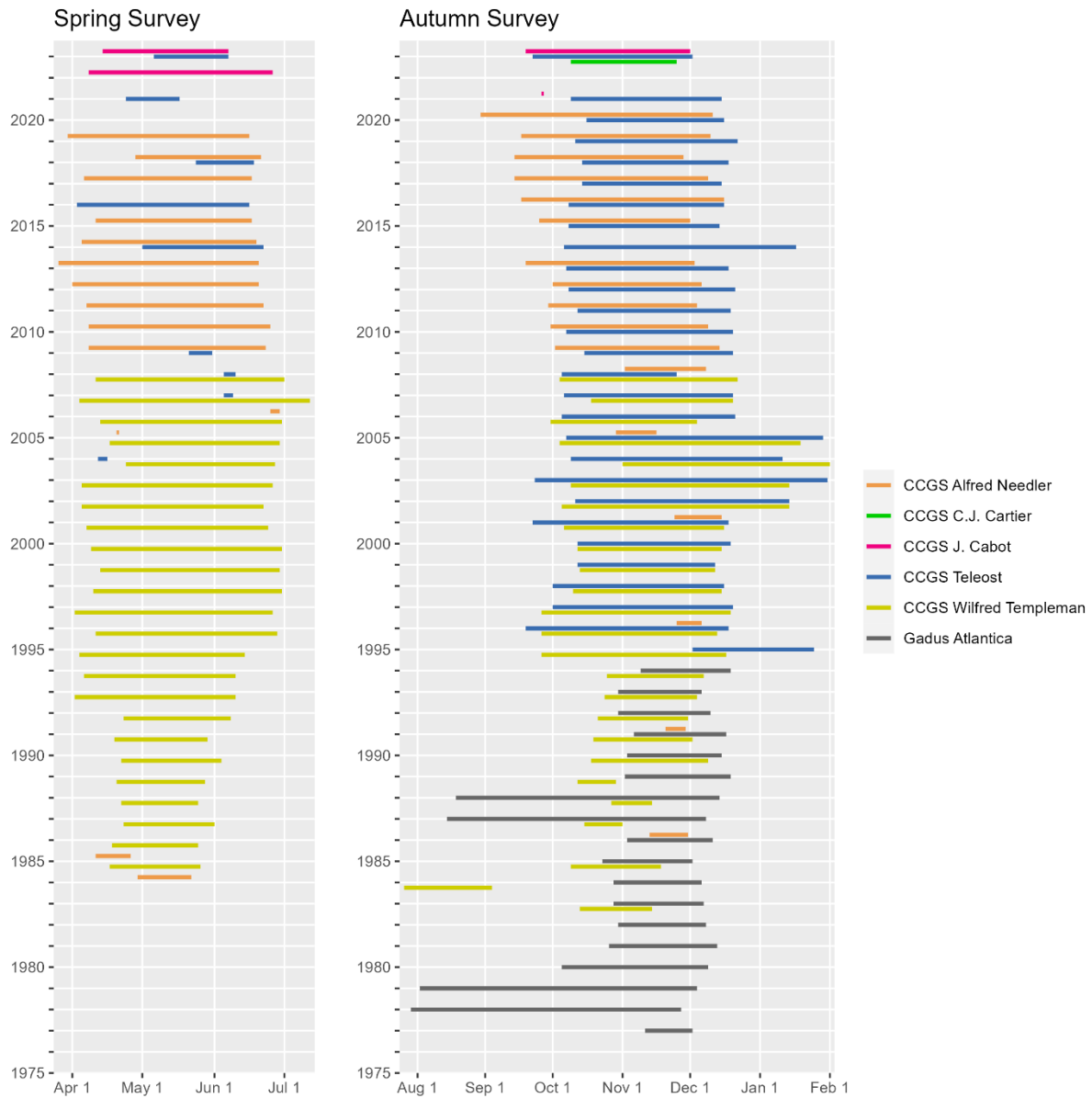


Figure 8. Timing of Canadian NL Spring (left) and Autumn (right) multispecies bottom trawl surveys. Horizontal bars simply represent the period between the first and last fishing set for each vessel. The different colours represent the primary research vessels in operation over the displayed time series. Note that there have also been multiple gear changes over this time series.

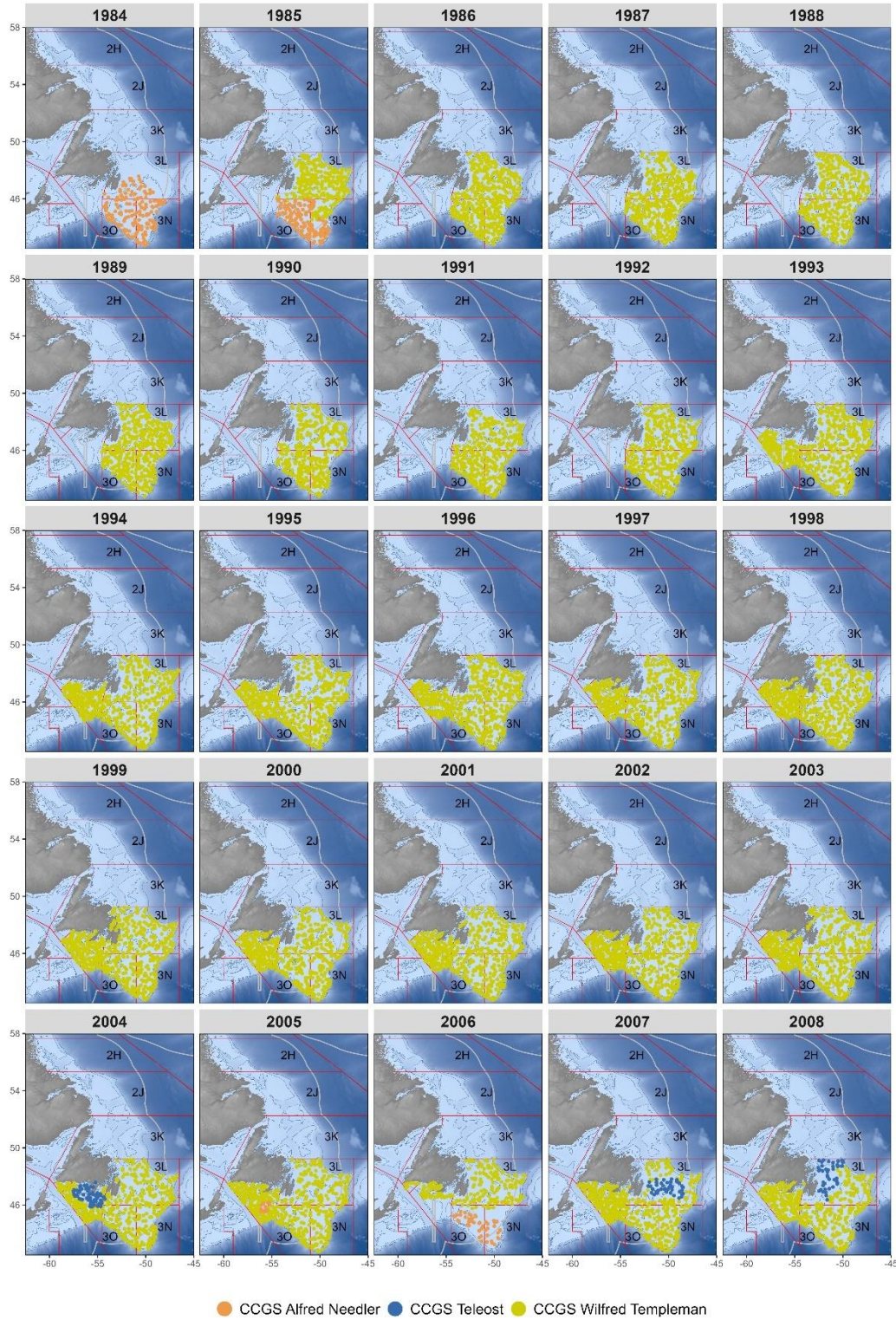


Figure 9. Fishing set locations colour-coded by research vessel for the Canadian NL Spring multispecies bottom trawl surveys.

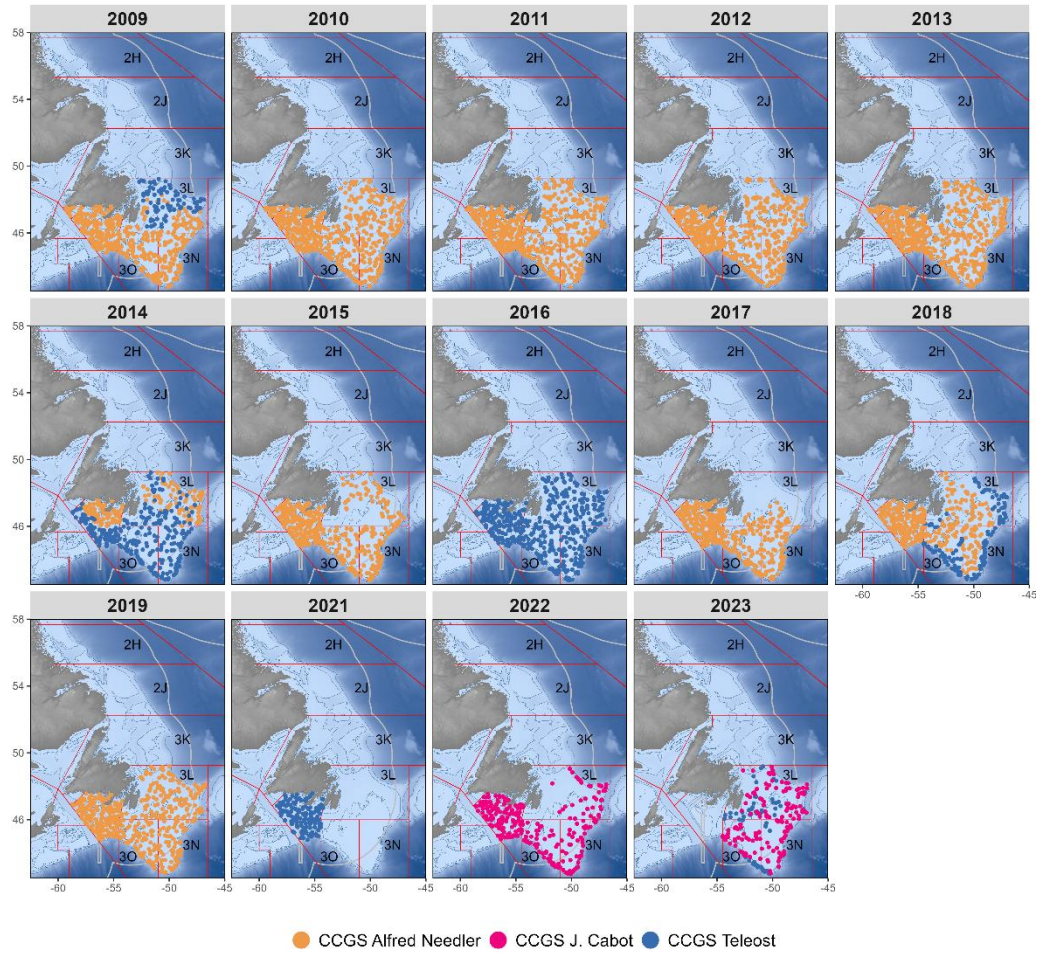


Figure 10. Fishing set locations colour-coded by research vessel for the Canadian NL Spring multispecies bottom trawl surveys.

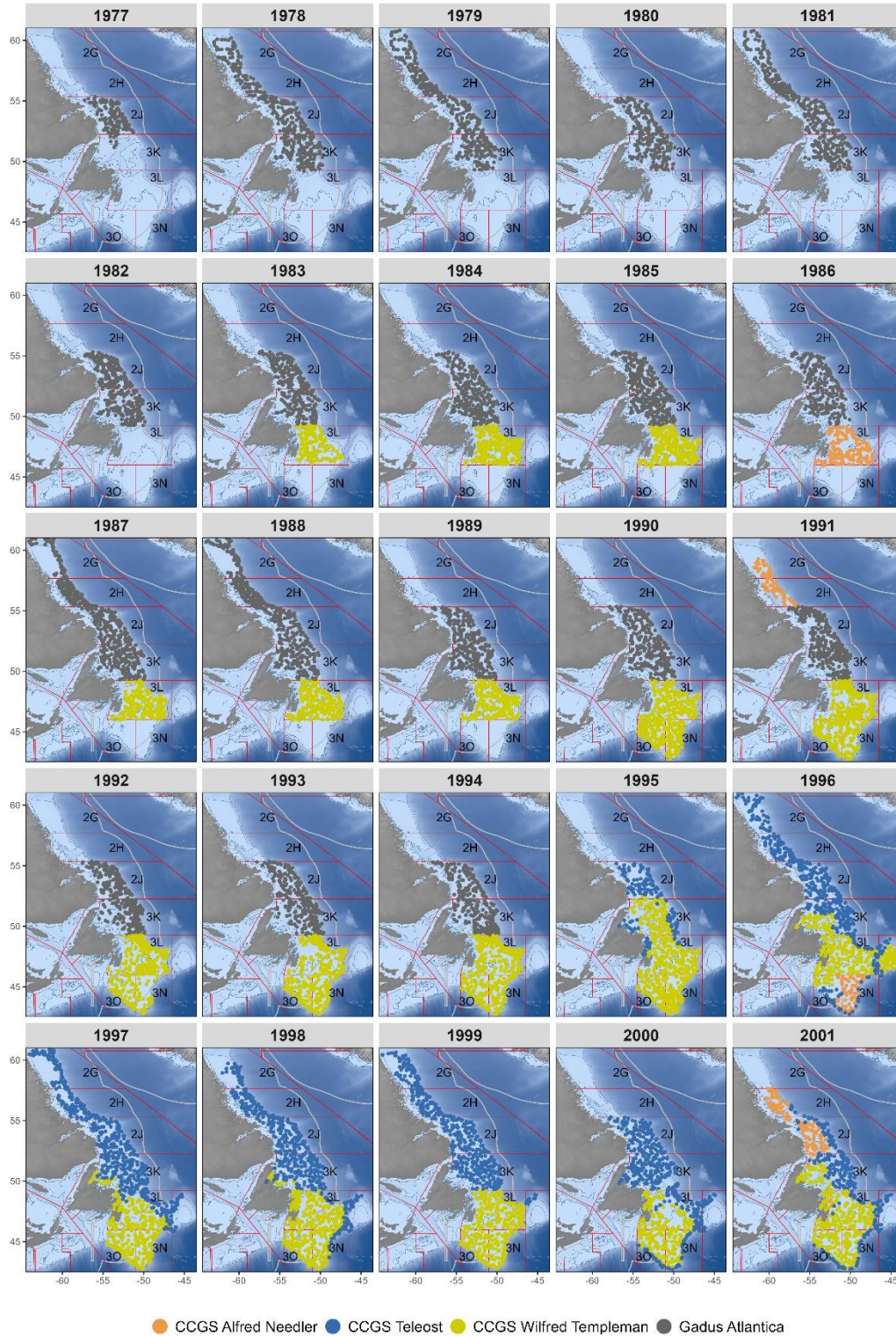


Figure 11. Fishing set locations colour-coded by research vessel for the Canadian NL Autumn multispecies bottom trawl surveys.

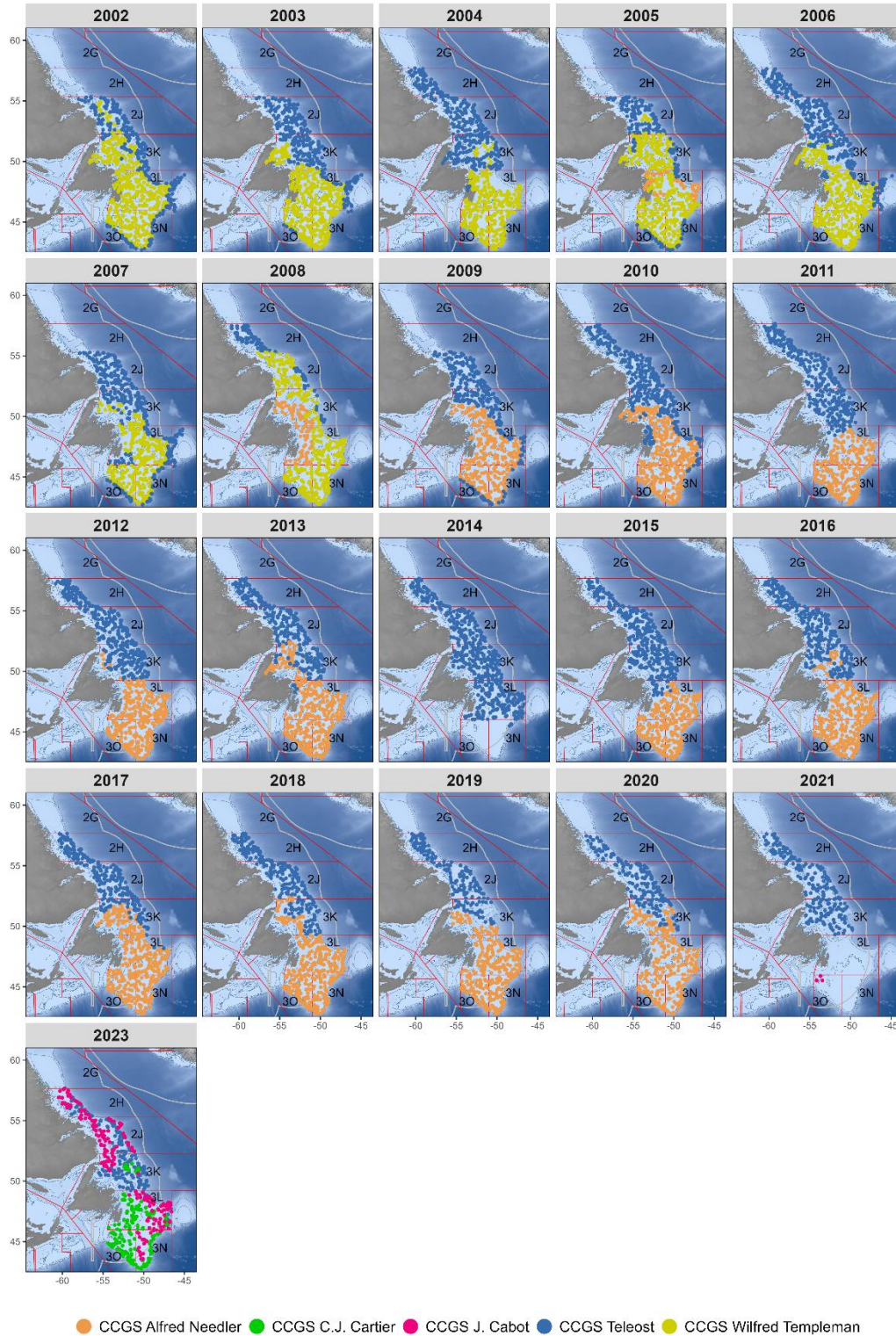


Figure 12. Fishing set locations colour-coded by research vessel for the Canadian NL Autumn multispecies bottom trawl surveys.

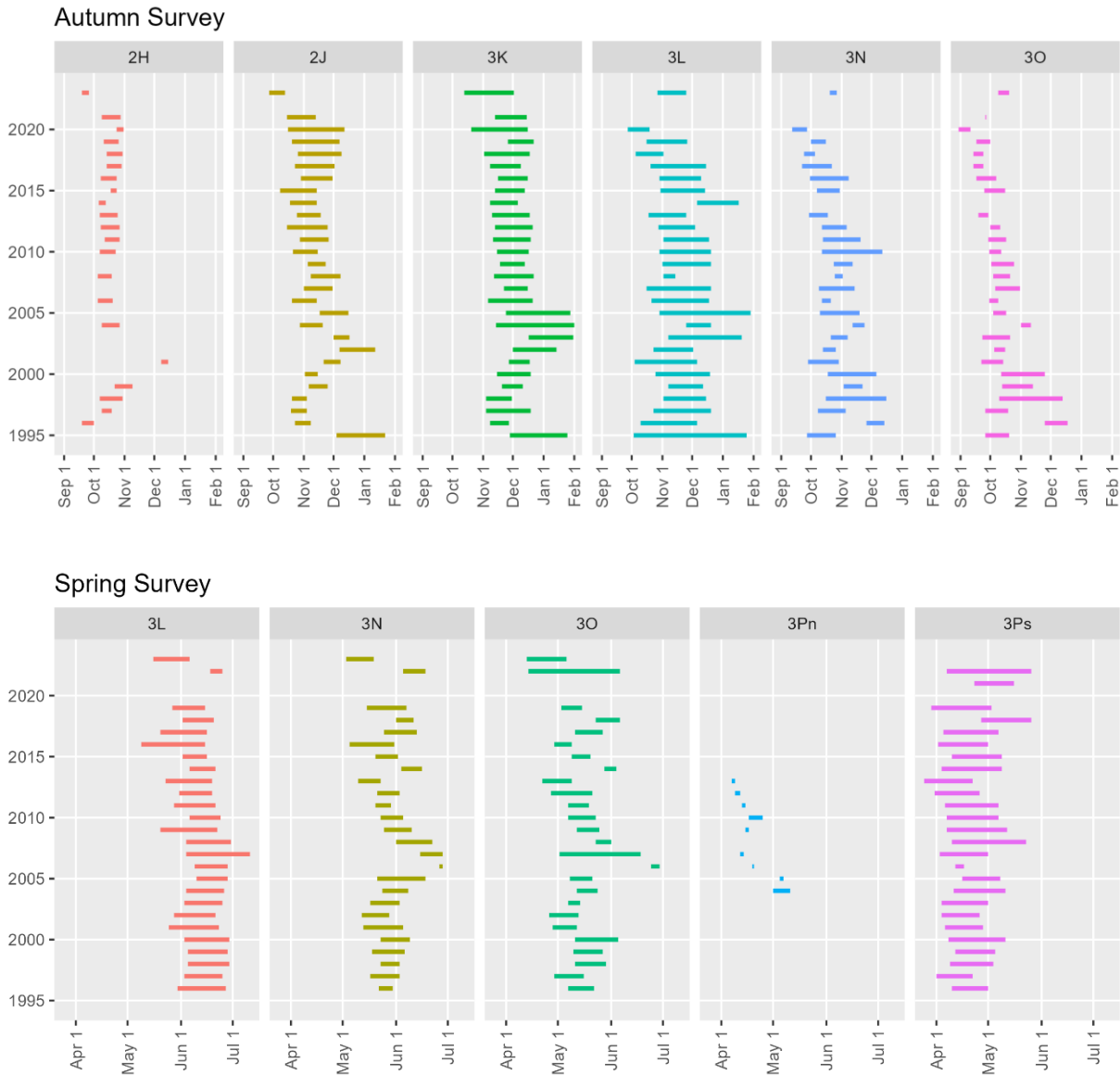


Figure 13. Timing of Canadian NL Autumn (top) and Spring (bottom) multispecies bottom trawl surveys by NAFO division. Horizontal bars represent the period between the first and last fishing set in each division.

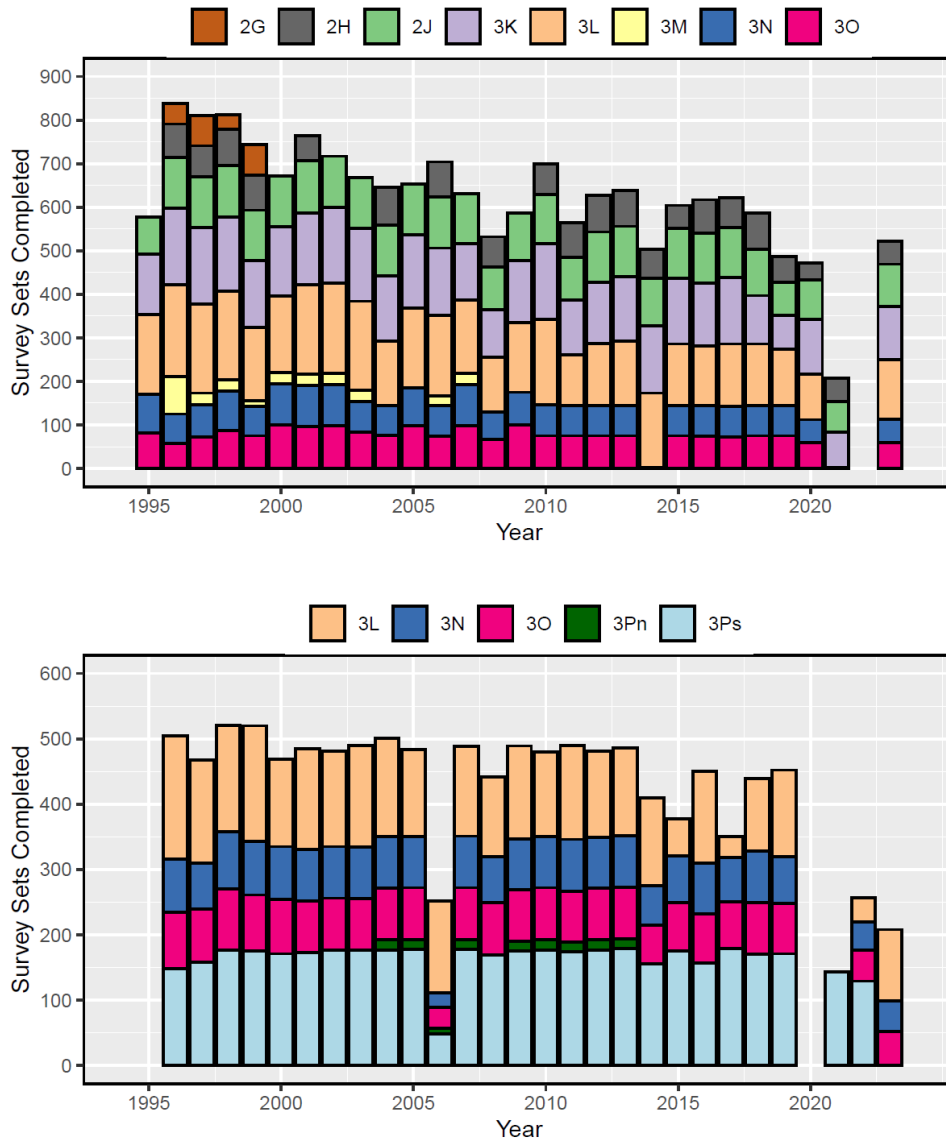


Figure 14. Total number of successful fishing sets in the Canadian Autumn (above) and Spring (below) multispecies bottom trawl surveys.

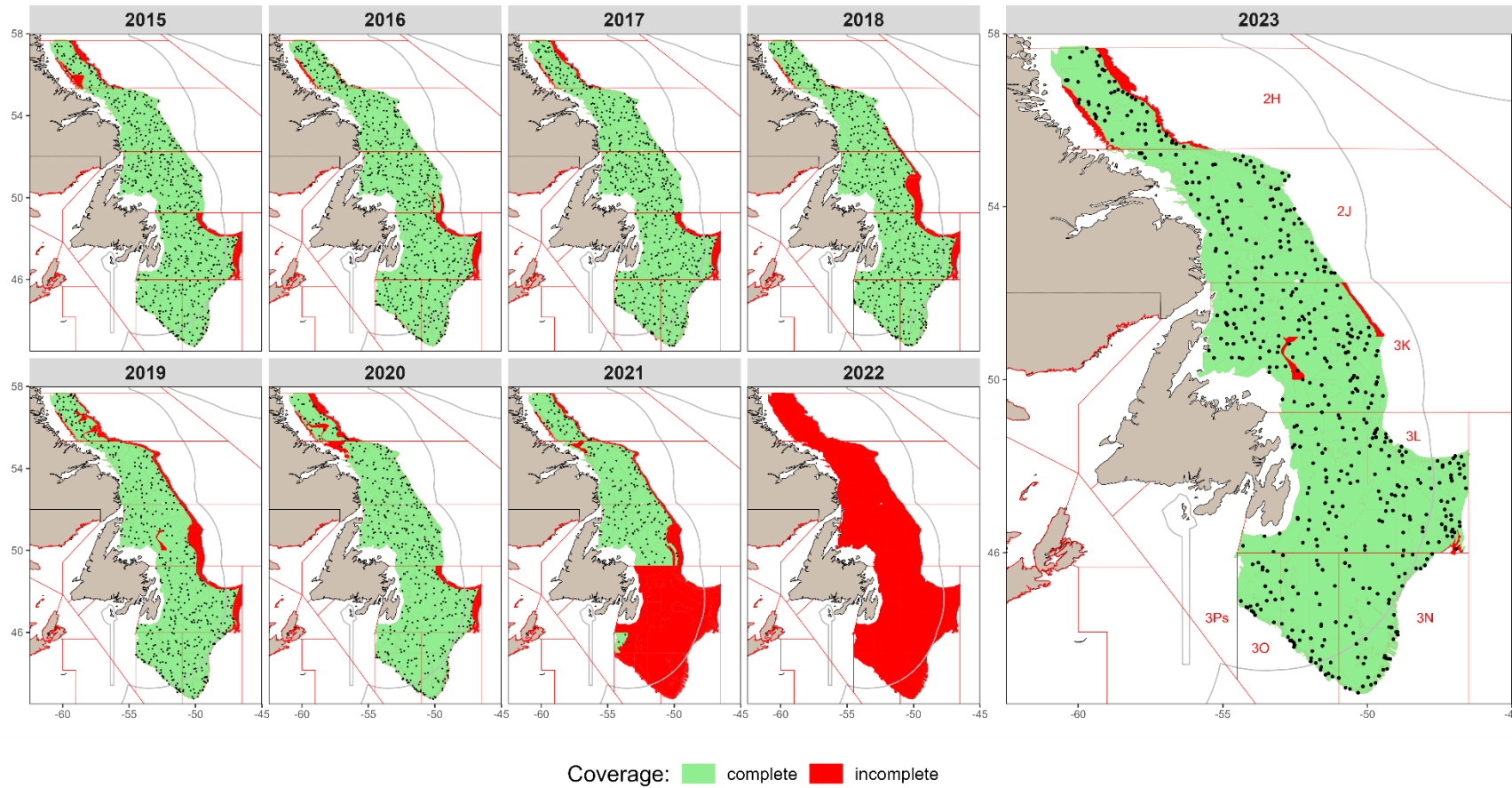


Figure 15. Summary of survey coverage in recent years for the Canadian Autumn multispecies bottom trawl surveys. Fishing set positions (circles) are overlaid on the survey stratification scheme. Strata with fewer than 2 successful sets are considered incomplete. Strata that are not coloured are not included in the current survey design.

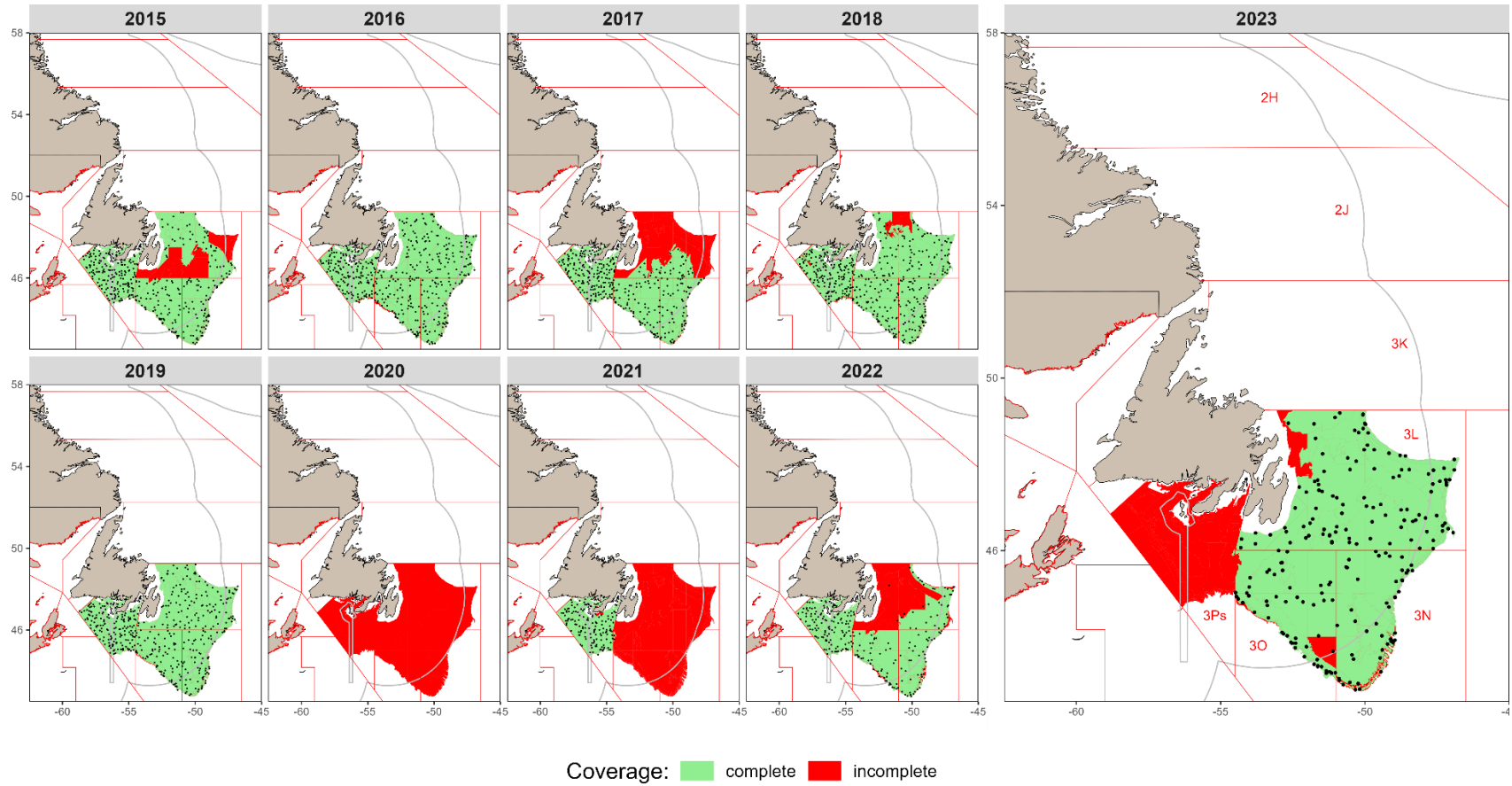


Figure 16. Summary of survey coverage in recent years for the Canadian spring multispecies bottom trawl surveys. Fishing set positions (circles) are overlaid on the survey stratification scheme. Strata with fewer than 2 successful sets are considered incomplete. Strata that are not coloured are not included in the current survey design.