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Canadian multi-species bottom trawl surveys in NAFO subarea 2 + Divisions 3KLNOPs: Vessel performance, catch distribution and survey biomass trends of key finfish resources with emphasis on 2016.

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Abstract

We update basic vessel performance and document the spatial coverage of the annual spring and autumn multi-species surveys conducted by the Department of Fisheries and Oceans, Newfoundland Region focusing on 2016. We also present recent (1995-2016 for autumn, 1996-2016 for spring) species-specific trends in survey biomass indices, noting particular concern for recent negative survey trends for numerous Grand Bank stocks.

Introduction

The Canadian Department of Fisheries and Oceans (DFO), Newfoundland 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 up to the surveys of 2008 are detailed in a suite of documents [see Healey *et al*. 2012, Healey and double (2009), Brodie and Stansbury (2007) , Brodie (2005), and references therein].

These surveys are stratified by depth range, and maps of Divs. 2GHJ3KLMNOPs illustrating the stratification boundaries are provided in Figs. 1-9. 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 (ed.) 1981). Within each stratum, one alternate station is also selected, and is occupied if a sample from one of the other units cannot be obtained (e.g. untrawlable bottom). 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.

The Canadian Coast Guard vessels employed during current autumn surveys are the CCGS *Alfred Needler* and the CCGS *Teleost*. The CCGS *Alfred Needler* (overall length 50m) conducts fishing sets at depths of 732m or less, whereas the CCGS *Teleost* (overall length 63m) completes survey sets to depths of 1500m. During spring surveys, typically only the CCGS *Alfred Needler* is used; the CCGS *Teleost* has been deployed at times when the CCGS *Alfred Needler* was unavailable due to significant mechanical problems. The CCGS *Wilfred Templeman,* which had been one of the primary vessels for survey work in the Newfoundland Region, was decommissioned in 2008.

Focus herein is upon the vessel performance of the spring and autumn surveys in 2016. In addition, trends in swept area survey biomass estimates for key finfish species since 1995 and their 2016 spring and autumn distribution are briefly discussed.

Methods

Survey results were analyzed to determine the total number of successful fishing "sets" (sampling stations for which all fishing tow protocols are met and with no or minimal damage to the survey gear). Counts of successful sets for both spring and autumn surveys were organized by stratum, division and vessel. Survey start and end dates and the depth ranges covered were also tabulated over the entire period in which the Campelen 1800 shrimp trawl has been used. This sampling gear was first deployed in the 1995 autumn survey, and has been used in all spring surveys since 1996. McCallum and Walsh (1996) provide a detailed description of the Campelen 1800 trawl.

In addition to the number of sets successfully completed, tabulations of the number of sets planned *apriori* per division/stratum and survey series (spring/autumn) were compiled to demonstrate slight changes to the intensity of the autumn survey in recent years, and to also provide a comparison of overall survey success.

Autumn Surveys

The current autumn survey design includes Divisions 2HJ3KLMNO, and this survey is generally conducted from mid-September to mid-December (Table 1). Division 2G has not been surveyed since 1999 and is no longer included in survey planning. Since the early-2000s, coverage of Division 2H was planned for every second year, though the amount of available vessel time was unchanged across years. In 2011 it was decided to cover Division 2H annually at the expense of dropping coverage in Divisions 3NO for strata beyond 732m. This was done for several reasons, including the importance of Division 2H for the assessment of several key shellfish and groundfish species. In addition, the deep-water coverage of strata in the Flemish Pass and western slopes of Division 3M was also permanently excluded from survey planning in 2010.

The survey allocation for the autumn of 2011 included coverage of Div. 2H (84 planned sets) – and current plans are to continue surveying Div. 2H annually (Table 1). To facilitate this, both the inshore strata of Divs. 3K and 3L (19 and 34 planned sets respectively) and the deep-water (>732m) strata of Divs. 3NO (48 planned sets) were excluded from the survey design when planning the 2011 survey, yielding a reduction of 101 planned sets compared to the 2010 allocation. The inshore Div. 3KL strata were 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 in recent years has 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. Portions of the deep-water strata in Divs. 3NO area are unsuitable for trawling and typically, a considerable amount of time in previous years was used to search for deployment sites near the intended site. There was a slight reduction in the number of vessel days available in 2011 but no further reductions to the planned coverage were considered necessary to take this into account. There have been no further substantive changes to the planned coverage and 674 sets have been selected each year since 2011 for the Div. 2HJ3KLMNO area. The general plan has been for the CCGS Alfred Needler to start in the south, surveying Div. 3O, then Div. 3N and finally Div. 3L. The CCGS Teleost starts in the north, surveying Div. 2H, then to Div. 2J, Div. 3K and finally Div. 3L deep strata (>732m). It has also become routine for the CCGS Needler to share some of the survey work in Div. 3K once the Div. 3LNO portion has been covered.

In 2012, 2014, and 2015 there was substantive mechanical issues with one of the research vessels. The details of the mitigation required to the survey program are outlined in Power et. al. (MS 2016) and references therein. In 2016, the deep-water 3L strata (>732m) were not attempted (30 planned sets) as the survey ran out of time.

Spring Surveys

The spring survey encompasses Divs. 3LNOPs, and is typically conducted from early-April through to late June. Spring survey allocations in Div. 3LNOP were consistent from 2006-2010 in regard to planned sets. A total of 512 sets were allocated annually, which includes 34 sets within the inshore strata of Div. 3L (Table 1). However, the inshore area is considered of lower priority and is infrequently occupied and starting in 2011 the planned sets did not include inshore Div. 3L, reducing the planned total to 478.

Results and Discussion

Survey Performance

A synopsis of the successful sets during autumn surveys over 1995-2016 (Table 2; see also Fig. 10-12) indicates that challenges in completing autumn surveys have continued over 2014-2015. It is noteworthy that the planned sets have declined over the time series and the number of successful sets were the lowest in the time series in 2014 (at 503). Divisionally, the greatest impact occurs with Divs. 2J3KL, particularly so in 2011 when only 340 of 445 sets were completed (Table 2) and this was the second lowest in the time-series. In 2014, there was better coverage in 2J3KL, including the coverage of deep strata in Division 3L for the first time since 2010. The overall low set count in 2014 is primarily due to the elimination of Divisions 3NO at the start of the survey as well as coverage beyond 750m in Div. 2H. In addition, the survey required an extension into January to complete the coverage in 3L. In 2015, the realized coverage was close to the planned coverage with the exception of no sampling in Div. 2H greater than 500m and in Div. 3L greater than 732m. The 2016 survey was also close to the planned coverage with the exception of all strata Div. 3L greater than 732m.

Detailed examination of coverage in the 2011-2016 autumn surveys (Table 4a-h, Fig. 10-12, 15a) identifies where the gaps exist. The deficiencies of the 2011 survey include five incomplete strata in Div. 2H (936, 937, 948, 949, and 950), with reduced set counts across most of Divs. 2J3KL due to the mid-survey adjustments. In fact, for 2012 onward, Div. 2H strata 937, 949 and 950 have been excluded from the planned sets due to difficulty with untrawlable bottom. The surveys in 2012 and 2013 were much improved in the core offshore areas in regard to meeting the planned number of sets but inshore strata in Divisions 3KL and the deepwater strata in Division 3L accounting for much of the shortfall. For 2014, most of the gaps exist with the elimination of Div. 3NO and strata beyond 750m in Div. 2H. For 2015, only strata greater than 500m in Div. 2H and strata greater than 732m in Div. 3L were not sampled and most other Divisions realized their planned allocation. For 2016, the greatest deficiency was for the strata in Div. 3L greater than 732m that were not sampled. Comparison of intended versus realized sets during 2009 to 2016 (Fig. 10b) indicate completion rates between 75% (2014) and 95% (2013) respectively with the shortfall usually occurring with Div.3L deep-water coverage.

Autumn surveys of 2009-2016 were conducted within the normal timeframe with two notable exceptions. The first was that during the autumn of 2010, the survey within Div. 3O was a couple of weeks later than normal and, secondly, the survey of 2014 required extension into January 2015.

In the spring surveys of 2009-2016, the number of sets completed (Table 3; see also Fig.13-14, 15b) is quite good – the percentage of intended sets completed over 1996-2016 has been 90% or higher with the exception of 2006 (46%), 2014 (85%) and 2015 (78%) (Fig. 15b). Mechanical difficulties with the primary vessel (CCGS *Alfred Needler*) in 2009 and 2014-2016 required the utilization of the CCGS *Teleost*, which completed 81 of 472 successful sets in 2009, 182 of 408 successful sets in 2014 over Divs. 3LNOPs and all sets in 3LNOPs in 2016.

Set counts by stratum for spring surveys in 2011-2016 (Table 5a-d) show that coverage issues were minimal in 2011-2014 and 2016 with only three incomplete strata in 2011, two in 2012, two in 2013 and three in 2016. However, the 2015 survey was largely incomplete in Div. 3L with 15 of 37 strata not sampled and less accomplished than planned for 12 of 22 of the remaining strata. The timing of the recent spring surveys was within the typical range with the exception of 2014 where Divisions 3NO were covered later than normal and 2016 which got off to a late start.

In addition to gaps in spatial coverage and reduced intensity in some years, another potential source of uncertainty in the survey may result from vessel effects that may be introduced when research vessels conduct survey sets in an area typically covered by another vessel (see Brodie and Stansbury, 2007). This was an issue in the 2014 autumn survey where CCGS *Teleost* conducted the entire Division 3L survey shallower than 732m. There was some variation over 2009-2014 in the proportion of sets conducted by the CCGS *Teleost* and the CCGS *Alfred Needler* within Div. 3K during autumn surveys. In addition, the CCGS *Teleost* conducted the entire 2016 3LNOPs spring survey, a large proportion of the 2014 spring 3LNO survey, and, portions of the 2009 spring survey, which is atypical but has occurred infrequently in previous surveys.

The decision to attempt coverage of Div. 2H annually at the cost of excluding the deep-water strata in Divs. 3NO has some impact on the information available for various assessments. For both Greenland Halibut and the Northern shrimp stock (*Pandalus Borealus*) within Shrimp Fishing Area 5, annual coverage of Div. 2H will be beneficial in monitoring resource trends, and should permit enhanced capabilities when providing of management advice, particularly for the relatively short-lived shrimp. Alternatively, the loss of the deep-water survey coverage in Divs. 3NO will have little to no impact on the stock assessment of traditionally important commercial species (e.g. Greenland Halibut, Witch Flounder and Grenadiers) as these strata are not included in the calculation of indices. Nevertheless, there is added protection for coral and sponge Vulnerable Marine Ecosystems within the Div. 3NO deep-water area (>732m) as DFO has no plan to sample these deep-water strata in the near future. In addition, in the recent past, Division 3M, the inshore strata of Divs. 3KL, and the deep-water portion of Divs. 3NO were routinely cancelled in order to preserve the continuity of other core offshore areas with long-standing coverage considered more crucial to stock assessment. In all autumn surveys from 2011 onward, none of these areas had been planned to be covered. Given the current rate of survey downtime and the realization that there are only two vessels operating the survey program since 2008, it is likely that in-situ unplanned reductions may be more frequent in the near future. 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 and ecosystem monitoring of multiple species.

Biomass Trends and Survey Catch Distribution

Biomass trends for the spring and autumn survey series based on the Campelen 1800 survey gear since autumn 1995 reveal many stocks continue to be in relatively poor shape, particularly on the Grand Bank (Table 6, Fig. 17-30). For the 13 stocks reported on here which are assessed by the Scientific Council, only three stocks (Div. 3LN Redfish, Divs. 3LNOPs Thorny Skate, and Divs. 2J3KL witch flounder were above their series average in 2016, and are either stable or increasing within the past five years. The rest of the stocks are below their series average in 2016 and are either stable or decreasing in the last 5 years, with the exception of Roughhead Grenadier which is above its spring average and near its autumn average. Maps of individual survey catch and graphs of spring and autumn survey series (Fig. 17-30) also show seasonal differences, most notably in Divs. 3NO cod, Divs. 3LNO American Plaice, Divs. 3LNO Yellowtail Flounder and Divs. 3LNOPs Thorny Skate where catches are higher in autumn than spring.

For the stocks assessed within the area of responsibility of Fisheries and Oceans Canada (NL Region) (Table 6, Fig. 31-47), only five of 18 stocks reported on here are above their series average in 2016. Of these five stocks, only two have shown an increasing trend in the past five years (Div. 2J3KL Atlantic Cod and Div. 2GHJ3KLNO and Subdiv. 3Ps Atlantic Halibut,), one has been stable (Witch Flounder in Subdiv. 3Ps), and two have been fluctuating (SA2+Div. 3K American Plaice, and SA 2 + Div. 3K Thorny Skate). Of the remaining 13 of the 18 Canadian stocks, eight are below their series average and two are below the spring series average but above the autumn average (Fig. 31-47).

Conclusion

Extensive mechanical delays during the 2009, 2011 and 2014 autumn surveys resulted in reduced survey coverage, interchange of research vessels outside of their normal area coverage pattern, and have extended the time required to complete surveys of the individual divisions. The number of survey sets completed in the autumn of 2009, 2011 and 2014 were relatively low, and some of the survey area was not covered. Spring surveys have generally been fully completed with limited coverage issues except for 2014 and 2015. Deficiencies in these surveys combined with those over 1995-2008 (see Brodie and Stansbury, 2007, Healey and Brodie, 2009) impact the assessments of many groundfish and invertebrate stocks to varying degrees, uncertainties which are typically not factored into the assessment results nor management advice. Nevertheless, recent negative trends in survey indices for several Grand Bank stocks raise concern over the status of many of the fishery resources in this area.

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Table 1. Number of survey sets planned per Division, for autumn and spring surveys over 2006-2016.

Fall Surveys

Division/	Year										
sub-Division	2006	2007	2008	2009	2010	2011[a]	2012	2013	2014[a]	2015[a]	2016
2H	83		77		77	84	84	84	84	84	84
2J	117	117	108	121	117	117	117	117	117	117	117
3K[b]	175	175	162	181	175	156	156	156	156	156	156
3L[b]	206	206	191	213	206	172	172	172	172	172	172
3M	26	26	23	26							
3N	94	94	88	97	94	70	70	70	70	70	70
3O	99	99	92	103	99	75	75	75	75	75	75
Total	800	717	741	741	768	674	674	674	674	674	674

Spring Surveys

Division/	Year										
sub-Division	2006	2007	2008	2009	2010	2011	2012	2013	2014[a]	2015	2016[a]
3L[b]	176	176	176	176	176	142	142	142	142	142	142
3N	79	79	79	79	79	79	79	79	79	79	79
3O	79	79	79	79	79	79	79	79	79	79	79
3Ps	178	178	178	178	178	178	178	178	178	178	178
Total	512	512	512	512	512	478	478	478	478	478	478

[a] Does not reflect survey allocation reductions implemented as a result of unplanned issues

[b] Includes inshore sets (34 in 3L; 19 in 3K) from 2006-2010 which were considered lower priority and were rarely achieved

Table 2. Summary of successful sets, Canadian autumn surveys 1995-2016. Depths surveyed by each vessel given in meters, number of sets appear in parentheses.

Year	Division	Ship			
		Teleost	*W.Templeman*	*A.Needler*	***Total***
1995	2G	Not surveyed in 1995			
	2H				
	2J	145-948 (84)			84
	3K	166-1444 (31)	162-494 (100)		131
	3L	733-1210 (5)	63-640 (161)		166
	3M	Not surveyed in 1995			
	3N		40-650 (90)		90
	3O		63-730 (81)		81
		1995 fall survey extended into January 1996 (66 sets)			**552**
1996	2G	127 - 1436 (47)			47
	2H	122 - 1415 (77)			77
	2J	126 - 1410 (117)			117
	3K	111 - 1368 (115)	126 - 472 (60)		175
	3L	805 - 1433 (31)	51 - 671 (180)		211
	3M	784 - 1400 (18)	127 - 707 (68)		86
	3N	390 - 1147 (13)		37 - 309 (54)	67
	3O	68 - 690 (24)	65 - 139 (19)	63 - 304 (15)	58
					838
1997	2G	201-1209 (69)			69
	2H	220-1382 (71)			71
	2J	123-1488 (117)			117
	3K	143-1431 (155)	117-421 (20)		175
	3L	161-1436 (71)	35-714 (134)		205
	3M	799-1379 (26)			26
	3N		41-769 (74)		74
	3O		62-611 (73)		73
					810
1998	2G	143-1488 (34)			34
	2H	98-1473 (83)			83
	2J	126-1398 (118)			118
	3K	122-1415 (154)	121-346 (17)		171
	3L	691-1437 (32)	34-675 (172)		204
	3M	768-1436 (26)			26
	3N	834-1447 (12)	37-1079 (78)		90
	3O		82-1076 (87)		87
					813
1999	2G	142-1415(69)			69
	2H	104-1454(81)			81
	2J	109-1375(115)			115
	3K	146-1477(154)			154
	3L	1366(1)	63-1407 (169)		170
	3M	853-1403(12)			12
	3N		39-664(68)		68
	3O		58-692(75)		75
					744
2000	2G	Not surveyed in 2000			
	2H				
	2J	127-1400 (117)			117
	3K	113-1379 (159)			159
	3L	152-1430 (74)	42-447 (102)		176
	3M	764-1401 (26)			26
	3N	747-1419 (24)	46-642 (70)		94
	3O	752-1424 (24)	62-654 (76)		100
					672
2001	2G	Not surveyed in 2001			
	2H	999-1466 (8)		117-655 (49)	57
	2J	120-1389 (49)		105-574 (71)	120
	3K	146-1479 (106)	128-439 (55)	170-252 (4)	165
	3L	146-1457 (34)	38-702 (169)	187-203 (2)	205
	3M	763-1407 (26)			26
	3N	739-1410 (24)	45-660 (70)		94
	3O	803-1391 (22)	67-703 (75)		97
					764
2002	2G	Not surveyed in 2002			
	2H				
	2J	102-1372 (98)	136-572 (19)		117
	3K	156-1395 (64)	121-481 (111)		175
	3L	763-1431 (30)	35-670 (176)		206
	3M	818-1403 (26)			26
	3N	811-1429 (24)	44-675 (70)		94
	3O	775-1504 (24)	65-696 (75)		99
		2002 fall survey extended into January 2003 (128 sets)			**717**
2003	2G	Not surveyed in 2003			
	2H				
	2J	123-1404 (116)			116
	3K	151-1474 (118)	115-489 (50)		168
	3L	753-1446 (30)	32-702 (175)		205
	3M	795-1455 (26)			26
	3N		43-727 (70)		70
	3O	761-1382 (8)	63-650 (75)		83
		2003 fall survey extended into January 2004 (210 sets)			**668**
2004	2G	Not surveyed in 2004			
	2H	109-1415 (87)			87
	2J	127-1365 (115)			115
	3K	112-1412 (135)	212-549 (16)		151
	3L	151-522 (4)	44-653 (143)		147
	3M	Not surveyed in 2004			
	3N		40-659 (69)		69
	3O		63-634 (76)		76
		2004 fall survey extended into February 2005 (36 sets)			**645**
2005	2G	Not surveyed in 2005			
	2H				
	2J	118-1427 (108)	172-416 (9)		117
	3K	150-1334 (26)	136-669 (141)		167
	3L	803-1351 (7)	50-706 (120)	121-667 (57)	184
	3M	Not surveyed in 2005			
	3N	776-1445 (17)	42-633 (69)		86
	3O	754-1410 (24)	69-649 (75)		99
		2005 fall survey extended into January 2006 (86 sets)			**653**
2006	2G	Not surveyed in 2006			
	2H	107-1437 (81)			81
	2J	107-1443 (117)			117
	3K	153-1384 (93)	109-480 (61)		154
	3L	111-1401 (34)	61-641 (151)		185
	3M	756-1352 (23)			23
	3N		46-650 (70)		70
	3O		63-674 (74)		74
					704
2007	2G	Not surveyed in 2007			
	2H				
	2J	127-1494 (115)			115
	3K	145-1358 (92)	149-683 (37)		129
	3L	81-1424 (48)	61-694 (120)		168
	3M	768-1404 (26)			26
	3N	775-1419 (25)	48-652 (69)		94
	3O	753-1410 (24)	64-632 (75)		99
					631
2008	2G	Not surveyed in 2008			
	2H	114-1392 (69)			69
	2J	253-1422 (20)	125-630 (79)		99
	3K	839-1439 (10)	147-608 (52)	148-455 (46)	108
	3L		62-664 (83)	71-332 (43)	126
	3M	Not surveyed in 2008			
	3N		38-643 (64)		64
	3O		60-661 (66)		66
					532
2009	2G	Not surveyed in 2009			
	2H				
	2J	111-1325 (108)			108
	3K	135-1412(92)		150-469 (51)	143
	3L	784-1385 (30)		62-682 (130)	160
	3M	Not surveyed in 2009			
	3N	798-1409 (11)		42-708 (64)	75
	3O	768-1397 (24)		48-696 (76)	100
					586
2010	2G	Not surveyed in 2010			
	2H	95-1451 (70)			70
	2J	109-1397 (113)			113
	3K	140-1442 (111)		123-478 (62)	173
	3L	100-1448 (55)		58-657 (141)	196
	3M	Not surveyed in 2010			
	3N	855-1219 (4)		40-614 (68)	72
	3O			61-667 (75)	75
					699
2011	2G	Not surveyed in 2011			
	2H	91-1480 (79)			79
	2J	132-1411 (99)			99
	3K	139-1429 (125)			125
	3L	201-529 (12)		61-663 (104)	116
	3M	Not surveyed in 2011			
	3N			43-673 (70)	70
	3O			64-692 (75)	75
					564
2012	2G	Not surveyed in 2012			
	2H	99-1435(84)			84
	2J	114-1425(115)			115
	3K	145-1435(133)		141-353(8)	141
	3L			65-725(142)	142
	3M	Not surveyed in 2012			
	3N			39-641(70)	70
	3O			62-631(75)	75
					627
2013	2G	Not surveyed in 2013			
	2H	91-1378(83)			83
	2J	99-1445(116)			116
	3K	140-1407(87)		155-488(60)	147
	3L	100-304(6)		57-657(142)	148
	3M	Not surveyed in 2013			
	3N			42-681(70)	70
	3O			66-630(75)	75
					639
2014	2G	Not surveyed in 2014			
	2H	101-677(66)			66
	2J	118-1402(110)			110
	3K	132-1469(154)			154
	3L	62-1388(170)			170
	3M	Not surveyed in 2014			
	3N	313-692(3)			3
	3O	Not surveyed in 2014			
					503
2015	2G	Not surveyed in 2015			
	2H	90-489(53)			53
	2J	116-1418(114)			114
	3K	134-1408(151)			151
	3L	165-335(19)		61-703(123)	142
	3M	Not surveyed in 2015			
	3N			39-72(69)	69
	3O			64-694(75)	75
					604
2016	2G	Not surveyed in 2016			
	2H	93-1354(74)			74
	2J	108-1451(115)			115
	3K	150-1385(114)		206-482(28)	142
	3L			60-673(138)	138
	3M	Not surveyed in 2016			
	3N			36-668(70)	70
	3O			60-678(73)	73
					612

Table 3. Summary of successful sets, Canadian spring surveys 1996-2016. Depths surveyed by each vessel given in meters, number of sets appear in parentheses.

Year	Division	Ship		Year	Division	Ship		Year	Division	Ship	
		W.Templeman	**Total**				**Total**				**Total**
1996	3L	66-664	188	2004	3L	47-710	151	2012	3L	60-723	132
	3N	42-665	82		3N	44-675	79		3N	38-665	78
	3O	65-685	86		3O	61-636	79		3O	63-656	79
	3Ps	42-613	146		3Ps	36-591[1]	175		3Ps	41-670	175
			502				**484**				**464**
1997	3L	60-681	158	2005	3L	64-672	133	2013	3L	62-632	134
	3N	35-689	71		3N	45-691	78		3N	40-689	79
	3O	62-669	81		3O	66-719	79		3O	64-650	79
	3Ps	34-498	157		3Ps	37-658[2]	176		3Ps	41-608	177
			467				**466**				**469**
1998	3L	53-721	163	2006	3L	60-70[3]	141	2014	3L	64-702[8]	135
	3N	38-682	88		3N	46-77[3]	22		3N	47-662[9]	60
	3O	64-657	93		3O	64-103[3]	32		3O	61-662[9]	59
	3Ps	40-670	175		3Ps	41-359	43		3Ps	39-462	154
			519				**238**				**408**
1999	3L	41-692	177	2007	3L	61-702[4]	137	2015	3L	65-685	56
	3N	40-659	82		3N	44-636	79		3N	39-674	72
	3O	62-679	86		3O	64-719	79		3O	63-628	74
	3Ps	41-870	171		3Ps	39-601	176		3Ps	38-667	173
			516				**471**				**375**
2000	3L	61-681	134	2008	3L	60-684[5]	122	2016[10]	3L	65-685	140
	3N	45-664	81		3N	40-623	71		3N	44-624	78
	3O	61-694	83		3O	64-704	80		3O	64-592	74
	3Ps	39-608	169		3Ps	39-632	167		3Ps	37-671	156
			467				**440**				**448**
2001	3L	34-695	154			A. Needler[6]					
	3N	40-650	79								
	3O	74-699	79	2009	3L	61-694[7]	142				
	3Ps	38-609	171		3N	44-668	78				
			483		3O	64-674	79				
					3Ps	40-678	173				
2002	3L	42-710	146				**472**				
	3N	40-641	79								
	3O	63-628	79	2010	3L	59-715	130				
	3Ps	37-625	175		3N	39-714	78				
			479		3O	60-673	80				
					3Ps	39-568	175				
2003	3L	62-698	156				**463**				
	3N	39-681	79								
	3O	63-726	79	2011	3L	57-723	144				
	3Ps	40-675	174		3N	40-673	79				
			488		3O	63-716	78				
					3Ps	37-622	172				
							473				

[1]CCGS Teleost conducted 68 sets in sub-Div. 3Ps.
[2]CCGS A. Needler conducted 14 sets in sub-Div. 3Ps.
[3]CCGS A. Needler conducted 47 sets in Divs 3NO.
[4]CCGS Teleost conducted 40 sets in Div. 3L.
[5]CCGS Teleost conducted 43 sets in Div. 3L.
[6]CCGS A. Needler became the primary ship for spring surveys in 2009.
[7]CCGS Teleost conducted 81 sets in Div. 3L.
[8]CCGS Teleost conducted 63 sets in Div. 3L.
[9]CCGS Teleost conducted all sets in Divs 3NO.
[10]CCGS Teleost conducted all sets for spring surveys in 2016

Table 4a. Number of successful autumn survey sets in Division 2G over 1996-1999. (Dates of first and last set in each year listed under survey year.)

Stratum	Area (sq. n.nmi.)	Depth (m)	Survey Year			
			1996	1997	1998	1999
			Se 30 - Oc 8	Oct 1-9	Oct 1-7	Oct 12-27
901	1213	201-300	4	8	1	5
902	120	301-400	2	3	2	2
903	80	401-500	**0**	3	2	2
904	153	501-750	**0**	2	2	2
905	164	751-1000	**0**	1	2	2
906	229	1001-1250	**0**	2	2	2
907	360	1251-1500	**0**	**0**	1	2
908	585	201-300	2	4	2	3
909	2773	<=200	8	**0**	2	12
910	2339	<=200	6	**0**	2	9
911	692	201-300	3	5	3	3
912	73	301-400	**0**	2	2	2
913	62	401-500	**0**	2	2	2
914	113	501-750	**0**	2	2	2
915	96	751-1000	**0**	**0**	1	**0**
916	146	1001-1250	**0**	1	2	**0**
917	165	1251-1500	**0**	**0**	1	**0**
918	515	1251-1500	1	**0**	**0**	**0**
919	316	1001-1250	1	2	**0**	**0**
920	172	751-1000	1	1	**0**	**0**
921	142	501-750	1	2	1	2
922	186	401-500	**0**	2	1	2
923	186	301-400	2	2	**0**	2
924	756	201-300	2	5	**0**	3
925	1804	<=200	4	**0**	1	4
926	433	201-300	2	3	**0**	2
927	832	301-400	2	6	**0**	2
928	783	401-500	3	3	**0**	2
929	1261	501-750	3	8	**0**	**0**
Annual Total	16749		47	69	34	69

Table 4b. Number of successful autumn survey sets in Division 2H over 1996-2016. (Dates of first and last set in each year listed under survey year.)

NAFO Division 2H			Survey Year														
Stratum[1]	Area (sq. n. miles)	Depth (m)	1996	1997	1998	1999	2001	2004	2006	2008	2010	2011	2012	2013	2014	2015	2016
			Sep 18-30	Oct 9-19	Oct 7-30	Oct 22-No 9	Dec 8-15	Oct 8-26	Oct 5-20	Oct 4-18	Oct 7-23	Oct 12-27	Oc 7-26	Oct 7-25	Oct 6-13	Oct 18-24	Oct 7-23
930	1028	<=200	4	**0**	5	4	3	5	4	3	3	4	5	5	3	5	4
931	276	201-300	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
932	55	301-400	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
933	50	401-500	2	2	2	2	**0**	2	2	2	2	3	2	2	2	2	2
934	78	501-750	2	2	2	2	**0**	2	2	2	2	2	2	2	2	**0**	**0**
935	96	751-1000	1	2	2	2	**0**	2	2	2	2	2	2	2	**0**	**0**	2
936	78	1001-1250	1	2	2	1	2	2	2	2	2	1	2	2	**0**	**0**	2
937	94	1251-1500	1	2	2	1	2	2	2	2	**0**	1	**0**	**0**	**0**	**0**	**0**
938	191	1251-1500	2	2	2	2	2	2	2	2	2	2	2	2	**0**	**0**	2
939	130	1001-1250	2	2	1	2	1	2	1	2	2	2	2	2	**0**	**0**	0
940	97	751-1000	2	2	2	2	1	2	2	2	2	2	2	2	**0**	**0**	2
941	89	501-750	2	2	2	2	2	2	2	1	2	2	2	2	2	**0**	2
942	55	401-500	2	2	2	2	2	2	2	2	2	2	2	1	2	2	**0**
943	354	201-300	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
944	860	301-400	3	6	4	4	1	4	4	3	3	4	5	6	5	5	4
945	461	401-500	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2
946	721	501-750	3	5	4	4	3	4	3	**0**	2	3	4	4	4	**0**	4
947	227	501-750	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2
948	246	401-500	2	2	2	1	2	1	2	2	**0**	1	2	2	2	2	**0**
949	206	301-400	2	2	**0**	1	2	2	1	**0**	1	1	**0**	**0**	**0**	**0**	**0**
950	261	201-300	2	2	**0**	2	2	2	2	1	**0**	**0**	**0**	**0**	**0**	**0**	**0**
951	234	401-500	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
952	177	301-400	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2
953	291	201-300	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3
954	971	<=200	4	**0**	5	4	3	5	4	3	3	4	5	5	5	5	4
955	389	201-300	2	3	2	2	2	2	2	1	2	2	2	2	2	2	2
956	1051	<=200	3	**0**	5	4	4	5	4	3	3	5	6	6	6	6	6
957	1371	<=200	5	**0**	7	7	5	7	6	5	5	6	7	6	7	4	7
958	294	201-300	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
959	178	301-400	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
960	107	401-500	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
961	211	501-750	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2
962	242	751-1000	2	2	2	2	**0**	2	2	2	2	2	2	2	**0**	**0**	2
963	265	1001-1250	2	2	2	2	**0**	2	2	2	2	2	2	2	**0**	**0**	2
964	342	1251-1500	2	2	2	2	**0**	2	2	2	2	2	2	2	**0**	**0**	2
Annual Total	11776		77	71	83	81	57	87	81	69	70	79	84	83	66	53	74

[1] For 2012 onward: 3 strata were dropped from planned coverage due to difficult bottom topography

Table 4c. Number of successful autumn survey sets in Division 2J over 1995-2016. (Dates of first and last set in each year listed under survey year.)

NAFO Division 2J			Survey Year																					
Stratum	Area (sq. n. miles)	Depth (m)	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
			De 4 - Ja 22	Oc 22 - No 7	Oc 19 - No 4	Oc 20 - No 4	Nov 6-25	Nov 1-14	No 21 - Dec 1	De 7 - Ja 12	Dec 1-17	Oc 27 - No 1	No 17-De 16	Oc 20-No 14	Nov 1-30	No7 - De 7	Nov 5-23	Oc 21-No 15	Oc 28-No26	Oc 14-No 24	Oc 25-No 18	Oc 18-No 14	Oc 8-No 14	Oc 28-No 29
201	633	<=200	**0**	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
202	621	201-300	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
203	487	301-400	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
204	288	401-500	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
205	1594	<=200	**0**	6	6	6	6	6	6	6	6	6	6	6	6	5	5	6	4	6	6	6	6	6
206	1870	<=200	5	7	7	7	7	7	7	7	7	7	7	7	7	6	6	7	5	7	7	7	8	7
207	2264	<=200	8	9	9	9	9	9	9	9	9	8	9	9	9	8	8	7	5	8	9	5	6	9
208	588	301-400	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
209	680	201-300	2	3	3	3	3	3	3	3	3	2	3	3	3	2	2	3	2	3	3	3	3	3
210	1035	201-300	3	4	4	4	4	4	4	4	4	4	4	4	4	3	3	4	3	4	4	4	4	4
211	251	301-400	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
212	557	501-750	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2
213	1583	201-300	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	6	5	6	6	5	7	6
214	1341	201-300	4	5	5	5	5	5	6	5	5	5	5	5	4	5	5	5	4	5	5	5	5	5
215	1302	201-300	2	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	5	5	5	4	5
216	360	301-400	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
217	241	401-500	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
218	362	501-750	3	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
219	283	751-1000	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2
220	303	1001-1250	**0**	2	2	2	1	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2
221	330	1251-1500	**0**	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2
222	450	301-400	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
223	158	401-500	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
224	228	501-750	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
225	195	1001-1250	**0**	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
226	201	1251-1500	**0**	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2
227	598	401-500	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
228	2196	201-300	7	8	8	8	8	8	7	8	8	8	8	8	8	7	7	8	6	8	8	8	8	8
229	536	301-400	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
230	185	501-750	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
231	186	751-1000	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
232	228	1001-1250	**0**	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
233	237	1251-1500	**0**	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
234	530	201-300	**0**	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
235	414	401-500	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
236	193	751-1000	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2
237	733	<=200	3	3	3	3	3	3	4	3	3	3	3	3	3	2	2	3	**0**	3	3	2	2	2
238	778	<=200	**0**	3	3	3	2	3	3	3	2	3	3	3	2	3	3	2	3	2	2	2	2	2
239	120	501-750	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
240	133	401-500	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Annual Total	25272		84	117	117	118	115	117	120	117	116	115	117	117	115	99	108	113	99	115	116	110	114	115

Table 4d. Number of successful autumn survey sets in Division 3K over 1995-2016. (Dates of first and last set in each year listed under survey year.)

NAFO Division 3K			Survey Year																					
Stratum	Area (sq. n. miles)	Depth (m)	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
			No 28 - Ja 25	Nov 7-26	No 4- De 19	Nov 4-30	No 20 - De 1	No 14 - De 1	No 27 - De 1	De 1 - Ja 14	De 17 - Ja 31	No 13 - Fe 1	No 24-Ja 28	No 6-De 21	No 22-De 16	Jo 11 - De 21	No 18-De 13	No 15-De 17	No 11 -De 19	No 12-De 20	No 10-De 18	No 11-De 6	No 13-De 13	No 15-De 15
608	798	<=200	**0**	3	3	3	**0**	3	2	3	2	3	2	3	**0**	1	**0**	4	**0**	**0**	**0**	**0**	**0**	**0**
609	342	201-300	**0**	2	2	2	**0**	2	2	2	2	2	2	2	**0**	1	2	2	**0**	**0**	**0**	**0**	**0**	**0**
610	256	301-400	**0**	2	2	2	**0**	2	2	2	2	2	2	2	**0**	**0**	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**
611	573	201-300	**0**	3	3	2	**0**	2	2	2	2	2	2	2	**0**	**0**	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**
612	445	<=200	**0**	2	2	2	**0**	2	2	2	2	2	2	2	**0**	**0**	**0**	2	**0**	**0**	2	**0**	**0**	**0**
613	30	501-750	**0**	2	2	2	**0**	2	2	2	2	2	2	2	**0**	**0**	**0**	2	**0**	**0**	2	**0**	**0**	**0**
614	263	301-400	**0**	2	2	2	**0**	2	2	2	2	2	2	2	**0**	**0**	**0**	2	**0**	**0**	3	**0**	**0**	**0**
615	251	201-300	**0**	2	2	2	**0**	2	2	2	2	2	2	2	**0**	**0**	**0**	2	**0**	**0**	2	**0**	**0**	**0**
616	250	<=200	**0**	2	2	2	**0**	2	2	2	2	2	1	2	**0**	**0**	**0**	**0**	**0**	**0**	1	**0**	**0**	**0**
617	593	301-400	2	3	3	3	3	3	3	3	3	3	3	3	2	2	2	3	2	3	3	3	3	3
618	1347	<=200	5	6	6	4	6	6	3	6	4	6	6	5	6	5	5	5	3	2	6	5	6	5
619	1753	<=200	4	7	7	6	6	8	8	8	6	8	8	8	4	7	7	8	2	3	8	7	6	8
620	2545	201-300	3	11	11	11	11	11	11	11	11	8	11	11	7	3	10	11	8	10	10	11	11	11
621	2537	201-300	6	11	11	11	11	11	6	11	11	8	10	11	7	9	8	11	6	8	11	11	10	11
622	691	401-500	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	2	3	3	3	3	3
623	494	301-400	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
624	1105	201-300	4	5	5	5	5	5	5	5	5	5	5	5	5	3	4	5	4	5	5	5	5	5
625	888	301-400	3	4	4	4	4	4	4	4	4	4	4	4	4	2	4	4	3	3	3	4	4	4
626	1113	301-400	4	5	5	5	5	5	4	5	5	4	5	5	2	4	4	5	4	5	5	5	4	5
627	1255	401-500	5	5	5	5	5	5	3	5	5	4	5	4	4	5	5	5	4	5	5	5	5	5
628	1085	301-400	5	5	5	5	5	5	3	5	5	5	5	3	3	4	4	5	4	6	5	5	5	5
629	495	301-400	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
630	332	301-400	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
631	1321	401-500	5	6	6	6	6	6	10	6	6	4	5	6	6	2	5	6	4	6	3	6	6	5
633	2067	301-400	8	9	9	9	9	9	9	9	9	9	9	8	9	5	8	9	7	8	5	9	9	6
634	1555	201-300	7	7	7	7	7	7	7	7	5	2	7	6	7	2	6	7	5	7	4	7	7	6
635	1274	201-300	6	5	5	5	5	5	5	5	5	2	3	1	2	5	5	5	5	5	4	5	3	4
636	1455	201-300	7	6	6	6	6	6	6	6	6	3	5	3	3	4	6	6	6	6	4	6	7	5
637	1132	201-300	5	5	5	5	5	1	5	5	5	5	5	4	3	4	4	5	5	5	4	5	5	5
638	2059	301-400	9	9	9	9	8	5	8	9	9	9	9	5	9	7	8	9	9	8	6	9	9	9
639	1463	301-400	7	6	6	6	7	3	5	6	6	3	5	3	6	3	6	6	6	6	6	6	6	5
640	69	401-500	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
641	230	501-750	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
642	418	751-1000	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
643	733	1001-1250	3	3	3	3	3	2	3	3	3	3	3	3	3	**0**	3	3	2	3	3	3	3	2
644	474	1251-1500	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2
645	216	401-500	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
646	325	501-750	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
647	360	751-1000	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2
648	228	1001-1250	**0**	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2
649	212	1251-1500	**0**	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2
650	134	401-500	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0
651	359	501-750	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
652	516	751-1000	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
653	531	1001-1250	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
654	479	1251-1500	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	**0**
Annual Total	37051		131	175	175	171	154	159	165	175	168	151	167	154	129	108	143	173	125	141	147	154	151	142

Table 4e. Number of successful autumn survey sets in Division 3L over 1995-2016. (Dates of first and last set in each year listed under survey year.)

NAFO Division 3L			Survey Year																					
Stratum	Area (sq. n.nmi.)	Depth (m)	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
			Oc 3 - Ja 25	Oc 9 - De 5	Oc 23 - De 2	No 2 - De 15	No 7 - De 12	Oc 24 - De 1	Oc 4 - De 6	Oc 23 - De 2	No 7 - Ja 20	No 24 - De 1	Oc 29-Ja 29	Oc 21-De 18	Oc16-De20	No 1-13	No 1- De 20	Oc 29-De 20	No 2-De 18	Oc 27-De 3	Oc 18-No 25	De 12-Ja 17	Oc 30-De 14	Oc 28-De 9	
328	1519	92-183	6	5	5	5	5	5	5	5	5	5	5	5	5	3	4	5	5	5	5	5	5	4
341	1574	92-183	6	6	4	5	5	5	5	5	5	4	5	5	4	5	5	5	5	5	5	5	5	5
342	585	92-183	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
343	525	92-183	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
344	1582	184-274	5	6	5	5	5	3	4	5	5	5	5	5	4	3	4	5	2	5	5	4	4	5
345	1432	275-366	7	5	5	5	5	3	5	5	5	5	5	5	5	4	4	4	3	5	5	5	5	4
346	865	275-366	3	3	3	2	3	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3
347	983	184-274	4	3	3	3	3	3	3	3	3	2	3	3	2	3	3	3	2	3	3	3	3	3
348	2120	92-183	7	7	7	6	7	4	7	7	7	7	7	7	7	6	6	7	5	7	7	7	7	7
349	2114	92-183	9	7	7	7	7	7	7	7	7	7	7	7	7	6	6	7	7	7	7	7	7	6
350	2071	56-91	8	7	7	7	7	7	7	7	7	7	7	7	6	6	6	7	7	7	7	7	7	7
363	1780	56-91	7	6	6	6	6	4	6	6	6	6	6	6	6	5	5	6	5	6	6	6	6	6
364	2817	92-183	9	10	9	9	9	2	9	9	9	9	9	9	9	8	8	9	7	9	9	9	9	8
365	1041	92-183	4	4	3	3	3	1	3	3	3	**0**	3	3	3	3	3	3	2	3	3	3	4	3
366	1394	184-274	5	5	5	5	5	2	5	5	5	**0**	5	5	5	4	4	5	4	5	5	5	5	5
368	334	275-366	2	3	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2	2	2
369	961	184-274	3	2	3	3	3	2	3	3	3	**0**	3	3	3	3	3	3	2	3	3	3	3	3
370	1320	92-183	5	4	4	4	4	4	4	4	4	1	4	4	4	4	4	4	3	4	4	4	4	4
371	1121	56-91	5	4	4	4	4	3	4	4	4	4	4	4	4	3	3	4	3	4	4	4	4	4
372	2460	56-91	10	9	8	8	8	2	8	8	8	8	8	8	8	8	7	8	6	8	8	7	8	8
384	1120	56-91	5	4	4	4	4	4	4	4	4	4	4	4	4	3	3	4	3	4	4	4	4	4
385	2356	92-183	9	9	8	8	8	8	8	8	8	8	8	8	8	7	7	8	6	8	8	8	8	8
386	983	184-274	4	3	3	3	3	3	3	3	3	**0**	3	3	3	3	3	3	2	3	3	3	3	3
387	718	275-366	3	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2	2	2
388	361	275-366	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
389	821	184-274	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	3	2	3	3	3	3	3
390	1481	92-183	6	5	5	5	5	5	5	5	5	5	5	5	5	4	4	5	4	5	5	5	5	5
391	282	184-274	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2
392	145	275-366	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
729	186	367-549	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
730	170	550-731	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
731	216	367-549	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2
732	231	550-731	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
733	468	367-549	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
734	228	550-731	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2	2	2
735	272	367-549	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2	2	2
736	175	550-731	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2	2	2
737	227	732-914	2	2	2	2	2	2	2	2	2	**0**	2	2	2	**0**	2	2	**0**	**0**	**0**	2	**0**	**0**
738	221	915-1097	2	2	2	2	2	2	2	2	2	**0**	1	2	2	**0**	2	2	**0**	**0**	**0**	2	**0**	**0**
739	254	1098-1280	1	2	2	2	2	2	2	2	2	**0**	2	2	2	**0**	2	2	**0**	**0**	**0**	2	**0**	**0**
740	264	1281-1463	**0**	2	2	2	2	2	2	2	2	**0**	2	2	2	**0**	2	2	**0**	**0**	**0**	2	**0**	**0**
741	223	732-914	**0**	2	2	2	2	2	2	2	2	**0**	**0**	2	2	**0**	2	2	**0**	**0**	**0**	2	**0**	**0**
742	206	915-1097	**0**	2	2	2	2	2	2	2	2	**0**	**0**	2	2	**0**	2	2	**0**	**0**	**0**	2	**0**	**0**
743	211	1098-1280	**0**	2	2	2	3	2	2	2	2	**0**	**0**	2	2	**0**	2	2	**0**	**0**	**0**	2	**0**	**0**
744	280	1281-1463	**0**	2	2	2	1	2	2	2	2	**0**	**0**	2	2	**0**	2	2	**0**	**0**	**0**	2	**0**	**0**
745	348	732-914	**0**	2	2	2	2	2	2	2	2	**0**	**0**	2	2	**0**	2	2	**0**	**0**	**0**	2	**0**	**0**
746	392	915-1097	**0**	2	2	2	2	2	2	2	2	**0**	**0**	2	2	**0**	2	2	**0**	**0**	**0**	2	**0**	**0**
747	724	1098-1280	**0**	3	2	2	2	2	2	2	2	**0**	**0**	2	2	**0**	2	2	**0**	**0**	**0**	2	**0**	**0**
748	159	732-914	**0**	2	2	2	2	2	2	2	2	**0**	**0**	2	2	**0**	2	2	**0**	**0**	**0**	2	**0**	**0**
749	126	915-1097	**0**	2	2	2	1	2	2	2	2	**0**	**0**	1	2	**0**	2	2	**0**	**0**	**0**	2	**0**	**0**
750	556	1098-1280	**0**	2	2	2	2	2	2	2	2	**0**	**0**	1	2	**0**	2	2	**0**	**0**	**0**	2	**0**	**0**
751	229	1281-1463	**0**	2	2	2	1	2	2	2	2	**0**	**0**	**0**	2	**0**	2	2	**0**	**0**	**0**	2	**0**	**0**
784	268	<=55	**0**	2	2	2	**0**	2	2	2	2	2	2	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
785	465	56-91	**0**	2	2	2	**0**	2	2	2	2	2	2	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
786	84	92-183	**0**	2	2	2	**0**	2	2	2	2	2	2	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
787	613	92-183	**0**	2	2	2	**0**	2	2	2	2	2	2	2	**0**	**0**	**0**	1	**0**	**0**	**0**	**0**	**0**	**0**
788	261	92-183	**0**	2	2	2	**0**	2	2	2	2	2	2	2	**0**	**0**	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**
789	72	275-366	**0**	2	2	2	**0**	2	2	2	2	2	2	2	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
790	89	92-183	**0**	2	2	2	**0**	2	2	2	2	2	2	**0**	**0**	**0**	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**
791	227	184-274	**0**	2	2	2	**0**	2	2	2	2	2	2	**0**	**0**	**0**	**0**	2	**0**	**0**	1	**0**	**0**	**0**
792	50	367-549	**0**	2	2	2	**0**	2	2	2	2	2	2	**0**	**0**	**0**	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**
793	72	92-183	**0**	2	2	2	**0**	2	2	2	2	2	2	**0**	**0**	**0**	1	2	**0**	**0**	1	**0**	**0**	**0**
794	216	92-183	**0**	2	2	2	**0**	1	2	2	2	2	2	2	**0**	**0**	**0**	2	**0**	**0**	1	**0**	**0**	**0**
795	164	184-274	**0**	2	2	2	**0**	2	2	2	2	2	2	2	**0**	**0**	**0**	2	**0**	**0**	1	**0**	**0**	**0**
796	175	275-366	**0**	2	2	2	**0**	2	2	2	2	2	2	2	**0**	**0**	**0**	2	**0**	**0**	2	**0**	**0**	**0**
797	98	92-183	**0**	2	2	2	**0**	2	2	2	2	2	2	2	**0**	**0**	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**
798	100	275-366	**0**	2	2	2	**0**	2	2	2	2	2	2	**0**	**0**	**0**	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**
799	72	92-183	**0**	2	2	2	**0**	2	2	2	2	2	2	2	**0**	**0**	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**
800	81	275-366	**0**	**0**	2	2	**0**	2	2	2	2	2	2	1	**0**	**0**	2	2	**0**	**0**	**0**	**0**	0	0
Annual Total	46338		166	211	205	204	170	176	205	206	205	147	184	185	168	126	160	196	116	142	148	170	142	138

Table 4f. Number of successful autumn survey sets in Division 3M over 1996-2007. Shaded cells indicate strata not included in the survey design after 1996. (Dates of first and last set in each year listed under survey year.)

Stratum	Area (sq. n.nmi.)	Depth (m)	Survey Year									
			1996	1997	1998	1999	2000	2001	2002	2003	2006	2007
			Se 25 - De 4	Dec 1-15	Dec 9-13	Dec 11-12	Oct 24-29	Oct 8-13	Oct 24 - No 5	Jan 13-18 (2	No 26 - De 2	Oc 16-29
501	342	<=146	2									
502	838	147-183	6									
503	628	184-256	4									
504	348	184-256	2									
505	703	184-256	5									
506	496	184-256	3									
507	822	257-366	5									
508	646	257-366	4									
509	314	257-366	2									
510	951	257-366	6									
511	806	257-366	5									
512	670	367-549	4									
513	249	367-549	2									
514	602	367-549	4									
515	666	367-549	3									
516	634	550-731	4									
517	216	550-731	2									
518	210	550-731	2									
519	414	550-731	3									
528	530	732-914	2	3	3	1	3	3	3	3	3	3
529	488	915-1097	2	3	3	2	3	3	3	3	3	3
530	1134	1098-1280	2	7	7	5	7	7	7	7	7	7
531	203	1281-1463	2	2	2	2	2	2	2	2	2	2
532	238	915-1097	2	2	2	2	2	2	2	2	2	2
533	98	732-914	2	2	2	**0**	2	2	2	2	2	2
534	486	915-1097	2	3	3	**0**	3	3	3	3	2	3
535	92	1098-1280	2	2	2	**0**	2	2	2	2	2	2
536	112	1281-1463	2	2	2	**0**	2	2	2	2	**0**	2
Total	13936		86	26	26	12	26	26	26	26	23	26

Table 4g. Number of successful autumn survey sets in Division 3N over 1995-2016. Shaded cells indicate strata not included in the survey design after 2010. (Dates of first and last set in each year listed under survey year.)

NAFO Division 3N			Survey Year																					
Stratum	Area (sq. n. miles)	Depth (m)	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
			e 27 - Oc 26	lo 25 - De 13	Oc 8 - No 5	lc 16 - De 16	Nov 3-22	Oc 17 - De 5	ie 28 - Oc 29	Oct 13-26	Oc 21 - No 7	Nov 11-23	Oc 10-No 19	Oct 12-21	Oc9-No14	Oc 24 - No 1	Oc 24-No 12	Oc 12-De 12	Oc 13-No 20	Oc 11- No 5	Se 29-Oc 18	Ja 17	Oc 7-30	Se 29-No7
357	164	275-366	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2
358	225	184-274	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2
359	421	92-183	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2
360	2992	56-91	17	6	9	8	8	8	8	8	8	8	8	8	8	7	7	8	8	8	8	**0**	8	8
361	1853	56-91	11	5	5	5	5	5	5	5	5	5	5	5	5	4	4	5	5	5	5	**0**	4	5
362	2520	56-91	5	6	7	7	7	7	7	7	7	7	7	7	7	6	6	7	7	7	7	**0**	7	7
373	2520	56-91	5	7	7	7	6	7	7	7	7	7	7	7	6	6	6	7	7	7	7	**0**	7	7
374	931	56-91	2	2	3	3	3	3	3	3	3	3	2	3	3	2	2	3	3	3	3	**0**	3	3
375	1593	<=55	9	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	**0**	4	4
376	1499	<=55	9	4	5	4	4	4	4	4	4	4	4	4	4	3	3	4	4	4	4	**0**	4	4
377	100	92-183	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2
378	139	184-274	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	**0**	2	2
379	106	275-366	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2
380	116	275-366	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2
381	182	184-274	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2
382	647	92-183	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2
383	674	56-91	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2
723	155	367-549	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2
724	124	550-731	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	**0**	2	2
725	105	367-549	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	1	2	2	2	**0**	2	2
726	72	550-731	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	**0**	2	2
727	160	367-549	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2
728	156	550-731	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2
752	134	732-914	**0**	**0**	**0**	2	**0**	2	2	2	**0**	**0**	**0**	**0**	2	**0**	**0**	1						
753	138	915-1097	**0**	**0**	**0**	2	**0**	2	2	2	**0**	**0**	1	**0**	2	**0**	1	1						
754	180	1098-1280	**0**	1	**0**	2	**0**	2	2	2	**0**	**0**	**0**	**0**	2	**0**	**0**	2						
755	385	1281-1463	**0**	**0**	**0**	2	**0**	2	2	2	**0**	**0**	**0**	**0**	2	**0**	**0**	**0**						
756	106	732-914	**0**	**0**	**0**	2	**0**	2	2	2	**0**	**0**	2	**0**	2	**0**	1	**0**						
757	102	915-1097	**0**	**0**	**0**	2	**0**	2	2	2	**0**	**0**	2	**0**	2	**0**	**0**	**0**						
758	99	1098-1280	**0**	**0**	**0**	2	**0**	2	2	2	**0**	**0**	2	**0**	3	**0**	**0**	**0**						
759	127	1281-1463	**0**	**0**	**0**	2	**0**	2	2	2	**0**	**0**	2	**0**	2	**0**	1	**0**						
760	154	732-914	**0**	**0**	**0**	2	**0**	2	2	2	**0**	**0**	2	**0**	2	**0**	2	**0**						
761	171	915-1097	**0**	**0**	**0**	2	**0**	2	2	2	**0**	**0**	2	**0**	2	**0**	2	**0**						
762	212	1098-1280	**0**	**0**	**0**	**0**	**0**	2	2	2	**0**	**0**	2	**0**	2	**0**	2	**0**						
763	261	1281-1463	**0**	**0**	**0**	**0**	**0**	2	2	2	**0**	**0**	2	**0**	2	**0**	2	**0**						
Annual Total	19523		90	67	74	90	68	94	94	94	70	69	86	70	94	64	75	72	70	70	70	3	69	70

Shaded cells indicate strata not included in the survey design after 2010. (Dates of first and last set in each year listed under survey year.)

Table 4h. Number of successful autumn survey sets in Division 3O over 1995-2016

NAFO Division 3O			Survey Year																					
Stratum	Area (sq. n.miles)	Depth (m)	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
			Se 26 - Oc 2	No 24 - De 1	Se 26 - Oc 1	Oc 10 - De 1	Oc 13 - No 1	Oc 11 - No 2	Se 22 - Oc 1	Oct 5-16	Se 23 - Oc 2	Oc 31 - No 1	Oct 4-17	Se 30 - Oc 9	Oc 6-31	Oct 3-20	Oct 2-25	Se 30-Oc 12	Se 29-Oc 17	Se 30-Oc 10	Se 19-29		Se 25-Oc 16	Se 16-Oc 6
329	1721	92-183	5	5	5	5	5	5	5	5	5	5	5	5	5	3	5	5	5	5	5	**0**	5	5
330	2089	56-91	5	6	6	6	6	6	6	6	6	7	6	6	6	5	7	6	6	6	6	**0**	6	6
331	456	56-91	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2
332	1047	92-183	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	**0**	3	3
333	147	184-274	2	**0**	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2
334	96	275-366	2	**0**	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2
335	58	275-366	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2
336	121	184-274	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	**0**	2	0
337	948	92-183	2	2	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	**0**	3	3
338	1898	56-91	5	2	5	5	5	5	5	5	5	5	5	4	5	5	6	5	5	5	5	**0**	5	5
339	585	92-183	2	3	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2
340	1716	56-91	4	5	5	5	7	5	5	5	5	5	5	5	5	3	5	6	5	5	5	**0**	5	5
351	2520	56-91	7	6	7	7	6	7	7	7	7	7	7	7	7	6	7	6	7	7	7	**0**	7	7
352	2580	56-91	17	5	6	7	7	7	7	7	7	7	7	8	7	6	7	7	7	7	7	**0**	7	7
353	1282	56-91	3	2	4	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	4	**0**	4	4
354	474	92-183	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2
355	103	184-274	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2
356	61	275-366	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2
717	166	367-549	2	**0**	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2
718	134	550-731	2	**0**	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	**0**	2	2
719	76	367-549	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2
720	105	550-731	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2
721	76	367-549	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2
722	93	550-731	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2
764	105	732-914	**0**	**0**	**0**	2	**0**	2	2	2	**0**	**0**	2	**0**	2	**0**	2							
765	124	915-1097	**0**	**0**	**0**	2	**0**	2	2	2	**0**	**0**	2	**0**	2	**0**	2							
766	144	1098-1280	**0**	**0**	**0**	**0**	**0**	2	2	2	**0**	**0**	2	**0**	2	**0**	2							
767	158	1281-1463	**0**	**0**	**0**	**0**	**0**	2	2	2	**0**	**0**	2	**0**	2	**0**	2							
768	99	732-914	**0**	**0**	**0**	2	**0**	2	2	2	**0**	**0**	2	**0**	2	**0**	2							
769	138	915-1097	**0**	**0**	**0**	2	**0**	2	2	2	**0**	**0**	2	**0**	2	**0**	2							
770	128	1098-1280	**0**	**0**	**0**	**0**	**0**	2	2	2	**0**	**0**	2	**0**	2	**0**	2							
771	175	1281-1463	**0**	**0**	**0**	**0**	**0**	2	2	2	**0**	**0**	2	**0**	2	**0**	2							
772	135	732-914	**0**	**0**	**0**	2	**0**	2	**0**	2	2	**0**	2	**0**	2	**0**	2							
773	128	915-1097	**0**	**0**	**0**	2	**0**	2	2	2	2	**0**	2	**0**	2	**0**	2							
774	135	1098-1280	**0**	**0**	**0**	**0**	**0**	2	2	2	2	**0**	2	**0**	2	**0**	2							
775	155	1281-1463	**0**	**0**	**0**	**0**	**0**	2	2	2	2	**0**	2	**0**	2	**0**	2							
Annual Total	20176		81	58	73	87	75	100	97	99	83	76	99	74	99	66	100	**75**	**75**	75	75	0	75	**73**

Shaded cells indicate strata not included in the survey design after 2010. (Dates of first and last set in each year listed under survey year.)

Table 5a. Number of successful spring survey sets in Division 3L over 1996-2016. (Dates of first and last set in each year listed under survey year.)

NAFO Division 3L			Survey Year																				
Stratum	Area (sq.n. miles)	Depth (m)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
			Ma 30- Ju 27	Ju 4-26	Ju 6-30	Ju 6-29	Ju 3-29	Ma26-Ju24	Ma29-Ju22	Ju 4-26	Ju 4-26	Ju 11-29	Ju 10-29	Ju5-July12	Ju 4-30	Ma 21-Ju 23	Ju 7-25	Ma 29-Ju 22	Ma 31-Ju 19	Ma 24-Ju 20	Ju 7-22	Ju 3-17	Ma9-Ju15
328	1519	92-183	7	6	5	5	5	5	5	5	5	4	5	5	1	5	5	5	6	6	4	**0**	5
341	1574	92-183	7	6	5	6	5	5	5	5	5	4	5	5	3	5	5	5	5	5	4	**0**	5
342	585	92-183	3	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2
343	525	92-183	2	2	2	2	2	2	2	2	2	2	2	3	2	2	1	2	2	2	2	2	2
344	1582	184-274	7	5	6	5	4	5	5	5	4	5	5	4	4	5	2	5	5	3	3	2	4
345	1432	275-366	6	5	6	5	4	5	5	5	4	5	5	4	4	5	3	5	3	5	4	2	4
346	865	275-366	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	3
347	983	184-274	4	4	4	3	3	3	3	3	3	3	3	2	3	3	3	3	2	3	3	2	3
348	2120	92-183	10	8	8	8	8	7	7	7	7	7	7	6	6	7	5	7	5	6	7	4	7
349	2114	92-183	9	8	8	7	8	7	7	7	6	6	7	7	6	7	6	7	7	5	7	**0**	7
350	2071	56-91	9	7	6	6	8	7	7	7	7	6	7	7	6	7	7	7	7	7	6	**0**	7
363	1780	56-91	8	6	6	6	7	6	6	6	6	5	6	6	5	6	6	6	6	6	6	**0**	6
364	2817	92-183	13	9	11	9	10	9	9	9	9	8	9	9	8	9	9	7	9	9	9	3	9
365	1041	92-183	5	4	5	4	2	3	3	3	3	3	3	2	3	3	3	3	2	3	3	2	3
366	1394	184-274	5	6	5	4	2	5	5	5	5	5	5	4	4	5	4	5	**0**	5	5	2	5
368	334	275-366	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
369	961	184-274	4	4	4	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3
370	1320	92-183	6	5	4	5	5	4	4	4	4	4	4	4	4	4	4	4	4	5	4	4	4
371	1121	56-91	5	5	4	4	4	4	4	4	4	5	4	4	4	3	4	4	4	3	4	**0**	4
372	2460	56-91	11	9	8	9	9	8	8	8	8	6	7	8	7	9	8	8	8	7	8	**0**	8
384	1120	56-91	5	5	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	3	4	3	4
385	2356	92-183	11	9	9	7	4	7	8	8	8	6	8	8	6	8	7	8	8	7	8	6	9
386	983	184-274	4	4	4	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	**0**	3
387	718	275-366	3	2	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2
388	361	275-366	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2
389	821	184-274	4	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	**0**	3
390	1481	92-183	7	6	5	5	3	5	5	5	5	5	5	5	3	5	5	5	5	4	5	4	4
391	282	184-274	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
392	145	275-366	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
729	186	367-549	2	3	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2
730	170	550-731	2	2	3	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
731	216	367-549	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2
732	231	550-731	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	**0**	2
733	468	367-549	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2
734	228	550-731	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	3	2	2	2	**0**	2
735	272	367-549	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
736	175	550-731	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
784	268	<=55	**0**	**0**	2	2	**0**	2	2	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
785	465	56-91	**0**	**0**	2	2	**0**	2	2	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
786	84	92-183	**0**	**0**	2	2	**0**	2	**0**	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**	2	**0**	**0**	**0**	**0**	**0**
787	613	92-183	**0**	**0**	2	2	**0**	2	**0**	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**	2	**0**	**0**	**0**	**0**	**0**
788	261	92-183	**0**	**0**	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
789	72	275-366	**0**	**0**	**0**	2	**0**	**0**	**0**	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
790	89	92-183	**0**	**0**	**0**	2	**0**	1	**0**	1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
791	227	184-274	**0**	**0**	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
792	50	367-549	**0**	**0**	**0**	2	**0**	2	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
793	72	92-183	**0**	**0**	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
794	216	92-183	**0**	**0**	**0**	2	**0**	**0**	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
795	164	184-274	**0**	**0**	**0**	2	**0**	**0**	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
796	175	275-366	**0**	**0**	**0**	2	**0**	**0**	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
797	98	92-183	**0**	**0**	**0**	2	**0**	**0**	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
798	100	275-366	**0**	**0**	**0**	2	**0**	**0**	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
799	72	92-183	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	2	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
800	81	275-366	**0**	**0**	**0**	2	**0**	1	**0**	1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0	**0**
Annual Total	41918		188	158	163	177	134	154	146	156	151	133	141	137	122	142	130	144	132	134	135	56	140

Shaded cells indicate strata not included in the survey design after 2010. (Dates of first and last set in each year listed under survey year.)

Table 5b. Number of successful spring survey sets in Division 3N over 1996-2016. (Dates of first and last set in each year listed under survey year.)

NAFO Division 3N			Survey Year																				
Stratum	Area (sq. n.miles)	Depth (m)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
			Ma 22-30	Ma 18 - Ju4	Ja 24 - Ju 4	Ma 19 - Ju 7	Ma 23 - Ju 9	Ma 14 - Ju 6	Ma 13 - 29	Ma 18 - Ju 4	Ma 24 - Ju 8	Ja 22 - Ju 19	Ju 27-29	Ju16-29	Ju 1 - 22	Ma 26-Ju 11	Ma 24-Ju 6	Ma 21-30	Ma 21- Ju 3	Ma 11-24	Ju 5-17	Ma 21-Ju 3	Ma5-31
357	164	275-366	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
358	225	184-274	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
359	421	92-183	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
360	2992	56-91	11	9	12	11	10	10	10	10	10	9	6	10	8	10	10	10	10	10	6	9	10
361	1853	56-91	7	5	7	7	6	6	6	6	6	7	4	6	5	6	6	6	6	6	4	5	6
362	2520	56-91	9	7	10	9	9	9	9	9	9	8	4	9	9	9	8	9	9	9	5	7	9
373	2520	56-91	9	7	10	9	9	9	9	9	9	9	**0**	9	8	8	9	9	9	9	5	7	8
374	931	56-91	3	3	4	3	4	3	3	3	3	3	2	3	2	3	3	3	3	3	2	3	3
375	1593	<=55	6	5	6	5	6	5	5	5	5	5	3	5	4	5	5	5	5	5	3	5	5
376	1499	<=55	5	4	6	6	4	5	5	5	5	5	3	5	4	5	5	5	5	5	3	4	5
377	100	92-183	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
378	139	184-274	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
379	106	275-366	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
380	116	275-366	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
381	182	184-274	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
382	647	92-183	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
383	674	56-91	2	2	3	2	3	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
723	155	367-549	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
724	124	550-731	2	2	2	2	2	2	2	2	2	2	**0**	2	1	2	2	2	1	2	2	2	2
725	105	367-549	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
726	72	550-731	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
727	160	367-549	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
728	156	550-731	2	1	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
Annual Total	17454		82	71	88	82	81	79	79	79	79	78	22	79	71	78	78	79	78	79	60	72	78

Table 5c. Number of successful spring survey sets in Division 3O over 1996-2016. (Dates of first and last set in each year listed under survey year.)

NAFO Division 3O			Survey Year																				
Stratum	Area (sq. n. miles)	Depth (m)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
			Ma 7 - 22	Ap30 - Ma17	Ma 12-30	Ma 11-28	Ma11-Ju5	Ap29 - Ma13	Ap27 - Ma14	Ma 8-15	Ma 12-24	Ma 9-22	Ju25-30	Ma3 - Ju19	Ma23-Ju1	Ma 13-26	Ma 8-24	Ma 8-20	Ap 27-Ma 21	\p 23- Ma 10	Ma 29-Ju 5	Ma 10-21	Ap29-Ma9
329	1721	92-183	6	6	7	6	5	5	5	5	5	5	**0**	5	5	5	5	5	5	5	3	5	5
330	2089	56-91	8	7	8	7	7	7	7	7	7	7	9	7	7	7	7	7	7	7	4	6	7
331	456	56-91	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
332	1047	92-183	4	3	4	4	4	3	3	3	3	3	**0**	3	3	3	3	3	3	3	2	3	3
333	147	184-274	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
334	96	275-366	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
335	58	275-366	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
336	121	184-274	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
337	948	92-183	3	3	4	3	4	3	3	3	3	3	**0**	3	3	3	3	3	3	3	2	3	2
338	1898	56-91	7	6	7	7	6	6	6	6	6	6	7	6	6	6	6	6	6	6	3	5	6
339	585	92-183	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
340	1716	56-91	6	6	7	6	5	5	5	5	5	5	2	5	6	5	5	5	5	5	3	5	5
351	2520	56-91	8	8	10	9	8	8	8	8	8	8	4	8	8	8	8	8	8	8	5	7	7
352	2580	56-91	9	8	10	9	9	8	8	8	8	8	5	8	8	8	8	8	8	8	5	7	9
353	1282	56-91	5	4	5	5	5	4	4	4	4	4	3	4	4	4	4	4	4	4	2	3	4
354	474	92-183	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
355	103	184-274	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
356	61	275-366	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
717	166	367-549	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	**0**
718	134	550-731	2	2	3	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	**0**
719	76	367-549	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
720	105	550-731	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	1	2	2	2	2	2
721	76	367-549	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
722	93	550-731	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	3	2	2	2	2	2	2
Annual Total	18552		86	81	93	86	83	79	79	79	79	79	32	79	80	79	80	78	79	79	59	74	74

Table 5d. Number of successful spring survey sets in sub-Division 3Ps over 1996-2016.

NAFO sub-Division 3Ps			Survey Year																				
Stratum	Area (sq. n.miles)	Depth (m)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
			Ap10-Ma1	Ap2-23	Ap10-Ma5	Ap13-Ma6	Ap8-Ma11	Ap7-29	Ap5-27	Ap5-Ma2	Ap11-Ma11	Ap17-Ma9	Ap13-18	Ap4-Ma2	Ap10-Ma23	Ap8-Ma13	Ap8-Ma8	Ap7-Ma8	Mar31-Ap26	Mar26-Ap23	Ap5-Ma10	Ap11-Ma10	Ap 2-Ma1
293	159	57-92	**0**	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
294	135	93-183	**0**	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
295	209	184-274	**0**	2	2	2	2	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2
296	71	275-366	**0**	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
297	152	93-183	**0**	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
298	171	184-274	**0**	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
299	212	275-366	**0**	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
300	217	184-274	**0**	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
306	363	184-274	3	3	3	3	3	3	3	3	3	3	**0**	3	3	3	3	3	3	3	2	3	3
307	395	93-183	4	3	3	3	3	3	3	3	3	3	**0**	3	3	3	3	3	3	3	2	3	3
308	112	57-92	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
309	296	184-274	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
310	170	184-274	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
311	317	93-183	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3
312	272	57-92	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
313	165	184-274	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
314	974	<=56	8	7	7	8	7	7	8	7	8	8	4	8	6	8	7	8	8	8	7	8	6
315	827	57-92	6	6	7	7	7	7	7	7	7	7	**0**	7	5	7	7	7	7	7	6	7	6
316	189	185-274	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
317	193	93-183	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
318	129	185-274	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
319	984	550-731	8	8	8	8	8	8	8	8	8	8	**0**	8	8	8	8	8	8	8	7	8	7
320	1320	93-183	10	9	11	8	11	10	10	11	11	11	**0**	11	9	10	11	11	10	11	8	11	9
321	1189	57-92	9	9	10	9	10	9	10	10	10	10	**0**	10	10	9	10	10	10	10	8	10	8
322	1567	93-183	11	11	13	12	11	12	13	13	13	13	5	13	12	13	13	12	13	14	12	13	11
323	696	93-183	5	4	6	6	5	6	6	5	6	6	**0**	6	6	6	6	5	6	6	5	5	5
324	494	93-183	3	3	4	4	4	4	4	4	4	4	**0**	4	4	4	4	4	4	4	4	4	3
325	944	57-91	9	6	8	8	8	8	8	8	8	8	**0**	8	8	8	8	8	8	8	7	8	7
326	166	57-91	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
705	195	275-366	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
706	476	275-366	3	3	4	4	4	4	4	4	4	4	**0**	4	3	4	4	4	4	4	3	4	3
707	74	275-366	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
708	126	367-549	2	2	3	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	**0**	2	**0**
709	147	550-731	2	**0**	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	**0**	2	2
711	593	367-549	4	5	5	5	5	5	5	5	5	5	**0**	5	5	5	5	5	5	5	4	5	4
712	731	367-549	6	5	6	6	5	6	6	6	6	6	**0**	6	5	6	6	6	6	6	5	6	5
713	851	367-549	7	6	7	7	6	6	7	7	7	7	**0**	7	6	7	7	7	7	7	6	7	6
714	1074	367-549	9	7	9	9	9	9	9	9	9	9	**0**	9	9	8	9	9	9	9	7	7	8
715	128	275-366	2	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
716	539	275-366	5	4	4	4	4	4	4	4	4	4	3	4	4	4	4	4	4	4	4	4	3
779	422	184-274	3	3	3	4	4	4	4	4	3	4	2	4	4	4	4	4	4	4	4	4	3
780	403	184-274	**0**	3	3	3	2	3	3	3	3	3	**0**	3	3	3	3	3	3	3	3	3	3
781	446	93-183	2	4	4	4	4	4	4	4	4	4	4	4	5	4	4	4	4	4	4	4	4
782	183	93-183	**0**	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
783	229	57-92	**0**	2	2	2	2	2	2	2	2	2	**0**	2	2	2	2	2	2	2	2	2	2
Annual Total			148	157	177	173	171	173	177	176	177	178	43	178	169	175	177	174	177	179	154	175	156

Table 6. Comparisons of survey biomass trends for various species sampled in the spring and autumn DFO (NL Region) multispecies surveys from 1995-2016. NS = No survey (Divs. 2HJ3K only surveyed in autumn, 3Ps only surveyed in spring); NA = data not finalized since 2012.

Features of RV Multi-species Surveys since 1995	Spring[1]		Autumn[2]	
Species/Stock/Area	Campelen Survey Trawl (1996-2016)		Campelen Survey Trawl (1995-2016)	
Stocks assessed at NAFO	2016 as a (%) of the mean value	5-year Trend	2016 as a (%) of the mean value	5-year Trend
Cod in Div. 3NO	30	Declining	95	Declining
Redfish in Div. 3LN	387	Increasing	113	Stable
American Plaice in Div. 3LNO	43	Declining	79	Stable
Yellowtail Flounder in Div. 3LNO	42	Declining	96	Stable
Witch Flounder in Div. 3NO	79	Declining	52	Declining
Capelin in Div. 3NO	9	Declining	NA	NA
Redfish in Div. 3O	67	Declining	42	Declining
Thorny Skate in Div. 3LNO and Subdiv. 3Ps	124	Stable	120	Stable
White Hake in Div. 3NO and Subdiv. 3Ps	70	Stable	39	Stable
Roughhead Grenadier in Subareas 2 and 3	113	Stable	96	Stable
Roundnose Grenadier in Subareas 2+3[3]	64	Stable	59	Stable
Witch Flounder in Div. 2J3KL	151	Stable	263	Increasing
Greenland halibut in SA 2 + Div. 3KLMNO	39	Stable	81	Declining
Northern shortfin squid in Subareas 3+4	<1	Stable	28	Stable
Stocks assessed within Canada				
Atlantic Cod in Div. 2J3KL	NS	NS	386	Increasing
Atlantic Cod in Subdiv. 3Ps	53	Declining	NS	NS
Atlantic Cod in Div. 2H	NS	NS	54	Stable
Haddock in Div. 3LNO	43	Stable	145	Fluctuating
Haddock in Subdiv. 3Ps	68	Fluctuating	NS	NS
Atlantic Halibut in Div.2GHJ3KLNO and Subdiv. 3Ps	300	Fluctuating	227	Fluctuating
American Plaice in Subarea 2 + Div 3K	NS	NS	144	Fluctuating
American Plaice in Subdiv. 3Ps	76	Stable	NS	NS
Witch Flounder in Subdiv. 3Ps	178	Stable	NS	NS
Yellowtail Flounder in Subdiv. 3Ps	86	Fluctuating	NS	NS
Greenland Halibut in Subdiv. 3Ps	51	Declining	NS	NS
Redfish in Subarea 2 + Div. 3K	NS	NS	85	Declining
Redfish in Subdiv. 3Ps	52	Stable	NS	NS
Striped Wolffish in Subareas 2+3	53	Declining	106	Fluctuating
Spotted Wolffish in Subareas 2+3	70	Stable	153	Fluctuating
Broadhead Wolffish in Subareas 2+3	71	Stable	206	Stable
Thorny Skate in SA 2+3K	NS	NS	165	Fluctuating

[1]Surveys only conducted in 3LNO+3Ps in depths <=732m

[2]3Ps not surveyed in autumn so metrics only apply to the non-3Ps portion of the stock area

[3]Has not been assessed by NAFO since 1999

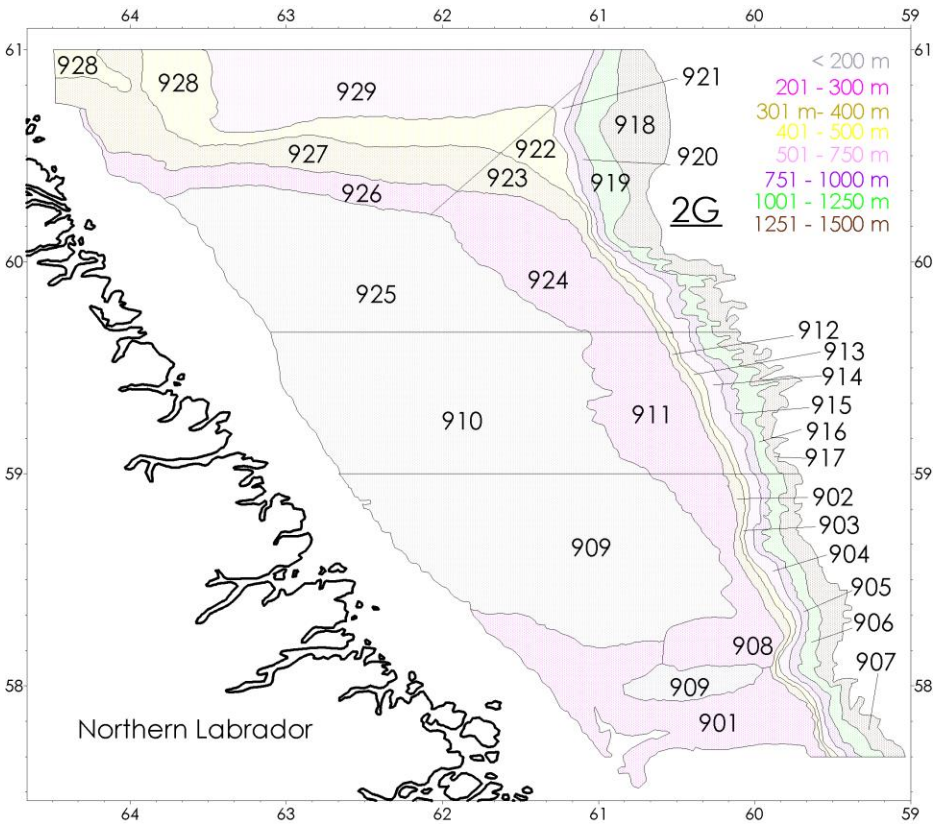


Fig 1. Stratification of Div. 2G

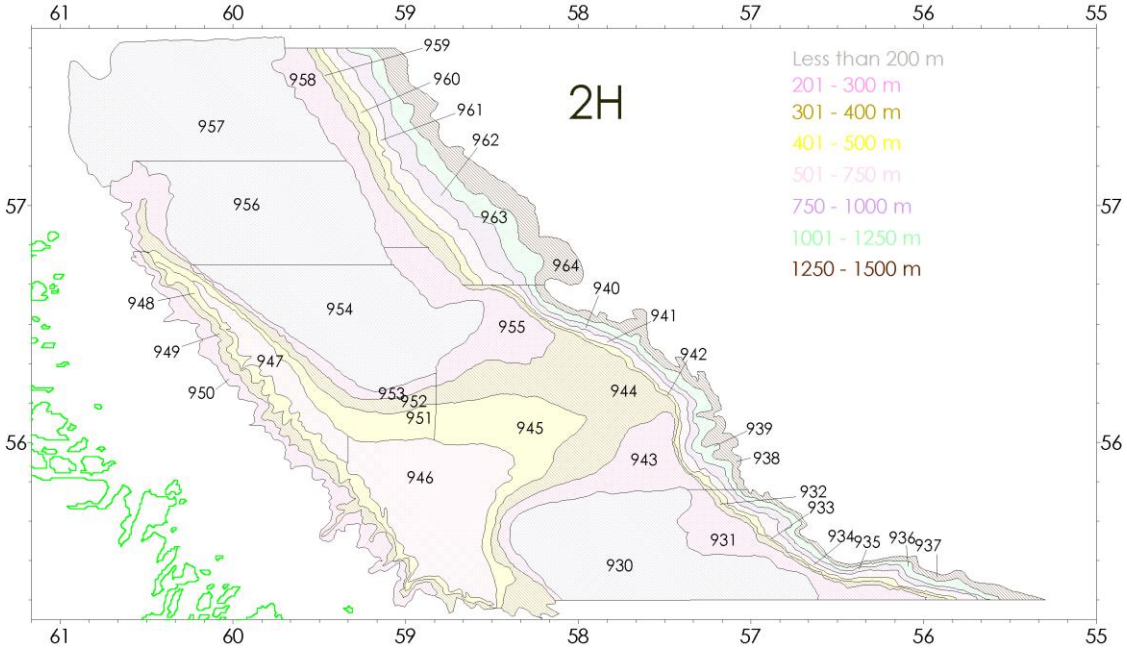


Fig 2. Stratification of Div. 2H

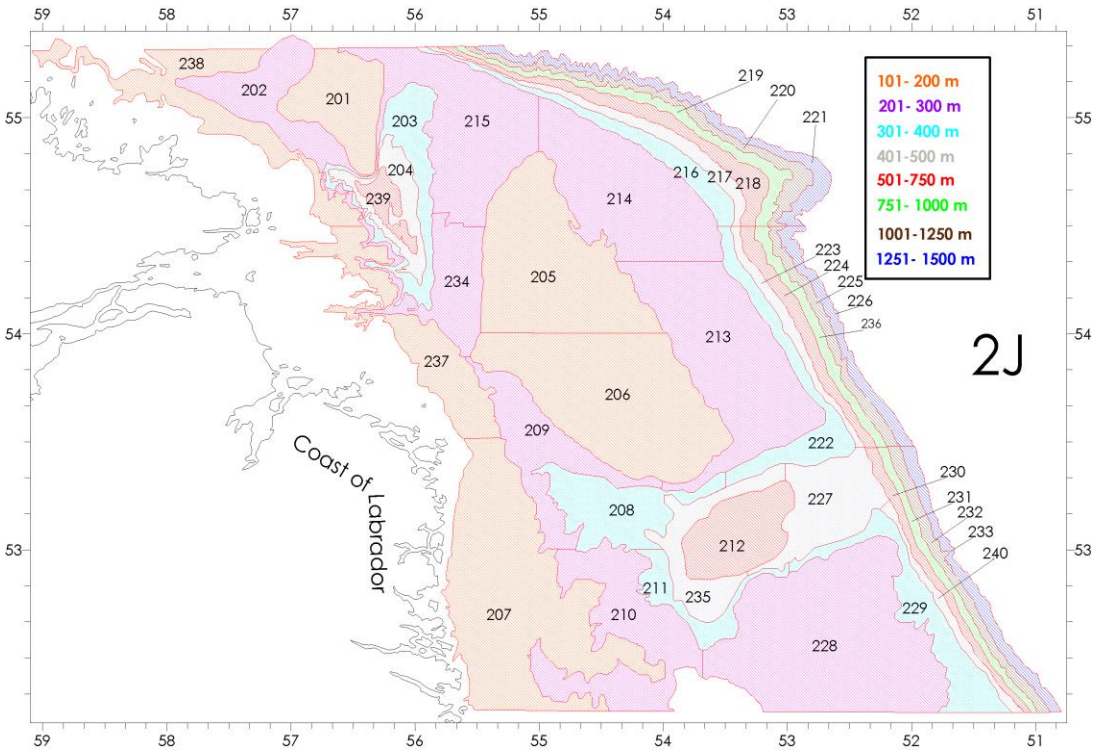


Fig 3. Stratification of Div. 2J

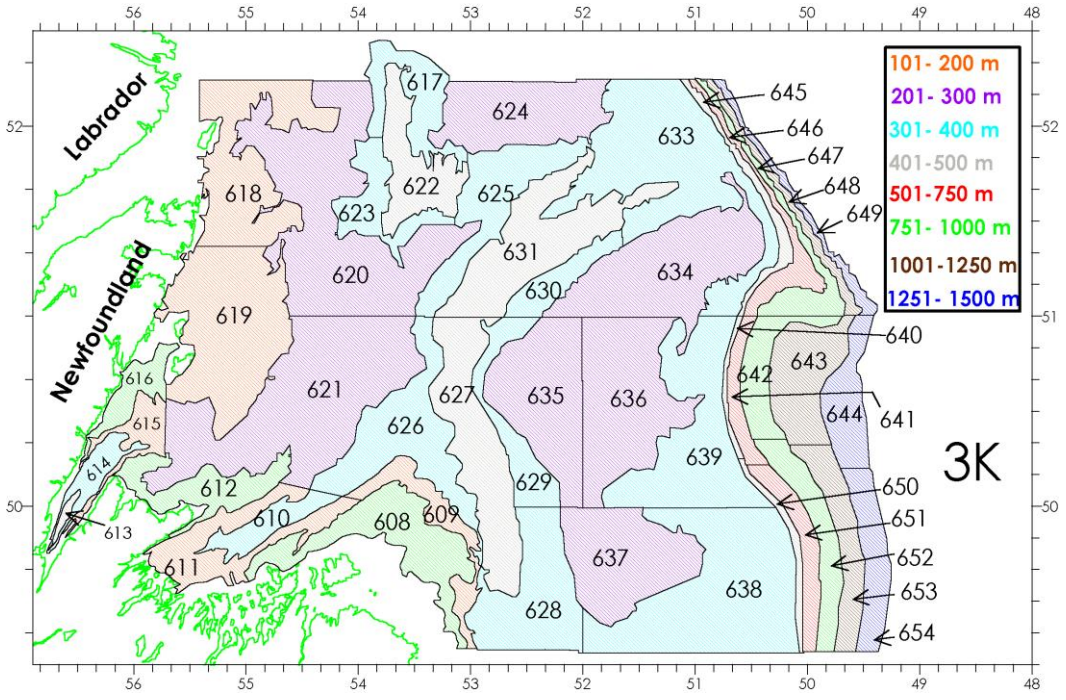


Fig 4. Stratification of Div. 3K

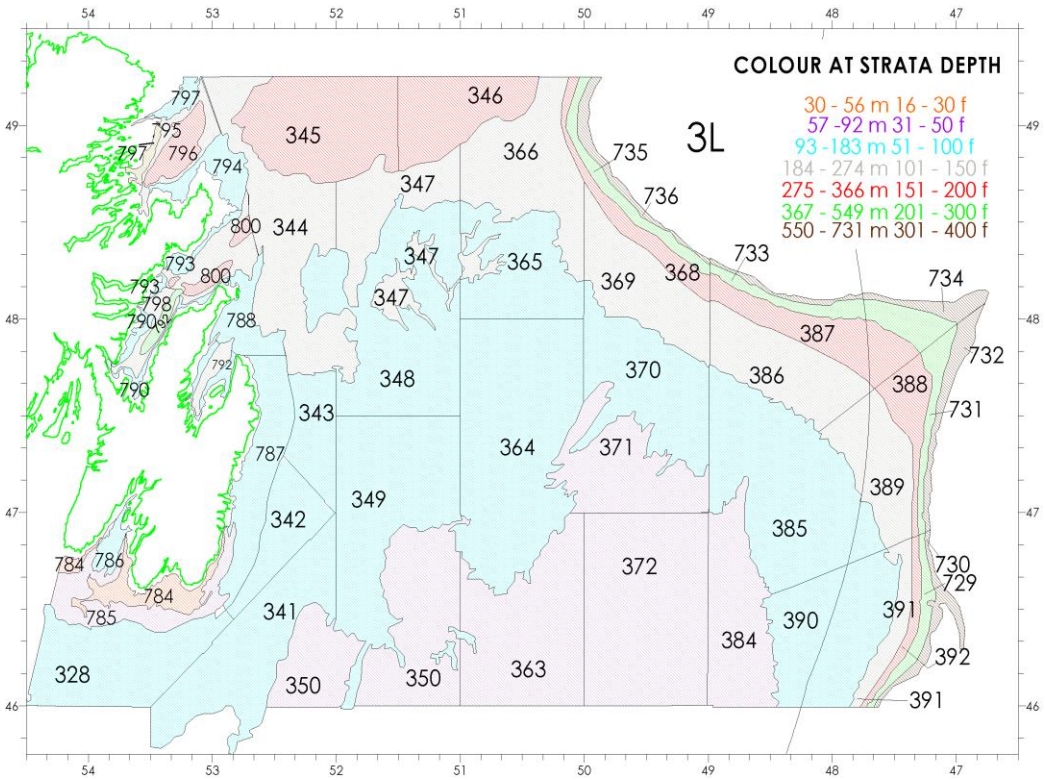


Fig 5. Stratification of Div. 3L

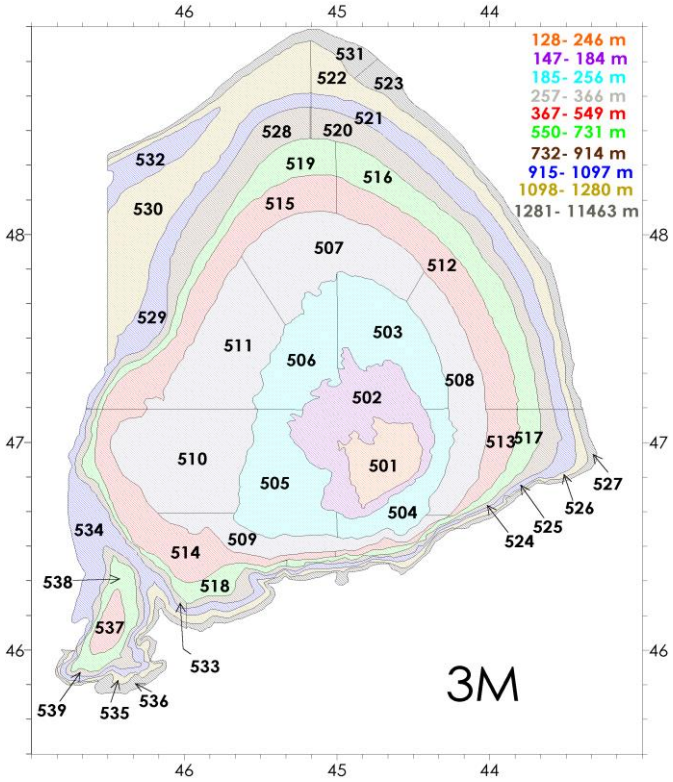


Fig 6. Stratification of Div. 3M

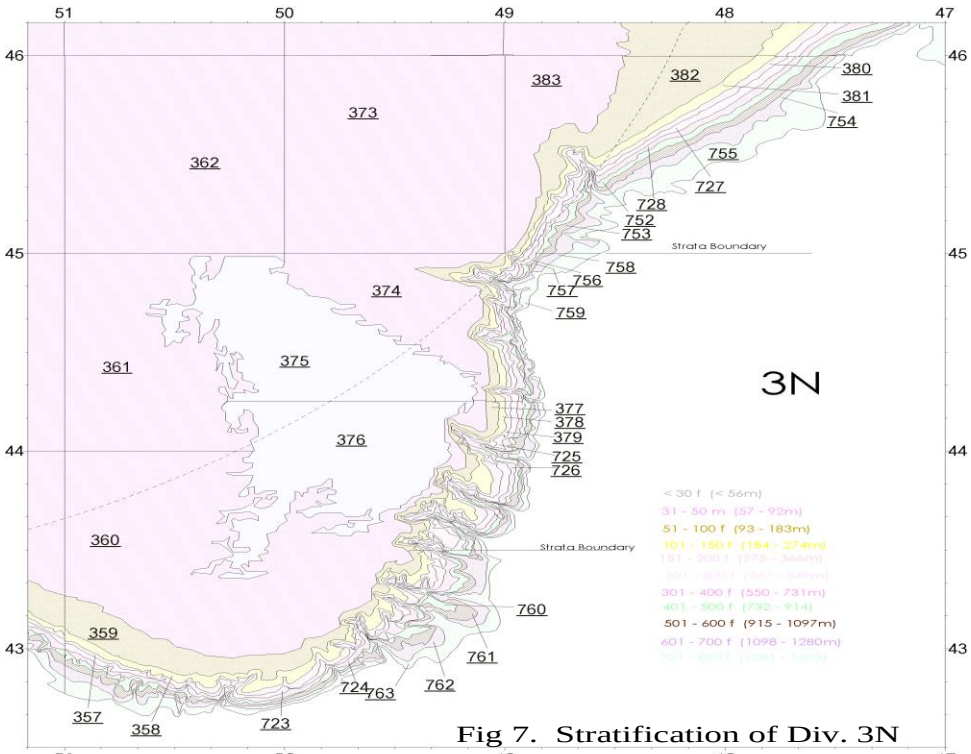


Fig 7. Stratification of Div. 3N

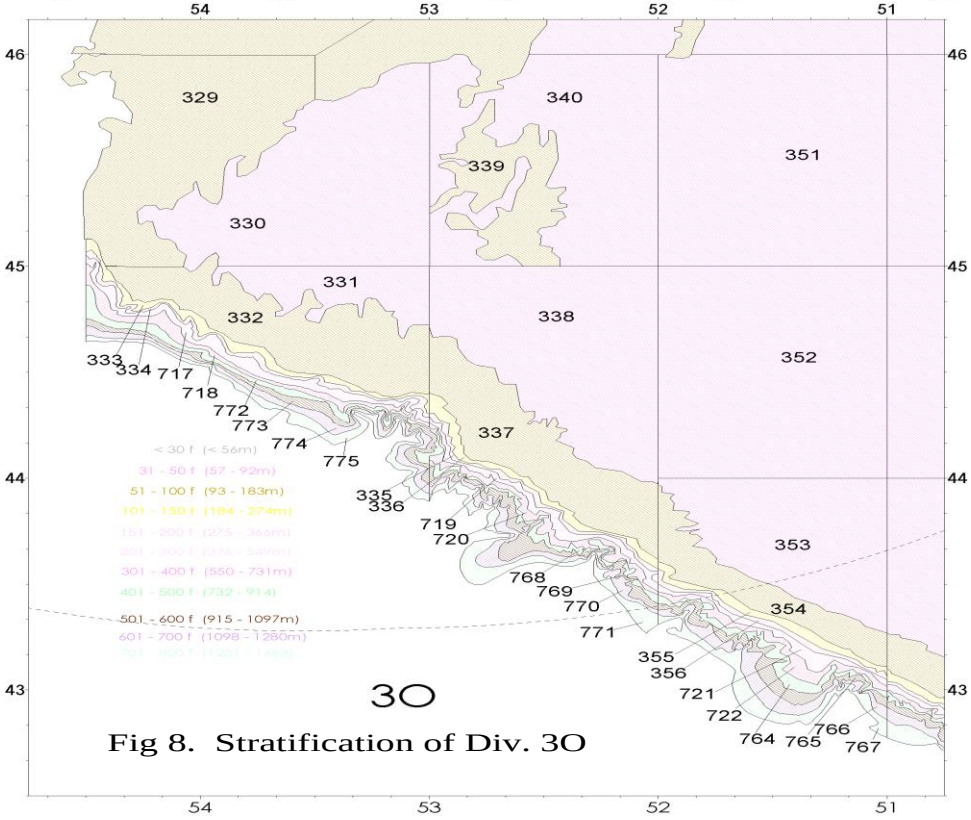


Fig 8. Stratification of Div. 3O

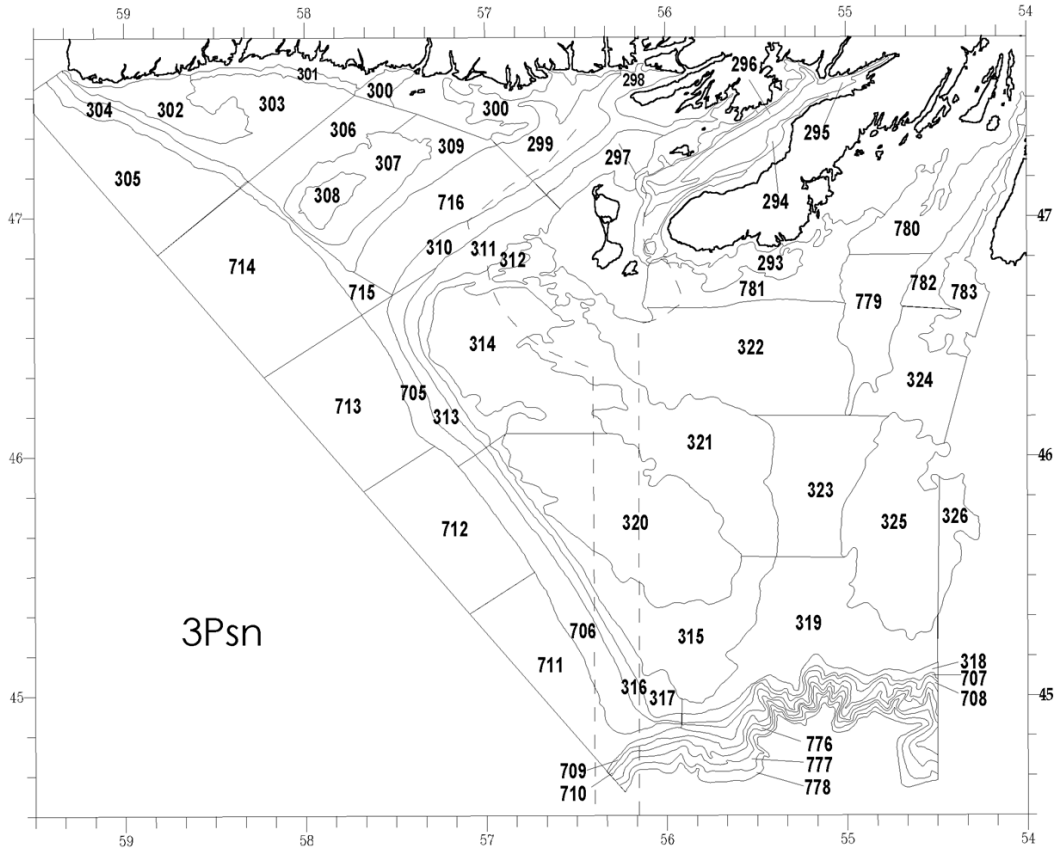


Fig. 9. Stratification of Div. 3P

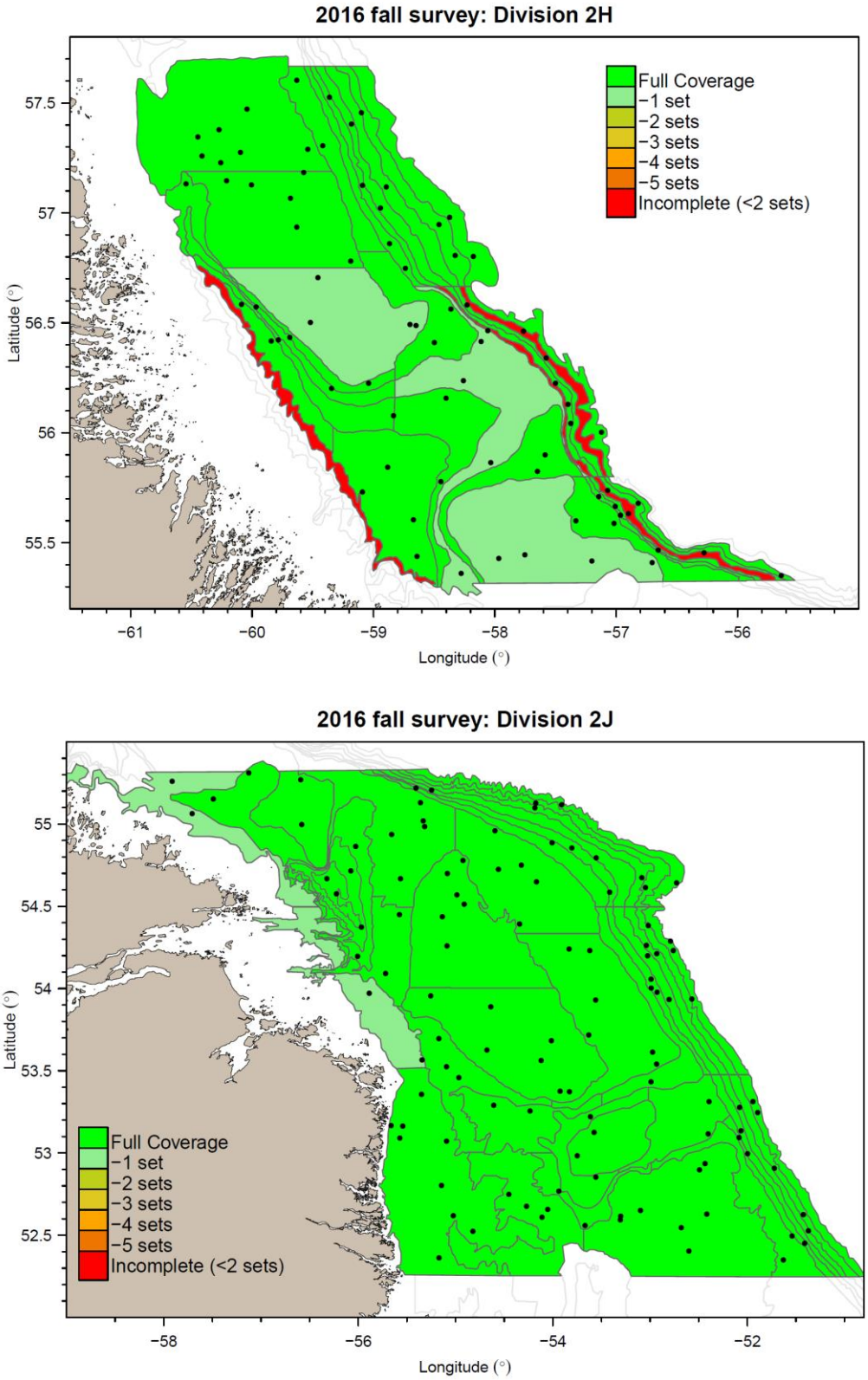


Fig. 10. Illustration of the number of survey sets completed versus intended for the 2016 Canadian Autumn RV Survey in Div. 2H (above) and Div. 2J (below).

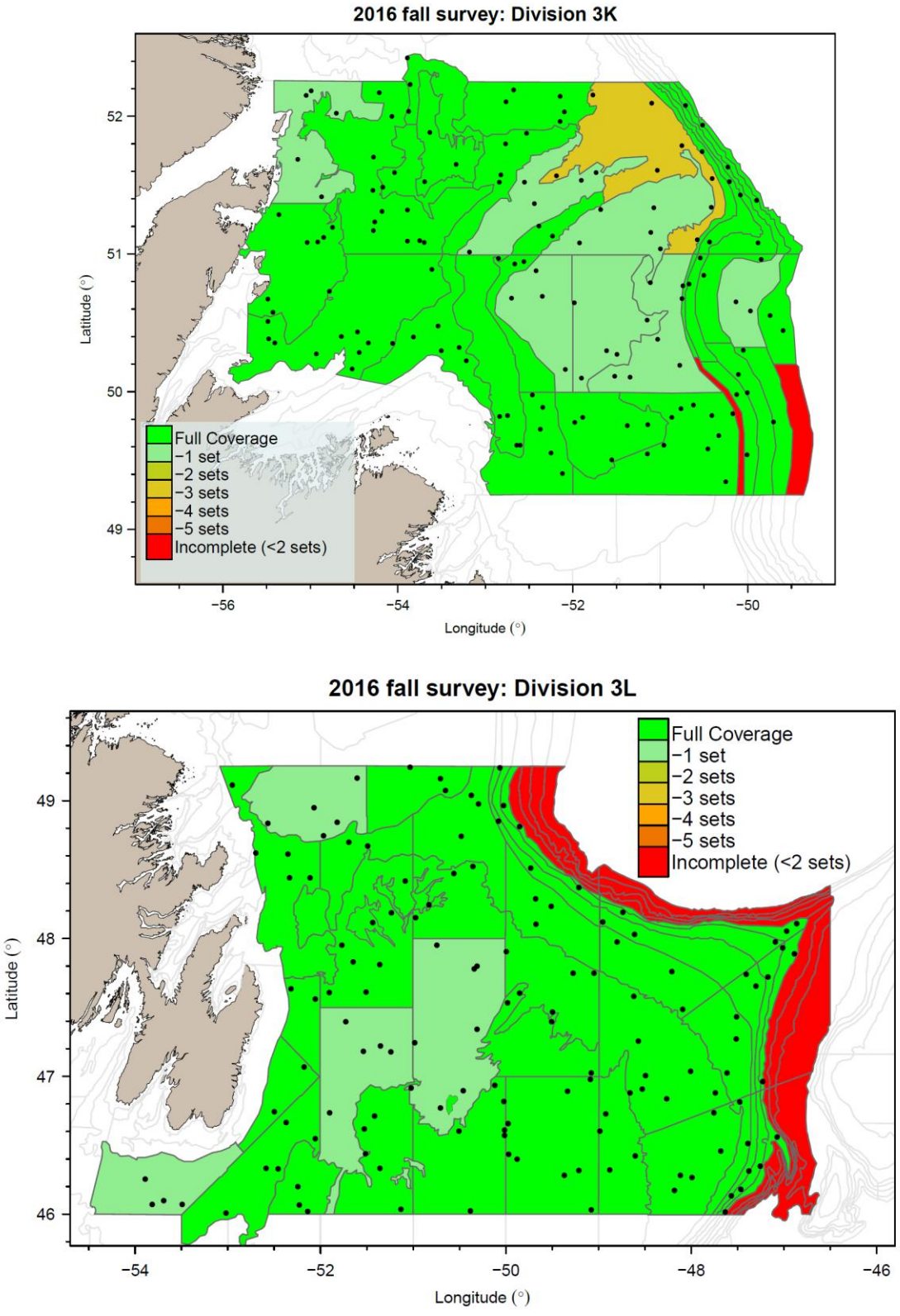


Fig. 11. Illustration of the number of survey sets completed versus intended for the 2016 Canadian Autumn RV Survey in Div. 3K (above) and Div. 3L (below).

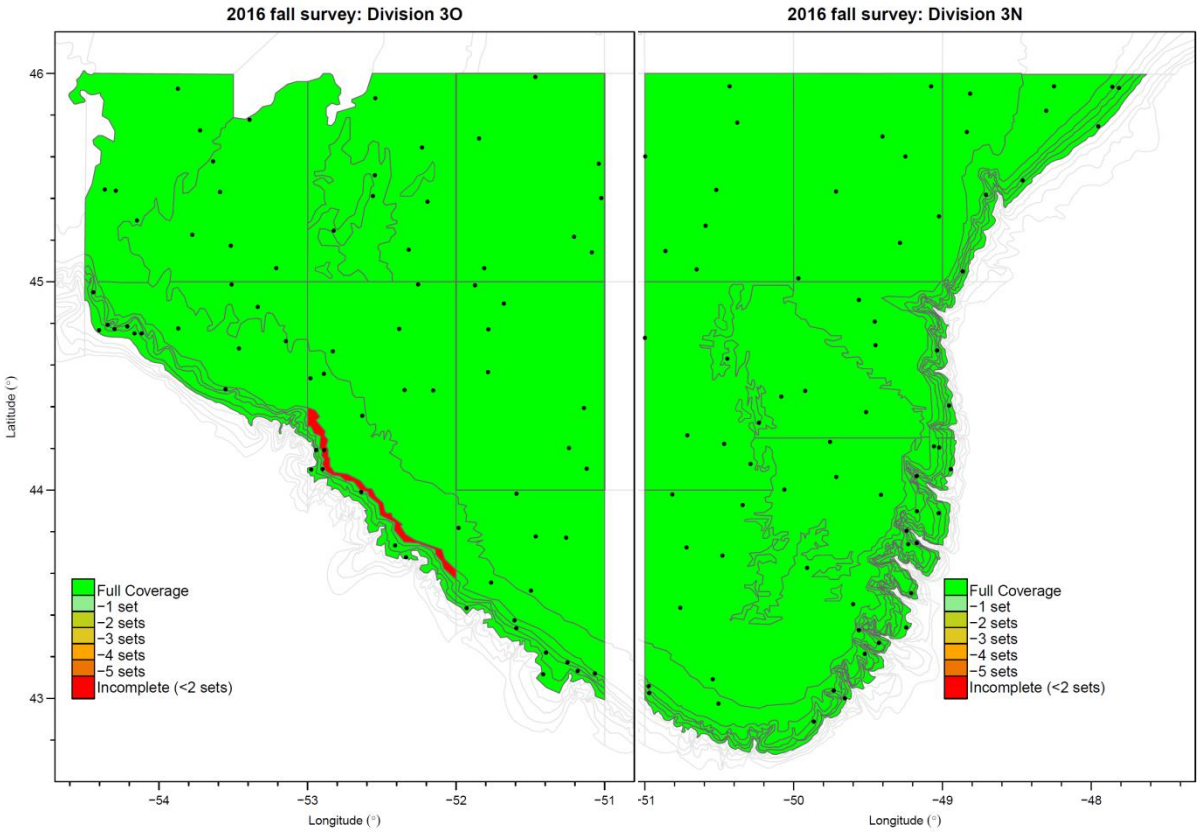


Fig. 12. Illustration of the number of survey sets completed versus intended for the 2016 Canadian Autumn RV Survey in Div. 3N (right) and Div. 3O (left).

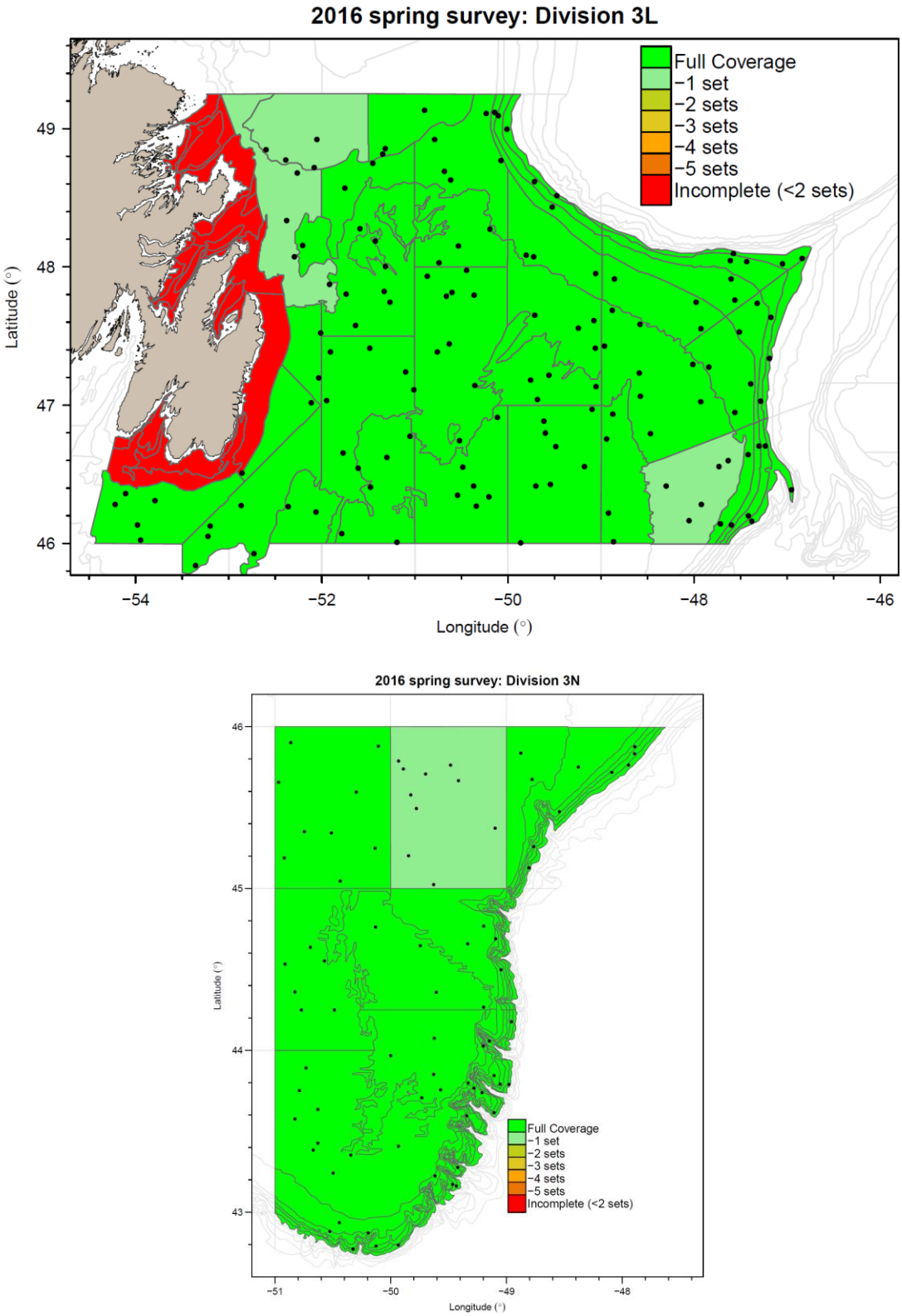


Fig. 13. Illustration of the number of survey sets completed versus intended for the 2016 Canadian Spring RV Survey in Div. 3L (above) and Div. 3N (below).

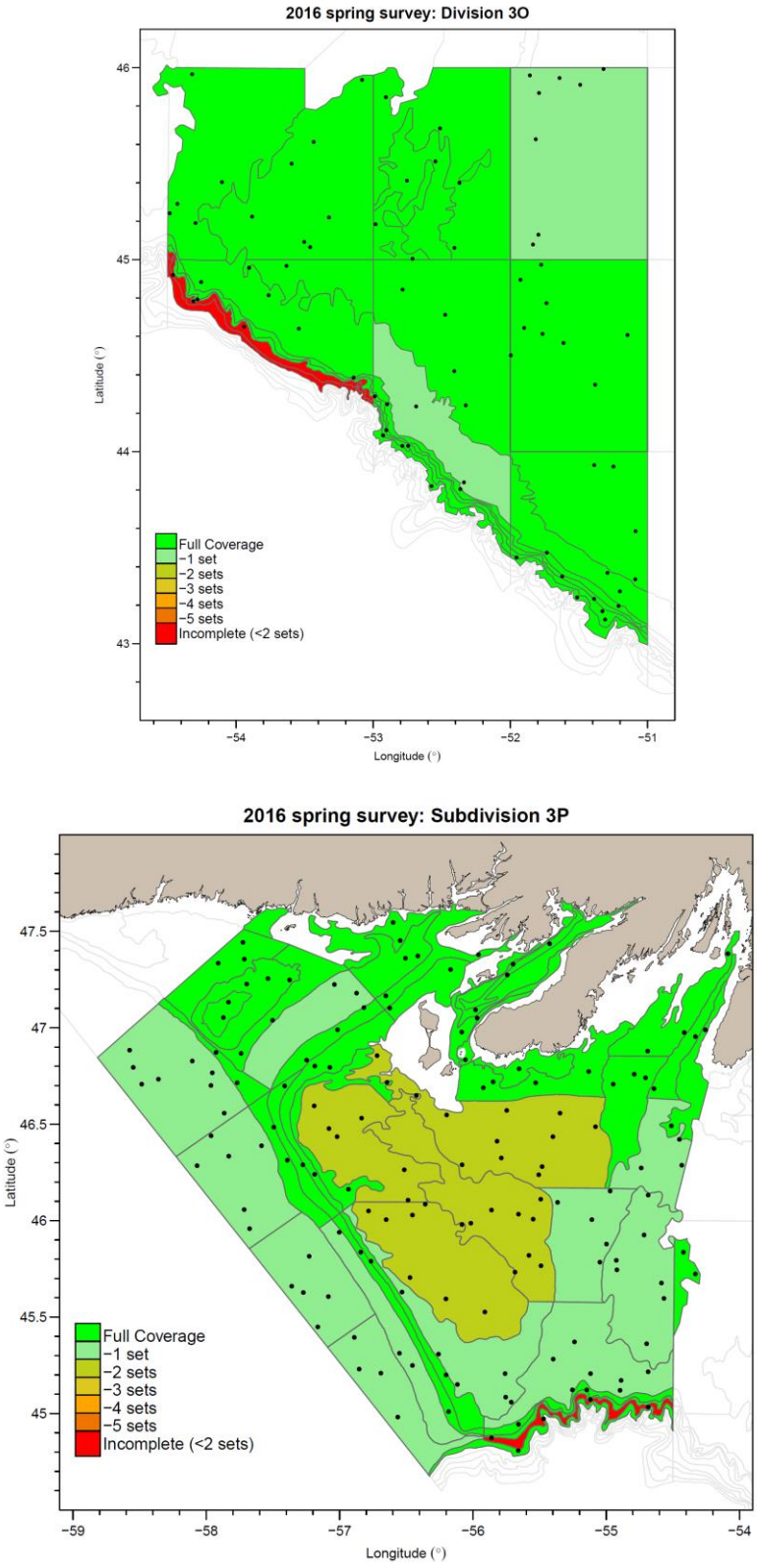


Fig. 14. Illustration of the number of survey sets completed versus intended for the 2016 Canadian Spring RV Survey in Div. 3O (above) and Subdiv. 3Ps (below).

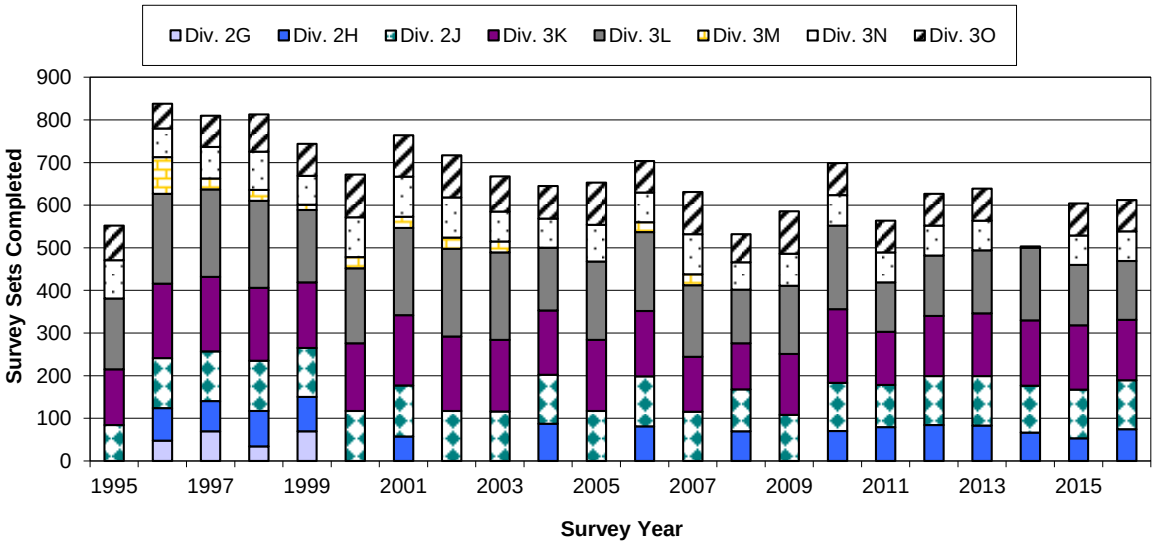


Fig. 15a. Number of successful autumn survey sets, by NAFO Division, 1995-2016.

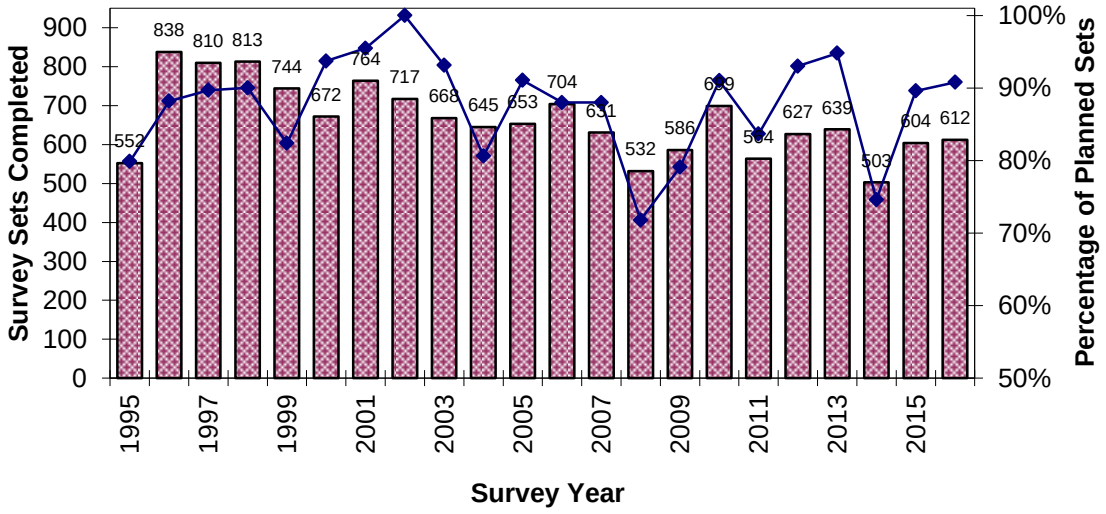


Fig. 15b. Number of successful autumn survey sets (bars with numbers), with percent of allocated sets realized (diamonds, joined line).

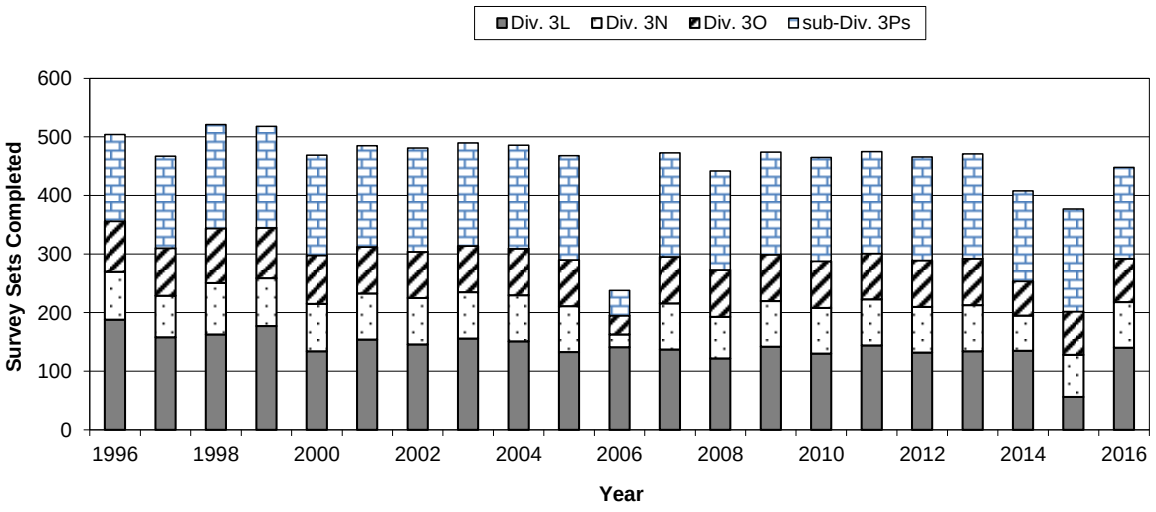


Fig. 16a. Number of successful spring survey sets, by NAFO Division, 1996-2016.

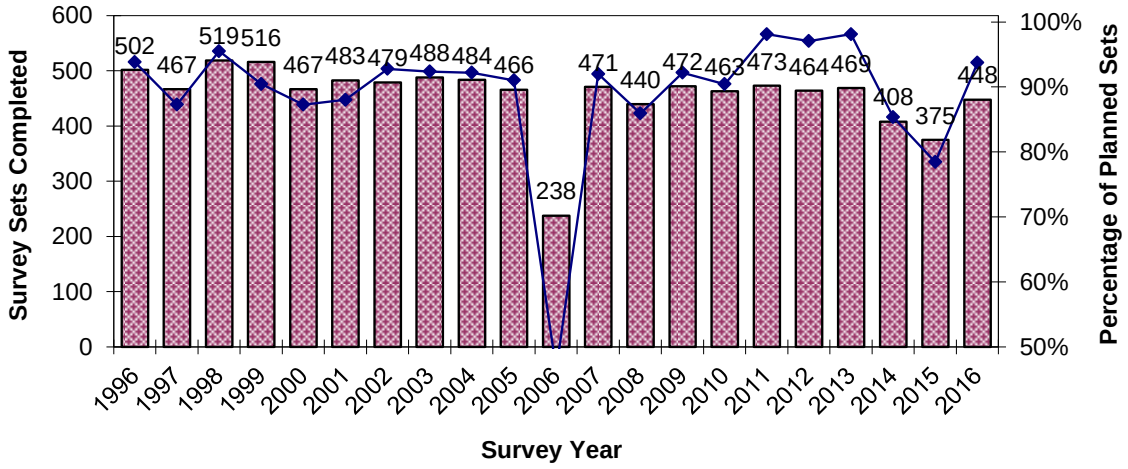


Fig. 16b. Number of successful spring survey sets (bars), with percent of allocated sets realized (diamonds).

Cod (*Gadus morhua*) in Div. 3NO

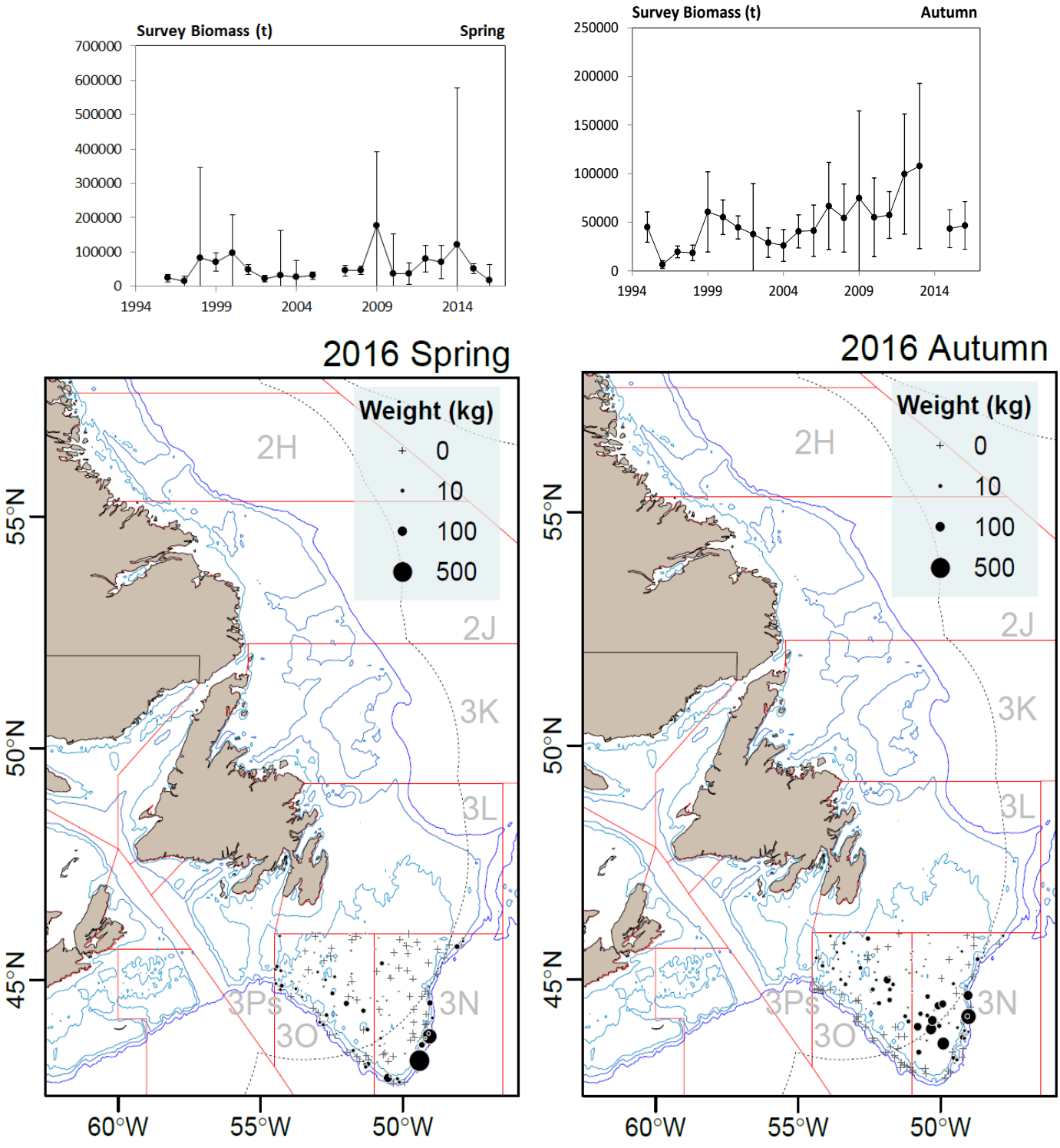


Fig.17. Canadian Spring (left) and Autumn (right) survey biomass indices (above, with 95% CI) and 2016 survey distribution plots (below) for cod in Divs. 3NO (not covered in autumn 2014).

Redfish (*Sebastes mentella* and *Sebastes fasciatus*) in Div. 3LN

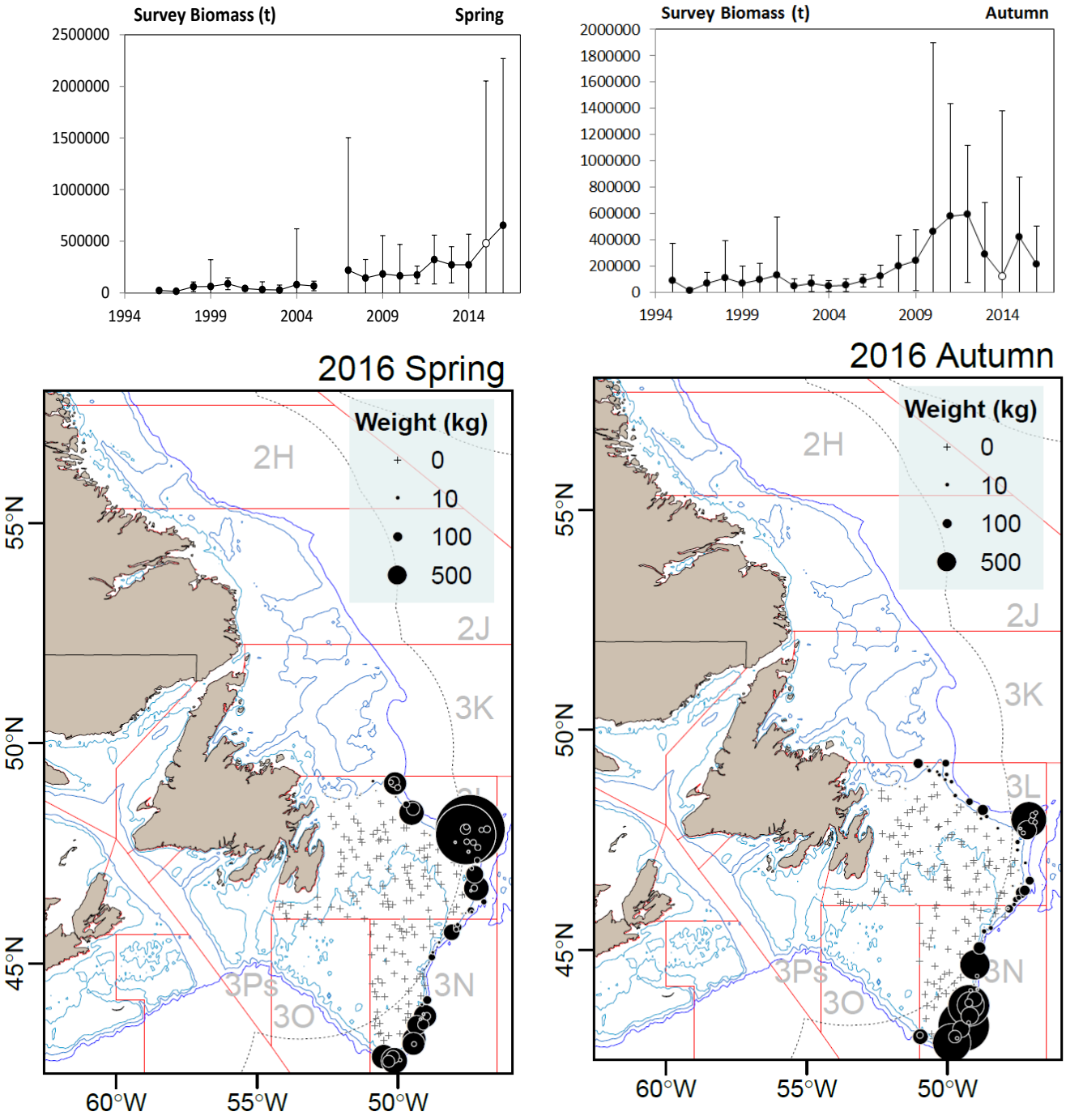


Fig.18. Canadian Spring (left) and Autumn (right) survey biomass indices (above, with 95% CI) and 2016 survey distribution plots (below) for redfish in Divs. 3LN. Open circles represent an incomplete survey (Div. 3NO was not covered in autumn 2014, Div. 3L coverage incomplete in spring 2015).

American Plaice (*Hippoglossoides platessoides*) in Div. 3LNO

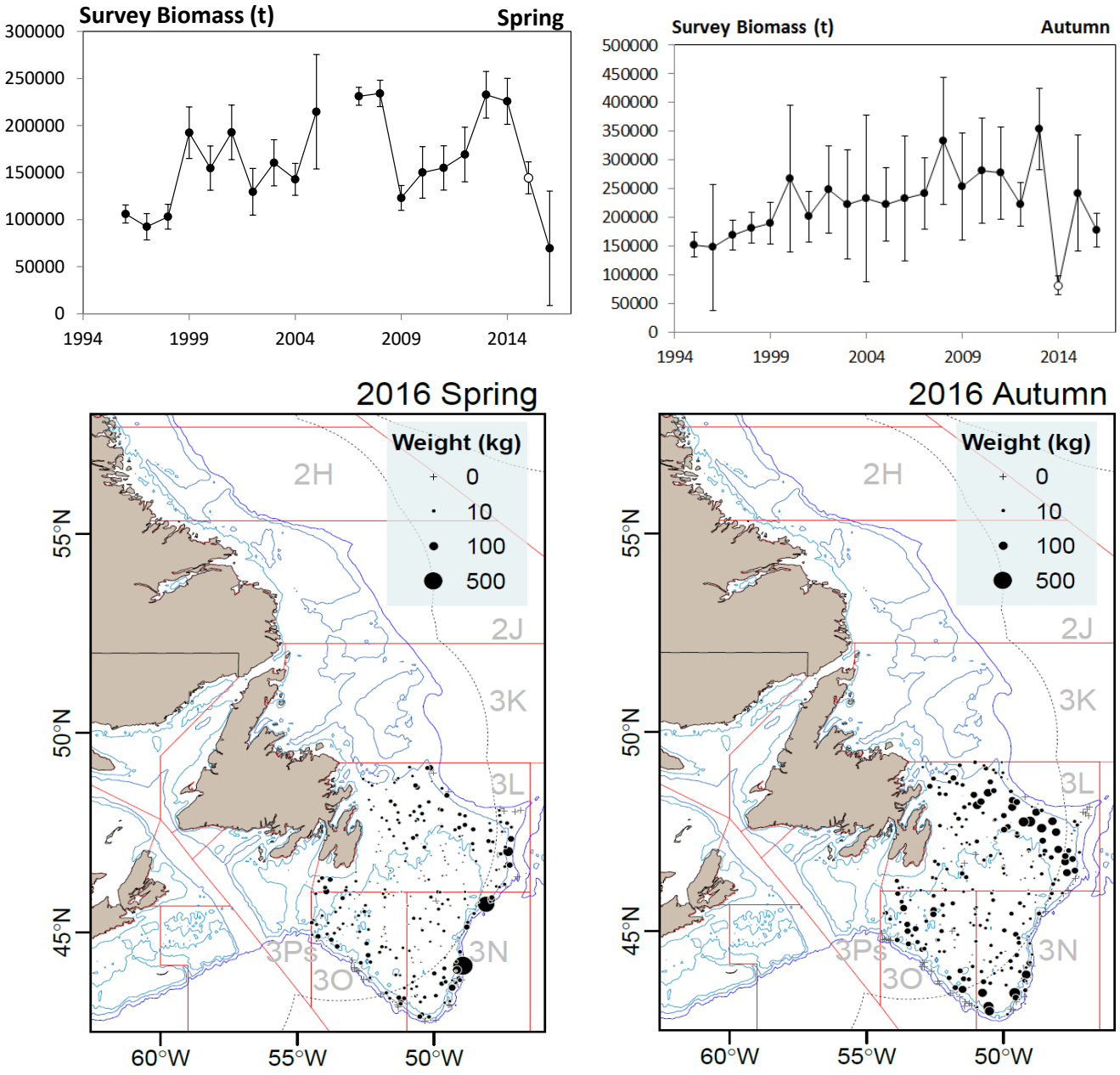


Fig.19. Canadian Spring (left) and Autumn (right) survey biomass indices (above, with 95% CI) and 2016 survey distribution plots (below) for American plaice in Divs. 3LNO. Open circles represent an incomplete survey (Div. 3NO was not covered in autumn 2014, Div. 3L coverage incomplete in spring 2015).

Yellowtail Flounder (*Limanda ferruginea*) in Div. 3LNO

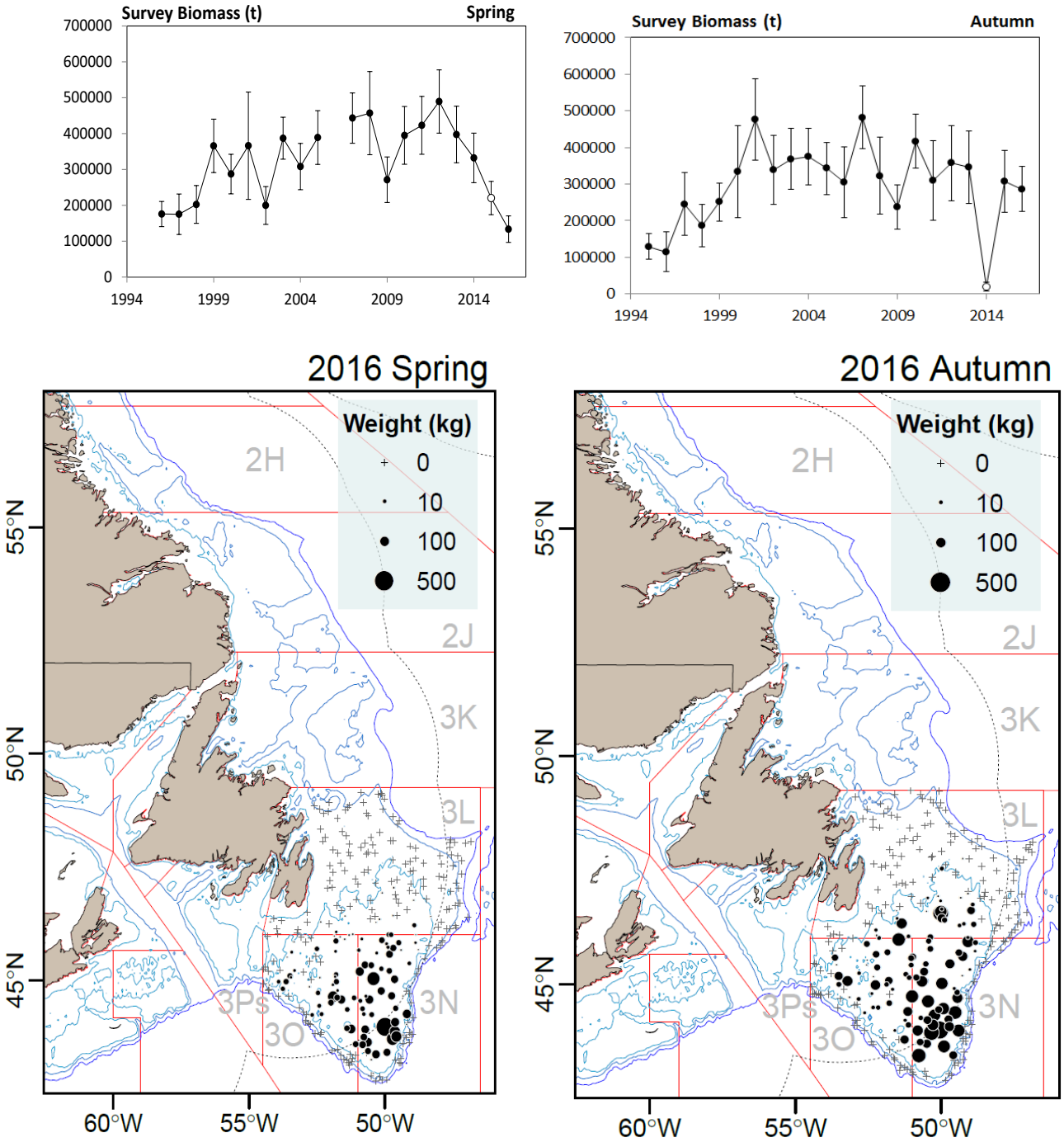


Fig. 20. Canadian Spring (left) and Autumn (right) survey biomass indices (above, with 95% CI) and 2016 survey distribution plots (below) for yellowtail flounder in Divs. 3LNO. Open circles represent an incomplete survey (Div. 3NO was not covered in autumn 2014, Div. 3L incomplete in 2015).

Witch Flounder (*Glyptocephalus cynoglossus*) in Div. 3NO

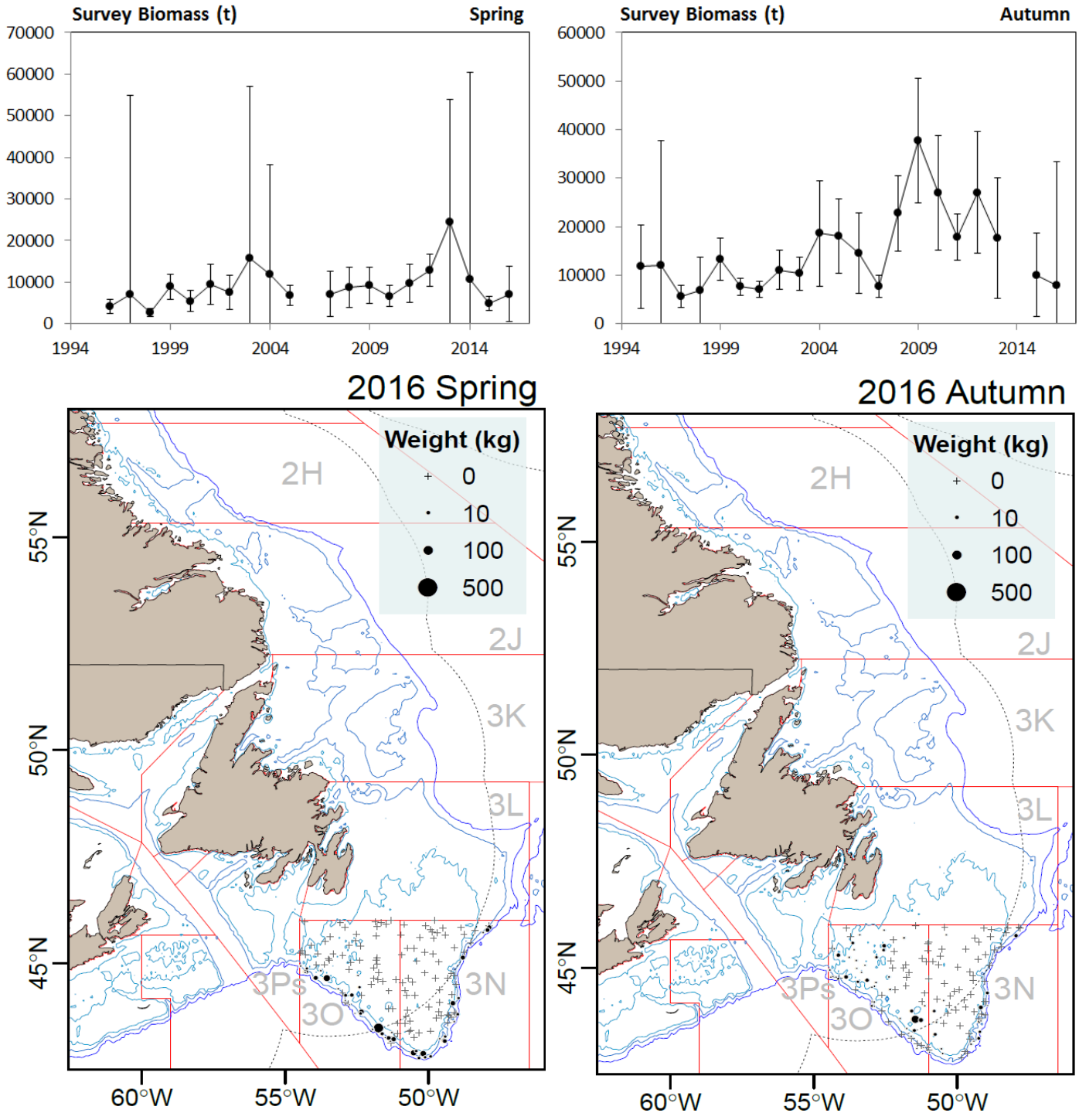


Fig. 21. Canadian Spring (left) and Autumn (right) survey biomass indices (above, with 95% CI) and 2016 survey distribution plots (below) for witch flounder in Divs. 3NO (not covered in autumn 2014).

Capelin (*Mallotus villosus*) in Div. 3NO

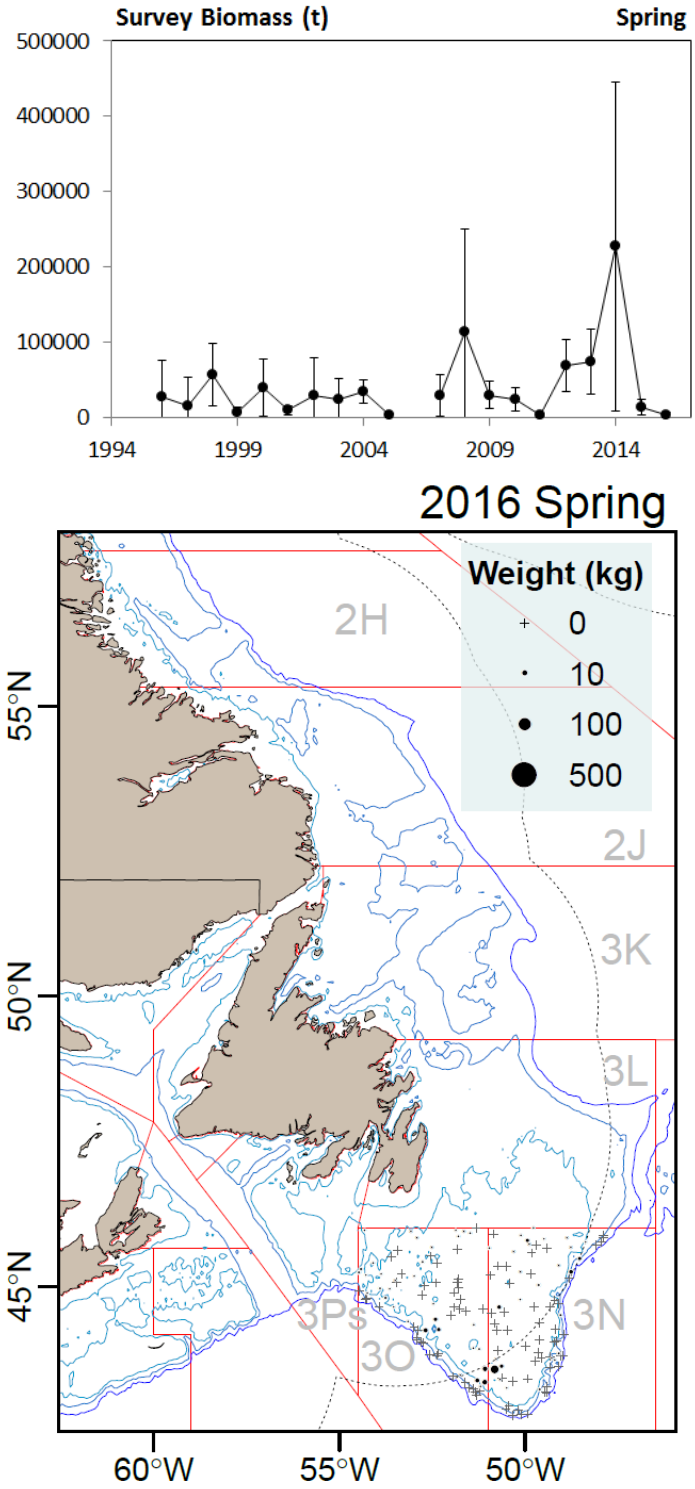


Fig. 22. Canadian Spring survey biomass indices (above, with 95% CI) and 2016 survey distribution plot (below) for capelin in Divs. 3NO. Autumn data not finalized since 2012.

Redfish (*Sebastes mentella* and *Sebastes fasciatus*) in Div. 3O

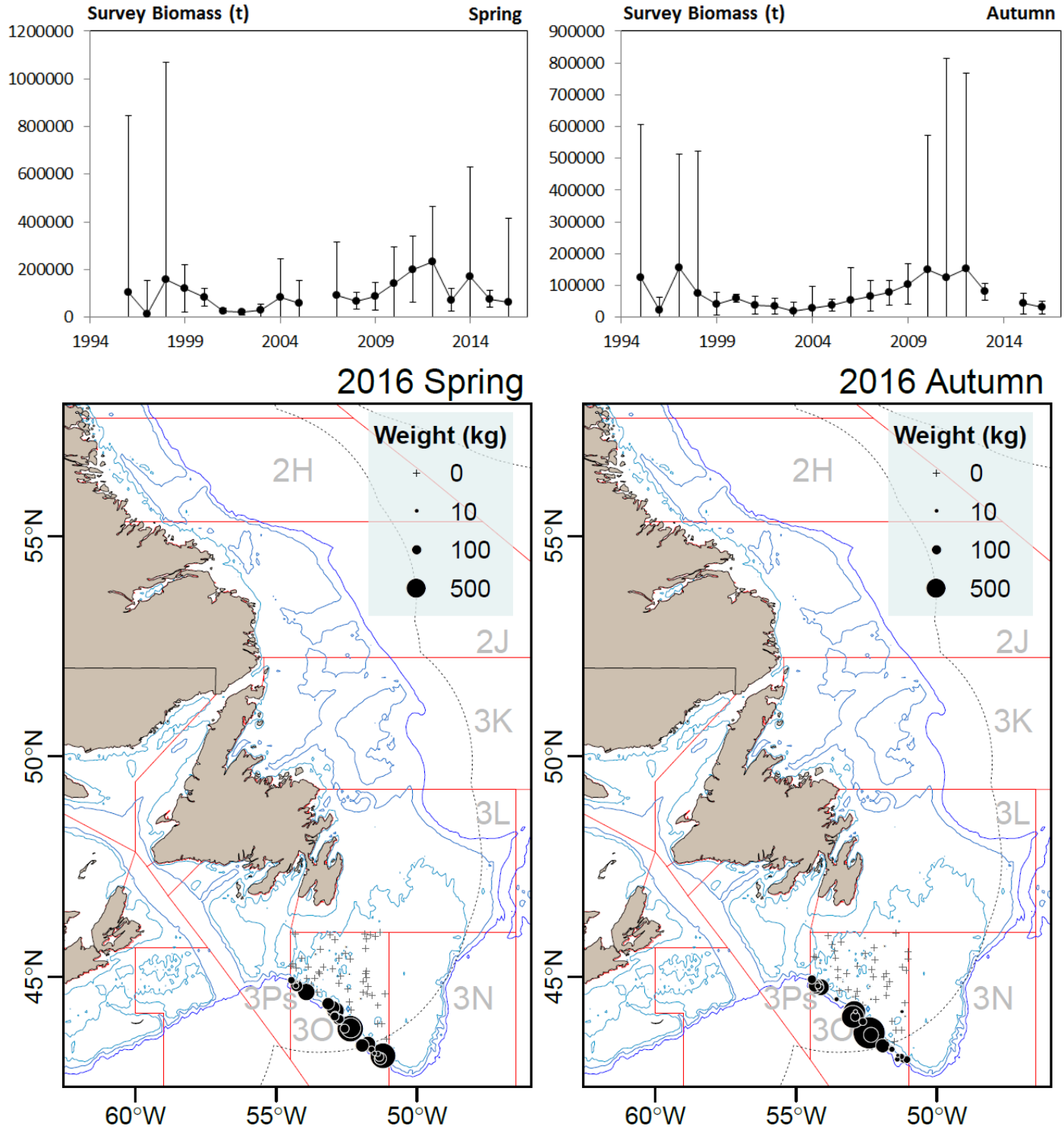


Fig. 23. Canadian Spring (left) and Autumn (right) survey biomass indices (above, with 95% CI) and 2016 survey distribution plots (below) for redfish in Div. 3O (not covered in autumn 2014).

Thorny Skate (*Amblyraja radiata*) in Div. 3LNO and Subdiv. 3Ps

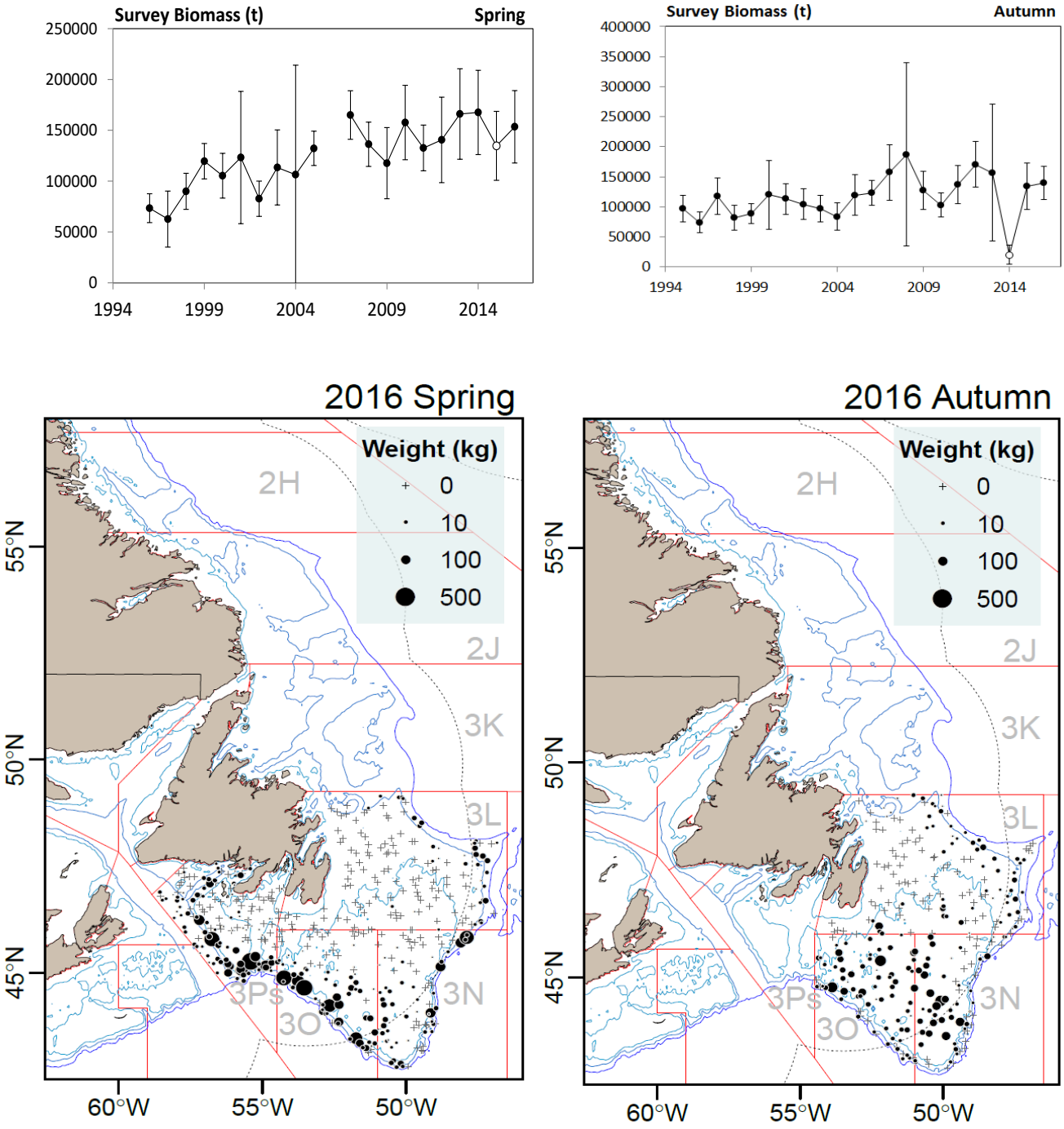


Fig. 24. Canadian Spring (left) and Autumn (right) survey biomass indices (above, with 95% CI) and 2016 survey distribution plots (below) for thorny skate in Divs. 3NOPs. Open circles represent an incomplete survey (Div. 3NO was not covered in autumn 2014, Div. 3L incomplete in spring 2015).

White Hake (*Urophycis tenuis*) in Div. 3NO and Subdiv. 3Ps

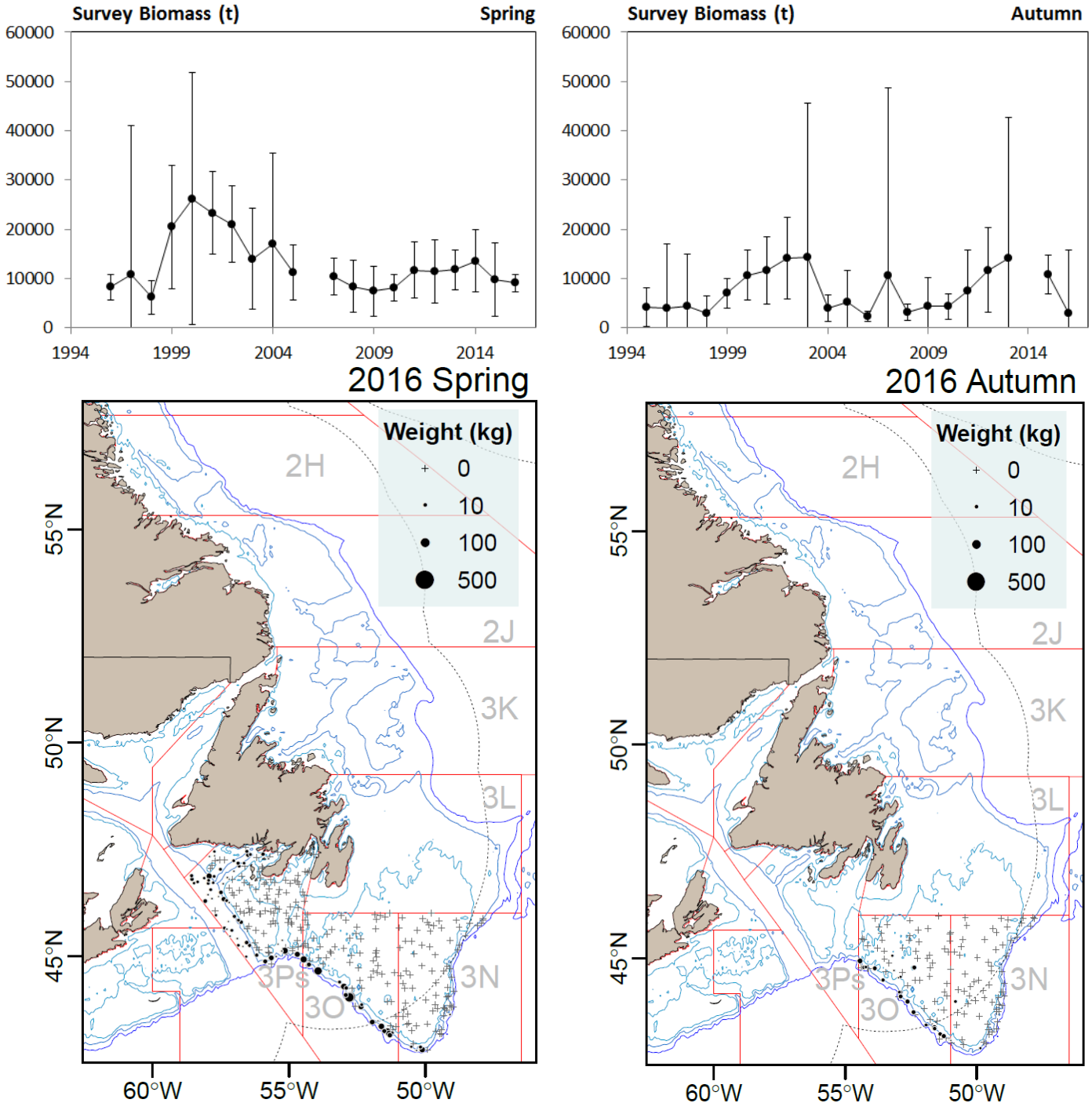


Fig. 25. Canadian Spring (left) and Autumn (right) survey biomass indices (above, with 95% CI) and 2016 survey distribution plots (below) for white hake in Divs. 3NOPs. Div. 3NO was not covered in autumn 2014.

Roughhead Grenadier (*Macrourus berglax*) in Subareas 2 and 3

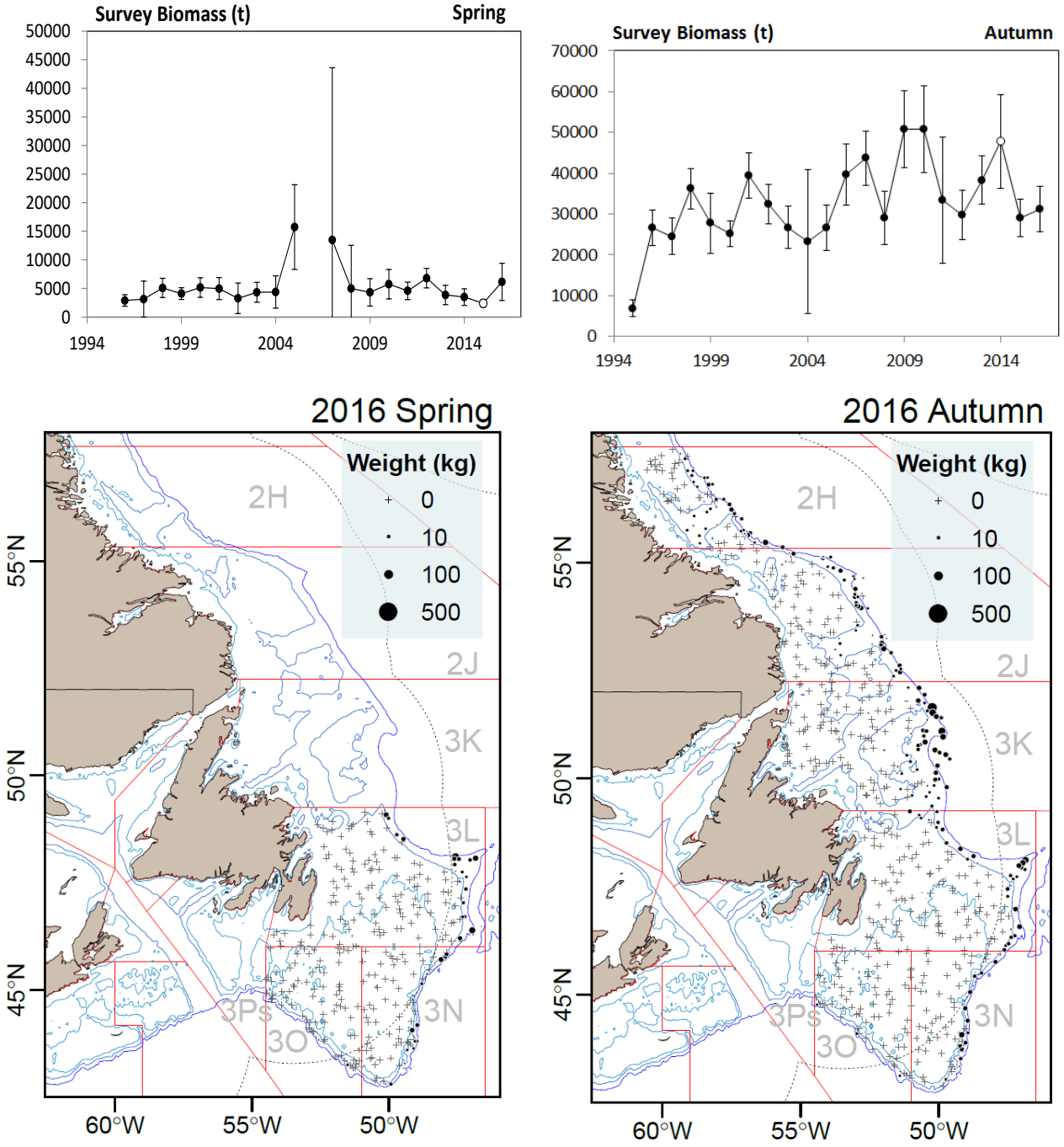


Fig. 26. Canadian Spring (left) and Autumn (right) survey biomass indices (above, with 95% CI) and 2016 survey distribution plots (below) for roughhead grenadier in Subareas 2+3. Open circles represent an incomplete survey (Div. 3NO was not covered in autumn 2014, Div. 3L incomplete in spring 2015).

Witch Flounder (*Glyptocephalus cynoglossus*) in Div. 2J3KL

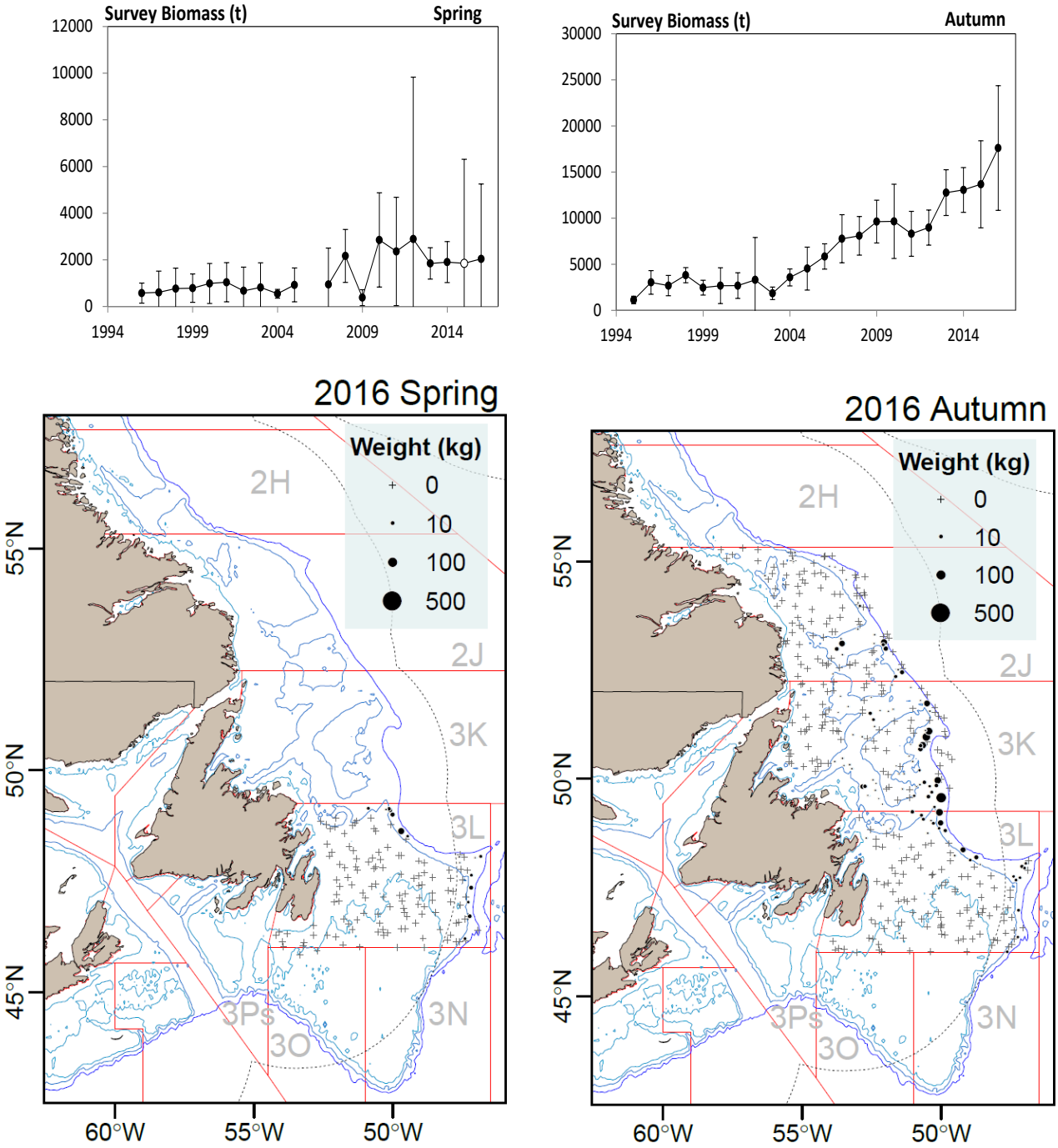


Fig. 27. Canadian Spring (left) and Autumn (right) survey biomass indices (above, with 95% CI) and 2016 survey distribution plots (below) for witch flounder in Divs. 2J3KL. Open circles represent an incomplete survey (Div. 3L incomplete in spring 2015).

Greenland halibut (*Reinhardtius hippoglossoides*) in SA 2 + Div. 3KLMNO

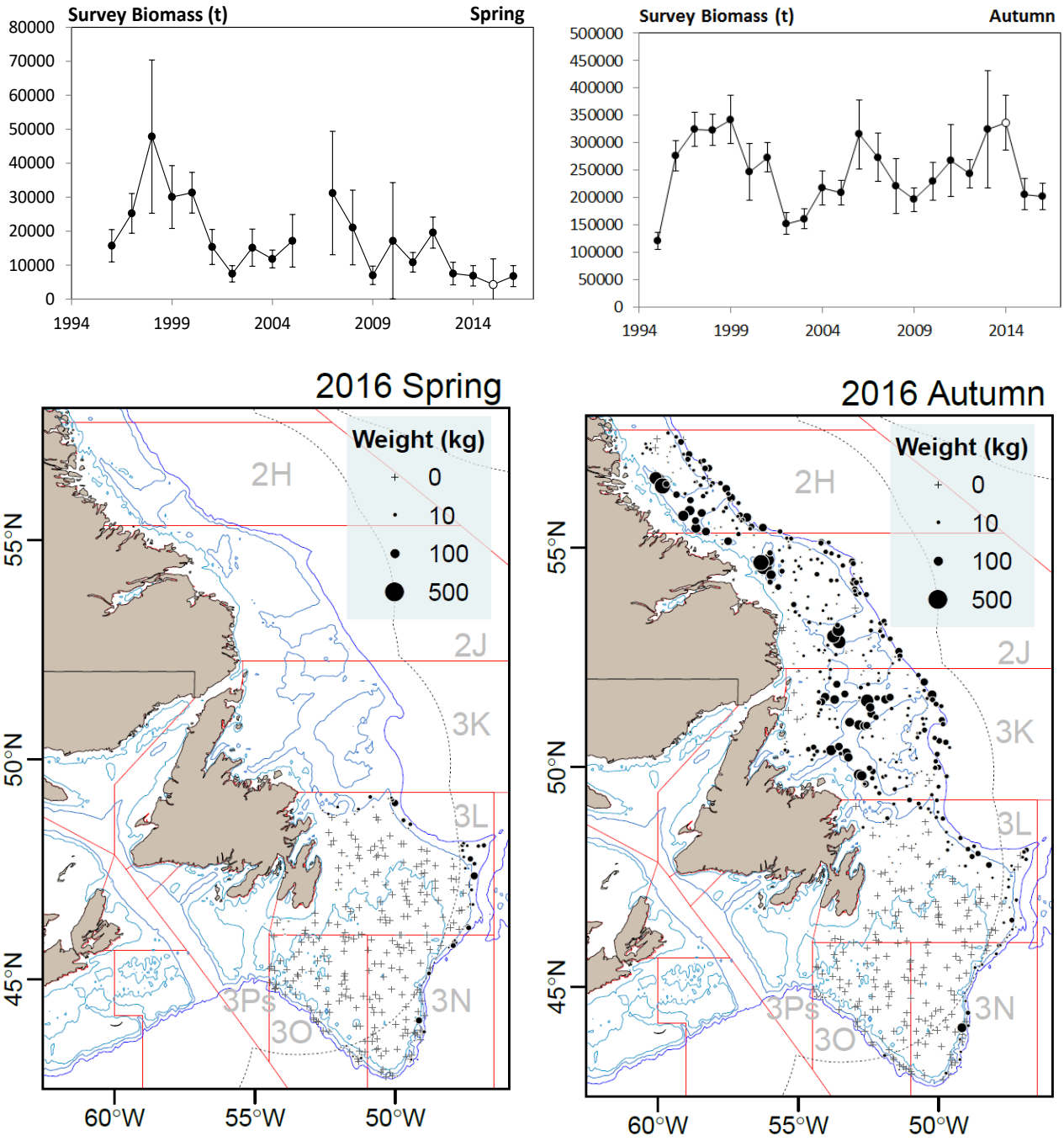


Fig. 28. Canadian Spring (left) and Autumn (right) survey biomass indices (above, with 95% CI) and 2016 survey distribution plots (below) for Greenland halibut in Divs. 2+3KLMNO. Open circles represent an incomplete survey (Div. 3NO was not covered in autumn 2014, Div. 3L incomplete in spring 2015).

Northern shortfin squid (*Illex illecebrosus*) in Subareas 3+4

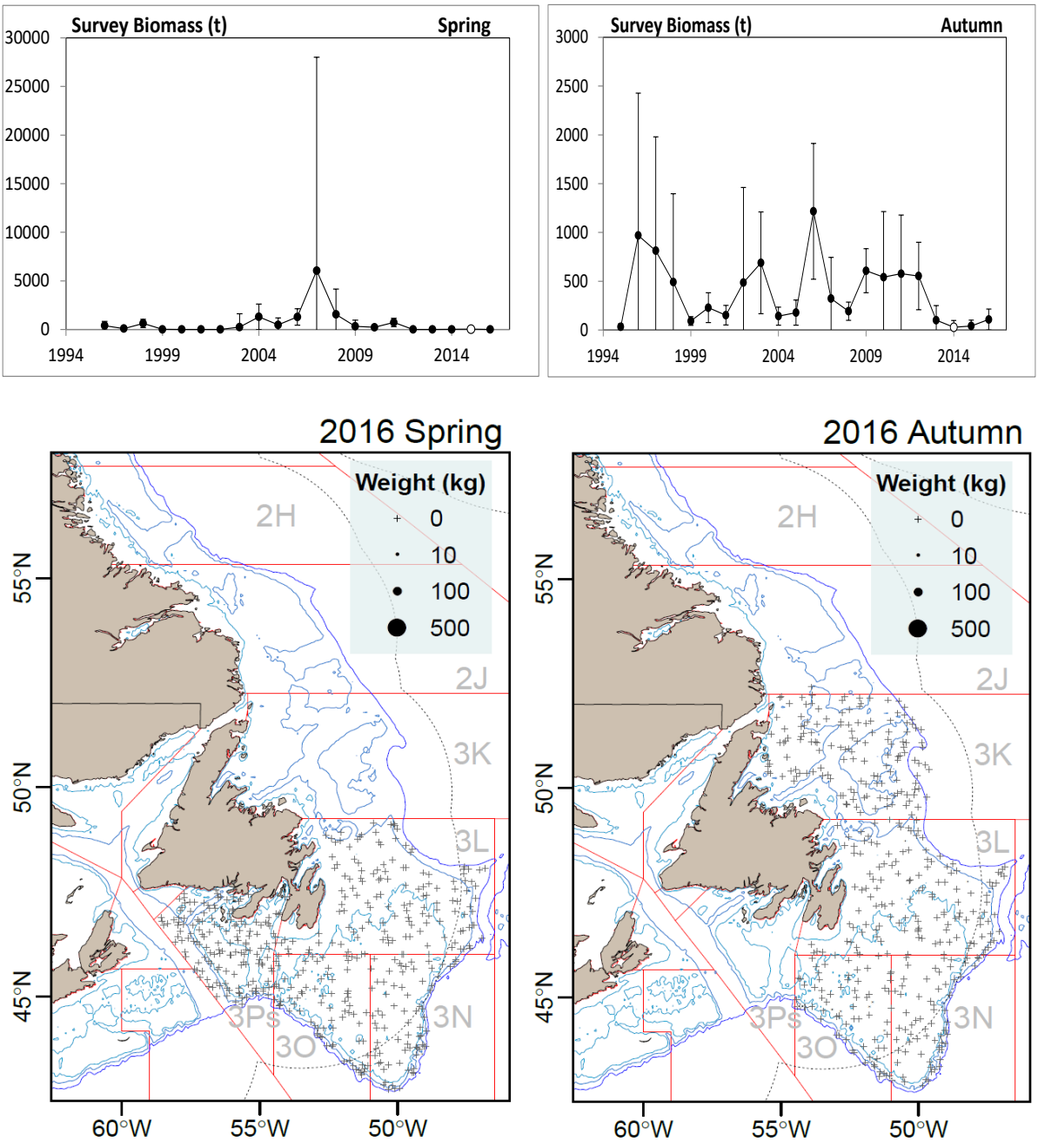


Fig. 29. Canadian Spring (left) and Autumn (right) survey biomass indices (above, with 95% CI) and 2016 survey distribution plots (below) for squid in SA 3. Open circles represent an incomplete survey (Div. 3NO was not covered in autumn 2014, Div. 3L incomplete in spring 2015).

Roundnose Grenadier (*Coryphaenoides rupestris*) in Subareas 2+3

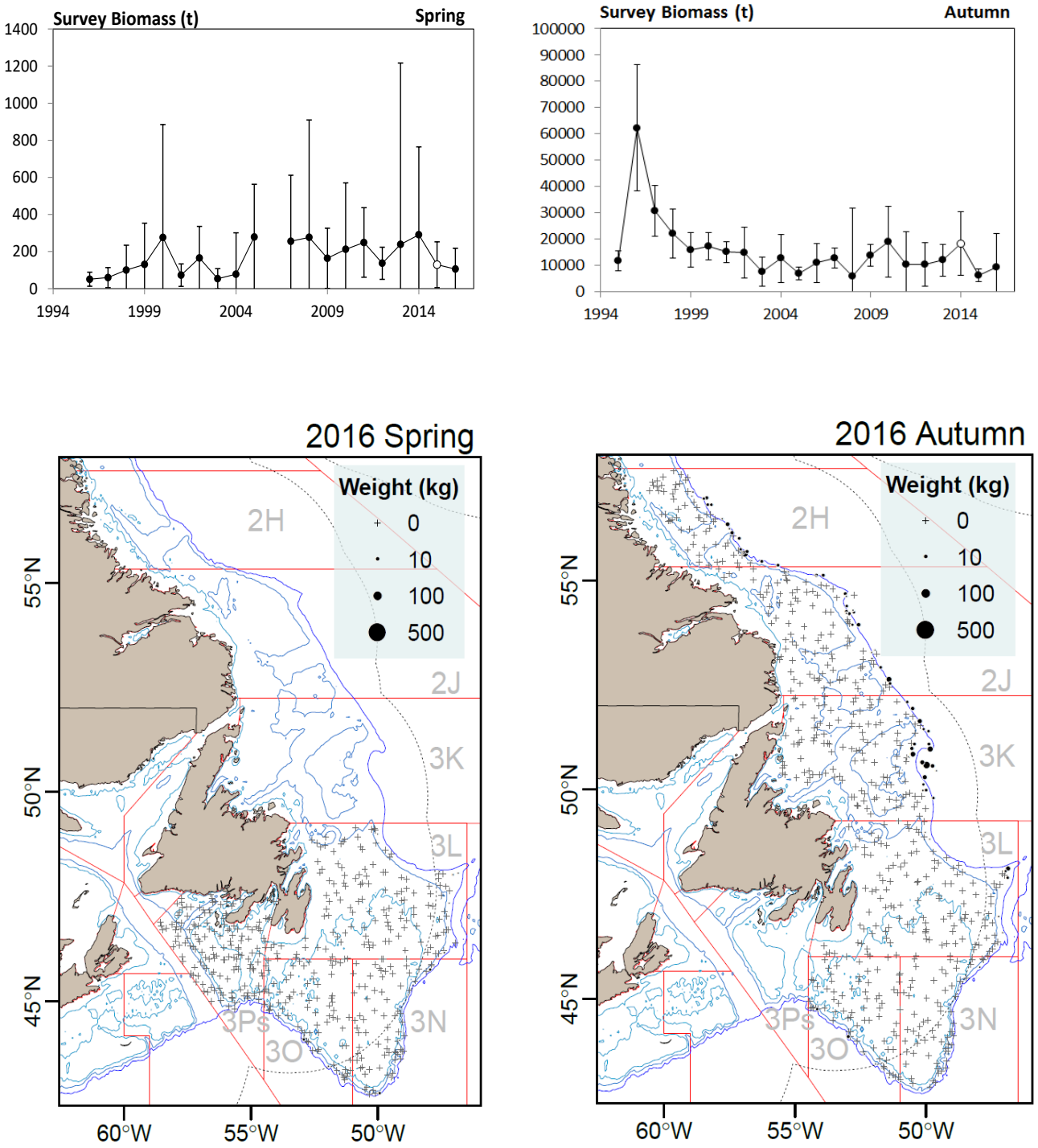


Fig. 30. Canadian Spring (left) and Autumn (right) survey biomass indices (above, with 95% CI) and 2016 survey distribution plots (below) for Roundnose Grenadier in SA 2+3. Open circles represent an incomplete survey (Div. 3NO was not covered in autumn 2014, Div. 3L incomplete in spring 2015).

Atlantic Cod (*Gadus morhua*) in Div. 2J3KL

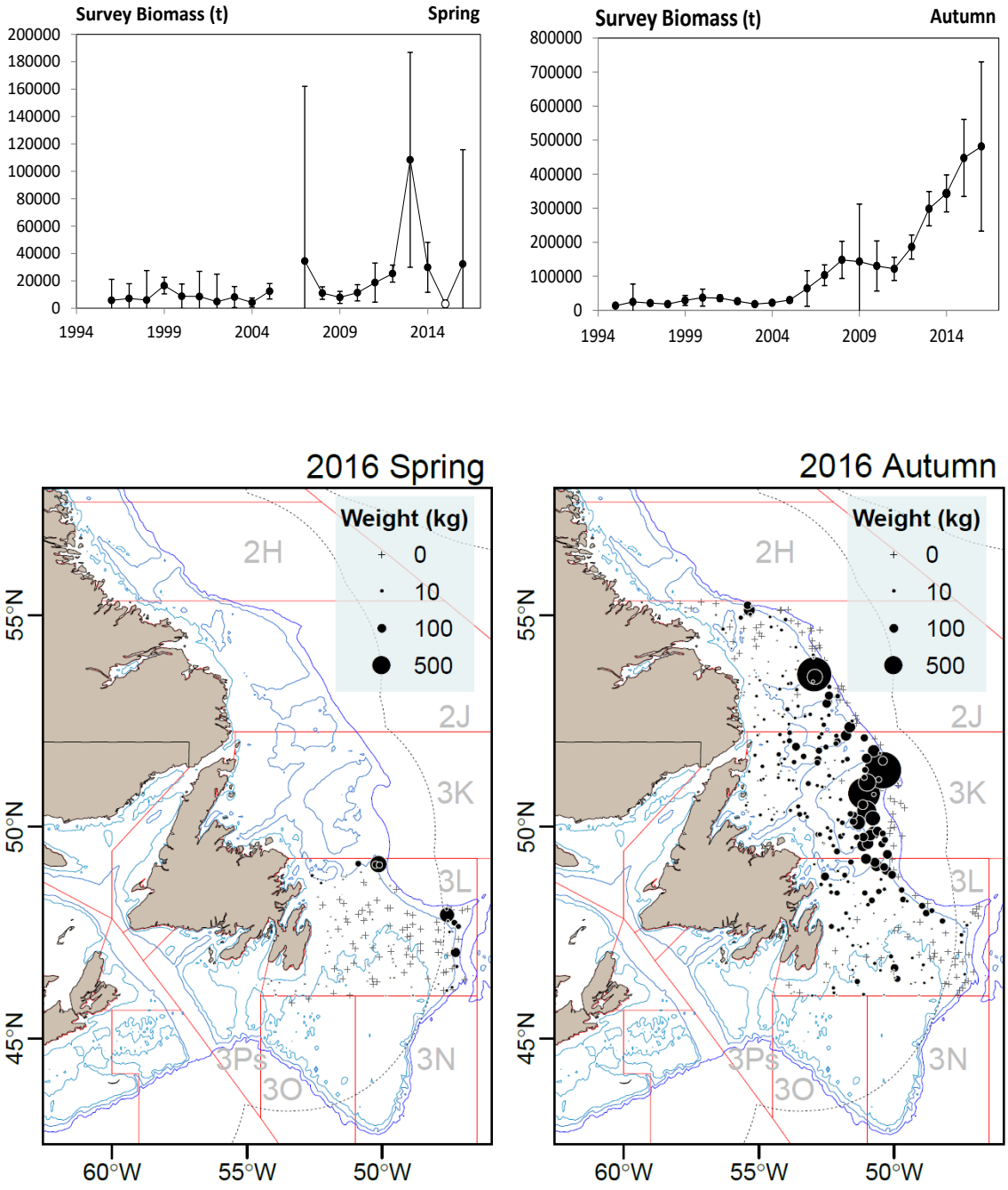


Fig. 31. Canadian spring (left) and autumn (right) survey biomass indices (above, with 95% CI) and 2016 survey distribution plots (below) for Atlantic Cod in Divs. 2J3KL. Open circles represent an incomplete survey (Div. 3L incomplete in spring 2015). Note that Div. 2J3K is not surveyed in the spring.

Atlantic Cod (*Gadus morhua*) in Subdiv. 3Ps

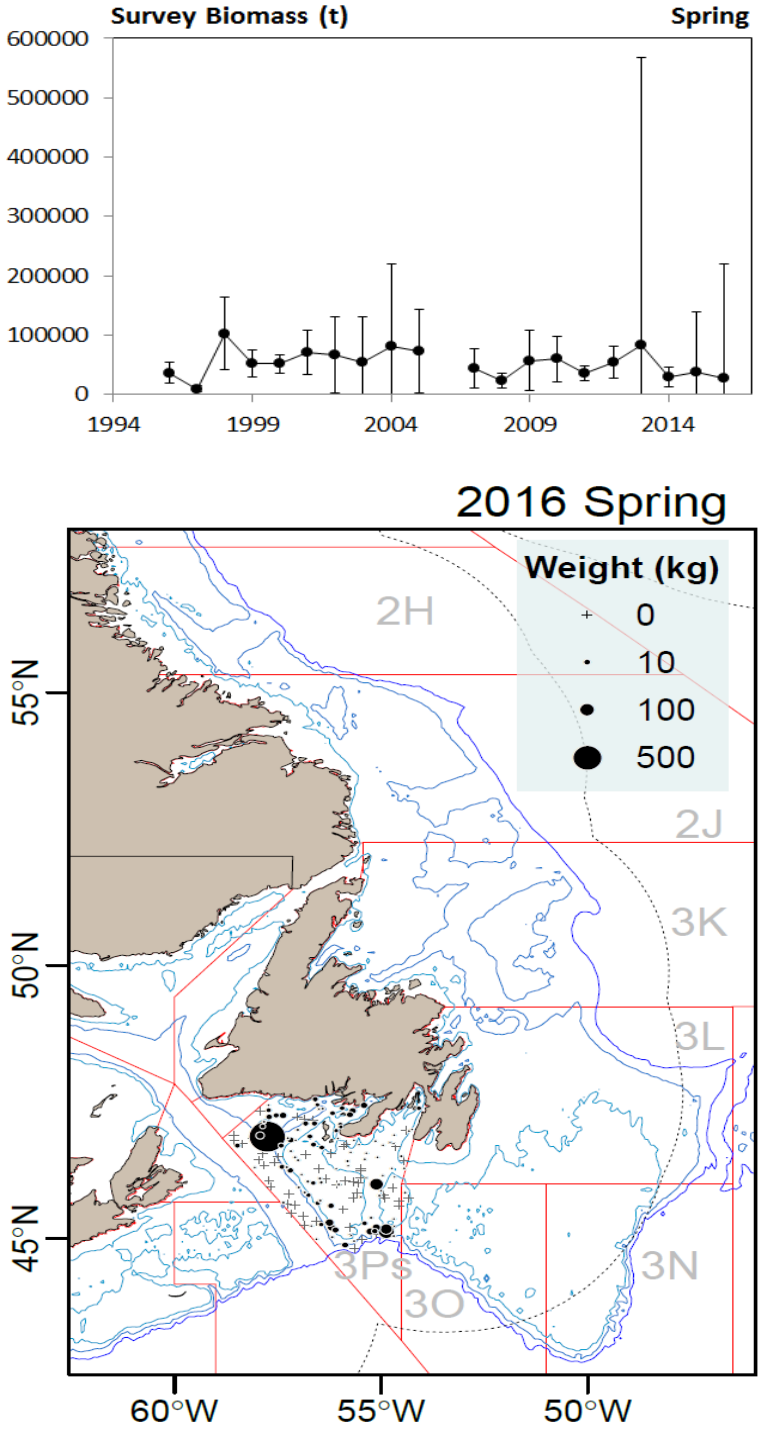


Fig. 32. Canadian spring survey biomass indices (above, with 95% CI) and 2016 survey distribution plot (below) for Atlantic Cod in Div. 3Ps.

Atlantic Cod (*Gadus morhua*) in Div. 2GH

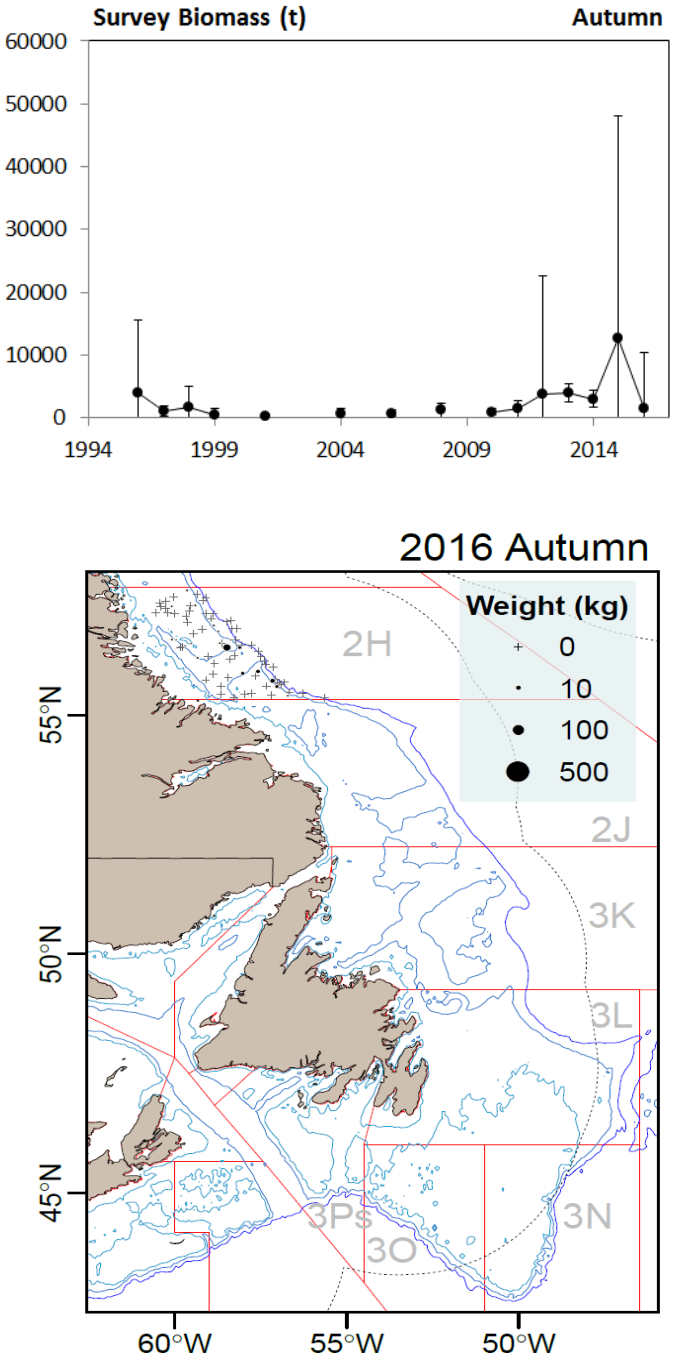


Fig. 33. Canadian autumn survey biomass index (above, with 95% CI) and 2016 survey distribution plot (below) for Atlantic Cod in Divs. 2GH.

Haddock (*Melanogrammus aeglefinus*) in Div. 3LNO

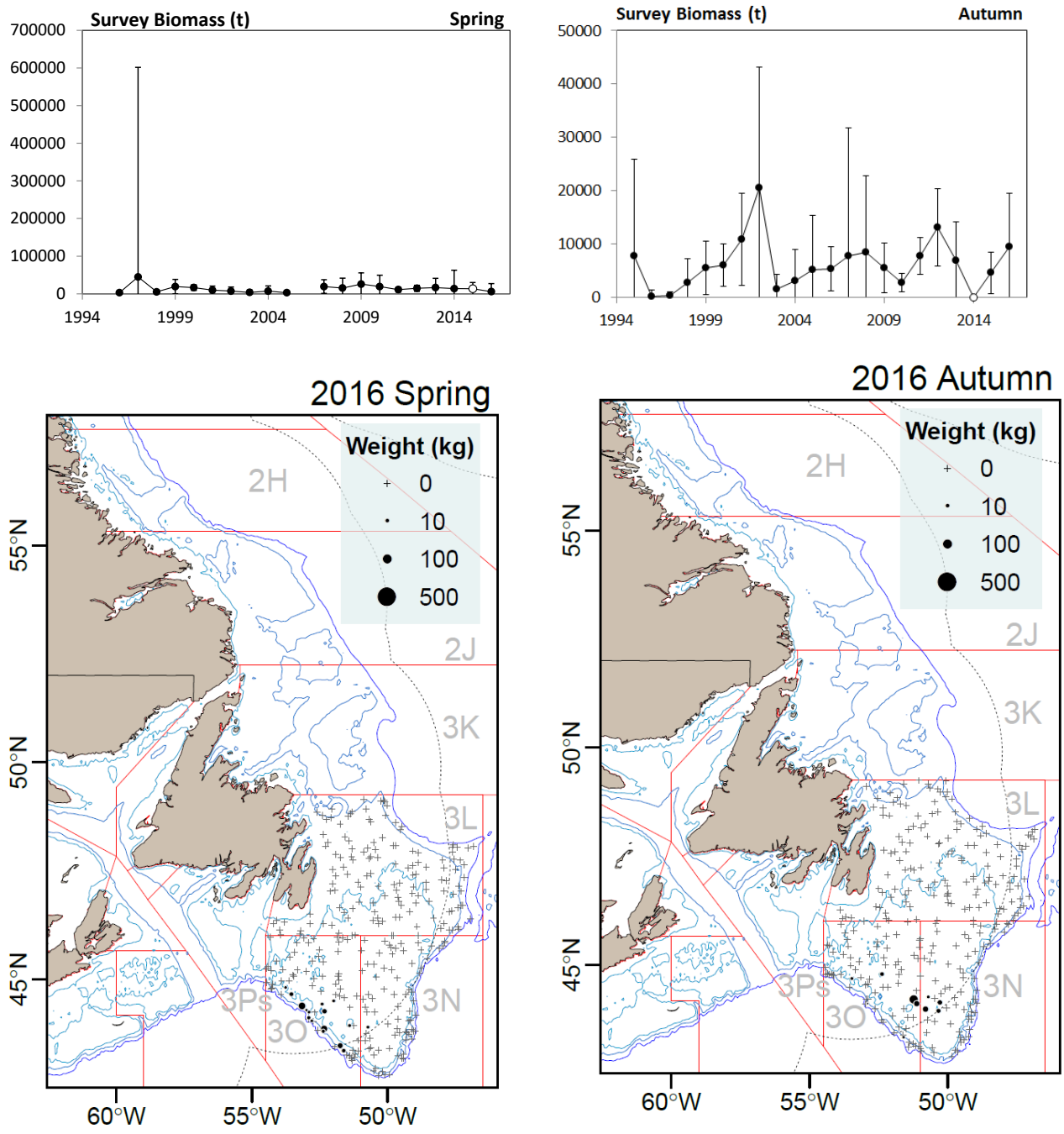


Fig. 34. Canadian Spring (left) and Autumn (right) survey biomass indices (above, with 95% CI) and 2016 survey distribution plots (below) for Haddock in Divs. 3LNO. Open circles represent an incomplete survey (Div. 3NO was not covered in autumn 2014).

Haddock (*Melanogrammus aeglefinus*) in Subdiv. 3Ps

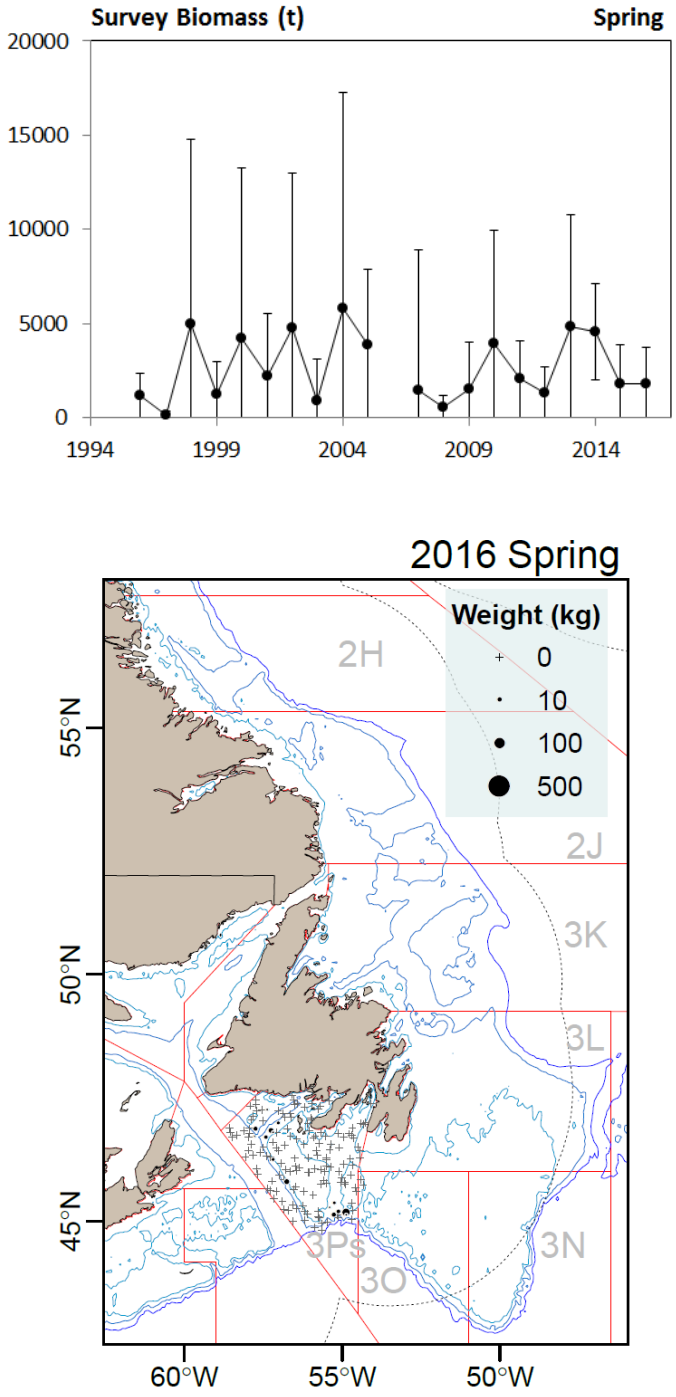


Fig. 35. Canadian Spring survey biomass index (above, with 95% CI) and 2016 survey distribution plots (below) for Haddock in Divs. 3Ps.

Atlantic Halibut (*Hippoglossus hippoglossus*) in Div.2GHJ3KLNO and Subdiv. 3Ps

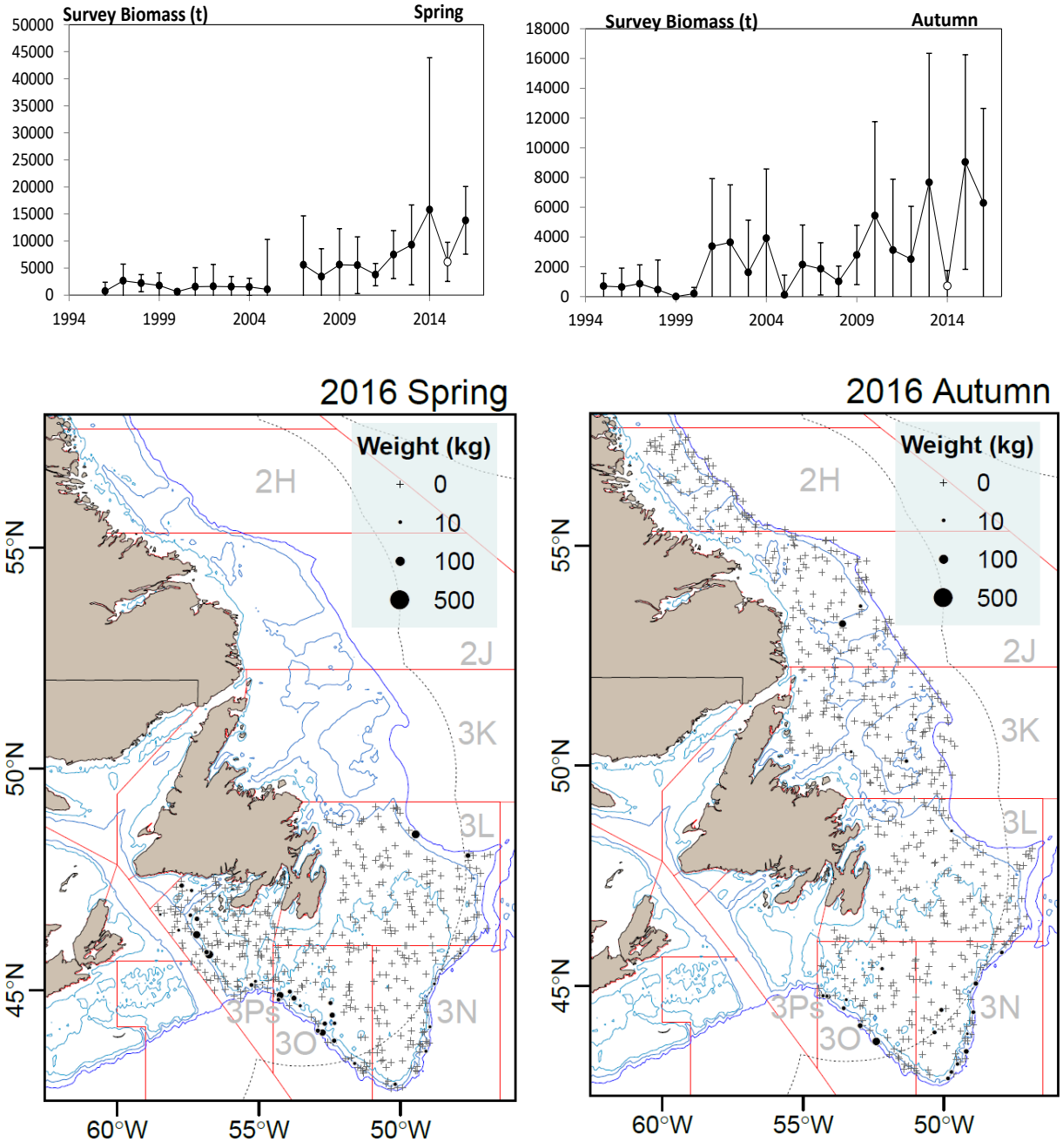


Fig. 36. Canadian Spring (left) and Autumn (right) survey biomass indices (above, with 95% CI) and 2016 survey distribution plots (below) for Atlantic Halibut in Divs. 2GHJ3KLNO and Subdiv. 3Ps. Open circles represent an incomplete survey (Div. 3NO was not covered in autumn 2014, Div. 3L incomplete in spring 2015).

American Plaice (*Hippoglossoides platessoides*) in Subarea 2+Div.3K

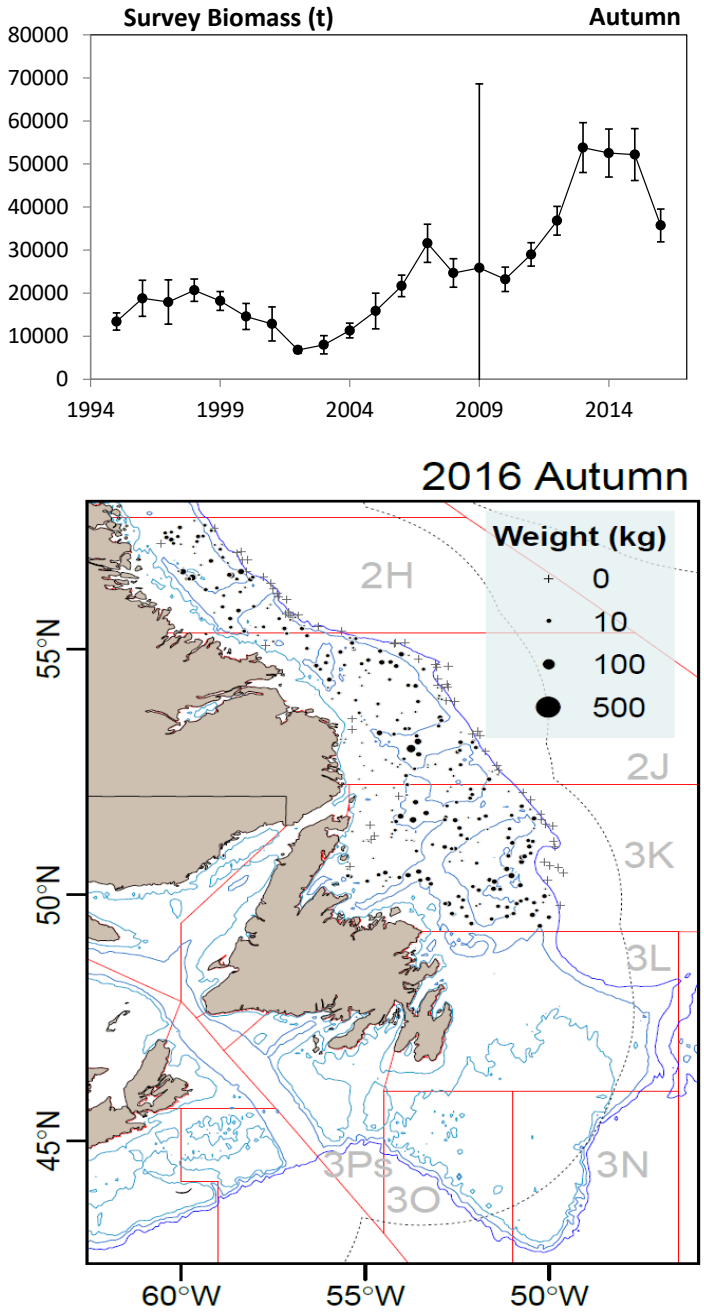


Fig. 37. Canadian autumn survey biomass index (above, with 95% CI) and 2016 survey distribution plots (below) for American Plaice in Subarea 2 + Div. 3K.

American Plaice (*Hippoglossoides platessoides*) in Subdiv. 3Ps

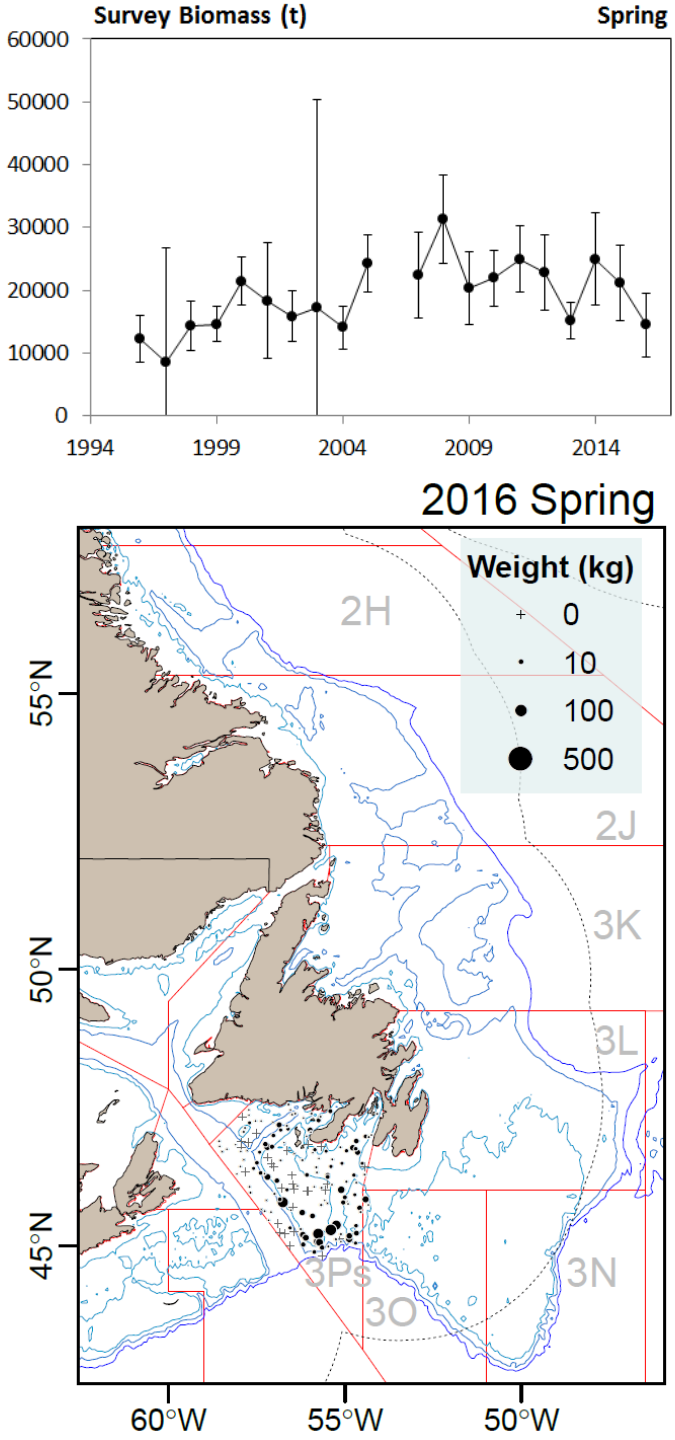


Fig. 38. Canadian Spring survey biomass index (above, with 95% CI) and 2016 survey distribution plots (below) for American Plaice in Subdiv. 3Ps.

Witch Flounder (*Glyptocephalus cynoglossus*) in Subdiv. 3Ps

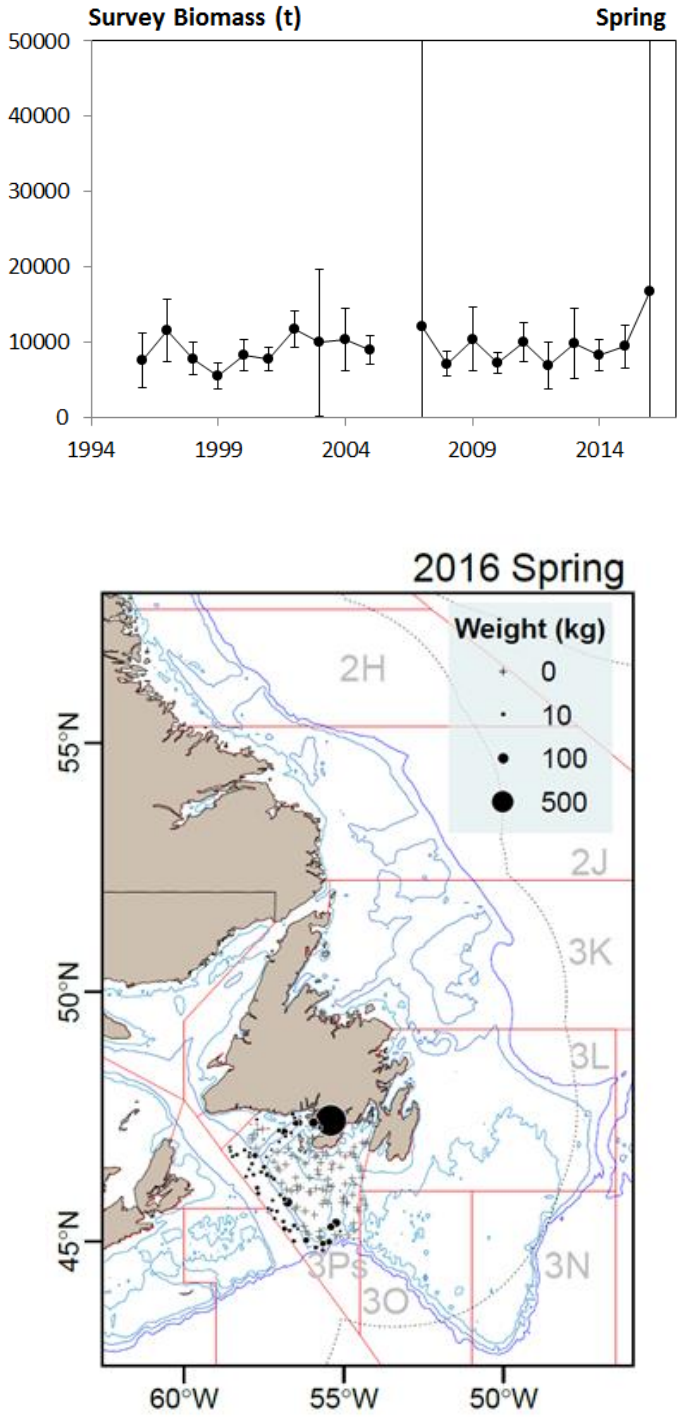


Fig. 39. Canadian Spring survey biomass index (above, with 95% CI) and 2016 survey distribution plots (below) for Witch flounder in Subdiv. 3Ps.

Yellowtail Flounder (*Limanda ferruginea*) in Subdiv. 3Ps

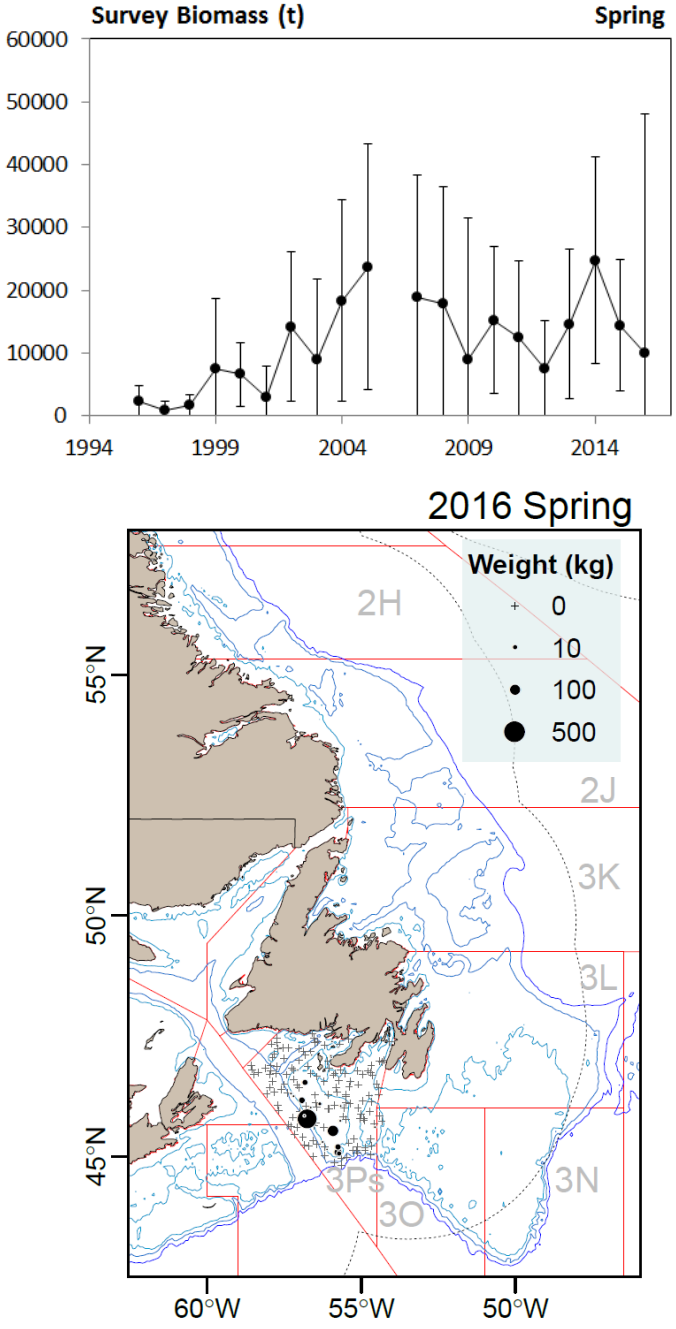


Fig. 40. Canadian Spring survey biomass index (above, with 95% CI) and 2016 survey distribution plots (below) for Yellowtail flounder in Subdiv. 3Ps.

Greenland Halibut (*Reinhardtius hippoglossoides*) in Subdiv. 3Ps

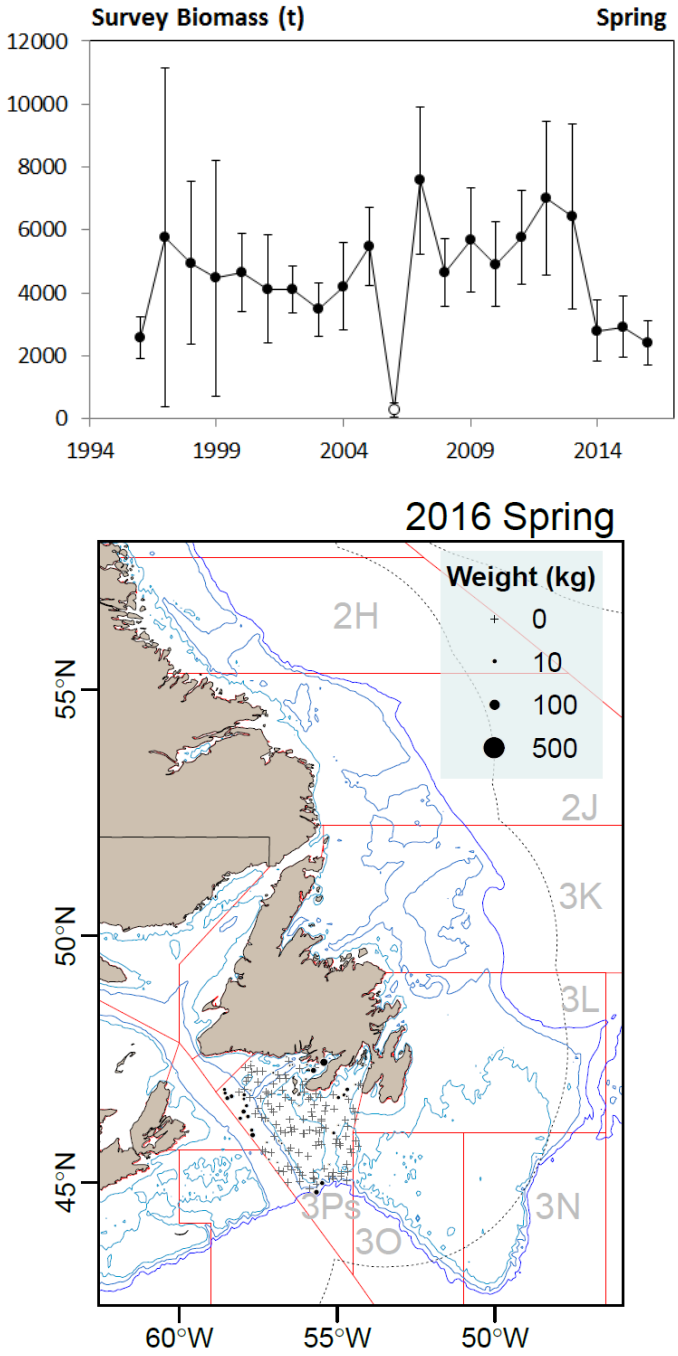
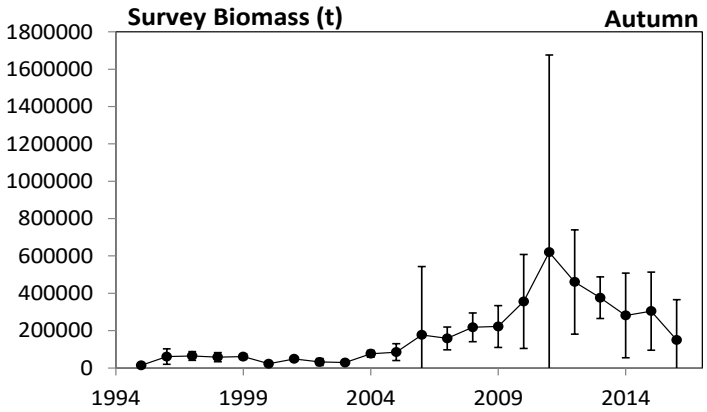


Fig. 41. Canadian Spring survey biomass index (above, with 95% CI) and 2016 survey distribution plots (below) for Greenland Halibut in Subdiv. 3Ps. Open circles represent an incomplete survey.

Redfish (*Sebastes mentella* and *Sebastes fasciatus)* in Subarea 2 + Div. 3K



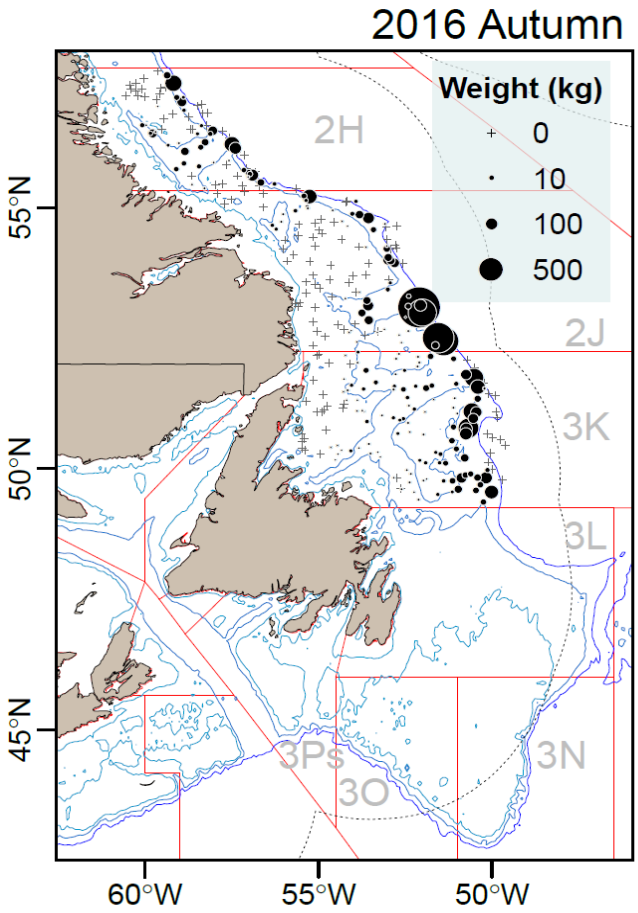


Fig. 42. Canadian Autumn survey biomass index (above, with 95% CI) and 2016 survey distribution plots (below) for Redfish in SA 2+ Div. 3K. Open circles represent an incomplete survey.

Redfish (*Sebastes mentella* and *Sebastes fasciatus)* in Subdiv. 3Ps

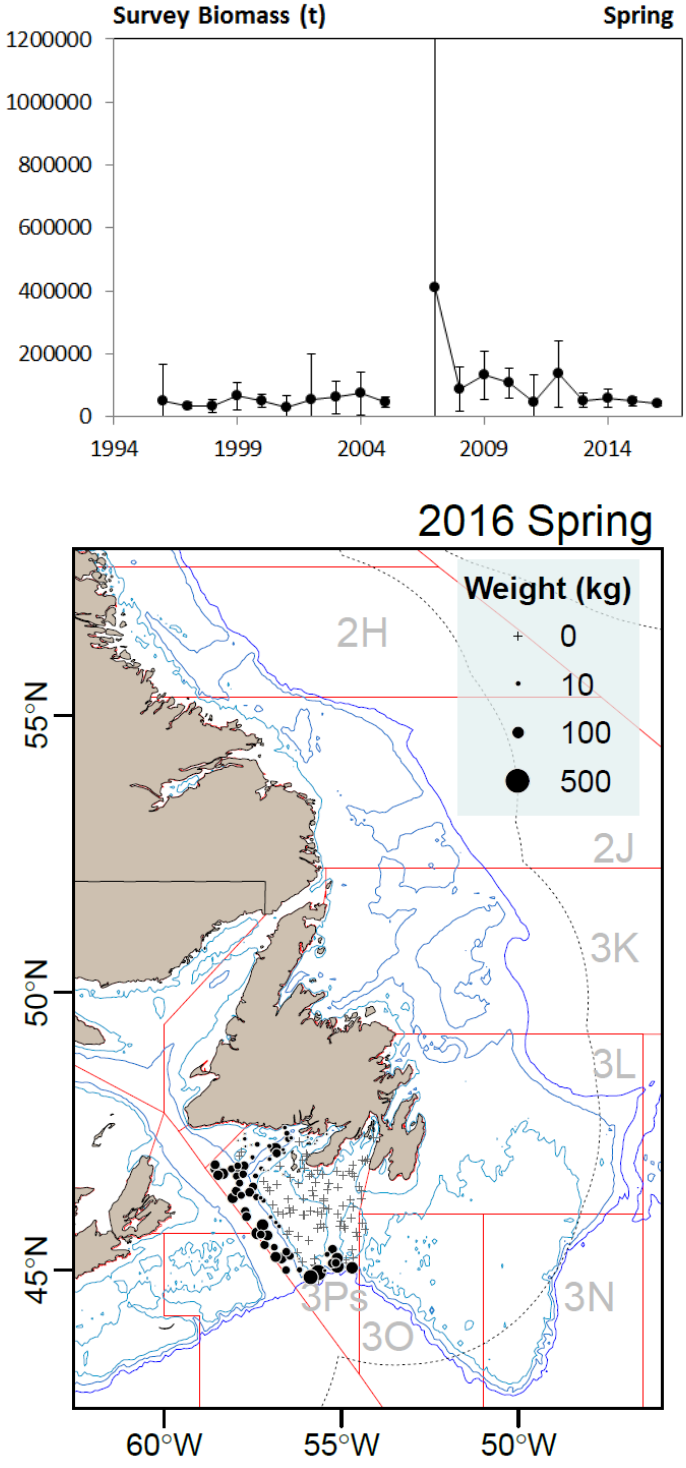


Fig. 43. Canadian Spring survey biomass index (above, with 95% CI) and 2016 survey distribution plots (below) for Redfish in Subdiv. 3Ps.

Striped Wolffish (*Anarhichas lupus*) in Subareas 2+3

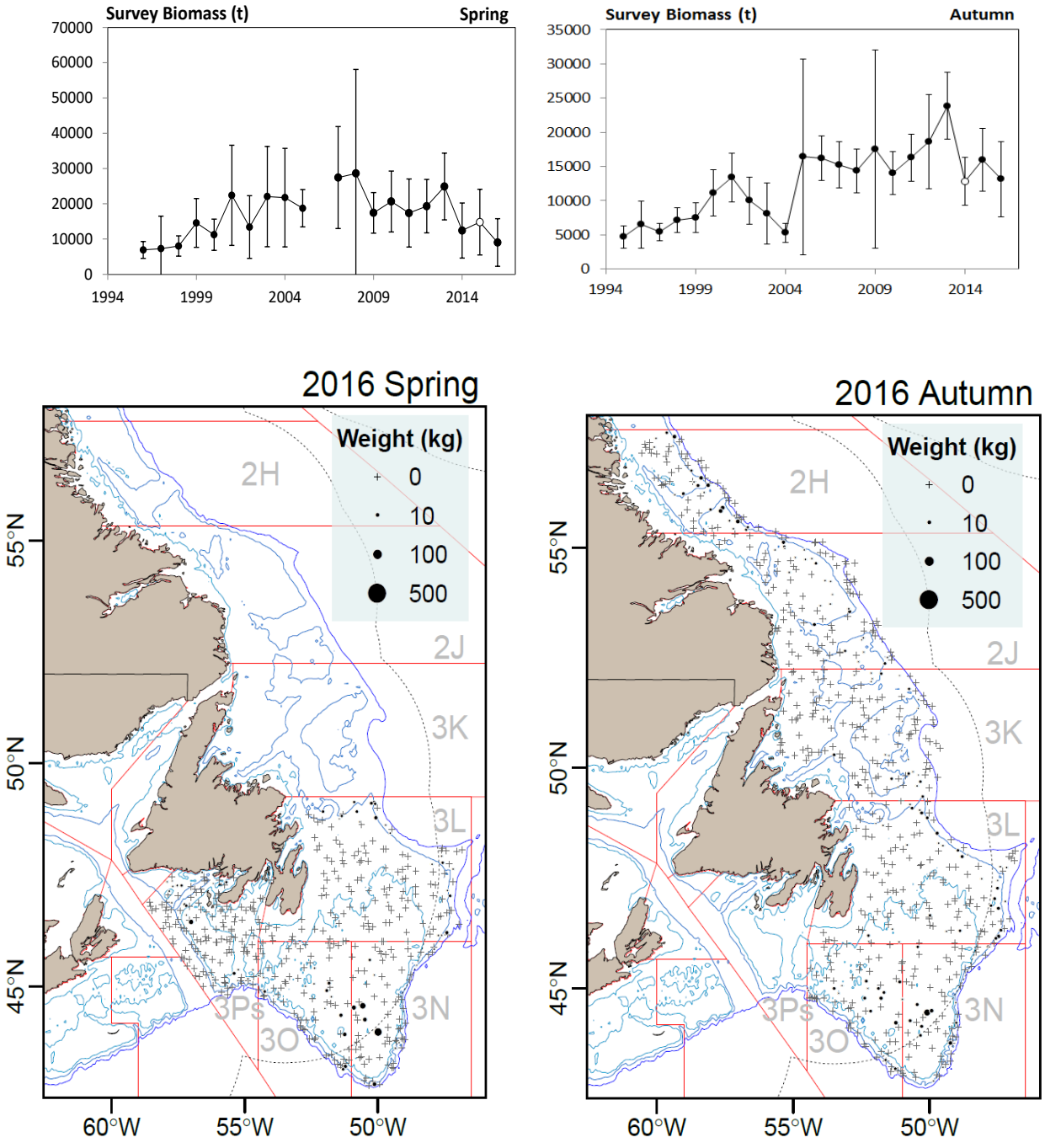


Fig. 44. Canadian Spring (left) and Autumn (right) survey biomass indices (above, with 95% CI) and 2016 survey distribution plots (below) for Striped Wolffish in SA 2+3. Open circles represent an incomplete survey (Div. 3NO was not covered in autumn 2014, Div. 3L incomplete in spring 2015).

Spotted Wolffish (*Anarhichas minor*) in Subareas 2+3

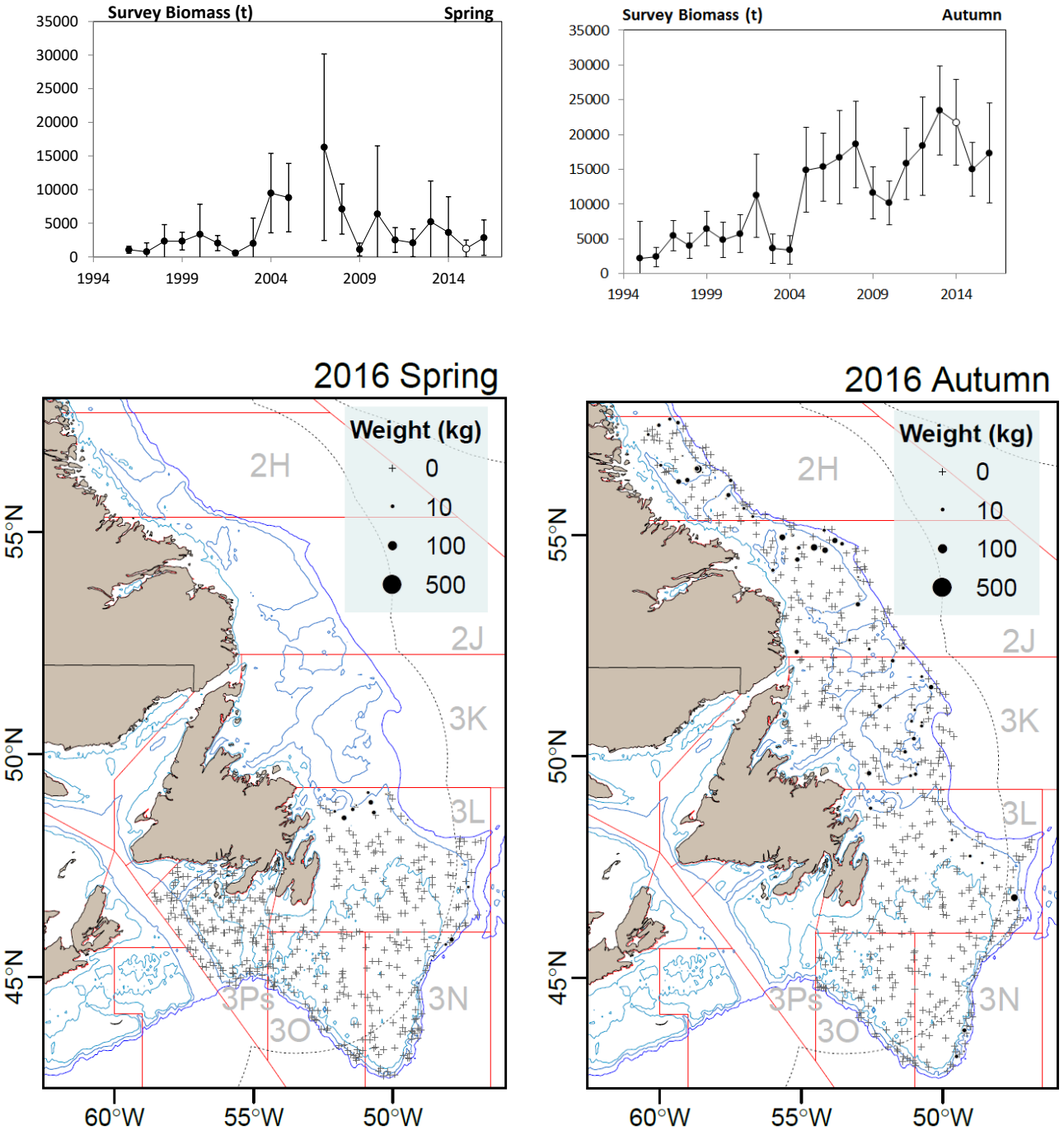


Fig. 45. Canadian Spring (left) and Autumn (right) survey biomass indices (above, with 95% CI) and 2016 survey distribution plots (below) for Spotted Wolffish in SA 2+3. Open circles represent an incomplete survey (Div. 3NO was not covered in autumn 2014, Div. 3L incomplete in spring 2015).

Broadhead Wolffish (*Anarhichas denticulatus*) in Subareas 2+3

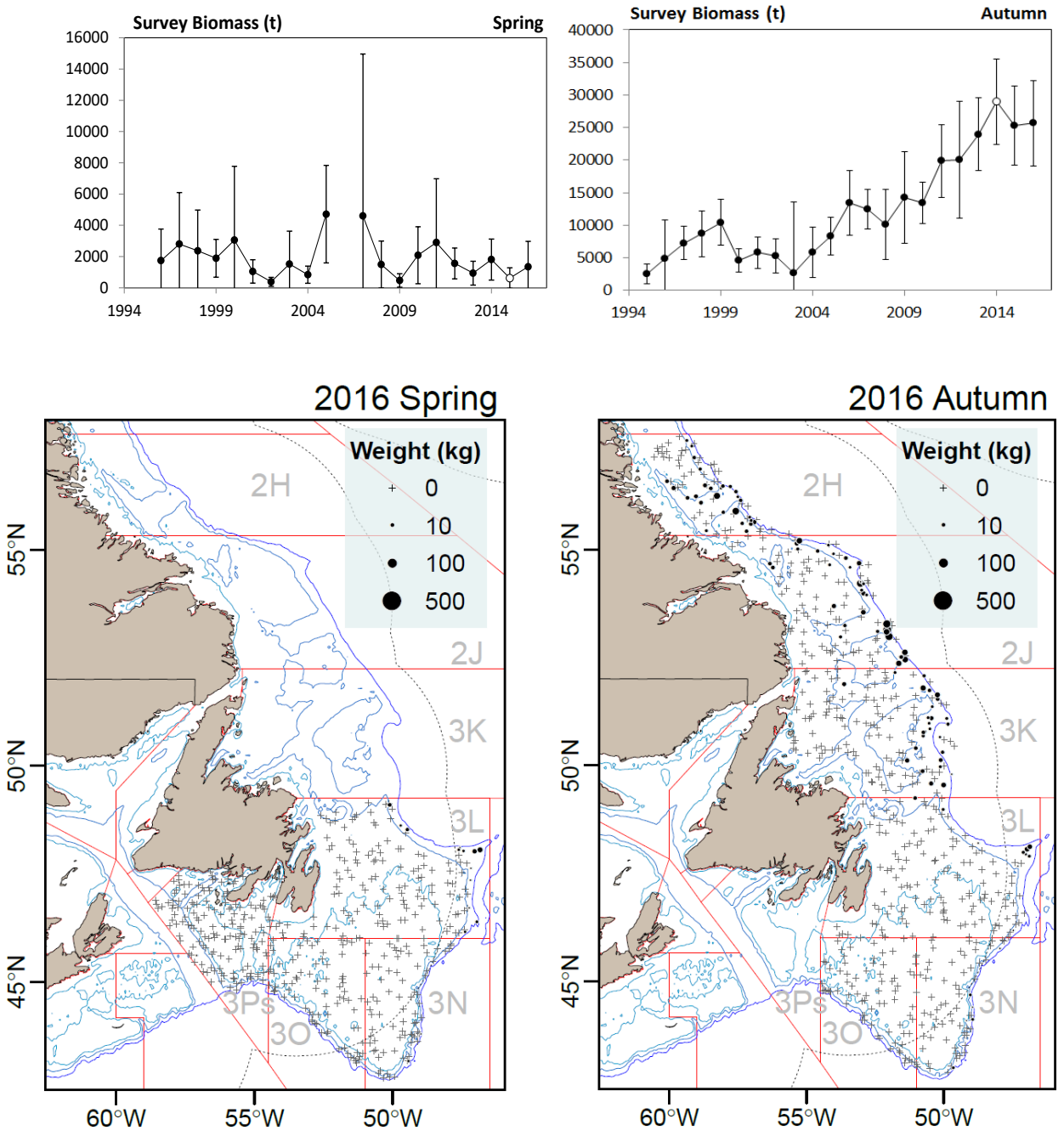


Fig. 46. Canadian Spring (left) and Autumn (right) survey biomass indices (above, with 95% CI) and 2016 survey distribution plots (below) for Broadhead Wolffish in SA 2+3. Open circles represent an incomplete survey (Div. 3NO was not covered in autumn 2014, Div. 3L incomplete in spring 2015).

Thorny Skate (*Amblyraja radiata*) in SA 2+3K

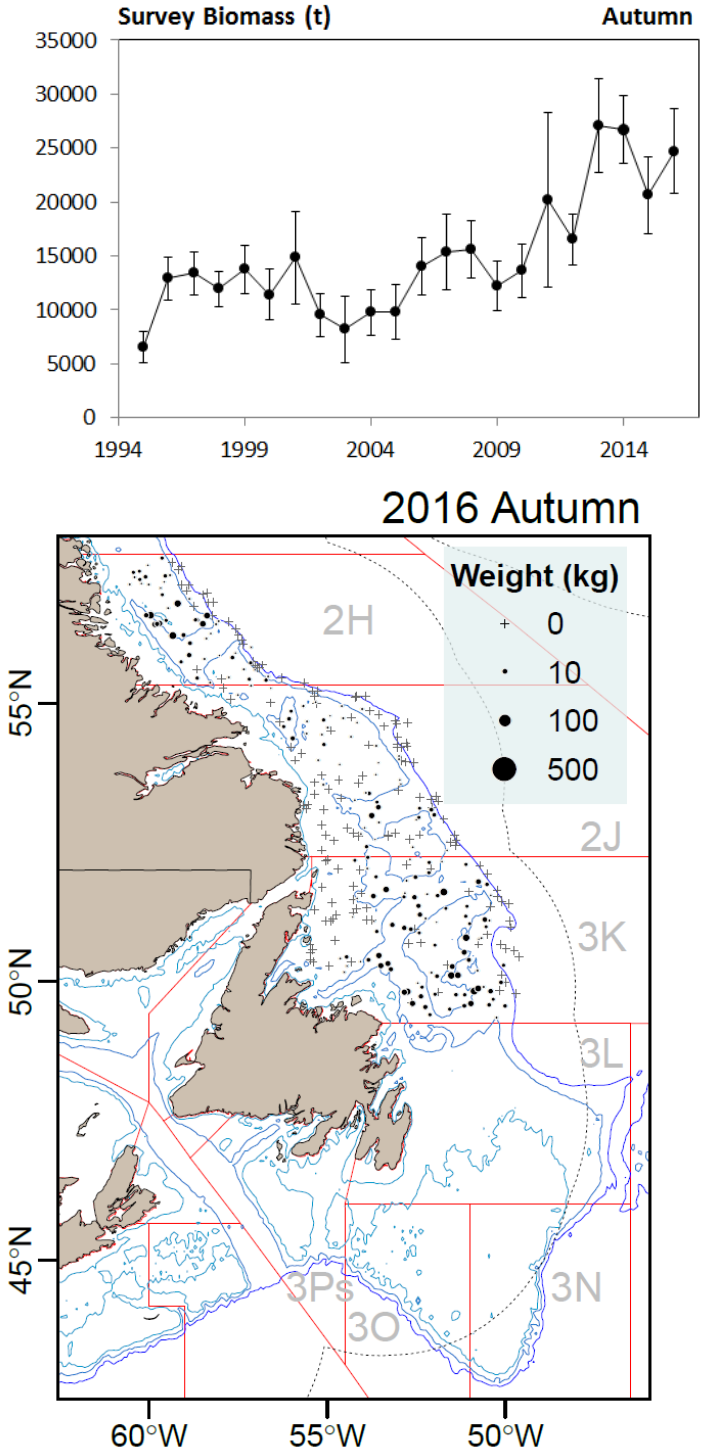


Fig. 47. Canadian autumn survey biomass index (above, with 95% CI) and 2016 survey distribution plots (below) for Thorny Skate in SA 2+ Div.3K.