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Gulf Region | Science Response 2019/008

UPDATE OF THE STOCK STATUS INDICATORS OF THE AMERICAN LOBSTER, *HOMARUS AMERICANUS*, STOCK OF THE SOUTHERN GULF OF ST. LAWRENCE TO 2018

Context

The most recent assessment of the American lobster stock of the southern Gulf of St. Lawrence (sGSL) was completed in 2013 with information up to 2011 for landings and 2012 for some indicators (DFO 2013; Rondeau et al. 2015). An update of the indicators was published in 2016 based on data mostly up to 2015 (DFO 2016). An update of the stock status indicators using the most recent and available information was requested by DFO Gulf Region Fisheries and Aquaculture Management (FAM) in support of the December 2018 Lobster Advisory Committee meeting. This Science Response Report results from the Science Response Process of November 21, 2018 on the update of the stock status indicators of the American lobster (*Homarus americanus*) stock of the southern Gulf of St. Lawrence, to 2018, held in Moncton, New Brunswick. The sGSL lobster stock indicators are positive, with landings at historically high levels.

Background

Five major Lobster Fishing Areas (LFAs; 23, 24, 25, 26A, and 26B) are defined in the sGSL for management purposes (Fig. 1). Management of the lobster fishery is based entirely on effort controls (input fishery) (Rondeau et al. 2015). The four most important measures in controlling effort are the fixed number of lobster fishing licences, maximum individual trap allocations, restrictions on gear characteristics, and defined fishing seasons. In addition to these management controls, other measures were implemented to protect key components of the lobster population. Lobsters can only be retained if they exceed a minimum legal size (MLS), designed to allow at least 50% of females to reach sexual maturity before being harvestable. Egg-bearing females and, in some areas, large-sized females, must also be released. These management measures vary within and among the main LFAs and sub-areas, and by year.

Analysis and Response

The status of the lobster stock of the sGSL is summarized using three categories of indicators: fishing pressure, abundance, and production. Fishery-dependent indicators include landings, at-sea sampling programs, and recruitment-index programs. Fishery-independent indicators are from a bottom trawl survey and SCUBA surveys. Preliminary landings for 2017 are compared to those in the last update (2015 landings) and to median landings values for the mid-term (1968 to 2011) and long term (1947 to 2011). The states of other indicators are also assessed in comparison to their levels or trends since the last assessment (2011 or 2012) and the last update year (2015 or 2016).

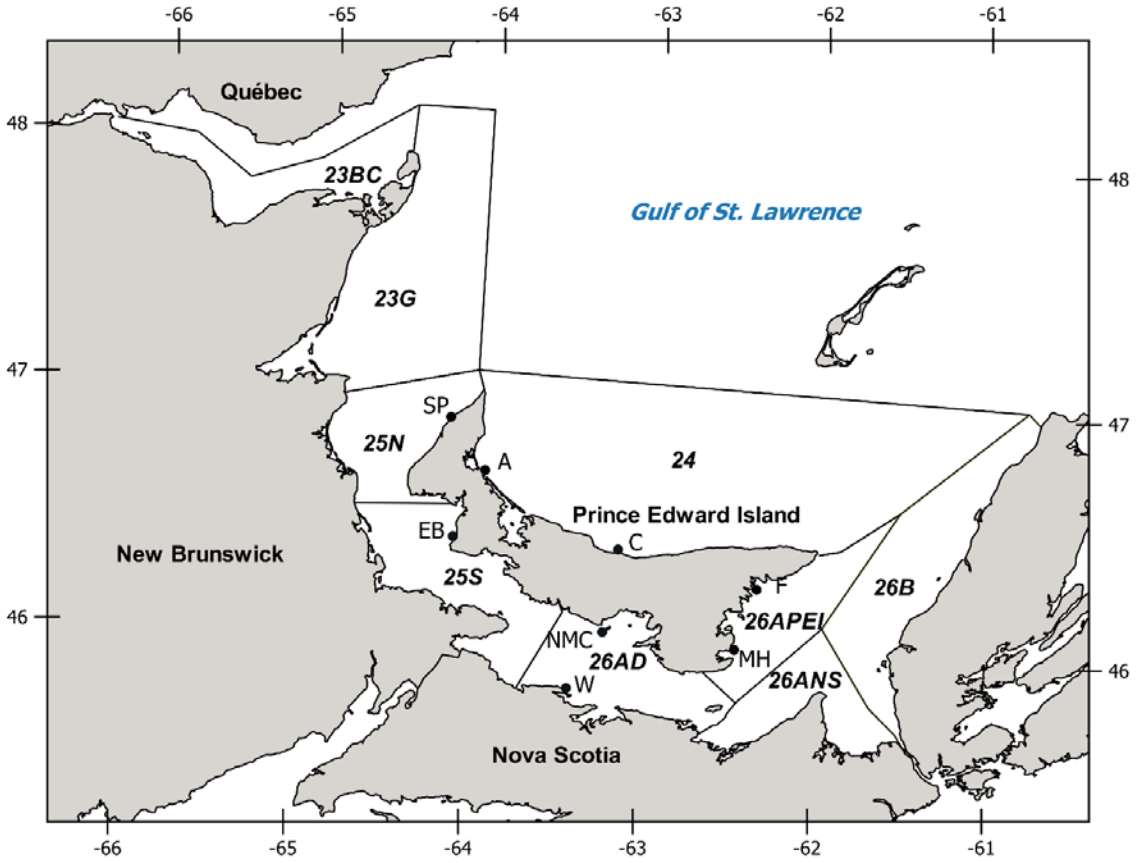

Figure 1. Lobster Fishing Areas (LFA) and sub-regions used for assessing the status of the American lobster stock in the southern Gulf of St. Lawrence. Also shown are the bio-collector locations; LFA 24 (A=Alberton, C=Covehead), LFA 25N (SP=Skinner's Pond), LFA 25S (EB=Egmont Bay), LFA 26AD (NMC=Nine Mile Creek, W=Wallace), and LFA 26APEI (F=Fortune, MH=Murray Harbour).

At-sea sampling data were available for 2016 and 2017 in most areas. The sampling coverage was variable between years and LFAs. There has not been any at-sea sampling program in LFA 26B since 2013. Data from the recruitment-index program were available for 2016 and 2017 for most areas while 2018 data were only available at this time for LFA 26B and from Nova Scotia licence holders in LFA 26A. There has not been any recruitment-index program in LFA 23 since 2004. The at-sea sampling data and the recruitment-index program data were obtained in collaboration with the PEI provincial government as well as harvesters' associations.

The Northumberland Strait bottom trawl survey is carried out annually between July and early August in LFA 25 and part of LFA 26A (Rondeau et al. 2015). The SCUBA surveys are carried out every year from mid-June to early August in LFAs 23, 25 and part of 26A (central Northumberland Strait). Data up to 2018 from these two surveys are included in this update.

As in previous assessments, some LFAs were divided into sub-regions (Fig. 1) to reflect data availability as well as geographic and biological similarities (Rondeau et al. 2015). LFA 23 was divided into sub-regions 23BC (Chaleur Bay) and 23G (Gulf of St. Lawrence side). LFA 25 was divided into sub-regions 25N (northern part) and 25S (southern part, central Northumberland Strait). LFA 26A was divided into three sub-regions: 26AD (west of Pictou Island, central Northumberland Strait), 26APEI (eastern side of PEI), and 26ANS (mainland Nova Scotia east of Pictou Island). LFAs 24 and 26B were not subdivided.

Fishing pressure indicators

Fishing pressure indicators include the proportion of empty traps and trends in nominal effort, the latter expressed as the number of licences or traps. The data for the empty trap indicator are from the at-sea sampling and the recruitment-index programs. Data on the number of licences and traps come from DFO FAM.

From 2012 to 2018, the total number of licences in the sGSL decreased by 1%, from 2,957 to 2,922. Trap allocations have not changed since 2016.

Since the last update, the percentage of empty traps has fluctuated slightly (Table 1). Data from both the at-sea sampling program and the recruitment-index program show averages of less than 20% empty traps per fishing trip in most areas. In 2017, the areas with the lowest proportion of empty traps (3% to 11%) are 25N and 25S. In sub-region 26AD, the percentage of empty traps, based on at-sea sampling data, has decreased steadily from 52% in 2011 to its lowest value of 15% in 2017. Compared to the last assessment (2012), the percentage of empty traps has remained stable in LFAs 23, 24, 25N, and 26B.

Table 1. Average percentages of empty (without commercial lobster) traps based on data from the at-sea sampling program (left of slash; data from August only for sub-regions 25N and 25S) and from the recruitment-index program (right of slash; regular traps) by sub-region in the southern Gulf of St. Lawrence lobster fishery, 2012 to 2018. In the table, "nd" means no data; "na" refers to the data not yet processed.

Year	23BC	23G	24	25N	25S	26AD	26ANS	26APEI	26B
2012	25 / nd	22 / nd	17 / 16	7 / 15	13 / 19	58 / 44	29 / 30	25 / 27	24 / 33
2013	17 / nd	20 / nd	16 / 14	8 / 14	10 / 12	35 / 32	13 / 17	27 / 18	18 / 23
2014	16 / nd	17 / nd	19 / 17	6 / 12	7 / 13	27 / 34	nd / 19	18 / 17	nd / 28
2015	nd / nd	nd / nd	19 / 12	7 / 12	12 / 15	21 / 26	nd / nd	20 / 16	nd / 30
2016	24 / nd	25 / nd	21 / 14	5 / 8	12 / 10	24 / 28	nd / 32	25 / 22	nd / 28
2017	18 / nd	20 / nd	16 / 13	9 / 11	3 / 4	15 / 22	nd / 23	17 / 13	nd / 21
2018	na / nd	na / nd	na / na	na / na	na / na	na / 28	nd / 17	na / na	nd / 26

Abundance indicators

Abundance indicators include two fishery-dependent indices (landings and catch-per-unit-effort (CPUE)) and two fishery-independent indices (from bottom trawl survey and SCUBA surveys).

Fishery-dependent: **landings**

Landings are considered to be a proxy for the abundance of the lobster stock (DFO 2013, 2014). Preliminary landings in 2017 of 32,524 t were three times the long-term median value (10,933 t) over the period 1947 to 2011 and represent the highest value in the time series (Fig. 2). Landings during 2016 and 2017 are above the Upper Stock Reference (USR; 13,798 t) (DFO 2014). The status of the stock is therefore in the healthy zone of the precautionary approach framework.

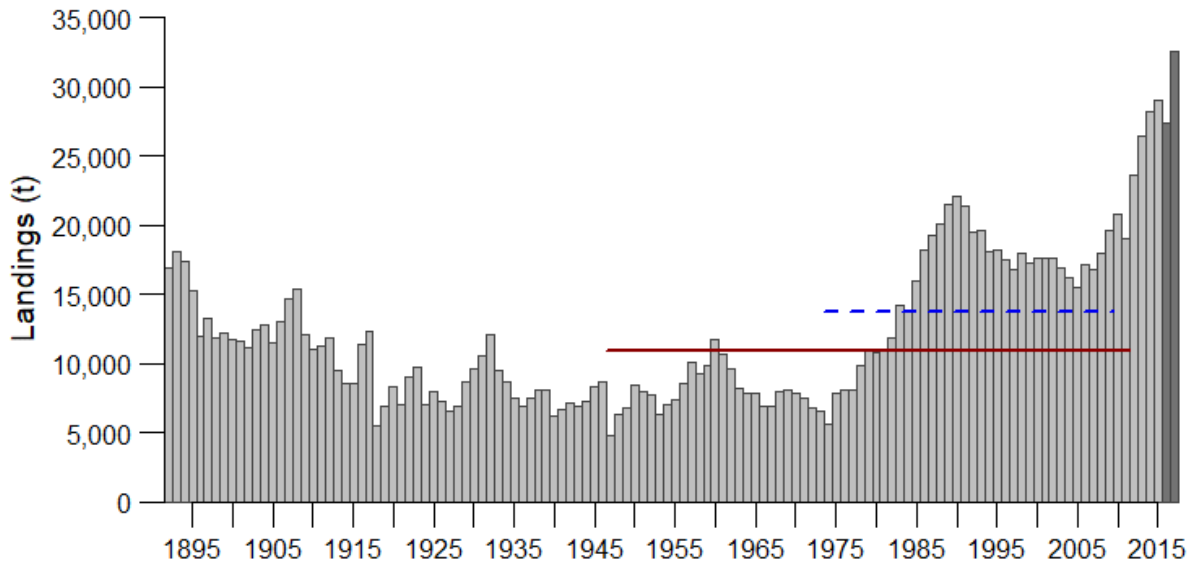

Figure 2. Reported lobster landings (t) in the southern Gulf of St. Lawrence (DFO Gulf Region) from 1892 to 2017. The horizontal solid line is the median landing of the time series for 1947 to 2011 (10,933 t). The dashed line represents the Upper Stock Reference point (13,798 t) for the lobster fishery of the southern Gulf of St. Lawrence (DFO 2014). Data added since the last update (2016 and 2017) are in a darker grey shading. Data for 2017 are preliminary.

Continued increasing trends in landings resulted in all but one LFA reaching record levels in 2017. The only exception was LFA 26A, although the preliminary 2017 landings were the second highest value in the time series (1947 to 2017), with the peak value recorded in 1988 (Fig. 3). Compared to 2015, the largest increases in landings were in LFA 25 (35%) and LFA 26B (21%).

The increasing trend seen in sub-region 25S continued with landings approaching levels observed during the peak of the mid 1980's (Fig. 4). Landings in sub-region 26AD also continued to increase but to a lesser extent. However, 2017 landings in 26ANS (1,111 t) were 33% lower than the historical high value observed in 2014 (1,665 t).

A slight decrease (8%) was recorded in LFA 23BC where the peak historical landings were also recorded in 2014. In sub-regions 23G, 26APEI, and 25N, preliminary landings in 2017 constitute the highest values of their time series (1947 to 2017). There are indications that some landings of lobster are not currently being attributed to the appropriate LFA in the southern Gulf of St. Lawrence, particularly for LFA 23, because lobsters are being purchased by buyers from another province.

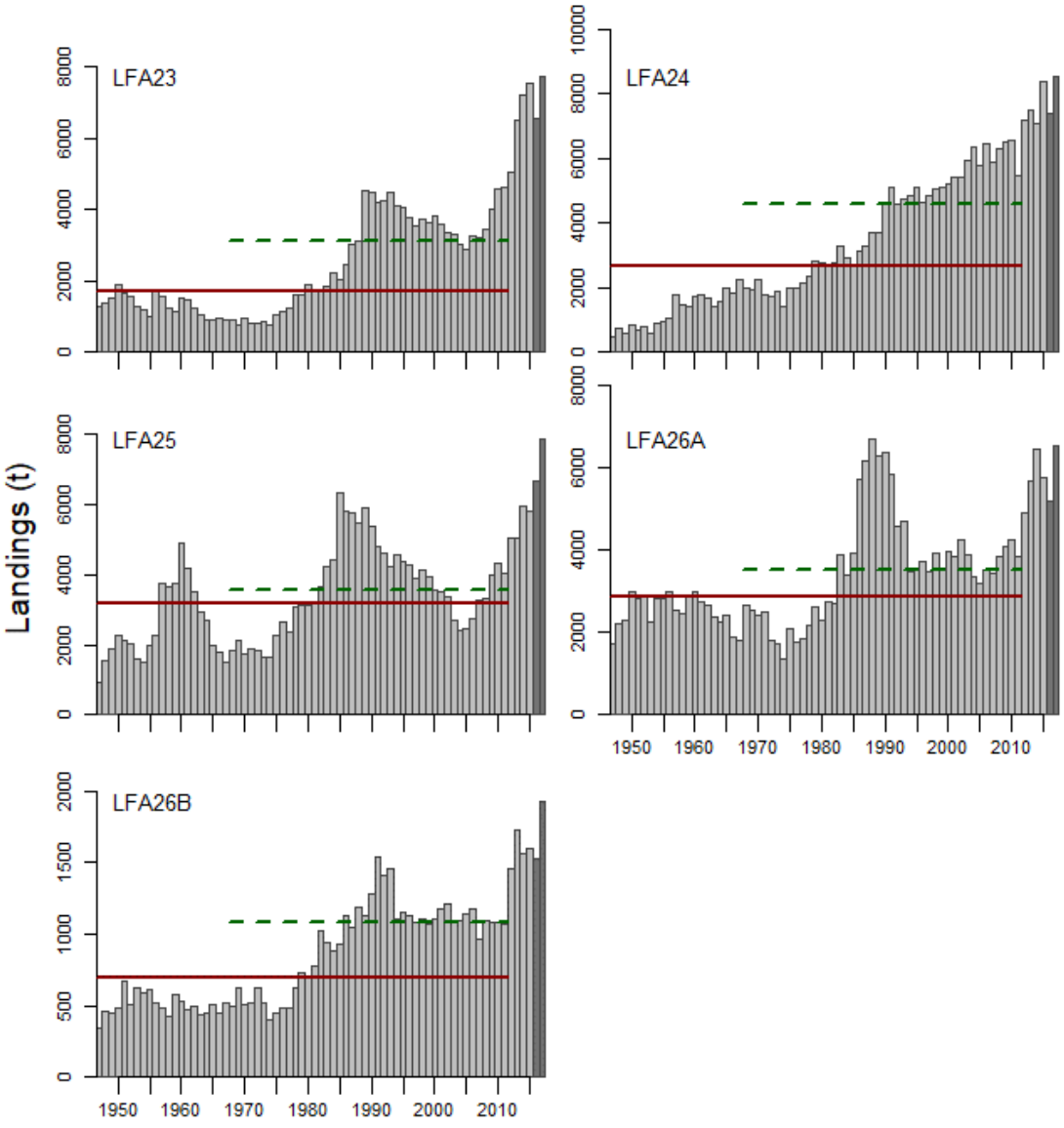

Figure 3. Reported lobster landings (t) by Lobster Fishing Area (23, 24, 25, 26A, 26B) in the southern Gulf of St. Lawrence, 1947 to 2017. The solid horizontal line is the median value for 1947 to 2011 (long-term) and the dashed horizontal line is the median value for 1968 to 2011 (mid-term). Data added since the last assessment update (2016 and 2017) are in a darker grey shading. Data for 2017 are preliminary.

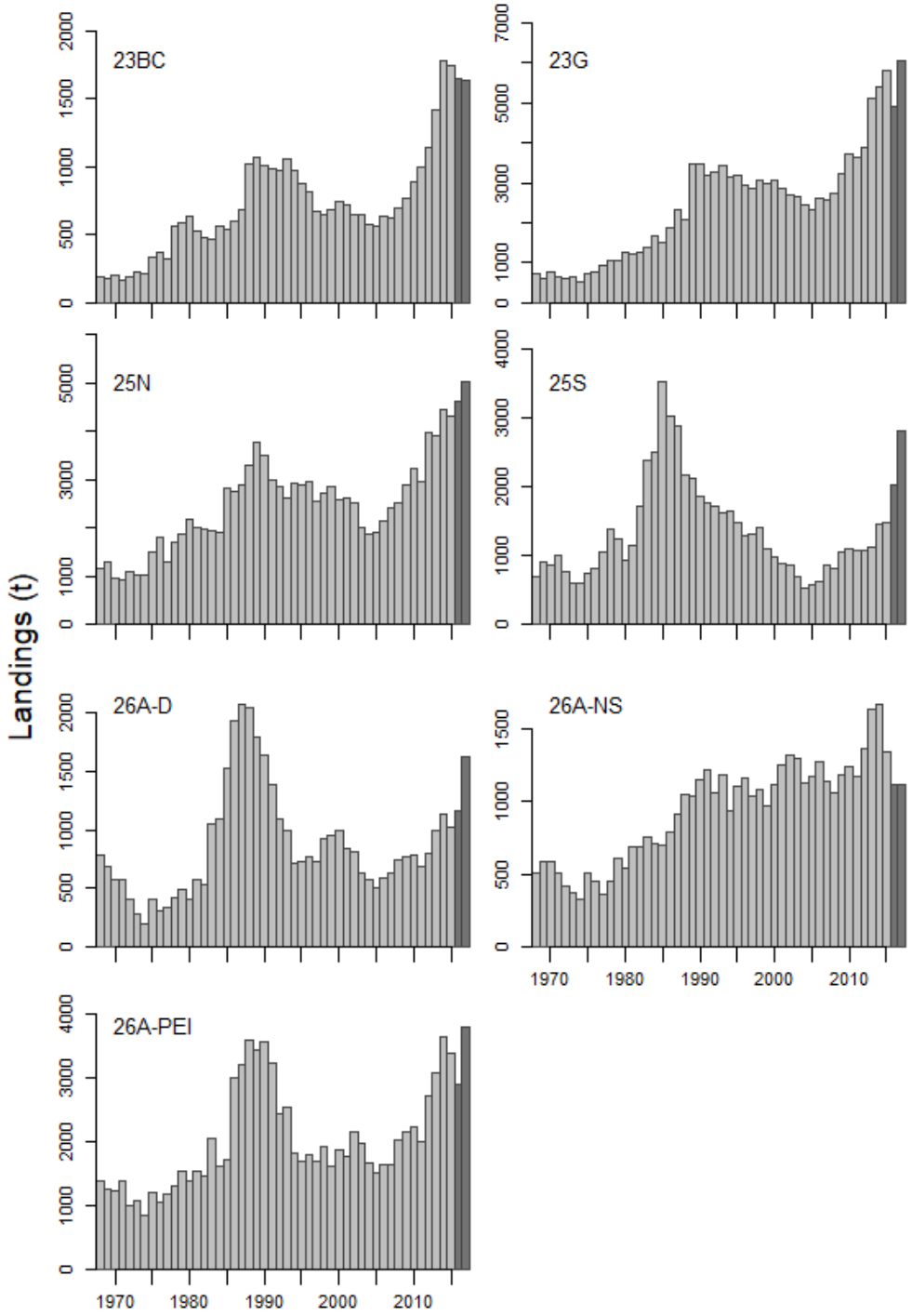

Figure 4. Reported lobster landings (t) for seven sub-regions in the southern Gulf of St. Lawrence, 1968 to 2017. Data added since the last assessment update are in a darker grey shading. Data for 2017 are preliminary.

Fishery-dependent: catch per unit effort (CPUE)

Trends in average catch per unit effort (CPUE; kg per trap) from both the at-sea sampling and the recruitment-index programs (number per trap in regular traps only) were similar with highest values in recent years (2014 to 2018) in all LFAs or sub-regions (Tables 2 and 3). From both

data sources, CPUE of males and non-berried females in sub-region 26AD and 25S more than doubled since the last assessment in 2012. Average CPUE values have also increased in almost all other areas with only LFA 24 indicating stable values. Limited data for LFA 23 and sub-region 26ANS precluded the evaluation of trends in their CPUE indicators.

Table 2. Average catch per unit effort (kg per trap) of male and non-berried female lobsters, based on data from the at-sea sampling program for the period 2012-2017. For sub-regions 25N and 25S, data are from the month of August only. In the table, "nd" means no data.

Year	23BC	23G	24	25N	25S	26AD	26ANS	26APEI	26B
2012	1.22	0.92	1.08	2.19	1.27	0.42	0.78	0.86	1.01
2013	1.54	1.04	1.13	1.84	1.32	0.78	1.38	0.84	1.33
2014	2.17	1.12	1.06	1.85	1.49	1.00	nd	1.17	nd
2015	nd	nd	1.22	1.84	1.48	1.24	nd	1.29	nd
2016	1.44	1.22	0.98	1.26	2.38	1.18	nd	1.04	nd
2017	1.98	1.33	1.18	2.59	3.43	1.33	nd	1.36	nd

Table 3. Average catch per unit effort (number per trap, regular traps) of male and non-berried female lobsters, based on data from the recruitment-index program for the period 2012 to 2018 where data are currently available. In the table, "nd" means no data; "na" refers to the data not yet processed. No data are available for LFA 23.

Year	24	25N	25S	26AD	26ANS	26APEI	26B
2012	3.58	4.75	3.23	1.02	1.78	2.36	2.43
2013	4.02	4.38	3.21	1.23	2.60	2.92	4.10
2014	3.50	4.09	3.39	1.43	2.65	3.42	3.61
2015	4.31	4.78	3.81	1.68	nd	4.43	4.08
2016	3.59	5.46	5.73	2.05	2.02	3.59	4.18
2017	4.34	6.75	7.26	2.27	2.74	4.42	4.99
2018	na	na	na	2.41	3.58	na	5.81

Fishery-independent: bottom trawl indices

Positive trends in catch rates (kg per standardized tow) were also observed in the fishery-independent bottom trawl survey (Fig. 5). In the three sub-regions covered by the survey, abundance indices of all sizes of lobsters in 2018 were higher, by a factor of 2 to 7 times, relative to 2012. The trawl survey is conducted after the fishery in LFA 26A but before the fishery in LFA 25.

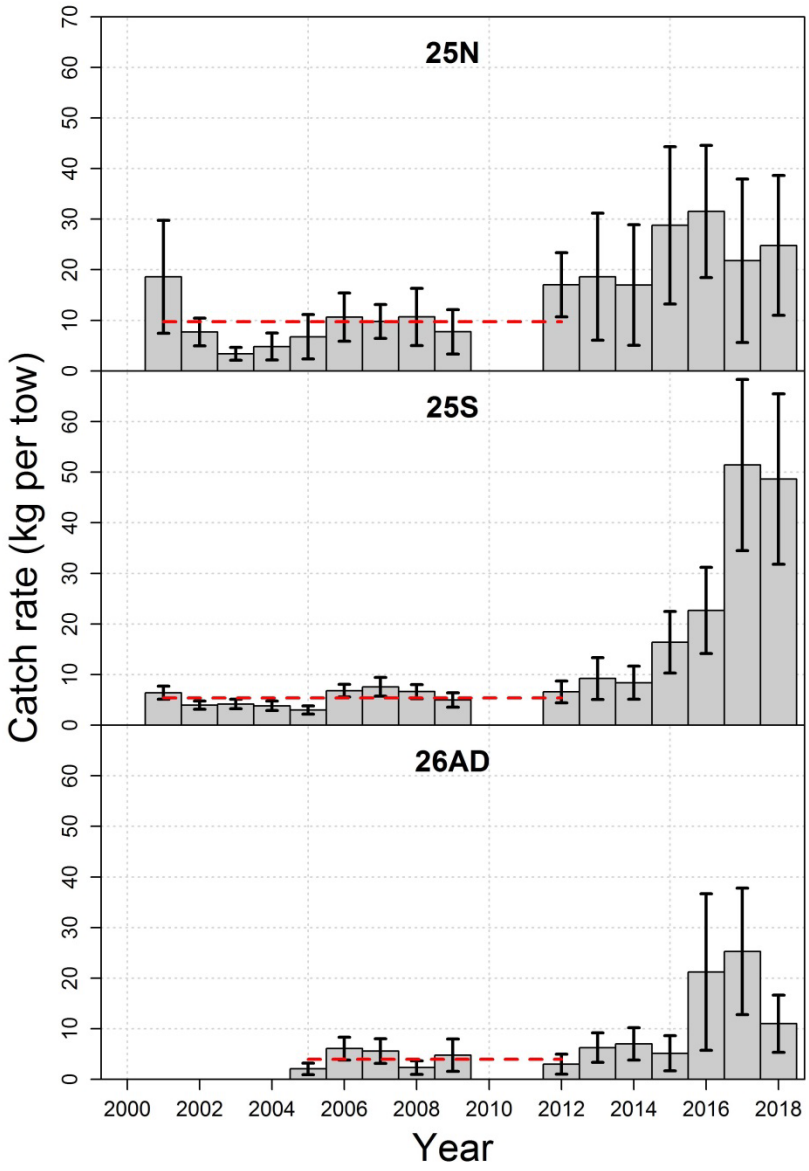

Figure 5. Catch rate (kg per standardized tow; mean in grey bars and 95% confidence intervals as vertical bars) of lobster, all sizes, from the Northumberland Strait bottom trawl survey for sub-regions 25N (upper panel), 25S (middle panel) and 26AD (bottom panel) for 2001 to 2009, and 2012 to 2018. The mean values for the period 2001 to 2012 for LFA 25 and for the period 2005 to 2012 for LFA 26AD are shown as red dashed horizontal lines in each panel.

A model-based biomass index for all lobster sizes from the trawl survey showed an overall 3-fold increase for LFA 25, from 10.9 to 34.3 kg per tow, between 2012 and 2018 (Table 4). The biomass index in LFA 26A has fluctuated, increasing from 13.3 kg per tow in 2012 to a high of 52.5 kg per tow in 2017, and subsequently decreasing to 28.2 kg per tow in 2018. High concentrations of legal-size lobsters were observed in 2017 except in the central portion of Northumberland Strait. There has been some expansion towards the central portion of the strait in the last two years.

Table 4. Biomass indices (kg per standardized tow) of sub-legal (< MLS), legal, and all sized lobsters from the bottom trawl survey in LFA 25 and LFA 26A, 2001 to 2009 and 2012 to 2018. In the table, "nd" means no data.

Year	LFA 25 Sub-legal	LFA 25 Legal	LFA 25 Total	LFA 26A Sub-legal	LFA 26A Legal	LFA 26A Total
2001	2.9	6.4	9.3	nd	nd	nd
2002	1.4	3.8	5.2	nd	nd	nd
2003	0.7	2.7	3.4	nd	nd	nd
2004	0.7	2.6	3.3	nd	nd	nd
2005	0.6	2.4	3.0	nd	nd	nd
2006	2.0	5.7	7.7	nd	nd	nd
2007	2.0	6.2	8.2	nd	nd	nd
2008	2.2	5.3	7.5	nd	nd	nd
2009	2.2	4.0	6.2	nd	nd	nd
2012	3.6	7.3	10.9	2.7	10.6	13.3
2013	4.7	9.1	13.8	6.8	16.0	22.8
2014	6.4	7.0	13.4	9.1	12.7	21.8
2015	11.5	8.8	20.3	6.6	7.7	14.3
2016	19.1	9.9	29.0	11.9	15.4	27.3
2017	22.6	9.4	32.0	24.9	27.6	52.5
2018	24.1	10.2	34.3	17.3	10.9	28.2

Fishery-independent: SCUBA surveys

The standardized abundance of all-size groups of lobster observed from SCUBA surveys in the sGSL increased from 2003 to 2018 (Fig. 6). From 2016 to 2018, the mean abundance increased by a further one third (48.8 to 64.7 lobsters per 100 m²), compared to more than 4 times from 2012 to 2016.

Differences were once again observed among sites along a north to south axis. A change in lobster abundances occurred in the central portion of Northumberland Strait, i.e. around the line between sub-regions 25S and 26AD (Fig. 7). Significant increases in abundances were observed in LFAs 23 and 25, while values in sub-region 26AD were the lowest and unchanged (Fig. 7).

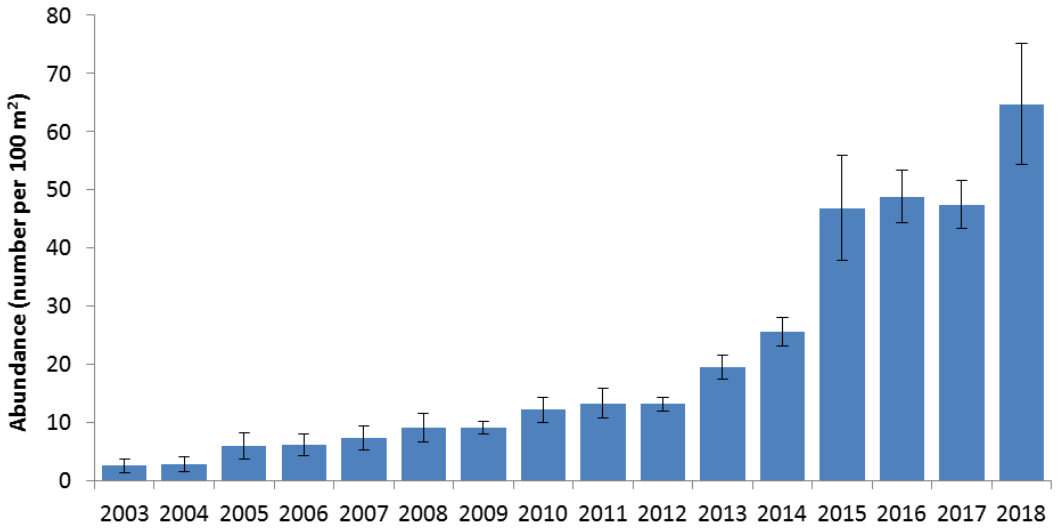

Figure 6. Standardized abundance (number of lobsters per 100 m²; mean as bars and 95% credibility intervals from the posterior distributions of the model fits as vertical lines) of all sizes of lobster from SCUBA surveys during 2003 to 2018. The standardized abundances from the Bayesian model are averaged over sites and cohorts (Rondeau et al. 2015).

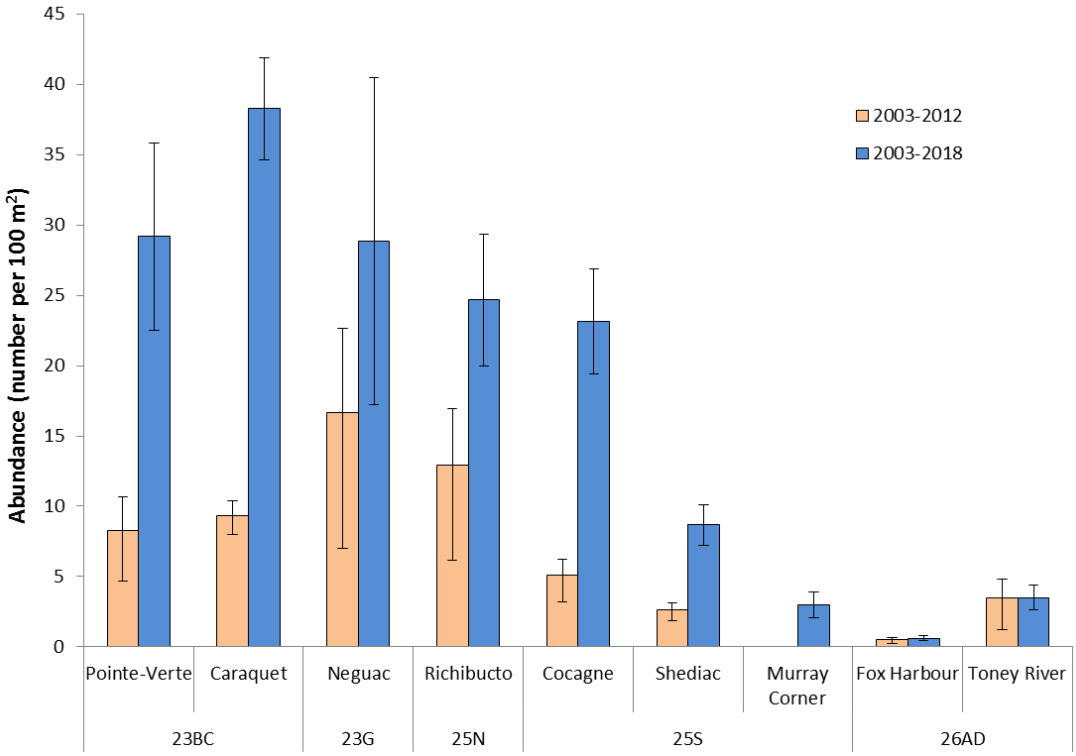

Figure 7. Standardized abundance (number of lobsters per 100 m²; mean as bars and 95% credibility intervals from the posterior distributions of the Bayesian model fits as vertical lines) by site from SCUBA surveys, averaged over years and cohorts for two time periods, 2003 to 2012 (orange bars, left) and 2003 to 2018 (blue bars, right).

Production indicators

Fishery-dependent: catch rates of berried females

Catch rates of berried females from the recruitment-index (Table 5) and at-sea sampling (Table 6) data reached their highest values of the time series in 2015 to 2018.

Table 5. Average number of berried females per regular trap by LFA and year based on the recruitment-index data. In the table, "nd" means no data,"na" refers to the data not yet processed. No data are available for LFA 23.

Year	24	25N	25S	26AD	26ANS	26APEI	26B
2012	0.44	0.72	0.91	0.24	0.45	0.40	0.52
2013	0.42	0.44	0.77	0.32	0.74	0.46	0.77
2014	0.46	0.59	0.60	0.41	0.50	0.56	0.58
2015	0.57	0.86	0.57	0.29	nd	0.54	0.95
2016	0.46	0.72	0.46	0.37	0.36	0.39	0.70
2017	0.56	1.28	1.14	0.34	0.71	0.68	1.01
2018	na	na	na	0.77	0.95	na	1.00

Table 6. Average catch per unit effort (kg per trap) of berried female lobsters, based on data from the at-sea sampling program for the period 2012-2017. For sub-regions 25N and 25S, data are from the month of August only. In the table, "nd" means no data.

Year	23BC	23G	24	25N	25S	26AD	26ANS	26APEI	26B
2012	0.18	0.10	0.13	0.26	0.32	0.12	0.25	0.15	0.17
2013	0.21	0.10	0.13	0.22	0.24	0.16	0.42	0.19	0.28
2014	0.36	0.07	0.12	0.15	0.14	0.24	nd	0.15	nd
2015	nd	nd	0.17	0.34	0.33	0.28	nd	0.17	nd
2016	0.32	0.14	0.12	0.18	0.13	0.23	nd	0.11	nd
2017	0.39	0.16	0.14	0.37	0.43	0.21	nd	0.25	nd

Fishery-dependent: catch rates of sub-legal lobsters

Catch rates of sub-legal lobsters (< MLS, excluding berried females) from the recruitment-index program were used as a fishery-dependent indicator of recruitment. Since the last update, CPUEs (2017 or 2018 where available) have continued to increase in all areas, except in LFA 24 where they were stable (Fig. 8). The most pronounced increases are observed in sub-regions 26ANS, 26B, 26AD and 25S. These increasing trends in recruit-size lobsters are corroborated by observations reported by harvesters.

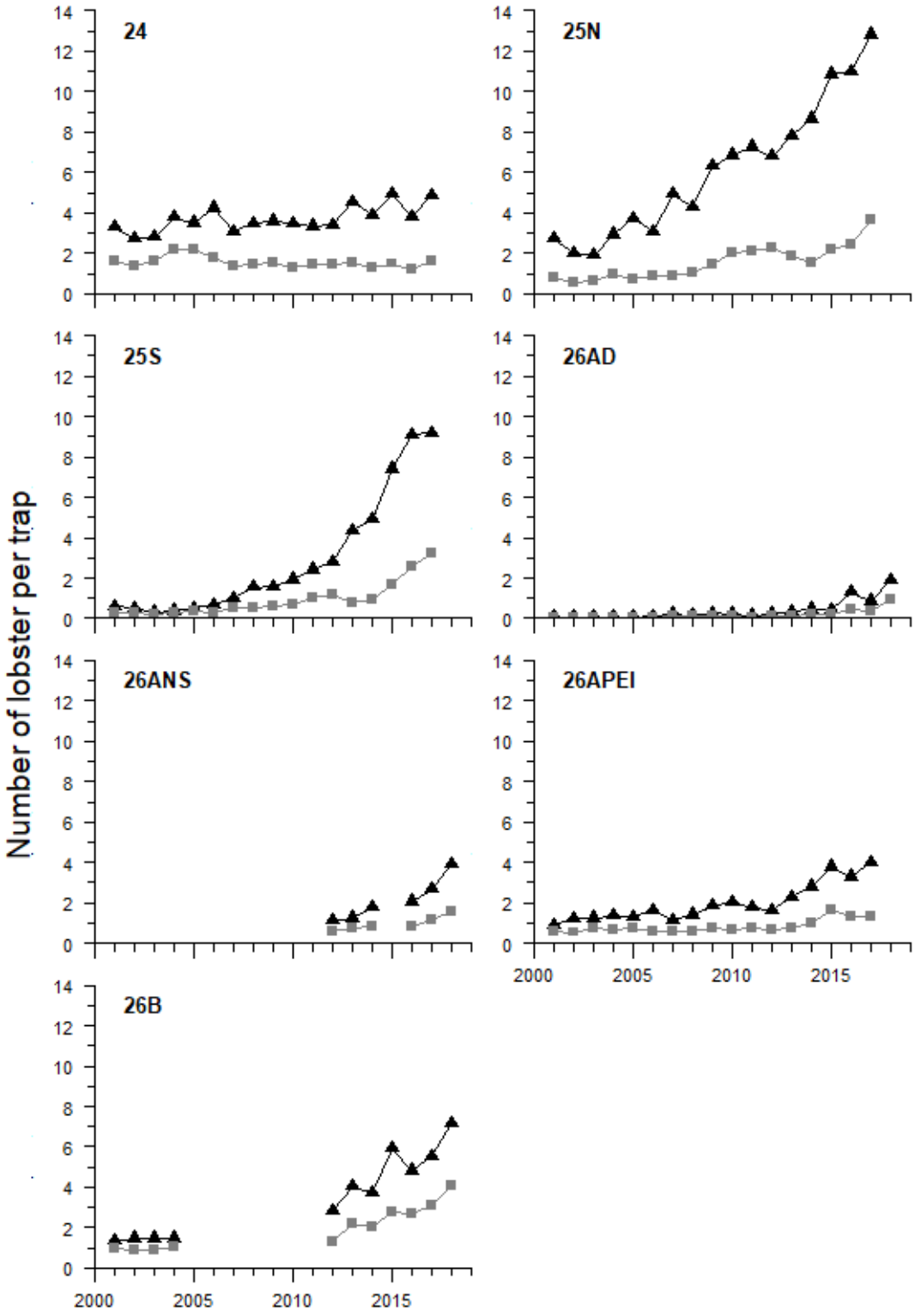

Figure 8. Average annual catch per unit effort (number of lobsters per trap) of sub-legal lobsters (< MLS; excluding berried-females) in regular (square symbols) and modified (triangle symbols; blocked escapement mechanisms) traps from the recruitment-index program, 2001 to 2017 or to 2018 according to data availability.

Fishery-independent : sub-legal lobsters in bottom trawl survey

The abundance index of sub-legal size lobsters from the trawl survey indicates that the biomass of sub-legal size lobsters has increased sharply since 2012 in all three sub-regions (Fig. 9).

In addition, the proportion of high density areas of sub-legal lobsters in LFA 25 for 2017 and 2018 was much higher than in 2012 (Fig. 10), but comparable to the high level observed in 2016. High density areas for sub-legal lobster in LFA26A have doubled over the period 2012 to 2018. In recent years, very high concentrations of sub-legal size lobsters continued to be observed outside the central portion of Northumberland Strait.

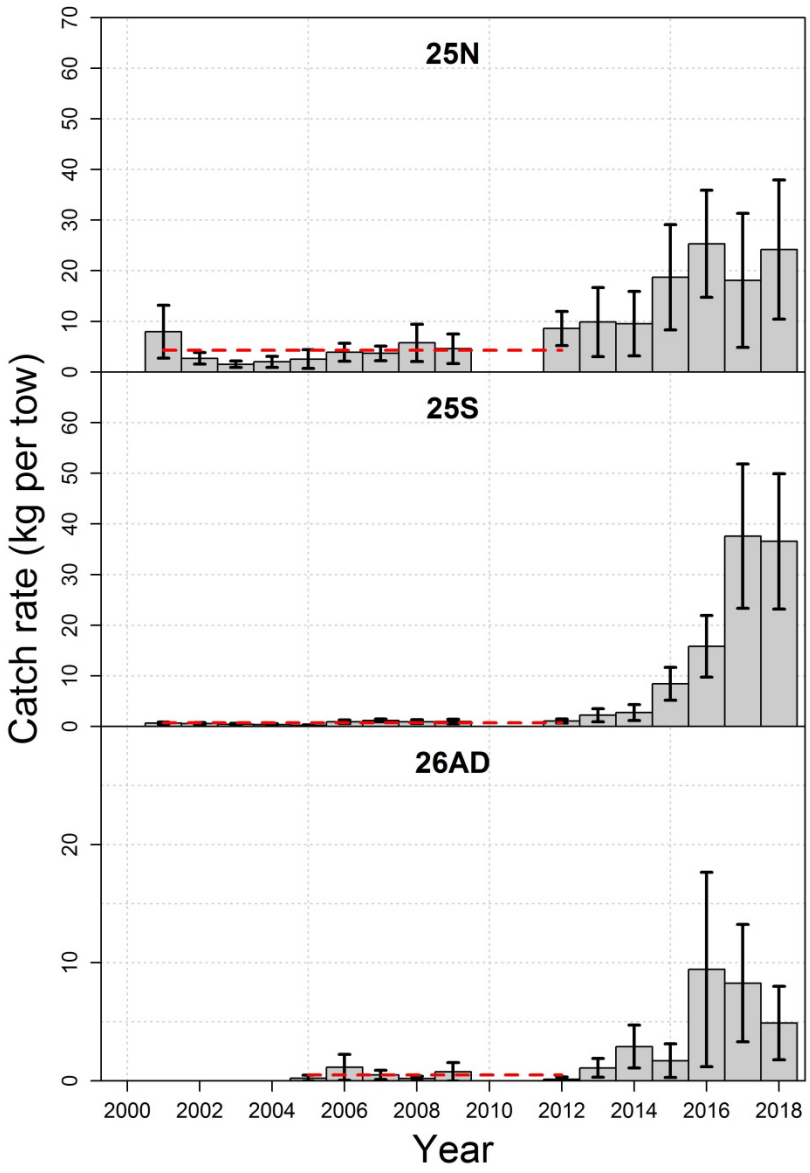

Figure 9. Catch rate (kg per standardized tow; mean in grey bars and 95% confidence intervals as vertical bars) of sub-legal size lobster from the Northumberland Strait bottom trawl survey for sub-regions 25N (upper panel), 25S (middle panel) and 26AD (bottom panel) for 2001 to 2009, and 2012 to 2018. The mean values for the period 2011 to 2012 for LFA 25 (2001-2012) and for the period 2005 to 2012 for LFA 26AD are shown as red dashed horizontal lines in each panel.

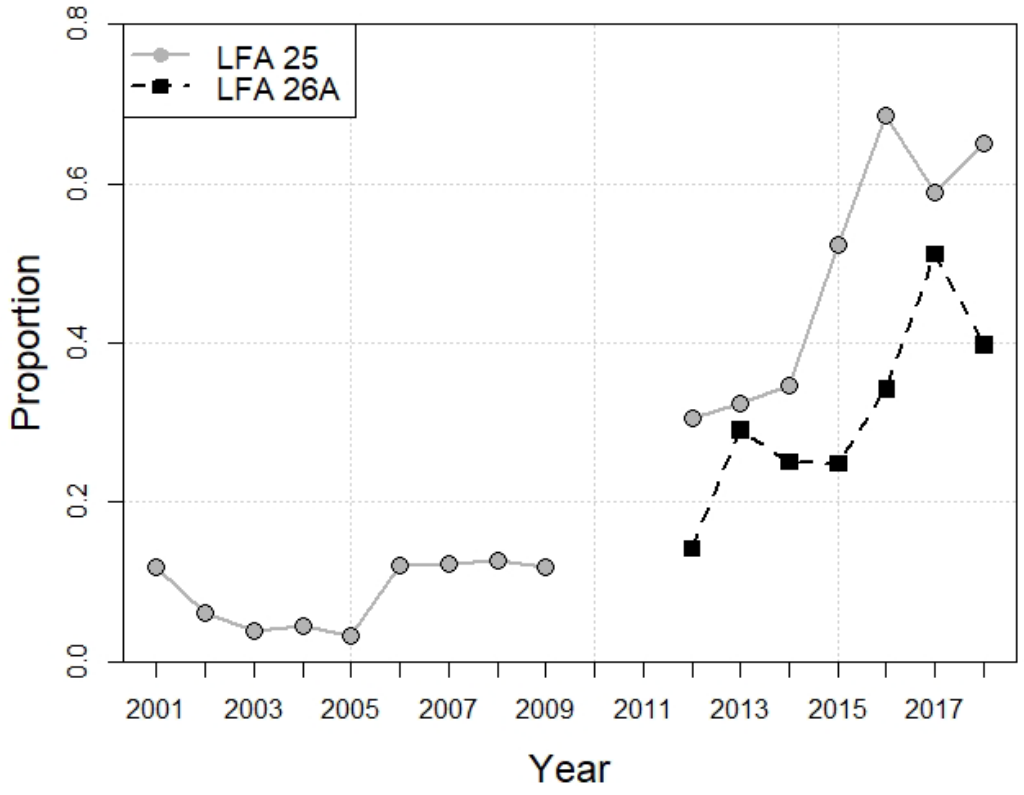

Figure 10. Proportion of surveyed area with high densities (> 400 kg per km²) of sub-legal lobster in LFA 25 (circle symbol and grey solid line) and LFA 26A (square symbol and black dashed line).

Fishery-independent: 1-year old lobster in SCUBA surveys

The abundances of 1-year old lobster, assessed by SCUBA surveys from 2003 to 2018, have shown increases in all sub-regions except 26AD (Fig. 11). Increasing trends and high values were observed in 2017 and 2018 in the site in LFA 23BC, outside the Northumberland Strait (Fig. 11). In contrast to the last update, abundances at two sites in 25S (Cocagne and Shediac) increased into 2017 then declined in 2018 but were significantly higher in both years compared to values in 2012. The abundance at the third site (Murray Corner) in LFA 25S decreased in 2017 and 2018 with 2018 values 80% lower than in 2016. Data from Pointe-Verte (23BC), Neguac (23G), and Richibucto (25N) are not shown in Figure 11 but followed the same increasing trend as Caraquet (23BC).

The abundances of 1-year old lobsters at the Shediac and Murray Corner sites (25S) remain lower compared to sites outside the Northumberland Strait (Fig. 12). One-year old lobsters at the Fox Harbour site (sub-region 26AD) were at extremely low abundance (<0.5 per 100 m²) during the entire time series.

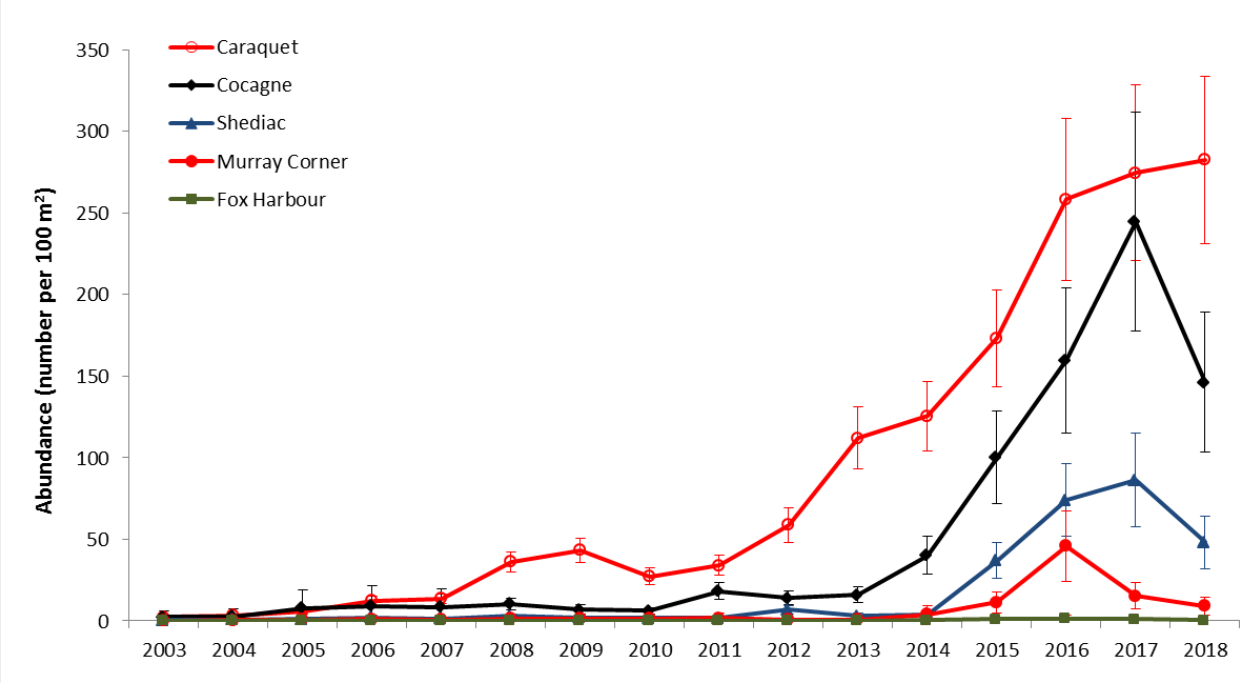

Figure 11. Standardized abundance (number per 100 m²; mean and 95% credibility intervals from the posterior distributions of the Bayesian model fits as vertical bars) for 1-year old lobsters based on SCUBA surveys for Caraquet (23BC), Cocagne (25S), Shediac (25S), Murray Corner (25S), and Fox Harbour (26AD).

Fishery-independent: young-of-the-year in bio-collectors

The abundance of settlers (number of young-of-the-year per m²), estimated from the industry-led monitoring of bio-collectors, showed higher lobster settlement at sites in LFA 24 and sub-region 25N, compared to the last update (DFO 2016). Abundance was at a record high level, with an average of over 21 settlers per m^2, at Skinner's Pond (in sub-region 25N) (Fig. 12). Over the same time period, abundances of settlers were much lower at the Cape Egmont (in 25S), Murray Harbour (in 26APEI), and Fortune (in 26APEI) sites, with average abundances of less than 3 settlers per m^2 in 2018 (Fig. 12). Young-of-the-year have not been observed in the bio-collectors at sites in central Northumberland Strait (sub-region 26AD) since 2014.

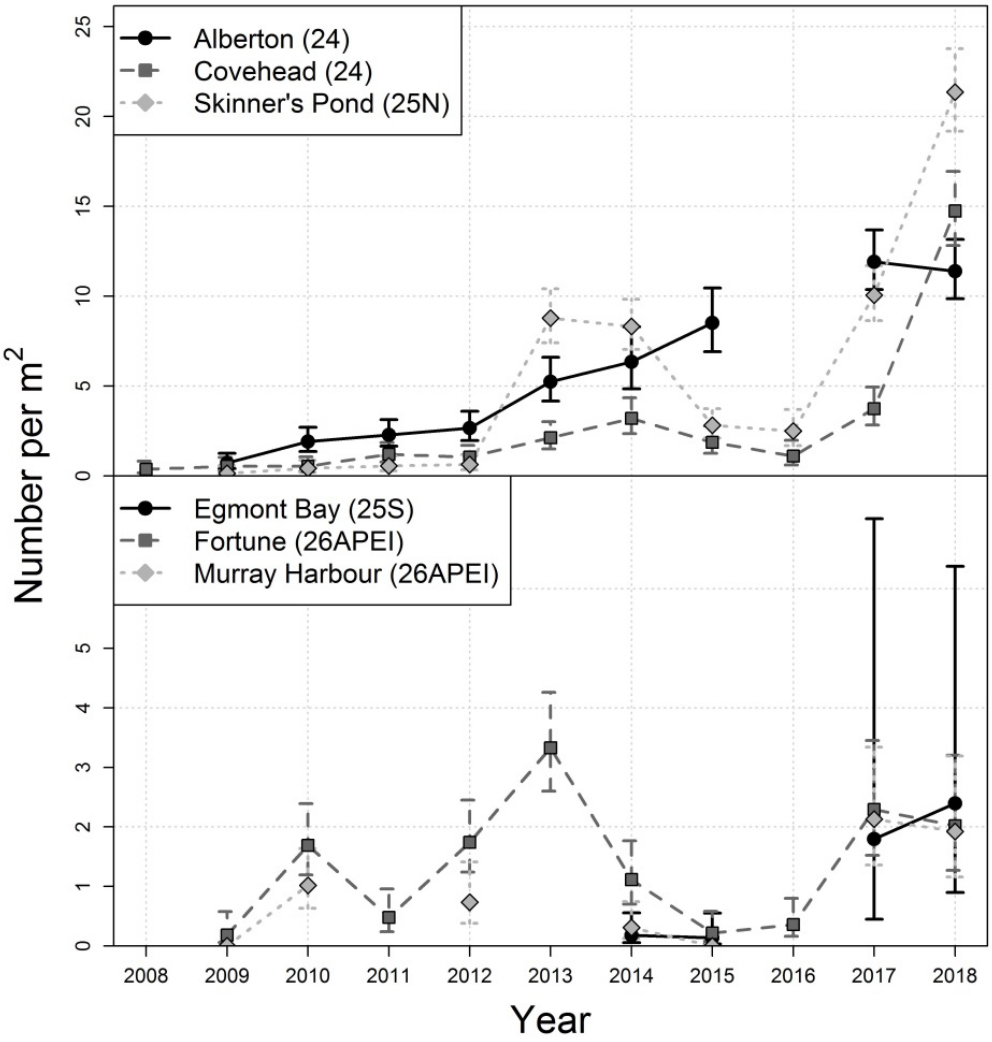

Figure 12. Density (number per m²; mean as symbols and 95% confidence intervals as vertical lines) of young-of-the-year lobsters from bio-collectors for six sites monitored during 2008 or 2009 to 2018.

Conclusions

Based on the update of the fishery-dependent and fishery-independent indices, lobsters in the sGSL continue to be in high abundance with most of the indicators in LFA sub-regions showing a positive change from the previous update (Table 5). Recent landings are either above long-term medians or the highest of the time series. The 2017 preliminary landings remain above the defined precautionary approach USR, and the sGSL lobster stock status is in the healthy zone. Production indices of berried females and recruitment are strong with highest values observed in recent years (2015 to 2018). Central Northumberland Strait (edges of sub-regions 25S and 26AD) continues to be an area of lower productivity, with almost no detections of young-of-the-year or one-year old lobsters.

Table 5. Summary of the direction of change from the last update in 2015 (increase as ⇧, no change as ⇔, and decrease as ⇩) of the stock status indicators of lobster by LFA sub-region in the southern Gulf of St. Lawrence. For the fishing pressure indicator (empty traps), a decrease in the indicator is considered to be positive for stock status. For all other indicators, an increase in the indicator value is considered to be positive for stock status. na means the indicator was not available for that sub-region.

Indicator class	Indicator	23BC	23G	24	25N	25S	26AD	26ANS	26APEI	26B
Fishing pressure	Empty traps	⇔	⇔	⇔	⇔	⇩	⇔	⇩	⇩	⇔
Abundance	Landings	⇩	⇧	⇔	⇧	⇧	⇧	⇩	⇧	⇧
	CPUE fishery	⇧	⇧	⇔	⇧	⇧	⇧	⇧	⇔	⇧
	Trawl survey	na	na	na	⇔	⇧	⇔	na	na	na
	SCUBA survey	⇧	⇧	na	⇧	⇧	⇔	na	na	na
Production	Berried females	⇔	⇧	⇔	⇧	⇧	⇧	⇧	⇧	⇔
	Sub-legal CPUE	na	na	⇔	⇧	⇧	⇧	⇧	⇧	⇧
	Sub-legal trawl survey	na	na	na	⇔	⇧	⇔	na	na	na
	1-year old SCUBA survey	⇧	⇧	na	⇧	⇧	⇔	na	na	na
	Young-of-the-year from bio-collector	na	na	⇧	⇧	⇧	⇔	na	⇧	na

There is continued concern regarding the accuracy of the catch data derived from the official catch system and the delay in the availability of these data. There are uncertainties in the amount of non-recorded lobster catches. Complete and integrated information on catch, effort, and fishing location from all users is still not available for lobster from the sGSL.

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Sources of information

This Science Response Report results from the Science Response Process of November 21, 2018 on the update of the stock status indicators of the American lobster (*Homarus americanus*) stock of the southern Gulf of St. Lawrence. No other publications are expected from this process.

DFO. 2013. American lobster, *Homarus americanus*, stock status in the southern Gulf of St. Lawrence: LFA 23, 24, 25, 26a and 26b. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/029.

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